



THE PRESIDENT'S
RECOVERY
PRIORITIES

Education

Ministry of
Education,
Science and
Technology

Lesson plans for
PRIMARY
Mathematics

4
CLASS

2
TERM

Foreword

Our country's future lies in the education of our children. The Government of Sierra Leone is committed to doing whatever it takes to secure this future.

As Minister of Education, Science and Technology since 2007, I have worked every day to improve our country's education. We have faced challenges, not least the Ebola epidemic which as we all know hit our sector hard. The Government's response to this crisis – led by our President – showed first-hand how we acted decisively in the face of those challenges, to make things better than they were in the first place.

One great success in our response was the publication of the Accelerated Teaching Syllabi in August 2015. This gave teachers the tools they needed to make up for lost time whilst ensuring pupils received an adequate level of knowledge across each part of the curriculum. The Accelerated Teaching syllabi also provided the pedagogical resource and impetus for the successful national radio and TV teaching programs during the Ebola epidemic.

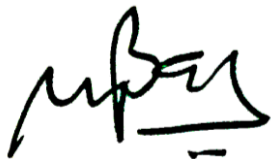
It is now time to build on this success. I am pleased to issue new lesson plans across all primary and JSS school grades in Language Arts and Mathematics. These plans give teachers the support they need to cover each element of the national curriculum. In total, we are producing 2,700 lesson plans – one for each lesson, in each term, in each year for each class. This is a remarkable achievement in a matter of months.

These plans have been written by experienced Sierra Leonean educators together with international experts. They have been reviewed by officials of my Ministry to ensure they meet the specific needs of the Sierra Leonean population. They provide step-by-step guidance for each learning outcome, using a range of recognised techniques to deliver the best teaching.

I call on all teachers and heads of schools across the country to make best use of these materials. We are supporting our teachers through a detailed training programme designed specifically for these new plans. It is really important that these Lesson Plans are used, together with any other materials you may have.

This is just the start of education transformation in Sierra Leone. I am committed to continue to strive for the changes that will make our country stronger.

I want to thank our partners for their continued support. Finally, I also want to thank you – the teachers of our country – for your hard work in securing our future.



Dr. Minkailu Bah

Minister of Education, Science and Technology














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Introduction to the Lesson Plan Manual

These lesson plans are based on the National Curriculum and meet the requirements established by the Ministry of Education, Science and Technology.

- 1  The lesson plans will not take the whole term, so use spare time to review material or prepare for exams
 - 2  Teachers can use other textbooks alongside or instead of these lesson plans.
 - 3  Read the lesson plan before you start the lesson. Look ahead to the next lesson, and see if you need to tell pupils to bring materials for next time.
 - 4  Make sure you understand the learning outcomes, and have teaching aids and other preparation ready – each lesson plan shows these using the symbols on the right.
 - 5  Quickly review what you taught last time before starting each lesson.
 - 6  Follow the suggested time allocations for each part of the lesson. If time permits, extend practice with additional work.
 - 7  Lesson plans have a mix of activities for the whole class and for individuals or in pairs.
 - 8  Use the board and other visual aids as you teach.
 - 9  Interact with all students in the class – including the quiet ones.
 - 10  Congratulate pupils when they get questions right! Offer solutions when they don't, and thank them for trying.
-  Learning outcomes
 Teaching aids
 Preparation

Lesson Title: Volume and Capacity	Theme: Geometry: Volume and Capacity	
Lesson Number: M-04-061	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to identify capacity and volume by comparing and contrasting.		Teaching Aids None		Preparation Write the matrix for capacity and volume from the lesson on the board.
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Opening (3 minutes)

- Ask:** What can we use to carry water?
- Say:** Turn to your partner and share 3 ideas.
- Invite 3- 4 pupils to share ideas. (Example answers: bucket, water bag, glass, cup, hands)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn about volume and capacity. 'Volume' is how much space an object takes up. 'Capacity' is how much water or other liquid an object can hold.
- Ask:** Which is bigger, a table or a bucket? Raise 1 finger if you think a table is bigger. Raise 2 fingers if you think a bucket is bigger.
- Say:** A table is bigger than a bucket because it takes up more space. A table has more volume than a bucket.
- Ask:** Which do you fill with water, a table or a bucket? Raise 1 finger if you think you fill a table with water. Raise 2 fingers if you think you fill a bucket with water.
- Say:** Buckets have 'capacity' because you can fill them with water. Tables do not have 'capacity.' You cannot fill them with water.
- Show pupils the matrix on the board:

Object	Does it take up space? (volume)	Can you fill it with water? (capacity)
Bar of soap		
Bag of water		
Water tank		
Package of biscuits		
Vimto can		
Vimto bottle		

- Read the names of the objects listed in the matrix with pupils. Read the headings at the top of each column with pupils.
- Say:** We are going to decide which objects have volume and which objects have capacity. First we will decide which objects have volume.
- Ask:** Does this object take up space?
- Say:** Point your thumb up if the object takes up space/has volume. Point your thumb down if the object does not take up space/does not have volume.

11. Read the out loud the name of each object so pupils can show thumbs up or thumbs down.
(Answer: Each object takes up space/has volume.)
12. If an object has volume, draw a tick mark in the matrix.

Object	Does it take up space? (volume)	Can you fill it with water? (capacity)
Bar of soap	✓	
Bag of water	✓	

Guided Practice (10 minutes)

1. Assign pupils to work in groups of 4 - 5.
2. **Say:** With your group, decide if each object has capacity. Can it be filled with water?
3. After 5 minutes, read the name of each object to the class one by one.
4. **Ask:** Does this object have capacity? Thumbs up if you can always or sometimes fill the object with water. Thumbs down if you can never fill the object with water. (Answers: Thumbs go up for a bag of water, water tank, Vimto can and Vimto bottle. These have capacity.)
5. If an object has capacity, draw a tick mark in the matrix.




Independent Practice (10 minutes)

1. Revise the meaning of 'volume' and 'capacity'.
2. **Say:** Remember, 'volume' is how much space an object takes up and 'capacity' is how much water or other liquid an object can hold.
3. **Say:** Draw 2 pictures:
 - a) An object that has capacity
 - b) An object that does not have capacity
4. Give pupils time to share their pictures in their groups. (Example answers: Has capacity: a bottle or can; Does not have capacity: package of potato crisps or a cell phone)
5. Invite 2-3 pupils to talk about the object they drew to show capacity.
6. **Ask:** How do you know that the object has capacity? Raise your hand to answer. (Answer: You can fill it with water or another liquid.)

Closing (2 minutes)

1. **Ask:** What is the difference between an object that has volume but does not have capacity and an object that has volume and also has capacity? Raise your hand to answer. (Answer: The object will have taken up space or volume but it might not be empty and be able to be filled with a liquid. The object will take up space or volume but not be able to be filled with a liquid.)
2. **Say:** Good job today, pupils! You learned how to compare and contrast objects by volume and capacity.

Lesson Title: Estimating Volume and Capacity	Theme: Geometry: Volume and Capacity	
Lesson Number: M-04-062	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to estimate volume and capacity.</p>		<p>Teaching Aids 1. 1.5-litre bottle of water 2. Bucket of water 3. Cups, cans or small bottles of 2 sizes</p>		<p>Preparation Gather: cups, cans or bottles of about 250mL and 500mL; 1.5 litre bottle filled with water; plastic bucket with water to re-fill the bottle.</p>
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Opening (3 minutes)

1. Review the meaning of 'volume' and 'capacity'.
2. **Say:** Remember that 'volume' is how much space an object takes up and 'capacity' is how much water or other liquid an object can hold.
3. **Say:** Think of 3 objects you have at home that have capacity. Tell them to your partner.
4. Invite pupils to share ideas. (Example answers: bucket, cooking pot, spoon, cup, bowl)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to estimate volume and capacity. 'Estimate' is when we name 'about how much' is in a measurement. It is also considered an educated guess.
2. Show pupils the 1.5-litre bottle filled with water and the 250-mL cup.
3. **Ask:** Which has more capacity? Raise 1 finger if you think the bottle has more capacity. Raise 2 fingers if you think the cup has more capacity. (Answer: Pupils raise 1 finger. A bottle has more capacity.)
4. **Ask:** Why does the bottle have more capacity? Raise your hand to answer. (Answer: It can hold more water.)
5. **Say:** A family is giving a party. They want to serve a cup of soda to each guest at the party. They need to find out how many bottles of soda to buy.
6. Show the 1.5 litre bottle and 250 mL cup to pupils.
7. **Ask:** How many full cups do you estimate, guess, I can pour from this bottle?
8. **Say:** Show your estimate by raising that many fingers. For example, if you think it is '2', raise 2 fingers. There are no right or wrong answers.
9. Invite 2 – 3 pupils to explain their thinking. (Example answers: 4 because it looks like you can pour 4 cups from the bottle, 7 because the bottle looks bigger than the cup)
10. Pour 1 cup of water from the bottle. Ask pupils to count the pour by saying '1.'
11. Continue pouring and counting until the bottle is empty.
12. Write the number of pours the board. (Example answer: Cup 1 is 6 pours.)
13. **Ask:** How close was your estimate to the actual number? Raise your hand to answer.
14. Fill the bottle again with water. Repeat steps 5 - 11 with a 500 mL cup. Write the number of pours on the board. (Example answer: Cup 2 is 3 pours.)
15. **Ask:** If you know the number of pours for Cup 1, how does that help you estimate for Cup 2?
16. **Say:** Tell your partner your ideas.
17. Invite 1-2 pupils to explain their thinking. (Example answers: I estimated less than 6 because the second cup is bigger. I estimated 3 because Cup 2 is twice as big as Cup 1.)

Guided Practice (10 minutes)

1. Assign pupils to work in groups of 4 - 5.
2. **Ask:** How many bottles of soda does the family need for 25 guests? Every guest will get Cup 2 size serving of soda.
3. Read with pupils: 'Cup 2 is 3 pours.'
4. Give pupils 2 minutes to talk in groups about how many bottles are needed.
5. **Ask:** Will 2 - 3 pupils to share their group's answer?
6. If pupils say 8 bottles because $8 \times 3 = 24$ and 24 is close to 25, ask them to think again.
7. **Say:** If only there are 8 bottles of soda, 1 person will not get a cup of soda. The family needs to buy 9 bottles of soda for everyone to get a serving.
8. Draw a picture to show why 9 bottles of soda are needed to pour 25 cups. Write how many cups each bottle pours on the bottle and show how the extra will be a remainder.




Independent Practice (10 minutes)

1. **Ask:** How many bottles of soda does the family need for the 25 guests to get a Cup 1 size serving of soda each?
2. Read with pupils 'Cup 1 is 6 pours.'
3. Ask pupils to draw a picture to show how many bottles are needed as was done in the guided practice.
4. **Say:** Share your pictures in your groups.
5. Invite 2-3 pupils to explain their answers and draw them on the board. (Answer: 5 bottles are needed for each guest to get a cup of soda.)

Closing (2 minutes)

1. **Ask:** About how many cups of soda will be left after serving all the guests a Cup 1 size serving of soda? Raise your hand to answer. (Answer: 5 cups of soda will be left over.)
2. **Say:** Good job today, pupils! You learned how to estimate using capacity!

Lesson Title: Volume Using Standard Measure (No Conversion)	Theme: Geometry - Volume and Capacity	
Lesson Number: M-04-063	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to calculate volume using standard measure and not conversion.		Teaching Aids None		Preparation None
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Opening (3 minutes)

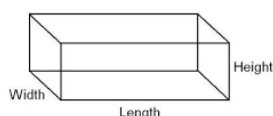
- Say:** I will say a math problem. Answer together.
- Say:** 4×5 (Answer: 20), 5×7 (Answer: 35), 20×6 (Answer: 120), 10×8 (Answer: 80), 9×6 (Answer: 56)
- Say:** Good job! Now let's try a couple with three terms: $2 \times 3 \times 10$ (Answer: $6 \times 10 = 60$), $4 \times 5 \times 7$ (Answer: 140)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to calculate volume using the formula. We practiced multiplying three terms together and we are going to do the same to find the volume of objects.
- Say:** Remember, volume is how much space an object takes up. We will look at the lengths of each of the sides to calculate the volume.

3. Draw:

Rectangular Prism



- Say:** This is a three dimensional rectangle. It has three sides marked for the length, width and height. In order to calculate how much space this box takes up, we will use a formula and multiply the three measurements together.
- Write:** Volume = $length \times width \times height$
- Write** the following measurements next to each label. Width = 5cm, Length = 10cm and Height = 7cm.
- Say:** To calculate the volume, we multiply the measures of each side together.
- Write:** Volume = $10 \times 5 \times 7 = 50 \times 7 = 350\text{cm}^3$
- Say:** The unit on this measurement is centimetres 'cubed' and we use the raised 3 to represent this. It is called a unit 'cubed' because the shape is like a cube and has three sides that we multiply.
- Say:** Let's try another one.
- Write** and **Say:** A tissue box has length of 10cm, width of 4cm and height of 3cm. What is the volume of the tissue box?
- Write:** Volume = $10 \times 4 \times 3 = 40 \times 3 = 120\text{cm}^3$
- Show pupils the teaspoon.

Guided Practice (10 minutes)

1. Put pupils in pairs.
2. **Say:** Copy the problems in your exercise books. Work with your partner to find the volume of the rectangular prisms.
3. **Write** on the board: 'Find the volume:'
 - a) Rectangular prism with sides: Length = 3cm, Width = 5cm, Height = 2cm (Answer: Volume = $3 \times 5 \times 2 = 15 \times 2 = 30 \text{ cm}^3$)
 - b) Rectangular prism with sides: Length = 4cm, Width = 3cm, Height = 1cm (Answer: Volume = $4 \times 3 \times 1 = 12 \times 1 = 12\text{cm}^3$)
 - c) A box of cereal has the following length sides, find the volume of the box:
Length = 8cm
Width = 4cm
Height = 10cm
(Answer: $8 \times 4 \times 10 = 32 \times 10 = 320\text{cm}^3$)
4. **Ask:** Who will come to the board to show how he or she solved the second problem?
5. Have students check their work while students solve the problems at the board.




Independent Practice (10 minutes)

1. **Say:** Copy the problems in your exercise books. Work with your partner to find the volume of the rectangular prisms.
2. **Write** on the board: 'Find the volume:'
 - a) Rectangular prism with sides: Length = 4cm, Width = 2cm, Height = 1cm (Answer: Volume = $4 \times 2 \times 1 = 8 \times 1 = 8\text{cm}^3$)
 - b) Rectangular prism with sides: Length = 5cm, Width = 4cm, Height = 2cm (Answer: Volume = $5 \times 4 \times 2 = 20 \times 2 = 40\text{cm}^3$)
 - c) A box of rice has the following length sides, find the volume of the box:
Length = 6cm
Width = 2cm
Height = 4cm
(Answer: $6 \times 2 \times 4 = 12 \times 4 = 48\text{cm}^3$)
 - d) A large box used for seating has the following length sides, find the volume of the large box.
Length = 2ft
Width = 3ft
Height = 5ft
(Answer: $2 \times 3 \times 5 = 6 \times 5 = 30\text{ft}^3$)
3. Have pupils exchange their notebooks and check their work while you read it aloud.

Closing (2 minutes)

1. **Ask:** How many terms are in the multiplication problem? Raise your hand to answer. (Answer: 3 terms)
2. **Ask:** Why is the unit on the volume called unit cubed? Raise your hand to answer. (Answer: Because we multiply 3 sides.)
3. **Say:** Good job today, pupils! You multiplied sides to find the volume of a number of objects!

Lesson Title: Capacity Using Standard Measure (No Conversion)	Theme: Geometry: Volume and Capacity	
Lesson Number: M-04-064	Class/Level: Primary 4	Time: 35 minutes

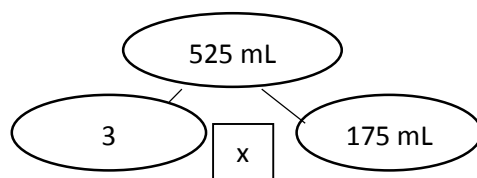
	Learning Outcomes By the end of the lesson, pupils will be able to calculate capacity using standard measure (not conversion).		Teaching Aids None		Preparation 1. Write on the board the number circles. 2. Write on the board the capacity problems from the lesson.
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Opening (3 minutes)

- Say:** I will say a math problem. Answer together.
- Say:** 100×4 (Answer: 400), 2×200 (Answer: 400), $400 + 250$ (Answer: 650), 400×2 (Answer: 800), $400 + 300$ (Answer: 700).
- If pupils are incorrect, say the correct answer and ask with pupils to repeat it. Then, repeat the problem and have pupils answer. Do this 2 times.

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn about litres and millilitres. We will multiply and divide with millilitres to find the total capacity of objects. Remember, capacity is how much fluid or liquid we can fill an object up with.
- Say:** One litre is the same as 1,000 mL. Count to 1 litre with me.
- Have pupils count with you '100 mL, 200 mL, 300 mL, 400 mL, 500 mL, 600 mL, 700 mL, 800 mL, 900 mL, 1 litre.'
- Tell pupils this story: Lucy has 3 cups with 175 mL of water in each cup. How much water does she have? She has 525 mL.
- Write:**



- Say:** The number circles show the story in numbers. 525 mL shows how much water Lucy has in all 3 cups.
- Ask:** What does 3 show? Raise your hand to answer. (Answer: Lucy has 3 cups.)
- Ask:** What does 175 mL show? Raise your hand to answer. (Answer: Lucy has 175 mL in each cup.)
- Ask:** What 2 multiplication problems can we make with these numbers? (Answer: $3 \times 175 \text{ mL} = 525 \text{ mL}$, $175 \text{ mL} \times 3 = 525 \text{ mL}$)
- Ask:** What addition problem can we make to represent this problem? Let's see.
- Say:** When we multiply the number of cups by 3, we are also adding three cups together.
- Write:** $175 + 175 + 175 = 525 \text{ mL}$
- Say:** Let's review how to set up and solve these problems using renaming.

14. **Write** on the board and solve with pupils:

$$\begin{array}{r} 21 \\ 175 \\ \times 3 \\ \hline 525 \end{array}$$

15. **Say:** We start by multiplying 3×5 which equals 15 so we put the 5 below the 3 and carry over the 1 (on top of the 7). Then we multiply $3 \times 7 = 21$ but we need to add the 1 we carried over. This gives us 22 but we must put the 2 down under the 7 and carry the other 2 over above the 1. Lastly, we multiply 3×1 and then add the last 2 we carried over to give us 5.

16. **Write:** The result is 525 mL total.

17. Revise adding the three numbers by lining them vertically and adding the three numbers together.

18. **Write** on the board and solve with pupils:

$$\begin{array}{r} 21 \\ 175 \\ 175 \\ + 175 \\ \hline 525 \end{array}$$

19. **Say:** We start by adding from the right. Add $5 + 5 + 5$ which equals 15 so we put the 5 below and carry over the 1 (on top of the 7). Then we add the $7 + 7 + 7$ which equals 21 and then we add the 1 we carried over. This gives us 22 so we put the 2 down and carry the other 2 over the first column of 1s. Lastly, we add $1 + 1 + 1$ which is 3 and then we add the 2 we carried over to give us 5.

20. **Write:** The result is 525 mL total which is the same as when we multiplied.

Guided Practice (10 minutes)

- Put pupils in pairs.
- Write:** 'Find the capacity of the container by adding or multiplying the fluid measurements together:'
 - $250\text{mL} \times 4 =$ (Answer: 1,000mL)
 - $750\text{mL} + 425\text{mL} + 25\text{mL} =$ (Answer: 1,200mL)
 - $125\text{mL} \times 5 =$ (Answer: 625mL)
 - $345\text{mL} + 325\text{mL} + 230\text{mL} =$ (Answer: 900mL)
- Say:** Copy these capacity problems into your exercise books and solve them with your partner.
- Say:** Make sure you line up your problems correctly and solve them using multiplication and addition in the vertical method. Check your work with a partner to ensure you have 'mL' next to the correct numbers.
- Invite a few pupils to come to the board and solve the problems.
- Have pupils check their work while the other students complete the problems on the board.

Independent Practice (10 minutes)

- Write:** 'Find the capacity of the container by adding or multiplying the fluid measurements together:'
 - $150\text{mL} \times 7 =$ (Answer: 1,050mL)
 - $250\text{mL} + 215\text{mL} + 855\text{mL} =$ (Answer: 1,320mL)
 - $95\text{mL} \times 5 =$ (Answer: 475mL)

d) $420\text{mL} + 425\text{mL} + 130\text{mL} =$ (Answer: 975mL)




e) Mary has a cup of soda that is 250mL, Peter's is 450mL and John's is 375mL. What is the total capacity of their drinks? (Answer: 1075mL total)

2. **Say:** Copy the capacity problems into your exercise books and solve them individually.
3. Have pupils to exchange their notebooks and check their answers while you read them aloud.

Closing (2 minutes)

1. Review how to solve the problems if there are any questions or mistakes.
2. **Ask:** What does capacity measure? Raise your hand to answer. (Answer: It measures how much liquid fills a container.)
3. **Ask:** Why is the unit mL important? Raise your hand to answer. (Answer: Because you can measure liquid with millilitres and litres.)

Lesson Title: Word Problems Involving Volume and Capacity	Theme: Geometry: Volume and Capacity	
Lesson Number: M-04-065	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to solve word problems involving volume and capacity.	 Teaching Aids None	 Preparation Write the word problems from the lesson on the board.
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Opening (3 minutes)

- Say:** I will say a math problem. Say the answer together.
- Say:** 200×4 (Answer: 800), $2 \times 5 \times 3$ (Answer: 30), 300×2 (Answer: 600), $6 \times 2 \times 3$ (Answer: 36), 50×3 (Answer: 150)
- If pupils cannot answer or are incorrect, tell them the answer. Then, repeat the problem and have pupils answer. Do this 2 times.

Introduction to the New Material (10 minutes)

- Say:** Today we are going to solve word problems using litres and millilitres to find volume and capacity.
- Say:** Let's review what volume and capacity are. **Ask:** Who can tell me what capacity is? Raise your hand to answer. (Answer: The amount of fluid an object can hold.)
- Ask:** What is volume? Raise your hand to answer. (Answer: The amount of space an object takes up.)
- Say:** We solved problems from stories I told you in the last few lessons. Today, we will solve more story problems involving both capacity and volume.
- Read all 4 problems aloud with pupils and determine if they are capacity or volume problems and what the unit of measure is for each.
 - A can of soda has a capacity of 355 mL. How much soda is in 4 cans? (Answer: Capacity, mL)
 - A tissue box has sides that measure length = 20cm, width = 6cm and height = 4cm. What is the volume or how much space does the box take up? (Answer: Volume, cm^3)
 - A can of soda has a capacity of 355 mL. I drink 100 mL. How much soda is left? (Answer: Capacity, mL)
 - A box speaker has sides that measure 2ft by 4ft by 3. How much space does the speaker take up? (Answer: Volume, ft^3)
- Ask:** How do we solve problem a.? Raise your hand to answer. (Answer: We can multiply one can of soda (355mL) by 4 to find out how much capacity is in all 4 cans. Or we can add 355mL four times to find the total.)
- Ask:** How do we solve problem b.? Raise your hand to answer. (Answer: We need to use the formula for volume and multiply the three sides together to find out how much space the tissue box takes up.)
- Ask:** Let's solve the first problem together.

9. **Write:**

$$\begin{array}{r} 22 \\ 355 \\ \times \quad 4 \\ \hline 1420 \end{array}$$

10. **Say:** You need to line up the problem vertically and multiply. Remember, start to the far right. 4×5 equals 20 so put the 0 down and carry the 2 over to the next column. Then multiply 4 times the next 5 which is 20 and add the 2 you carried over. This gives us 22 so put the 2 down and carry over the extra 2 to the next column over the 3. Lastly, multiply 4×3 to get 12 and add the remaining 2 to get 14. The result is 1,420mL. Don't forget the unit for capacity.
11. **Ask:** What do you need to do to solve for the volume in problem b.? Raise your hand to answer. (Answer: Multiply the 3 sides together and use a cubic unit.)
12. **Say:** Let's solve this together.
13. **Write:** $20\text{cm} \times 6\text{cm} \times 4\text{cm} = 120 \times 4 = 480\text{cm}^3$
14. **Say:** Remember the unit is in centimetres cubed because we are trying to see how much space the tissue box takes up on the table.

Guided Practice (10 minutes)

1. Put pupils in pairs.
2. **Say:** Copy the final two problems in your notebooks and work with your partner to solve them for volume or capacity.
3. **Say:** Work with a partner to solve the remaining problems.
4. Invite pupils to come to the board to show how they solved the problem.




Independent Practice (10 minutes)

1. **Say:** Copy the following problems in your notebooks and solve them independently.
2. **Write:** 'Find the volume and/or capacity of the following story problems:'
 - a) A large bottle of cola holds 755mL and a small bottle holds 435mL? How much more does the large bottle hold? (Answer: 320mL)
 - b) A planting box has sides that measure length = 4ft, width = 3ft and height = 3ft. What is the volume or how much space does the box take up? (Answer: 36ft^3)
 - c) There are three vases that have 100mL, 245mL and 435mL of water for flowers? What is the total capacity of water in all three vases? (Answer: 780mL)
 - d) I box of chocolates has sides that measure 20cm by 5cm by 8cm. How much space does the box take up? (Answer: 800cm^3)
3. **Write** the following challenge problem on the board: Timothy has a large soda bottle with 950mL of orange soda. He pours his big brother a cup with 450mL and his little brother a cup with 150mL. How much is left for him?
4. Have pupils to exchange their notebooks and check their work while you read the answers aloud.

Closing (2 minutes)

1. **Ask:** What does capacity measure? Raise your hand to answer. (Answer: The amount of fluid you can fill in a container or object.)
2. **Ask:** What does volume measure? Raise your hand to answer. (Answer: The amount of space an object takes up.)
3. **Ask:** What do you do to find the volume of an object? Raise your hand to answer. (Answer: You multiply the length times width times height of the object.)

Lesson Title: Like Fractions with Denominators up to 12	Theme: Numbers and Numeration: Fractions	
Lesson Number: M-04-066	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to identify, read, write and model like fractions with denominators up to 12.		Teaching Aids None		Preparation 1. Draw on the board the 2 circles in the introduction to new material. 2. Draw on the board 2 long rectangles of equal size for the lesson.
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Opening (3 minutes)

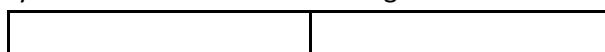
- Say:** Count by 4s to 40 two times.
- Say:** Count by 8s to 40 two times.
- Ask:** Which numbers did you use to count by both 4s and 8s? (Answer: 8, 16, 24, 32, 40)
- Say:** Counting by 8s is like saying every other number of counting by 4s.

Introduction to the New Material (10 minutes)

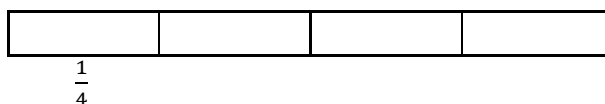
- Say:** Today we are going to learn about fractions with like denominators.
- Revise the idea that fractions are equal parts of a whole. Show pupils the circles drawn on the board.
- Say:** Fractions are equal parts of a whole.
- Ask:** Which circle shows two equal parts? Raise your hand to answer. (Answer: The first circle)



- Ask:** Which circle is cut into unequal parts? Raise your hand to answer. (Answer: The second circle. The parts are not equal.)
- Show pupils the first rectangle drawn on the board. **Say:** I am going to draw a line down the middle of this rectangle to divide it in half. There are 2 equal parts. These are called 'halves.' Copy the rectangle in your notebook and follow along.

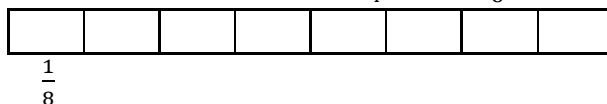


- Count each half: $\frac{1}{2}, \frac{2}{2}$.
- Say:** I will draw a line down the middle of each half to make 4 equal parts called 'fourths'.
- Draw a line down the middle of each half. Write $\frac{1}{4}$ under the first box.



- Say:** The '4' in $\frac{1}{4}$ means that many equal parts. The '1' means '1 of the equal parts'.
- Count each fourth: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$. Point to each fourth as you count it.
- Say:** Now count the fourths with me: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$.
- Ask:** How can I make 8 equal parts called 'eighths'? Raise your hand to answer. (Answer: Draw a line down the middle of each fourth.)

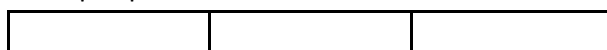
14. Draw a line down the middle of each fourth. Erase $\frac{1}{4}$. Write $\frac{1}{8}$ under the first box.



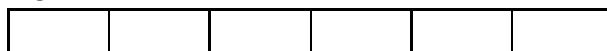
15. **Ask:** What does the '8' in the fraction mean? Raise your hand to answer. (Answer: 8 equal parts)
 16. **Ask:** What does the '1' mean? Raise your hand to answer. (Answer: 1 of the equal parts)
 17. Count all the eighths with pupils: $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}$. Point to each eighth as you count it and write the fractions below each box.

Guided Practice (10 minutes)

1. Put pupils in pairs and have them draw the second rectangle in their notebooks.
 2. **Say:** This rectangle has 3 equal parts called 'thirds'.



3. **Say:** Copy the rectangle into your exercise books. Make the three equal parts.
 4. **Write:** $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}$
 5. **Say:** Count the thirds in your rectangle.
 6. **Ask:** How can we divide this rectangle into 6 equal parts, called 'sixths'? Raise your hand to answer. (Answer: Draw a line down the middle of each third.)
 7. **Say:** Divide your rectangle into sixths.



8. **Write:** $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}$
 9. **Say:** Count the sixths in your rectangle.
 10. **Ask:** How can we divide this rectangle into 12 equal parts, called 'twelfths'? Raise your hand to answer. (Answer: Draw a line down the middle of each sixth.)
 11. **Say:** Count the twelfths and write the fractions below each box.




Independent Practice (10 minutes)

1. Tell students to copy the problems in their notebooks and solve them individually.
 2. **Say:** Draw the following rectangles and divide them by what the question is asking. Make sure to label them with the fraction under each equal part.
 a) A rectangle that shows fourths:
 b) A rectangle that shows eighths:
 c) A rectangle that shows tenths:

Closing (2 minutes)

1. Count fourths, eighths and tenths aloud as a class.
 2. **Ask:** How many equal parts are in ninths? Raise your hand to answer. (Answer: 9)
 3. **Say:** Good job today, pupils! You identified and modelled fractions with equal parts using rectangles.

Lesson Title: Compare and Order Like Fractions	Theme: Numbers and Numeration: Fractions	
Lesson Number: M-04-067	Class/Level: Primary 4	Time: 35 minutes

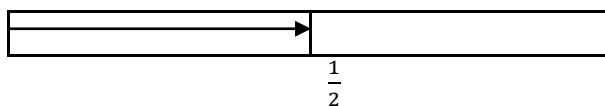
	Learning Outcomes: By the end of the lesson, pupils will be able to compare, order and model like fractions with denominators up to 12.		Teaching Aids None		Preparation Draw on the board 3 long rectangles of equal size lined up vertically one on top of the other.
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Opening (3 minutes)

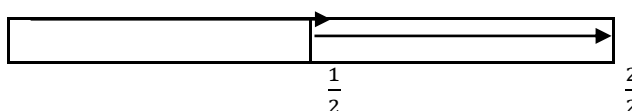
- Say:** Count by 3s to 60 two times.
- Say:** Count by 6s to 60 two times.
- Ask:** Which numbers did you use to count in both 3s and 6s? Raise your hand to answer.
(Answer: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn how to put fractions in order and compare them.
- Show pupils the first rectangle drawn on the board.
- Say:** I will mark on this rectangle how much of it is $\frac{1}{2}$ which is like dividing the rectangle in two equal parts.



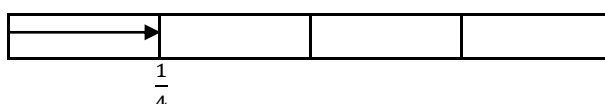
- Draw an arrow in the rectangle to show how much of the rectangle is $\frac{1}{2}$.
- Move your finger from left to right along the arrow. Write ' $\frac{1}{2}$ ' under the middle line.
- Say:** This much of the rectangle is $\frac{1}{2}$.
- Say:** I will mark on this rectangle how much of it is $\frac{2}{2}$.



- Draw an arrow in the rectangle to show how much of the rectangle is $\frac{2}{2}$. Write ' $\frac{2}{2}$ ' at the end of the rectangle.
- Move your finger from left to right along the arrows. Count the halves out loud.
- Show pupils the second rectangle drawn on the board.



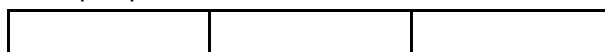
- Say:** The rectangle is divided into four equal parts. Count the fourths with me: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$.
- Point to the end of each fourth as you count it.
- Say:** I will mark on this rectangle to show how much of it is $\frac{1}{4}$.



14. Draw an arrow in the rectangle to show how much of the rectangle is $\frac{1}{4}$.
15. Move your finger from left to right along the arrow. **Write** $\frac{1}{4}$ at the end of the first section.
16. **Say:** This much of the rectangle is $\frac{1}{4}$.
17. **Ask:** Which number in a fraction changes when we count fraction parts? Talk with your partner.
18. Invite 1 - 2 pupils to share their answers. (Answer: Only the top number changes.)
19. **Say:** The top number in a fraction is called the 'numerator'.
20. **Say:** Say 'numerator' with me 3 times.
21. **Ask:** Is $\frac{1}{4}$ bigger than or smaller than $\frac{3}{4}$?
22. **Say:** Let's use these symbols, <, > and = to represent this comparison.
23. **Write:**
 - < means less than
 - > means greater than
 - = means equal to
24. **Write:** $\frac{1}{4} < \frac{3}{4}$ and **Say:** This means that $\frac{1}{4}$ is smaller or less than $\frac{3}{4}$?
25. **Ask:** Is $\frac{1}{4}$ bigger than or smaller than $\frac{1}{2}$? Raise your hand to answer. (Answer: It is smaller than $\frac{1}{2}$.)
26. Mark $\frac{2}{4}$ on the rectangle below the middle line.
27. **Ask:** Is $\frac{2}{4}$ bigger than or small than $\frac{1}{2}$? Raise your hand to answer. (Answer: They are the same.)
28. **Say:** Yes, they are the same because they are equivalent fractions.
29. Write and Say: $\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$

Guided Practice (10 minutes)

1. Show pupils the third rectangle drawn on the board.
2. **Say:** This rectangle has 3 equal parts called 'thirds'.



3. **Say:** Copy the rectangle into your exercise books. Make equal parts.
4. **Write:** $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}$
5. **Ask:** Where do we write $\frac{1}{3}$ to show how long it is? Raise your hand to answer.
6. Invite a pupil to come to the board and write the fraction at the correct place.
7. **Say:** Mark your rectangles to show how much $\frac{1}{3}, \frac{2}{3}$ and $\frac{3}{3}$ of it are.
8. **Say:** Complete the comparison by using the symbols: <, >, or =
 - a) $\frac{1}{3}$ $\frac{2}{3}$ (Answer: <)
 - b) $\frac{3}{3}$ $\frac{2}{3}$ (Answer: >)
 - c) 1 $\frac{3}{3}$ (Answer: =)

Independent Practice (10 minutes)

1. **Say** and **write**: Draw and label the rectangle to show sixths with the following: $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}$.



2. **Write**: 'Complete the comparison by using the symbols: <, >, or =:'

- a) $\frac{2}{6}$ $\frac{1}{6}$ (Answer: >)
b) $\frac{6}{6}$ $\frac{4}{6}$ (Answer: >)
c) 1 $\frac{6}{6}$ (Answer: =)
d) $\frac{3}{6}$ $\frac{4}{6}$ (Answer: <)




3. **Draw** 2 rectangles and **write**: 'Draw the rectangles and split it into parts with the following labels:'

- a) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}$
b) $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$
c) Write 1 comparison for each of the rectangles. (Example answers: a. $\frac{1}{8} < \frac{2}{8}, \frac{4}{8} > \frac{3}{8}$; b. $\frac{1}{10} = \frac{1}{10}, \frac{5}{10} < \frac{9}{10}$)

Closing (2 minutes)

- Count thirds, fourths and sixths aloud as a class.
- Say**: Good job today, pupils! You compared and ordered fractions with like denominators using a rectangle.

Lesson Title: Equivalent Fractions	Theme: Numbers and Numeration: Fractions	
Lesson Number: M-04-068	Class/Level: Primary 4	Time: 35 minutes

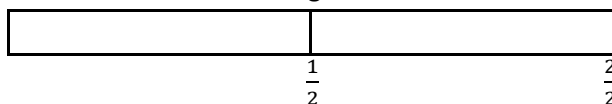
	Learning Outcomes By the end of the lesson, pupils will be able to identify and compare equivalent fractions with denominators up to 12.		Teaching Aids None		Preparation Draw on the board 3 long rectangles of equal size.
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Opening (3 minutes)

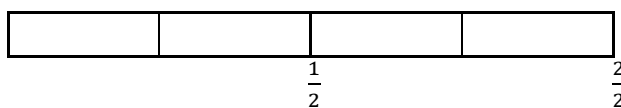
- Say:** Count by 3s to 45 two times.
- Say:** Count by 9s to 45 two times.
- Ask:** Which numbers did you use to count in both 3s and 9s? (Answer: 9, 18, 27, 36, 45)
- Say:** Counting by 9s is like saying every third number of counting by 3s.

Introduction to the New Material (10 minutes)

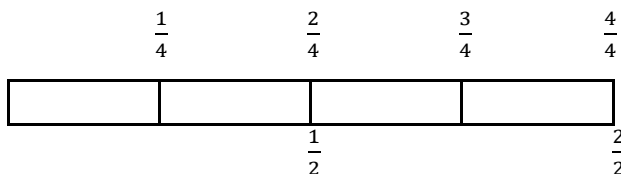
- Say:** Today we will learn how to find fractions of the same size. Fractions of the same size are called 'equivalent fractions'.
- Say:** Say with me, 'Equivalent fractions are the same size.'
- Show pupils the first rectangle drawn on the board.
- Say:** This rectangle is marked to show how long each half is after it was split into 2 equal parts.



- Count with pupils both halves, $\frac{1}{2}, \frac{2}{2}$.
- Say:** I will mark this rectangle to show how long fourths of it are.
- Ask:** How can I make fourths on this rectangle? Raise your hand to answer. (Answer: Draw a line in the middle of each half.)
- Divide the rectangle into fourths.

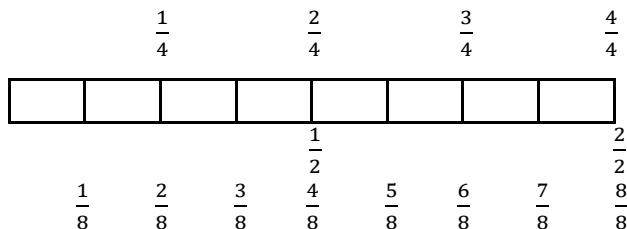


- Say:** Count the fourths in the rectangle.
- Write** the fourths above the rectangle.



- Ask:** How many fourths are as long as $\frac{1}{2}$? Raise your hand to answer. (Answer: $\frac{2}{4}$)
- Say:** Say with me ' $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent'.
- Write:** $\frac{1}{2} = \frac{2}{4}$
- Ask:** Which other fractions on the rectangle are equivalent? Raise your hand to answer. (Answer: $\frac{2}{2}$ and $\frac{4}{4}$ are equivalent.)

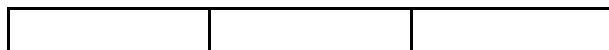
15. Repeat steps 6 - 9 with eighths.
 16. **Draw** the final rectangle on the board like the following:



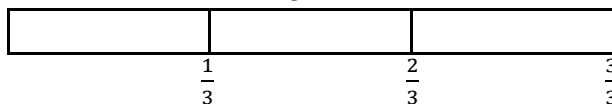
17. **Say:** Find and name all equivalent fractions on the rectangle.
 18. **Say:** Turn and discuss with your partner.
 19. **Invite** 4-6 pupils to share their responses. (Answer: $\frac{1}{4} = \frac{2}{8}, \frac{2}{4} = \frac{1}{2}, \frac{1}{2} = \frac{4}{8}, \frac{2}{4} = \frac{4}{8}, \frac{3}{4} = \frac{6}{8}, \frac{4}{4} = \frac{2}{2}, \frac{2}{2} = \frac{8}{8}, \frac{4}{4} = \frac{8}{8}$)

Guided Practice (10 minutes)

- Put pupils in pairs.
- Show pupils the second rectangle drawn on the board that is divided into 3 equal parts or thirds.



- Say:** Copy the rectangle into your exercise books. Make equal parts and label them with your partner.
- Ask:** Where do we write $\frac{1}{3}$?
- Invite a pupil to come to the board and write the fraction at the correct place.
- Say:** Mark how long each third on the rectangle is.



- Say:** Divide the rectangle into sixths.
- Say:** Remember, that means draw a line down the middle of each third.
- Say:** Mark above the rectangle how long each sixth is.
- Show pupils how to find and name all equivalent fractions. (Answer: $\frac{1}{3} = \frac{2}{6}, \frac{2}{3} = \frac{4}{6}, \frac{3}{3} = \frac{6}{6}$)




Independent Practice (10 minutes)

- Write:** $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$
- Say:** Draw and mark a rectangle to prove these fractions are equivalent.

Closing (2 minutes)

- Ask:** What do you notice about the numbers in fractions equivalent to $\frac{1}{2}$?
- Invite** 1- 2 pupils to answer. (Answer: The top number, the numerator, is half as big as the bottom number, the denominator.)
- Say:** Good job today, pupils! You identified and compared equivalent fractions!

Lesson Title: Related Fractions with Denominators up to 12	Theme: Numbers and Numeration: Fractions	
Lesson Number: M-04-069	Class/Level: Primary 4	Time: 35 minutes

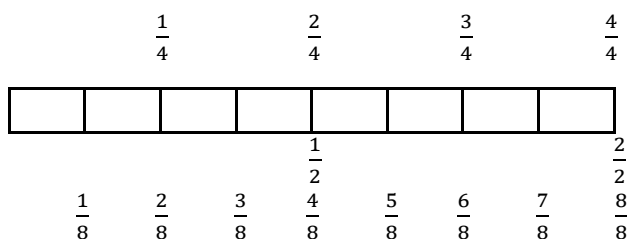
	Learning Outcomes By the end of the lesson, pupils will be able to compare, order and model related fractions with denominators up to 12.		Teaching Aids None		Preparation Draw on the board a rectangle marked with halves, fourths and eighths.
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Opening (3 minutes)

- Say:** Tell your partner as many fractions as you can equivalent to $\frac{1}{2}$.
- Invite 1-2 pupils to come to the board and write fractions equivalent to $\frac{1}{2}$. (Example answer: $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn how to put fractions in order. We will use fractions with different denominators.
- Say:** The denominator is the bottom number of a fraction, like the 4 in $\frac{1}{4}$ or the 6 in $\frac{1}{6}$. It tells how many equal parts there are.
- Say:** Practice saying 'denominator' with me 3 times.
- Say:** This rectangle shows halves, fourths and eighths.
- Revise how long each fraction is with pupils. Show how you split the rectangle into equal halves, fourths and eighths.
- Say:** First we split the rectangle into half. Then we draw a line in the middle of each of these parts to find fourths. Lastly, we split each fourth in half to find equal eighths.



- Say:** Let's put these fractions in order from smallest to largest. You can use the rectangle and move from left to right. As you move to the right, the fractions are bigger. You will see this on a number line in later math lessons.
- Write:** $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$
- Ask:** Which fraction is smallest? Raise your hand to answer. (Answer: $\frac{1}{8}$ is the smallest.)
- Ask:** Which fraction is the next largest? Raise your hand to answer. (Answer: $\frac{1}{4}$ is the next largest.)
- Ask:** Which fraction is largest? Raise your hand to answer. (Answer: $\frac{1}{2}$ is biggest.)

12. **Write:** $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}$
13. **Say:** What do you notice about the denominators? Tell your partner.
14. **Ask:** Who will explain? Raise your hand to answer. (Example answers: They count backwards in 2's. The numbers in the denominators get smaller.)
15. **Ask:** Where does $\frac{1}{6}$ go in the group from smallest to largest? Tell your partner?
16. Invite a pupil come to the board and write $\frac{1}{6}$ in the correct place in the group. (Answer: $\frac{1}{8}, \frac{1}{6}, \frac{1}{4}, \frac{1}{2}$)

Guided Practice (10 minutes)

1. **Say:** Draw a rectangle in your exercise book. Draw the same size as in the introduction to new material.
2. **Say:** Divide the new rectangle into halves, fourths and eighths.
3. **Say:** Mark how long each half, fourth and eighth is, so your rectangle looks like the one on the board.
4. **Write:** $\frac{2}{4}, \frac{2}{8}$ and $\frac{3}{8}, \frac{3}{6}$
5. Guide pupils to identify which fraction in each pair is larger.
6. **Say:** Use the symbols $>$, $<$ and $=$ to compare the sets of fractions.
7. **Write:** $\frac{2}{4} > \frac{2}{8}, \frac{3}{8} < \frac{3}{6}$




Independent Practice (10 minutes)

1. **Write:**
 - a) $\frac{1}{4}, \frac{1}{8}, \frac{3}{8}, \frac{3}{4}, \frac{1}{2}$
 - b) $\frac{1}{1}, \frac{1}{4}, \frac{2}{8}, \frac{7}{8}, \frac{2}{4}$
2. **Say:** Write these in order from smallest to largest. You may use your fraction rectangles to help.
3. **Say:** Check your answers with a partner.
4. Have pupils to exchange their notebooks and check their work while you read the answers aloud. answers with pupils. (Answers: a. $\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{3}{4}$; b. $\frac{1}{4} = \frac{2}{8}, \frac{2}{4}, \frac{7}{8}, \frac{1}{1}$)

Closing (2 minutes)

1. **Ask:** What do you notice about the numbers in fractions smaller than $\frac{1}{2}$? Raise your hand to answer. (Answer: The numerator is less than half as big as the denominator.)
2. **Say:** Good job today, pupils! You compared fractions with different denominators.

Lesson Title: Equivalent, Like and Related Fractions	Theme: Numbers and Numeration: Fractions	
Lesson Number: M-04-070	Class/Level: Primary 4	Time: 35 minutes

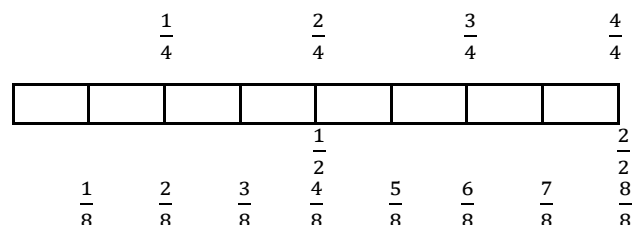
	Learning Outcomes By the end of the lesson, pupils will be able to compare and order equivalent, like and related fractions.		Teaching Aids None		Preparation 1. Draw on the board a rectangle marked with halves, fourths and eighths. 2. Draw a matrix with 3 columns. Write the headings for each column.
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Opening (3 minutes)

- Say:** Tell your partner as many fractions as you can less than $\frac{1}{2}$.
- Ask:** Who will share? Raise your hand to share. (Example answers: $\frac{1}{3}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn how to compare fractions. We will use fractions with different denominators and different numerators.
- Say:** The denominator is the bottom number of a fraction, like the 4 in $\frac{1}{4}$ or the 6 in $\frac{1}{6}$. It tells how many equal parts there are. The numerator is the top number in the fraction. It tells how many parts we are counting.
- Say:** Use our fraction rectangle to name all the fractions it shows equal to $\frac{1}{2}$.



- Ask:** Which fractions are equal to $\frac{1}{2}$? Raise your hand to answer.
- Write them in the matrix.
- Ask:** Which fractions are less than $\frac{1}{2}$? Raise your hand to answer.
- Write** them in the matrix.

less than $\frac{1}{2}$	equal to $\frac{1}{2}$	more than $\frac{1}{2}$
$\frac{1}{8} \frac{2}{8} \frac{3}{8} \frac{1}{4}$	$\frac{2}{4} \frac{4}{8}$	

- Point to the fractions in the matrix and show how the ones below the 'less than $\frac{1}{2}$ ' are fractions that are smaller than $\frac{1}{2}$. Point to the rectangle and show them these numbers are to the left of the $\frac{1}{2}$.
- Say:** Foday and Fatima both have cake. Foday has $\frac{1}{2}$ of a cake. Fatima has $\frac{3}{8}$ of a cake.
- Ask:** Who has more? Raise 1 finger if Foday has more. Raise 2 fingers if Fatima has more. (Answer: Foday has more. Pupils raise 1 finger.)

- Repeat with other fractions in the matrix that are filled out. Remember, they will fill out the rest of the matrix for greater than in the next sections.
- Erase the fractions from the matrix.

Guided Practice (10 minutes)

- Put pupils in pairs.
- Write** and **Say**: Copy the matrix into your exercise books.

less than $\frac{1}{2}$	equal to $\frac{1}{2}$	more than $\frac{1}{2}$

- Say**: With your partner, complete the matrix using fourths and eighths and all fractions on the rectangle from the introduction.

Answers:

less than $\frac{1}{2}$	equal to $\frac{1}{2}$	more than $\frac{1}{2}$
$\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{1}{4}$	$\frac{2}{4}$ $\frac{4}{8}$	$\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ $\frac{8}{8}$ $\frac{3}{4}$ $\frac{4}{4}$ $\frac{2}{2}$

- Invite 3 pupils from different groups to come and fill in a section of the matrix.
- Tell other pupils to check their work while the pupils write the answer.

Independent Practice (10 minutes)




- Say**: Complete the matrix for thirds and sixths.
- Say**: Remember, you will need to draw a new rectangle, cut it in thirds and then cut it in sixths.
- Say**: Check your answers with a partner.

Closing (2 minutes)

- Go over answers with pupils.
- Say** and **write**:

less than $\frac{1}{2}$	equal to $\frac{1}{2}$	more than $\frac{1}{2}$
$\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{1}{4}$	$\frac{2}{4}$ $\frac{4}{8}$	$\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ $\frac{8}{8}$ $\frac{3}{4}$ $\frac{4}{4}$ $\frac{2}{2}$
$\frac{1}{3}$ $\frac{1}{6}$ $\frac{2}{6}$		$\frac{2}{3}$ $\frac{3}{3}$ $\frac{4}{6}$ $\frac{5}{6}$ $\frac{6}{6}$

Lesson Title: Compare Equivalent Fractions and Fractions Greater than One	Theme: Numbers and Numeration Subtraction and Addition of Fractions	
Lesson Number: M-04-071	Class/Level: Primary 4	Time: 35 minutes

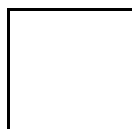
	Learning Outcomes By the end of the lesson, pupils will be able to compare equivalent fractions and fractions greater than 1.		Teaching Aids None		Preparation Draw on the board a square for the lesson.
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Opening (3 minutes)

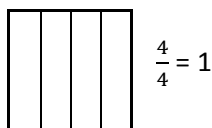
1. Review multiplication facts with pupils.
2. **Ask:** What is the rule for multiplying any number by 1? Raise your hand to answer. (Answer: The number does not change when you multiply by 1.)

Introduction to the New Material (10 minutes)

1. **Say:** Last week we found equivalent fractions by seeing if they were the same length. Today we will learn how to find equivalent fractions a different way. We will also learn to count fractions greater than 1.
2. Show pupils the square on the board.



3. **Ask:** How many squares is this? Show me by raising 1 finger. (Answer: Pupils raise 1 finger.)
4. Divide the square into fourths.



5. **Write** on the board: $\frac{4}{4} = 1$.
6. **Say:** If the top number and the bottom number in a fraction are the same, then the fraction equals 1.
7. Tell pupils to name other fractions equal to 1. Write them on the board. (Example answers: $\frac{2}{2}$; $\frac{3}{3}$; $\frac{5}{5}$)
8. **Write** on the board: $\frac{2}{3} \times 1 = \frac{2}{3}$
9. Read with pupils. **Write** on the board: $\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$
10. **Say:** $\frac{2}{2}$ is equal to 1. When we multiply by a fraction equal to 1, it gives us an equivalent fraction.
11. Tell pupils to find in their exercise books the rectangles they labelled with thirds and sixths from Lesson 68. **Ask:** Do your rectangles show $\frac{2}{3} = \frac{4}{6}$? Raise your hand to answer. (Answer: Yes.)
12. Repeat with other fractions.
13. **Say:** Now we will learn how to count fractions bigger than 1.

14. **Draw** on the board a second square and divide it into fourths.
15. Count the total number of fourths in the 2 squares with pupils: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}$
16. **Write** the fractions on the board under the squares.
17. **Say:** The top number is bigger than the bottom number in a fraction when the fraction is bigger than 1.
18. Tell pupils to name other fractions bigger than 1. Write them on the board. (Example answers: $\frac{3}{2}, \frac{5}{3}$)

Guided Practice (10 minutes)

1. **Write** on the board: $\frac{5}{6}$ $\frac{8}{10}$ and **Say:** Copy these fractions into your notebook.
2. **Say:** We are going to compare these fractions to see which is bigger. We cannot compare sixths and tenths. Sixths are a different size than tenths. We need make both fractions into equivalent fractions with the same bottom number.
3. **Say:** I see the bottom numbers are 6 and 10. $6 \times 10 = 60$. I want to make both fractions into equivalent fractions with a bottom number of 60.
4. **Say:** Six times 10 equal 60. We need to multiply $\frac{5}{6} \times \frac{10}{10}$ to get an equivalent fraction with a bottom number of 60.
5. **Write:** $\frac{5}{6} \times \frac{10}{10} = \frac{50}{60}$. Ensure pupils understand that $\frac{50}{60}$ is equivalent to $\frac{5}{6}$.
6. Tell pupils to write $\frac{8}{10}$ in their exercise books. **Say:** 10 times 6 equal 60. We need to multiply $\frac{8}{10} \times \frac{6}{6}$ to get an equivalent fraction with a bottom number of 60.
7. **Write:** $\frac{8}{10} \times \frac{6}{6} = \frac{48}{60}$. Ensure pupils understand that $\frac{48}{60}$ is equivalent to $\frac{8}{10}$.
8. **Ask:** Which fraction is bigger? Raise your hand to answer. (Answer: $\frac{5}{6}$ is bigger because it is equivalent to $\frac{50}{60}$. $\frac{8}{10}$ is only equivalent to $\frac{48}{60}$.)
9. Repeat with $\frac{3}{5}$ and $\frac{5}{9}$. (Answer: $5 \times 9 = 45$. The bottom number is 45. $\frac{3}{5} \times \frac{9}{9} = \frac{27}{45}$ $\frac{5}{9} \times \frac{5}{5} = \frac{25}{45}$ therefore $\frac{3}{5}$ is bigger.)




Independent Practice (10 minutes)

1. **Write** on the board: $\frac{4}{7}$ $\frac{6}{10}$
2. Tell pupils they are going to find out which is bigger.
3. Tell pupils to talk with a partner about what bottom number both equivalent fractions need to have.
4. Ask 1 or 2 pupils to share their answer with the class. (Answer: Both equivalent fractions need a bottom number of 70.)
5. Tell pupils to use equivalent fractions with a bottom number of 70 to compare the fractions.

Closing (2 minutes)

1. Go over problems and answers with pupils. (Answer: $\frac{4}{7} \times \frac{10}{10} = \frac{40}{70}$ $\frac{6}{10} \times \frac{7}{7} = \frac{42}{70}$ $\frac{6}{10}$ is bigger.)
2. **Say:** Good job today, pupils! You compared fractions with unlike or different denominators and fractions greater than 1.

Lesson Title: Addition of Equivalent Fractions	Theme: Numbers and Numeration Subtractions and Addition of Fractions	
Lesson Number: M-04-072	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to add equivalent fractions with denominator up to 12.		Teaching Aids None		Preparation 1. Write on the board 3 steps to add with equivalent fractions. 2. Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

1. Review fractions equivalent to 1. Remind pupils that fractions equivalent to 1 have the same number on the top and on the bottom.
2. Tell pupils to work with a partner to name as many fractions equivalent to 1 as they can in 1 minute.
3. Choose 1 or 2 pupils to come to the board and write the fractions they thought of. (Example answers: $1 = \frac{1}{1} = \frac{2}{2} = \frac{3}{3} = \frac{4}{4} = \frac{5}{5} = \frac{6}{6} = \frac{12}{12}$ etc.)

Introduction to the New Material (10 minutes)

1. **Say:** Yesterday we compared fractions by using equivalent fractions. Today we will use equivalent fractions to add.
2. **Say:** Let's practice what we call the bottom number of a fraction. The bottom number of a fraction is called the 'denominator'. The denominator tells us how many parts there are.
3. Practice saying 'denominator' with pupils 3 times.
4. **Say:** The denominator needs to be the same for both fractions before we can add.
5. **Write** on the board $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$. Read with pupils.
6. **Say:** We only add the top numbers in fractions. I add fractions with the same denominator easily. I add the top numbers. The denominator for the answer stays the same.
7. **Write** on the board: $\frac{1}{4} + \frac{1}{5} =$
8. **Say:** We will add $\frac{1}{4} + \frac{1}{5} =$. We cannot add fourths and fifths. Fourth's are a different size than fifth's. We need make both fractions into equivalent fractions with the same denominator.
9. Read aloud with pupils the 3 steps to add fractions that have different denominators.
 - a) Step 1: Decide what the new denominator is.
 - b) Step 2: Make equivalent fractions with the new denominator.
 - c) Step 3: Add the equivalent fractions.
10. **Say:** Step 1 is to decide what the new denominator is. I see the bottom numbers are 4 and 5. $4 \times 5 = 20$. I want to make both fractions into equivalent fractions with a bottom number of 20.
11. **Write** on the board: $\frac{1}{4} + \frac{1}{5} = \frac{\quad}{20}$
12. **Say:** Step 2 is to make equivalent fractions with the new denominator.
13. **Say:** Four times 5 equal 20. We need to multiply $\frac{1}{4} \times \frac{5}{5}$ to get an equivalent fraction with a denominator of 20.

14. **Write** on the board $\frac{1}{4} \times \frac{5}{5} = \frac{5}{20}$. Make sure pupils understand that $\frac{5}{20}$ is equivalent to $\frac{1}{4}$.
15. **Say:** Five times 4 equal 20. We need to multiply $\frac{1}{5} \times \frac{4}{4}$ to get an equivalent fraction with a denominator of 20.
16. **Write** on the board $\frac{1}{5} \times \frac{4}{4} = \frac{4}{20}$. Make sure pupils understand that $\frac{4}{20}$ is equivalent to $\frac{1}{5}$.
17. **Say:** Step 3 is to add the equivalent fractions.
18. Solve on the board $\frac{5}{20} + \frac{4}{20} = \frac{9}{20}$. Review with pupils that you only add the top number in fractions.
19. **Write** on the board: $\frac{1}{4} + \frac{1}{5} = \frac{9}{20}$
20. Repeat with $\frac{3}{8} + \frac{1}{5} =$ (Answer: New denominator is 40. $\frac{3}{8} \times \frac{5}{5} = \frac{15}{40}$ $\frac{1}{5} \times \frac{8}{8} = \frac{8}{40}$ $\frac{15}{40} + \frac{8}{40} = \frac{23}{40}$
 $\frac{3}{8} + \frac{1}{5} = \frac{23}{40}$)

Guided Practice (10 minutes)

- Read with pupils the problems written on the board:
 - $\frac{2}{5} + \frac{1}{3} =$
 - $\frac{2}{9} + \frac{3}{4} =$
 - $\frac{1}{10} + \frac{2}{3} =$
 - $\frac{3}{4} + \frac{1}{5} =$
- Have pupils copy these problems into their exercise books.
- Guide pupils to solve the first 2 problems step by step. For each problem:
 - Say the step with pupils.
 - Do the step with pupils.
 - Review the step with pupils.
- Read the problems and answers aloud with pupils. (Answers: a. New denominator is 15. $\frac{2}{5} \times \frac{3}{3} = \frac{6}{15}$ $\frac{1}{3} \times \frac{5}{5} = \frac{5}{15}$ $\frac{6}{15} + \frac{5}{15} = \frac{11}{15}$ $\frac{2}{5} + \frac{1}{3} = \frac{11}{15}$ b. New denominator is 36. $\frac{2}{9} \times \frac{4}{4} = \frac{8}{36}$ $\frac{3}{4} \times \frac{9}{9} = \frac{27}{36}$ $\frac{8}{36} + \frac{27}{36} = \frac{35}{36}$ $\frac{2}{9} + \frac{3}{4} = \frac{35}{36}$)




Independent Practice (10 minutes)

- Have pupils complete the last 2 problems on their own.

Closing (2 minutes)

- Go over problems and answers with pupils. (Answers: c. New denominator is 30. $\frac{1}{10} \times \frac{3}{3} = \frac{3}{30}$ $\frac{2}{3} \times \frac{10}{10} = \frac{20}{30}$ $\frac{3}{30} + \frac{20}{30} = \frac{23}{30}$ $\frac{1}{10} + \frac{2}{3} = \frac{23}{30}$ d. New denominator is 20. $\frac{3}{4} \times \frac{5}{5} = \frac{15}{20}$ $\frac{1}{5} \times \frac{4}{4} = \frac{4}{20}$ $\frac{15}{20} + \frac{4}{20} = \frac{19}{20}$ $\frac{3}{4} + \frac{1}{5} = \frac{19}{20}$)
- Say:** Good job today, pupils! You solved a number of addition problems involving fractions with like and unlike denominators.

Lesson Title: Subtraction of Equivalent Fractions	Theme: Numbers and Numeration Subtractions and Addition of Fractions	
Lesson Number: M-04-073	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to subtract equivalent fractions with denominators up to 12.		Teaching Aids None		Preparation 1. Write on the board 3 steps to subtract with equivalent fractions. 2. Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

1. Review making equivalent fractions.
2. Tell pupils to work with a partner to find as many fractions equivalent to $\frac{1}{4}$ as they can in 1 minute.
3. Remind pupils to multiply $\frac{1}{4}$ by a fraction equivalent to 1 such as $\frac{2}{2}$.
4. Choose 1 or 2 pupils to come to the board and write the equivalent fractions they found.
(Example answers: $\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20} = \frac{6}{24} = \frac{12}{48}$ etc.)

Introduction to the New Material (10 minutes)

1. **Say:** Yesterday we added fractions by using equivalent fractions. Today we will use equivalent fractions to subtract.
2. Review with pupils that the bottom number in a fraction is called the 'denominator'. Practice saying 'denominator' with pupils 3 times.
3. **Say:** The denominator needs to be the same for both fractions before we can subtract.
4. **Write** on the board $\frac{2}{4} - \frac{1}{4} = \frac{1}{4}$. Read with pupils.
5. **Say:** We only subtract the top numbers in fractions. I subtract fractions with the same denominator easily. I subtract the top numbers. The denominator for the answer stays the same.
6. **Write** on the board $\frac{1}{4} - \frac{1}{5} =$
7. **Say:** We are going to subtract $\frac{1}{4} - \frac{1}{5} =$. We cannot subtract fifths from fourths. We need make both fractions into equivalent fractions with the same denominator.
8. Read aloud with pupils the 3 steps to subtract fractions with different denominators.
 - a) Step 1: Decide what the new denominator is.
 - b) Step 2: Make equivalent fractions with the new denominator.
 - c) Step 3: Subtract the equivalent fractions.
9. **Say:** Step 1 is to decide what the new denominator is. I see the bottom numbers are 4 and 5. $4 \times 5 = 20$. I want to make both fractions into equivalent fractions with a bottom number of 20.
10. **Write** on the board: $\frac{1}{4} - \frac{1}{5} = \frac{\quad}{20}$
11. **Say:** Step 2 is to make equivalent fractions with the new denominator.

12. **Say:** Four times 5 equal 20. We need to multiply $\frac{1}{4} \times \frac{5}{5}$ to get an equivalent fraction with a denominator of 20.
13. **Write** on the board $\frac{1}{4} \times \frac{5}{5} = \frac{5}{20}$. Ensure pupils understand that $\frac{5}{20}$ is equivalent to $\frac{1}{4}$.
14. **Say:** Five times 4 equal 20. We need to multiply $\frac{1}{5} \times \frac{4}{4}$ to get an equivalent fraction with a denominator of 20.
15. **Write** $\frac{1}{5} \times \frac{4}{4} = \frac{4}{20}$. Ensure pupils understand that $\frac{4}{20}$ is equivalent to $\frac{1}{5}$.
16. **Say:** Step 3 is to subtract the equivalent fractions.
17. **Write** on the board $\frac{5}{20} - \frac{1}{20} = \frac{4}{20}$. Review with pupils that you only subtract the top number in fractions.
18. **Write** on the board: $\frac{1}{4} - \frac{1}{5} = \frac{1}{20}$
19. Repeat with $\frac{3}{8} - \frac{1}{5} =$ (Answer: New denominator is 40. $\frac{3}{8} \times \frac{5}{5} = \frac{15}{40}$ $\frac{1}{5} \times \frac{8}{8} = \frac{8}{40}$ $\frac{15}{40} - \frac{8}{40} = \frac{7}{40}$)
20. $\frac{3}{8} - \frac{1}{5} = \frac{7}{40}$

Guided Practice (10 minutes)

1. Read with pupils the problems written on the board:

a. $\frac{2}{5} - \frac{1}{3} =$ b. $\frac{3}{4} - \frac{2}{9} =$ c. $\frac{2}{3} - \frac{1}{10} =$ d. $\frac{3}{4} - \frac{1}{5} =$

2. Have pupils copy these problems into their exercise books.
3. Guide pupils to solve the first 2 problems step by step. For each problem:
- Say the step with pupils.
 - Do the step with pupils.
 - Review the step with pupils.

4. Read the problems and answers aloud with pupils. (Answers: a. New denominator is 15. $\frac{2}{5} \times \frac{3}{3} = \frac{6}{15}$ $\frac{1}{3} \times \frac{5}{5} = \frac{5}{15}$ $\frac{6}{15} - \frac{5}{15} = \frac{1}{15}$ $\frac{2}{5} - \frac{1}{3} = \frac{1}{15}$ b. New denominator is 36. $\frac{3}{4} \times \frac{9}{9} = \frac{27}{36}$ $\frac{2}{9} \times \frac{4}{4} = \frac{8}{36}$ $\frac{27}{36} - \frac{8}{36} = \frac{19}{36}$ $\frac{3}{4} - \frac{2}{9} = \frac{19}{36}$)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.

Closing (2 minutes)

1. Go over problems and answers with pupils. (Answers: c. New denominator is 30. $\frac{2}{3} \times \frac{10}{10} = \frac{20}{30}$ $\frac{1}{10} \times \frac{3}{3} = \frac{3}{30}$ $\frac{20}{30} - \frac{3}{30} = \frac{17}{30}$ $\frac{2}{3} - \frac{1}{10} = \frac{17}{30}$ d. New denominator is 20. $\frac{3}{4} \times \frac{5}{5} = \frac{15}{20}$ $\frac{1}{5} \times \frac{4}{4} = \frac{4}{20}$ $\frac{15}{20} - \frac{4}{20} = \frac{11}{20}$ $\frac{3}{4} - \frac{1}{5} = \frac{11}{20}$)
2. **Say:** Good job today, pupils! You solved a number of subtraction problems involving fractions with like and unlike denominators.

Lesson Title: Addition and Subtraction of Equivalent Fractions	Theme: Numbers and Numeration Subtraction and Addition of Fractions	
Lesson Number: M-04-074	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to solve problems involving addition and subtraction of equivalent fractions with denominator up to 12.</p>		<p>Teaching Aids None</p>		<p>Preparation 1. Write on the board 3 steps to add with equivalent fractions. 2. Write on the board 3 steps to subtract with equivalent fractions. 3. Write on the board the problems for guided and independent practice.</p>
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Opening (3 minutes)

1. Review making equivalent fractions.
2. Tell pupils to work with a partner to find as many fractions equivalent to $\frac{2}{3}$ as they can in 1 minute.
3. Remind pupils to multiply $\frac{2}{3}$ by a fraction equivalent to 1.
4. Choose 1 or 2 pupils to come to the board and write the equivalent fractions they found.
(Example answers: $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15} = \frac{12}{18}$ etc.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will review adding and subtracting with equivalent fractions.
2. Review that denominator means the bottom number in a fraction.
3. Say 'denominator' with pupils 3 times.
4. **Write** on the board: $\frac{5}{8} + \frac{1}{9} =$
5. **Ask:** What do we need to do before we can add these fractions? Raise your hand to answer.
(Answer: Make equivalent fractions with the same denominator.)
6. Read aloud with pupils the 3 steps to add fractions that have different denominators.
 - a) Step 1: Decide what the new denominator is.
 - b) Step 2: Make equivalent fractions with the new denominator.
 - c) Step 3: Add the equivalent fractions.
7. Ask pupils to help you use the steps to solve on the board: $\frac{5}{8} + \frac{1}{9} =$
 - a) Say each step with pupils.
 - b) Do each step with pupils.
 - c) Review each step with pupils.
8. Review the answer on the board with the pupils. (Answer: The new denominator is 72. $\frac{5}{8} \times \frac{9}{9} =$
 $\frac{45}{72}$ $\frac{1}{9} \times \frac{8}{8} = \frac{8}{72}$ $\frac{45}{72} + \frac{8}{72} = \frac{53}{72}$ $\frac{5}{8} + \frac{1}{9} = \frac{53}{72}$)
9. **Write** on the board: $\frac{5}{7} - \frac{1}{2} =$
10. **Ask:** What do we need to do before we can subtract these fractions? (Answer: Make equivalent fractions with the same denominator.)

11. Read aloud with pupils the 3 steps to subtract fractions that have different denominators.
 - a) Step 1: Decide what the new denominator is.
 - b) Step 2: Make equivalent fractions with the new denominator.
 - c) Step 3: Subtract the equivalent fractions.
12. Ask pupils to help you use the steps to solve on the board: $\frac{5}{7} - \frac{1}{2} =$
 - a) Say each step with pupils.
 - b) Do each step with pupils.
 - c) Review each step with pupils.
13. Review the answer on the board with the pupils. (Answer: The new denominator is 14. $\frac{5}{7} \times \frac{2}{2} =$
 $\frac{10}{14} - \frac{1}{2} \times \frac{7}{7} = \frac{7}{14} - \frac{7}{14} = \frac{3}{14}$)

Guided Practice (10 minutes)

1. Read with pupils the problems written on the board:
 - a. $\frac{4}{5} - \frac{1}{7} =$
 - b. $\frac{3}{8} + \frac{1}{3} =$
 - c. $\frac{3}{4} - \frac{1}{3} =$
 - d. $\frac{5}{6} + \frac{1}{8} =$
2. Have pupils copy these problems into their exercise books.
 - a) Tell pupils to solve the first problem.
 - b) Tell pupils to check the first problem with a partner.
3. Go over the problem and answer aloud with pupils. (Answers: a. The new denominator is 35. $\frac{4}{5}$
 $\times \frac{7}{7} = \frac{28}{35}$ $\frac{1}{7} \times \frac{5}{5} = \frac{5}{35}$ $\frac{28}{35} - \frac{5}{35} = \frac{23}{35}$ $\frac{4}{5} - \frac{1}{7} = \frac{23}{35}$)




Independent Practice (10 minutes)

1. Have pupils complete the last 3 problems on their own.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: b. $\frac{3}{8} + \frac{1}{3} = \frac{17}{24}$ c. $\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$ d. $\frac{5}{6} + \frac{1}{8} = \frac{46}{48}$)
2. **Say:** Good job today, pupils! You solved a number of addition and subtraction problems involving fractions with like and unlike denominators.

Lesson Title: Word Problems Involving Addition and Subtraction of Fractions	Theme: Numbers and Numeration Subtraction and Addition of Fractions
Lesson Number: M-04-075	Class/Level: Primary 4 Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to solve word problems involving addition and subtraction of fractions with denominators up to 12.	 Teaching Aids None	 Preparation Write the word problems on the board.
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Opening (3 minutes)

- Review making equivalent fractions.
- Tell pupils to work with a partner to find as many fractions equivalent to $\frac{3}{4}$ as they can in 1 minute.
- Remind pupils to multiply $\frac{3}{4}$ by a fraction equivalent to 1.
- Choose 1 or 2 pupils to come to the board and write the equivalent fractions they found.
(Example answers: $\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{15} = \frac{15}{20} = \frac{18}{24}$ etc.)

Introduction to the New Material (10 minutes)

- Say:** Today we will solve word problems by adding and subtracting fractions. We will read and solve the problems.
- Read all 4 problems aloud with pupils.

<p>a. Amadu drinks $\frac{1}{3}$ of a bottle of soda. Joseph drinks $\frac{2}{3}$ of a bottle of soda. How much more soda does Joseph drink than Amadu?</p>	<p>b. Fatmata drinks $\frac{1}{6}$ of a bottle of soda. Maria drinks $\frac{3}{4}$ of a bottle of soda. How much soda do they drink in all?</p>
<p>c. Amadu walks $\frac{4}{10}$ of a kilometre to school. He walks $\frac{4}{10}$ of a kilometre home. How far does he walk in all?</p>	<p>d. Fatmata drinks $\frac{1}{3}$ of a bottle of soda. Maria drinks $\frac{3}{4}$ of a bottle of soda. How much more soda does Maria drink than Fatmata?</p>
- Read problem a. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: $\frac{1}{3}, \frac{2}{3}$)
- Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Subtract. Pupils raise 2 fingers.)
- Ask:** What is the subtraction problem? Raise your hand to answer. (Answer: $\frac{2}{3} - \frac{1}{3} =$)
- Read problem b. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: $\frac{1}{6}, \frac{3}{4}$)

9. **Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Add. Pupils raise 1 finger.)
10. **Ask:** What is the addition problem? Raise your hand to answer. (Answer: $\frac{1}{6} + \frac{3}{4} =$)
11. Read problem c. again with pupils.
12. **Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: $\frac{4}{10}$, $\frac{4}{10}$)
13. **Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Add. Pupils raise 1 finger.)
14. **Ask:** What is the addition problem? Raise your hand to answer. (Answer: $\frac{4}{10} + \frac{4}{10} =$)

Guided Practice (10 minutes)

1. Put pupils in pairs.
2. **Say:** Remember that you only add or subtract the top numbers in fractions. The denominator must be the same.
3. Read problem a. again with pupils. Guide pupils to notice the denominators are the same.
4. Guide pupils to understand they do not need to find equivalent fractions to solve the first problem.
5. Tell pupils to solve problem a.
6. Tell pupils to check the first problem with a partner.
7. Go over the problem and answer aloud with pupils. (Answers: a. $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$ Joseph drinks $\frac{1}{3}$ more of a bottle of soda than Amadu.)
8. Read problem b. again with pupils.
9. **Say:** Notice the denominators are different. We need to find equivalent fractions to solve problem b.
10. Tell pupils to solve problem b.
11. Tell pupils to check the problem with a partner. (Answer: b. $\frac{1}{6} + \frac{3}{4} = \frac{22}{24}$ They drink $\frac{22}{24}$ in all.)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. $\frac{4}{10} + \frac{4}{10} = \frac{8}{10}$ He walks $\frac{8}{10}$ of a kilometre in all. d. $\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$ Maria drinks $\frac{5}{12}$ more of a bottle of soda than Fatmata.)
2. **Say:** Good job today, pupils! You solved a number of addition and subtraction word problems involving fractions with like and unlike denominators.

Lesson Title: Horizontal and Vertical Lines	Theme: Geometry Lines and Angles	
Lesson Number: M-04-076	Class/Level: Primary 4	Time: 35 minutes

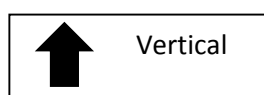
 <p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Identify horizontal and vertical lines. 2. Draw horizontal and vertical lines. 	 <p>Teaching Aids</p> <ol style="list-style-type: none"> 1. Picture of vertical arrow, labelled 'vertical' 2. Picture of horizontal arrow, labelled 'horizontal' 3. 'Geometry cards' 	 <p>Preparation</p> <ol style="list-style-type: none"> 1. Gather 'geometry cards' for pupils to use for Lessons 76 to 80. Index cards may be used. If there are no index cards, pupils may carefully tear our 1 sheet from their exercise books to use as a geometry card. 2. Make 1 geometry card large enough for pupils to see. It must have exactly straight sides and square corners. 3. Make or find arrow pictures.
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Opening (3 minutes)

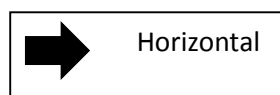
1. Find an object shaped like a rectangle in the classroom.
2. Play the 'I Spy' game with pupils to have them guess the object. (See Lesson 45 for instructions for the 'I Spy' game.)
3. For example, **Say:** 'I spy with my little eye, an object that is a large rectangle that is black.'
(Answer: front board)
4. Repeat with different objects as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn about horizontal and vertical lines.
2. Show pupils the picture of the vertical arrow.



3. **Say:** This picture shows a vertical arrow. This arrow points up and show a direction that is up and down.
4. Show pupils how to move their hand up and down in a vertical motion.
5. Practice saying 'vertical' with pupils 3 times while making the hand motion.
6. Show pupils the picture of the horizontal arrow.



7. **Say:** This picture shows a horizontal arrow. This arrow points right and show a direction that is left and right.
8. Show pupils how to move their hand side to side in a horizontal motion.
9. Practice saying 'horizontal' with pupils 3 times while making the hand motion.
10. Show pupils how to draw vertical lines.
 - a) Trace along the edge of the large geometry card.
 - b) Show how to draw vertical line that begins from the top and goes down.

- c) Show how to draw a vertical line than begins from the bottom and goes up.
- 11. Show pupils how to draw horizontal lines.
 - a) Trace along the edge of the large geometry card.
 - b) Show how to draw horizontal line using the top of the geometry card.
 - c) Show how to draw a vertical line using the bottom of the geometry card.
- 12. Give pupils index cards to use as geometry cards or have them carefully tear a page from their exercise books and fold it into fourths.
- 13. Have pupils write their names on their geometry cards. Tell them they will use them all week.

Guided Practice (10 minutes)

- 1. Guide pupils to draw vertical lines.
 - a) Tell pupils to put their pencil at the top right corner of the geometry card and trace down to the bottom right corner.
 - b) Tell pupils to put their pencil at the bottom right corner of the geometry card and trace up to the top right corner.
 - c) Tell pupils to write the word 'vertical' next to each line.
- 2. Guide pupils to draw horizontal lines.
 - a) Tell pupils to put their pencil at the top left corner of the geometry card and trace across to the top right corner.
 - b) Tell pupils to put their pencil at the bottom left corner of the geometry card and trace across to the bottom right corner.
 - c) Tell pupils to write the word 'horizontal' next to each line.




Independent Practice (10 minutes)

- 1. Have pupils draw a picture that only uses horizontal and vertical lines.
 - a) Tell pupils to use their geometry cards to draw the lines.
 - b) Tell them they may make rectangles or squares with horizontal and vertical lines.
 - c) Explain that all the lines in their pictures must go straight up and down or straight across. They may not use any other type of line.

Closing (2 minutes)

- 1. Ask 1 or 2 pupils to share their pictures.
- 2. Talk about the shapes in the pictures. Talk about whether it is difficult to draw a picture with only horizontal and vertical lines.

Lesson Title: Perpendicular and Parallel Lines	Theme: Geometry Lines and Angles	
Lesson Number: M-04-077	Class/Level: Primary 4	Time: 35 minutes

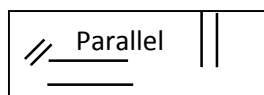
	<p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Identify perpendicular and parallel lines. 2. Draw perpendicular and parallel lines. 		<p>Teaching Aids 'Geometry cards' from Lesson 76</p>		<p>Preparation</p> <ol style="list-style-type: none"> 1. Draw pictures of parallel lines. 2. Draw pictures of perpendicular lines.
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Opening (3 minutes)

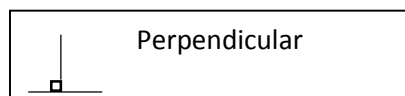
1. Ask pupils to think of a letter of the alphabet made from only vertical and horizontal lines.
2. Choose a pupil to give the clues for the 'I Spy' game to have them guess the letter. (See Lesson 45 for instructions for the 'I Spy' game.)
3. For example, **Say:** 'I spy with my little eye, a letter that have one vertical line and one horizontal line on top.' (Answer: T)
4. Repeat with different pupils and letters as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn about parallel and perpendicular lines.
2. Show pupils the picture of the parallel lines.



3. **Say:** This picture shows parallel lines.
4. **Ask:** Do the lines touch 1 another? Raise your hand to answer. (Answer: No)
5. **Say:** Parallel lines are lines that never touch. They will not touch no matter how long they are. They may be horizontal. They may be vertical. They may be slanted.
6. Show pupils how to put their hands a fixed distance apart in front of them perfectly straight. Show them how to move their hands up and down with changing the distance between them.
7. Practice saying 'parallel' with pupils 3 times while making the hand motion.
8. Show pupils the picture of the perpendicular lines.



9. **Say:** This picture shows perpendicular lines.
10. **Ask:** Do the lines touch 1 another? Raise your hand to answer (Answer: Yes)
11. **Say:** Perpendicular lines are lines that meet at a square corner. One line is vertical. One line is horizontal. The square in the corner means they form a perfect 90 degree angle.
12. Show pupils how to make a 'T' with their hands. Show them how to hold the right hand vertical (up and down). Hold the left hand horizontal. Put the left hand on top of the right hand to make a 'T'.
13. Practice saying 'perpendicular' with pupils 3 times while making the 'T'.

14. Show pupils how to draw parallel lines.
 - a) Trace along the top of the large geometry card.
 - b) Trace along the bottom edge of the large geometry card.
15. Show pupils how to draw perpendicular lines.
 - a) Trace along the bottom of the large geometry card, from left to right.
 - b) Trace up the side of the geometry card, from the bottom right corner to the top right corner.
 - c) Draw a small square where the lines meet, to show a square corner.
16. Have pupils take out their geometry cards.

Guided Practice (10 minutes)

1. Guide pupils to draw parallel lines.
 - a) Tell pupils to put their pencil at the top right corner of the geometry card and trace down to the bottom right corner. This makes a vertical line.
 - b) Tell pupils to put their pencil at the top left corner of the geometry card and trace down to the bottom left corner. This makes a second vertical line.
 - c) Tell pupils to write the word 'parallel' next to the set of lines.
2. Guide pupils to draw perpendicular lines.
 - a) Tell pupils to put their pencil at the bottom left corner of the geometry card and trace across to the bottom right corner. This makes a horizontal line.
 - b) Tell pupils to draw a dot on the line where it ends.
 - c) Tell pupils to move their geometry card, so the bottom left corner of the card exactly touches the dot.
 - d) Tell pupils to draw a vertical line up from the dot.
 - e) Tell pupils to draw a small square where the lines meet to show a square corner.
 - f) Tell pupils to write the word 'perpendicular' next to the set of lines.




Independent Practice (10 minutes)

1. Have pupils use their geometry cards to draw other sets of parallel lines.
2. Tell them to label each set of parallel lines with the word 'parallel'.
3. Have pupils use their geometry cards to draw other sets of perpendicular lines.
4. Tell them to label each set of perpendicular lines with the word 'perpendicular'.

Closing (2 minutes)

1. Play a quick game to help pupils remember 'vertical,' horizontal,' 'parallel' and 'perpendicular'.
 - a) Say 1 of the vocabulary words.
 - b) Pupils repeat the word and make the hand gesture.
2. **Say:** Good job today, pupils! You learned how to identify and draw parallel and perpendicular lines.

Lesson Title: Identifying and Naming Angles (Equal to, Greater or Less Than a Right Angle)	Theme: Geometry Lines and Angles	
Lesson Number: M-04-078	Class/Level: Primary 4	Time: 35 minutes

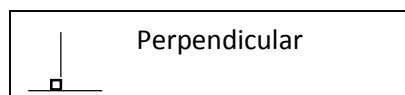
	Learning Outcomes By the end of the lesson, pupils will be able to: 1. Identify types of angles. 2. Name types of angles.		Teaching Aids 1. Alphabet strip 2. 'Geometry cards' from Lesson 76		Preparation 1. Gather or make an alphabet strip with uppercase letters. 2. Draw on the board a matrix with 3 columns.
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Opening (3 minutes)

1. Ask pupils to think of a letter of the alphabet that has no horizontal lines.
2. Choose a pupil to give the clues for the 'I Spy' game to have them guess the letter. (See Lesson 45 for instructions for the 'I Spy' game.)
3. For example, **Say:** 'I spy with my little eye, a letter that have one vertical line and two half circles coming out from the right side of the vertical line.' (Answer: B)
4. Repeat with different pupils and letters as time permits.

Introduction to the New Material (10 minutes)


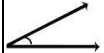

1. **Say:** Today we will learn to identify and name angles.
2. Show pupils the picture of the perpendicular lines.



3. Review that perpendicular lines are lines that meet at a square corner.
4. **Say:** The space inside the corner is called an angle. Explain that a square angle is called a 'right angle.'
5. **Write** on the board the letter 'L'.
6. As a class, identify the right angle in 'L.'
7. **Say:** Angles that are less than a right angle are called 'acute' angles.
8. Have pupils hold their left thumb and pointer finger in the shape of an 'L' and say 'right angle'.
9. Have pupils bring their pointer finger halfway down toward their thumb and say 'acute angle'.
10. **Write** on the board the letter 'V'.
11. As a class, identify the acute angle in 'V'.
12. **Say:** Angles more than a right angle are called 'obtuse' angles.
13. Have pupils hold their left thumb and pointer finger in the shape of an 'L' and say 'right angle'.
14. Have pupils stretch their pointer finger a far away as they can from their thumb and say 'obtuse angle'.
15. **Write** on the board an 'X'.
16. As a class, identify the obtuse angles on each side of the X.

Guided Practice (10 minutes)

1. Put pupils in groups of 3.
2. Show pupils the matrix drawn on the board.

		
Right angles	Acute angles	Obtuse angles
L	V	X

- Say:** As a class, put 2 uppercase letters of the alphabet into the first column, 'Right angles'.
(Examples Answer: T, E, F, H, I, L)
- Say:** As a class, put 2 uppercase letters of the alphabet into the second column, 'Acute angles'.
(Examples Answer: A, K, M, N, V, W, X, Y, Z)
- Tell pupils to copy the matrix into their exercise books.
- Ask pupils to work in their groups to put other letters into each column of the matrix. Give pupils 5 minutes to complete the matrix.




Independent Practice (10 minutes)

- Have pupils continue to put letters in the matrix on their own.
- Tell pupils there is 1 letter with both acute and obtuse angles. They can write it in both columns.

Closing (2 minutes)

- Go over answers. (Answers: Right angles: E, F, H, L, T; Acute angles: A, K, M, N, V, X, Y, Z; Obtuse angles: X)
- Ask:** Why didn't we put B in a column? Raise your hand to answer. (Answer: The letter does not have right, acute or obtuse angles.)
- Say:** Good job today, pupils! You used the uppercase alphabet to identify the three types of angles.

Lesson Title: Drawing Angles (Equal to, Greater or Less Than a Right Angle)	Theme: Geometry Lines and Angles	
Lesson Number: M-04-079	Class/Level: Primary 4	Time: 35 minutes

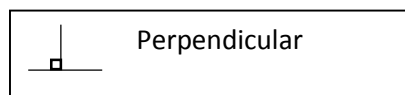
	Learning Outcomes By the end of the lesson, pupils will be able to draw different types of angles.		Teaching Aids 'Geometry cards' from Lesson 76		Preparation Draw the angles from the introduction on the board.
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Opening (3 minutes)

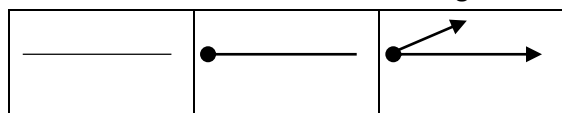
- Review vocabulary from the week with pupils 'vertical,' horizontal,' 'parallel', 'perpendicular', 'right angle', 'acute angle' and 'obtuse angle'.
 - Say 1 of the new words.
 - Pupils repeat the word and make the hand gesture.
- Repeat 2 or 3 times as time permits.

Introduction to the New Material (10 minutes)

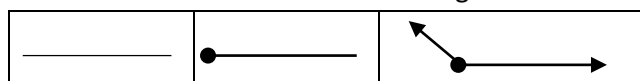
- Say:** Today we will learn how to draw right angles, acute angles and obtuse angles.
- Show pupils the picture of the perpendicular lines.



- Review with pupils how to use the geometry card to make perpendicular lines. (See Lesson 77)
- Draw perpendicular lines on the board.
- With pupils, identify the right angles.
- Ask:** Can we use our geometry cards to make a right angle? Raise your hand to answer. (Answer: Yes)
- Show pupils how to make an acute angle.
 - Trace along the bottom edge of the large geometry card.
 - Put a dot at the beginning of the horizontal line.
 - Draw a straight line from the dot to make an acute angle.
 - Draw arrows at the end of each side of the angle.



- Show pupils how to make an obtuse angle.
 - Trace along the bottom edge of the large geometry card.
 - Put a dot at the beginning of the horizontal line.
 - Draw a straight line from the dot to make an obtuse angle.
 - Draw arrows at the end of each side of the angle.



Guided Practice (10 minutes)

1. Guide pupils to draw each type of angle, using their geometry cards.
2. Have pupils write the name of each angle next to the angle they draw.




Independent Practice (10 minutes)

1. Have pupils use their geometry cards to draw and label each type of angle on their own.
2. **Say:** Draw 3 different types of acute and obtuse angles. Also, draw a 90 degree angles that does not look like the perpendicular line we drew in the introduction. Hint, it can be facing a different direction.

Closing (2 minutes)

1. Ask pupils to share their drawings of angles with a partner.
2. Invite 3 – 4 pupils to come to the board and draw each type of angle.
3. Play the vocabulary game from this lesson's Opening.

Lesson Title: Comparing Angles Inside and Outside of the Classroom	Theme: Geometry Lines and Angles	
Lesson Number: M-04-080	Class/Level: Primary 4	Time: 35 minutes




	Learning Outcomes By the end of the lesson, pupils will be able to compare different types of angles inside and outside of the classroom.		Teaching Aids Objects		Preparation 1. Gather objects that show different kinds of angles, such as fabric with patterns, Chinese fan, scissors, books, etc. 2. Draw a matrix with 3 columns.
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Opening (3 minutes)

- Review vocabulary from the week with pupils 'vertical,' horizontal,' 'parallel', 'perpendicular', 'right angle', 'acute angle' and 'obtuse angle.'
 - Say 1 of the vocabulary words.
 - Pupils repeat the word and make the hand gesture.
- Repeat 2 or 3 times as time permits.

Introduction to the New Material (10 minutes)

- Say:** Two days ago, we found angles in letters of the alphabet. Today we will find right angles, acute angles and obtuse angles in objects.
- Show pupils the matrix drawn on the board.

 Right Angles	 Acute angles	 Obtuse angles

- As a class, look at the gathered objects.
- Decide which column each object goes in. (Answer will vary depending on the found objects.)
- Talk about objects that can go in more than 1 column.
 - A Chinese fan can go in all 3 columns. It can be opened to a right angle, an acute angle or an obtuse angle.
 - A book can go in all 3 columns. It can be opened to a right angle, an acute angle or an obtuse angle.
 - Scissors can go in all 3 columns. They can be opened to a right angle, an acute angle or an obtuse angle.
 - Fabric may go in more than column, depending upon the pattern.
- Write the names of the objects in each column.

Guided Practice (10 minutes)

- Have pupils draw a matrix with columns in their exercise books.

2. Have pupils work in groups to identify objects in the classroom or at home with acute, right and obtuse angles,
3. Have pupils write the names of these objects or draw them in the correct column of the matrix.




Independent Practice (10 minutes)

1. Have pupils continue to add objects to the matrix on their own for 2 minutes.
2. **Write** and **Say**: Fill in the following sentence in uppercase letters:
 - a) 'My favourite colour is _____'
 - b) 'My favourite subject in school is _____'
3. Tell pupils to copy the sentence in their notebooks and then name all the angles and lines they see in their favourite colour or subject. (Example answers: a. BLUE: horizontal, vertical, perpendicular, right angle; b. MATH: horizontal, vertical, perpendicular, right angle, acute angle)

Closing (2 minutes)

1. **Ask** pupils to share their matrices with their groups.
2. **Write** the word 'EXTRA' on the board.
3. **Ask**: What are all the lines and angles in the word?
4. Invite 3-4 pupils to share. (Answer: horizontal, vertical, perpendicular, right, acute, obtuse)
5. **Say**: Good job today, pupils! You compared angles and lines of objects inside and outside the classroom.

Lesson Title: Multiplication of Like Fractions with Denominators up to 6	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-081	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to model multiplication of like fractions with denominators up to 6 by a whole number.		Teaching Aids None		Preparation 1. Draw on the board a set of 5 squares. 2. Draw on the board a set of 5 circles. 3. Write on the board the problems for guided and independent practice.
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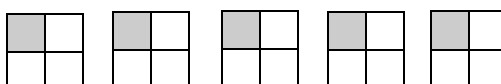
Opening (3 minutes)

- Review multiplication as repeated addition.
 - Write** on the board $2 + 2 + 2 = \underline{\quad}$. As a class, chorally say the addition sentence and the answer. (Answer: $2 + 2 + 2 = 6$)
 - Write** on the board $2 + 2 + 2 = 6$.
 - Beneath it, **write** $\underline{\quad} \times 2 = 6$. **Ask:** What is the missing factor? Raise your hand to answer. (Answer: 3)
 - Write** $3 \times 2 = 6$. As a class, chorally say the multiplication problem and the answer. (Answer: $3 \times 2 = 6$)
- Repeat other numbers as time permits.

Introduction to the New Material (10 minutes)

- Say:** Today we will learn one way to multiply a fraction by a whole number.
- Write** on the board $5 \times \frac{1}{4}$. Read the multiplication problem with pupils.
- Show pupils the set of 5 squares drawn on the board. Shade in $\frac{1}{4}$ in each square.

- Say:** This drawing shows $5 \times \frac{1}{4}$.



- Say:** The whole number is how many squares. **Ask:** How many squares are there? Raise your hand to answer. (Answer: 5)
- Say:** The denominator is how many equal parts are in each square. is how much of each square is shaded. **Ask:** How much of each square is shaded? Raise your hand to answer. (Answer: $\frac{1}{4}$)
- Count the shaded fourths aloud with pupils: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}$
- Say:** $5 \times \frac{1}{4}$ is the same as counting $\frac{1}{4}$ five times. We counted $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}$, so $5 \times \frac{1}{4} = \frac{5}{4}$.
- Ask:** What addition problem does this show? Raise your hand to answer. (Answer: $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$)
- Write** on the board under the squares: $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} =$
- Review with pupils that you only add the top numbers in fractions. The denominator must be the same. Guide pupils to notice the denominators are the same.

12. **Say:** The denominator in my addition problem is 4. I know the denominator in my answer must be 4 as well.
13. **Write** on the board $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$. Solve with pupils. (Answer: $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$)
14. **Say:** $5 \times \frac{1}{4}$ is the same as adding $\frac{1}{4}$ five times. We added $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$, so $5 \times \frac{1}{4} = \frac{5}{4}$.
15. **Write** on the board: $5 \times \frac{2}{4}$
16. **Say:** I am going to show this problem with circles. **Ask:** How many circles do I need? Raise your hand to answer. (Answer: 5)
17. Draw on the board 5 circles.
18. **Say:** The denominator of the fraction is 4. I need to divide each circle into fourths.
19. Divide each circle into fourths. By creating a cross in each one.
20. **Say:** The top number in my fraction tells how many fourths to shade in each circle.
21. **Ask:** How many fourths do I shade in each circle? Raise your hand to answer. (Answer: 2)
22. Shade 2 fourths in each circle.
23. Count the shaded fourths aloud with pupils. Count the numerator in $2 \times \frac{2}{4}, \frac{4}{4}, \frac{6}{4}, \frac{8}{4}, \frac{10}{4}$.
24. **Say:** $5 \times \frac{2}{4}$ is the same as counting $\frac{2}{4}$ five times. We counted $\frac{2}{4}, \frac{4}{4}, \frac{6}{4}, \frac{8}{4}, \frac{10}{4}$, so $5 \times \frac{2}{4} = \frac{10}{4}$.
25. Repeat steps 9 to 14 to show $5 \times \frac{2}{4}$ as repeated addition.

Guided Practice (10 minutes)

- Write** the problems on the board: 'Multiply the fraction by a whole number:'
 - $4 \times \frac{1}{5} =$
 - $6 \times \frac{2}{5} =$
 - $5 \times \frac{3}{5} =$
 - $2 \times \frac{4}{5} =$
 - $3 \times \frac{5}{5} =$
- Have pupils copy problems a. and b. into their exercise books.
- Guide pupils through each step of solving problems a. and b.
 - Draw the correct number of circles.
 - Divide the circles into the correct fraction.
 - Shade in the correct part of each circle.
 - Count the shaded parts. Write the answer.
 - Write the addition problem for the shaded part. Write the answer.
 - Write the answer next to the multiplication problem.
 - Tell pupils to check problems a. and b. with a partner.
- Write** the answers on the board. (Answers: a. Draw 4 circles. Divide each circle into fifths. Count $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$. Add $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{4}{5}$. Write $4 \times \frac{1}{5} = \frac{4}{5}$. b. Draw 6 circles. Divide each circle into fifths. Count $\frac{2}{5}, \frac{4}{5}, \frac{6}{5}, \frac{8}{5}, \frac{10}{5}, \frac{12}{5}$. Add $\frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{12}{5}$. Write $6 \times \frac{2}{5} = \frac{12}{5}$.)




Independent Practice (10 minutes)

- Have pupils complete the last 3 problems on their own following the steps.

Closing (2 minutes)

- Go over answers with pupils. (Answers: c. $5 \times \frac{3}{5} = \frac{15}{5}$ d. $2 \times \frac{4}{5} = \frac{8}{5}$ e. $3 \times \frac{5}{5} = \frac{15}{5}$)
- Say:** Good job today, pupils! You multiplied a whole number by a fraction and used models and repeated addition to find the answer.

Lesson Title: Multiplication of Like Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-082	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to model multiplication of like fractions with denominators up to 12 by a whole number.		Teaching Aids None		Preparation 1. Draw on the board a shaded square for the opening. 2. Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

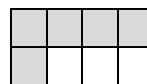
1. **Draw** on the board.



2. **Say:** This shows 1 square with $\frac{4}{4}$ shaded. The whole number is 1. The fraction is $\frac{4}{4} \cdot \frac{4}{4} = 1$.
3. With the class, **Say:** $\frac{4}{4} = 1$.
4. Tell pupils to work with a partner to come up with different fractions equivalent to 1. (Example answers: $\frac{4}{4} = \frac{2}{2} = \frac{10}{10} = \frac{8}{8} = 1$)
5. Choose pupils to stand up and recite the fractions equivalent to 1 they thought of.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn another way to multiply a fraction by a whole number.
2. **Write** on the board $5 \times \frac{1}{8}$. Read the multiplication problem with pupils.
3. **Say:** Yesterday, we drew a picture first. Then we wrote an addition problem. Today, we will write the addition problem first. Then we will draw a picture to model another way to represent the multiplication of a fraction by a whole number.
4. **Ask:** What addition problem can I write for $5 \times \frac{1}{8}$? Raise your hand to answer. (Answer: $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{5}{8}$)
5. **Write** on the board the addition problem. Solve it with pupils.
6. **Say:** I want to draw a picture to show the addition problem.
7. **Ask:** How many eighths are in our answer? Raise your hand to answer. (Answer: 5)
8. Draw on the board a rectangle. Divide it into eighths. Shade $\frac{5}{8}$.



9. **Say:** I can draw 1 rectangle to show five $\frac{1}{8}$'s. I can show $5 \times \frac{1}{8}$ with 1 rectangle.
10. Count the eighths aloud with pupils: $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}$.
11. **Say:** $5 \times \frac{1}{8}$ is the same as counting $\frac{1}{8}$ five times. We counted $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}$, so $5 \times \frac{1}{8} = \frac{5}{8}$.
12. **Write** on the board: $5 \times \frac{1}{8} = \frac{5}{8}$.

13. **Ask:** Is $\frac{5}{8}$ less than 1, equal to 1 or more than 1? Point your finger down if it is less than 1. Point 2 fingers sideways if it is equal to 1. Point your finger up if it is more than 1. (Answer: It is less than 1. Pupils point their fingers down.)
14. **Write** on the board: $5 \times \frac{3}{8}$
15. **Ask:** What is the addition problem for $5 \times \frac{3}{8}$? Raise your hand to answer. (Answer: $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} = \frac{15}{8}$)
16. **Write** on the board the addition problem. **Say:** We need to count $\frac{3}{8}$ five times to get the answer.
17. Count the eighths aloud with pupils. Count the numerator in 3s: $\frac{3}{8}, \frac{6}{8}, \frac{9}{8}, \frac{12}{8}, \frac{15}{8}$.
18. **Say:** $5 \times \frac{3}{8}$ is the same as counting $\frac{3}{8}$ five times. We counted $\frac{3}{8}, \frac{6}{8}, \frac{9}{8}, \frac{12}{8}, \frac{15}{8}$, so $5 \times \frac{3}{8} = \frac{15}{8}$.
19. **Ask:** How many eighths are equivalent to 1? (Answer: 8)
20. Draw a rectangle. Divide it into eighths. Shade all $\frac{8}{8}$.
21. **Say:** My picture shows $\frac{8}{8}$. I need to show $\frac{15}{8}$. I need to draw 1 more rectangle and shade $\frac{7}{8}$.
22. Draw the second rectangle. Shade it.



23. **Ask:** Is $\frac{15}{8}$ less than 1, equal to 1 or more than 1? Point your finger down if it is less than 1. Point 2 fingers sideways if it is equal to 1. Point your finger up if it is more than 1. (Answer: It is more than 1. Pupils point their fingers up.)

Guided Practice (10 minutes)

1. **Write** the following on the board: 'Multiply the fraction by a whole number by using addition and draw a model to represent the multiplication.'

a. $3 \times \frac{1}{8} =$ b. $2 \times \frac{5}{8} =$ c. $5 \times \frac{3}{8} =$ d. $11 \times \frac{2}{8} =$ e. $2 \times \frac{4}{8} =$

2. Have pupils copy problems a. and b. into their exercise books.
3. Guide pupils through each step of solving problems a. and b.
- Write the addition problem for the multiplication problem. Solve it. Write the answer.
 - Draw the picture.
 - Write the answer next to the multiplication problem.
4. (Answers: a. Add $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$. Draw 1 rectangle. Divide into eighths. Shade $\frac{3}{8}$. Write $3 \times \frac{1}{8} = \frac{3}{8}$.
 . b. Add $\frac{5}{8} + \frac{5}{8} = \frac{10}{8}$. Draw 2 rectangles. Divide into eighths. Shade in $\frac{10}{8}$. Write $2 \times \frac{5}{8} = \frac{10}{8}$.)




Independent Practice (10 minutes)

1. Have pupils complete the last 3 problems on their own.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. $5 \times \frac{3}{8} = \frac{15}{8}$ d. $11 \times \frac{2}{8} = \frac{22}{8}$ e. $2 \times \frac{4}{8} = \frac{8}{8}$)
2. **Say:** Good job today, pupils! You multiplied a fraction by a whole number by modelling the repeated addition with shaded figures.

Lesson Title: Multiplication of Like Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-083	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to multiply like fractions with denominators up to 12 by a whole number.</p>		<p>Teaching Aids None</p>		<p>Preparation 1. Write on the board the 4 problems from Lessons 81 and 82, with answers. 2. Write on the board the 3 steps to multiply a whole number by a fraction. 3. Write on the board the problems for guided and independent practice.</p>
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Opening (3 minutes)

- Write** on the board the numbers used to skip count in 12s to 120: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120.
- As a class, use the numbers on the board to skip count forward in 12s to 120 two times.
- Give pupils time to copy the numbers into their exercise books to use during the lesson.

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to multiply a fraction by a whole number without pictures.
- Say:** Turn to a partner and talk about all the ways you learned to solve these problems so far.
- Give pupils 1 or 2 minutes to talk to one another.
- Invite 2-3 pupils to share answers. (Example answers: Draw a picture. Skip count. Write an addition problem.)
- Say:** Here are 2 problems we solved this week with pictures, skip counting and addition.
- Read aloud with pupils the problems written on the board: $5 \times \frac{3}{8} = \frac{15}{8}$ $5 \times \frac{3}{5} = \frac{15}{5}$
- Ask pupils to talk with a partner about what is the same about both problems.
- Invite 3 or 4 pupils to share their ideas with the class. (Answers: They both multiply the number 5 times a fraction. The fractions both have '3' as the top number. The answers both have 15 as the top number. The answers have the same denominator as the fraction in the problem.)
- Say:** Here are more two problems we solved this week with pictures and addition.
- Read aloud with pupils the problems written on the board: $2 \times \frac{4}{5} = \frac{8}{5}$ $2 \times \frac{4}{8} = \frac{8}{8}$
- Ask pupils to talk with a partner about what is the same about both problems.
- Invite 3 or 4 pupils to share their ideas with the class. (Answers: They both multiply the number 2 times a fraction. The fractions both have 4 as the top number. The answers both have 8 as the top number. The answers have the same denominator as the fraction in the problem.)
- Explain to pupils that the things they noticed are in the steps to multiply a whole number by a fraction.
- Read aloud with pupils the 3 steps to multiply a whole number by a fraction.
 - Step 1: Write the denominator for the answer.
 - Step 2: Multiply the whole number and the top number of the fraction.
 - Step 3: Write the top number of the answer.

15. **Write** on the board: $6 \times \frac{5}{12} =$
16. **Say:** Step 1 says to write the denominator for answer. **Ask:** What is the denominator for the answer? Raise your hand to answer. (Answer: 12)
17. **Write** on the board: $6 \times \frac{5}{12} = \frac{\quad}{12}$
18. **Say:** Step 2 says to multiply the whole number and the top number or numerator of the fraction. **Ask:** What 6×5 ? Raise your hand to answer. (Answer: 30)
19. **Say:** Step 3 says to write the top number of the answer. **Ask:** What is the top number or numerator of the answer? Raise your hand to answer. (Answer: 30)
20. **Write** on the board $6 \times \frac{5}{12} = \frac{30}{12}$. Read aloud with pupils.
21. Repeat steps 15 to 20 with $12 \times \frac{3}{12} =$ (Answer: $\frac{36}{12}$)

Guided Practice (10 minutes)

1. Read with pupils the problems written on the board:
 - a. $\frac{3}{12} \times 10 =$
 - b. $6 \times \frac{5}{12} =$
 - c. $12 \times \frac{2}{12} =$
 - d. $9 \times \frac{4}{12} =$
 - e. $\frac{5}{12} \times 8 =$
 - f. $\frac{10}{12} \times 8 =$
2. Have pupils copy the problems into their exercise books.
3. **Say:** The order of factors does not matter in multiplication. $\frac{3}{12} \times 10$ is the same as $10 \times \frac{3}{12}$.
4. **Say:** Remember to use the 3 steps to solve the problems.
5. Have pupils solve problems a. and b. with a partner.
6. Go over answers. (Answers: a. $\frac{3}{12} \times 10 = \frac{30}{12}$ b. $6 \times \frac{5}{12} = \frac{30}{12}$).




Independent Practice (10 minutes)

1. Have pupils complete the last 4 problems on their own.
2. Remind pupils to use repeated addition if they don't know an answer to a multiplication problem. For example, 12×2 is the same as $12 + 12$.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. $12 \times \frac{2}{12} = \frac{24}{12}$ d. $9 \times \frac{4}{12} = \frac{36}{12}$ e. $\frac{5}{12} \times 8 = \frac{40}{12}$ f. $\frac{10}{12} \times 8 = \frac{80}{12}$)
2. **Say:** Good job today, pupils, you multiplied a fraction with a whole number without using repeated addition or drawing pictures.

Lesson Title: Multiplication of Related Fractions with Denominators up to 6	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-084	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to model multiplication of related fractions with denominators up to 6 by a whole number up to 12.		Teaching Aids None		Preparation 1. Draw on the board a set of 2 rectangles. 2. Write on the board the problems and directions for guided and independent practice.
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Opening (3 minutes)

1. Review multiplication facts with 2, 3, 4, 5, 6.
2. Chant aloud with the class the multiplication facts, beginning with 2×1 up to 2×9 . Repeat for facts with 3, 4, 5 and 6 as time permits.

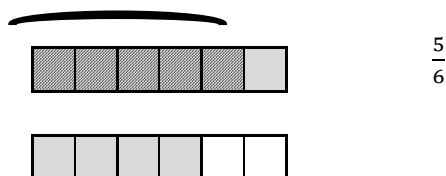
Introduction to the New Material (10 minutes)

1. **Say:** Today we will multiply related fractions by whole numbers. We will compare the answers to see which is bigger.
2. **Write** on the board $5 \times \frac{1}{3}$. Read the multiplication problem with pupils.
3. **Ask:** How do I solve $5 \times \frac{1}{3}$? Raise your hand to answer. (Answer: Write 3 for the denominator of the answer. Multiply 5×1 . Write 5 for the top number of the answer.)
4. **Write** on the board $5 \times \frac{1}{3} = \frac{5}{3}$.
5. **Ask:** How many thirds are in our answer? Raise your hand to answer. (Answer: 5)
6. **Ask:** How many thirds are equivalent to 1? Raise your hand to answer. (Answer: 3)
7. Draw a rectangle. Divide it into thirds. Shade all $\frac{3}{3}$.
8. **Say:** My picture shows $\frac{3}{3}$. I need to show $\frac{5}{3}$. I need to draw 1 more rectangle and shade $\frac{2}{3}$.
9. Draw the second rectangle. Shade it.



10. **Ask:** Is $\frac{5}{3}$ less than 1, equal to 1 or more than 1? Point your finger down if it is less than 1. Point 2 fingers sideways if it is equal to 1. Point your finger up if it is more than 1. (Answer: It is more than 1. Pupils point their fingers up.)
11. **Write** on the board $5 \times \frac{1}{6}$. Read the multiplication problem with pupils.
12. **Ask:** How do I solve $5 \times \frac{1}{6}$? Raise your hand to answer. (Answer: Write 6 for the denominator of the answer. Multiply 5×1 . Write 5 for the top number of the answer.)
13. Write on the board $5 \times \frac{1}{6} = \frac{5}{6}$.
14. **Say:** Now I want to use my picture to show $5 \times \frac{1}{6} = \frac{5}{6}$.

15. **Ask:** How can I make thirds into sixths? Raise your hand to answer. (Answer: Draw a line down the middle of each third.)
16. Draw a line down the middle of each third in the rectangle you already drew. Count the sixths in each rectangle. Then, count $\frac{5}{6}$.
17. **Say:** Now I will show: $5 \times \frac{1}{6} = \frac{5}{6}$



18. **Ask:** Which is bigger $\frac{5}{3}$ or $\frac{5}{6}$? Raise your hand to answer. (Answer: $\frac{5}{3}$)
19. Write on the board $\frac{5}{3} > \frac{5}{6}$. Read aloud with pupils as 'five-thirds is more than five-sixths.'

Guided Practice (10 minutes)

- Read with pupils the problems and directions written on the board:
 - $2 \times \frac{2}{3} = \frac{4}{3}$ b. $3 \times \frac{2}{3} = 2$ c. $2 \times \frac{1}{3} = \frac{2}{3}$ d. $2 \times \frac{1}{6} = \frac{1}{3}$
- Have pupils copy problem set a. into their exercise books.
- Guide pupils through each step of solving problem set a. in their exercise books.
 - Multiply to solve $2 \times \frac{3}{3} = \frac{6}{3}$. Write the answer.
 - Draw 2 rectangles. Shade all $\frac{3}{3}$ in the first rectangle. Shade all $\frac{3}{3}$ in the second rectangle.
 - Multiply to solve $2 \times \frac{6}{6} = \frac{12}{6}$.
 - Divide the thirds in the rectangles into sixths.
 - Count $\frac{12}{6}$. Shade all $\frac{6}{6}$ in the first rectangle. Shade all $\frac{6}{6}$ in the second rectangle.
 - Guide pupils to see $\frac{6}{3} = \frac{12}{6}$. Tell them to write this in their exercise books.




Independent Practice (10 minutes)

- Have pupils complete problem sets b. and c. on their own.
- Say:** Follow the steps a – f like we did for the first problem.
- Tell pupils to check their drawings and answers with a partner.

Closing (2 minutes)

- Go over answers with pupils. (Answers: b. $3 \times \frac{2}{3} = \frac{6}{3}$, $3 \times \frac{2}{6} = \frac{6}{6}$, $\frac{6}{3} > \frac{6}{6}$ c. $2 \times \frac{1}{3} = \frac{2}{3}$, $2 \times \frac{1}{6} = \frac{2}{6}$, $\frac{2}{3} > \frac{2}{6}$)
- Say:** Good job today, pupils! You learned how to model multiplication for related fractions and make comparisons between the pair of fractions using a model.

Lesson Title: Multiplication of Related Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-085	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to model multiplication of related fractions with denominator up to 12 by a whole number up to 12.		Teaching Aids None		Preparation Write on the board the problems and directions for guided and independent practice.
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Opening (3 minutes)

1. Review multiplication facts with 7, 8 and 9.
2. Chant aloud with the class the multiplication facts, beginning with 7×1 up to 7×9 .
3. Then, chant the multiplication facts with 7 backwards, beginning with 7×9 down to 7×1 .
4. Repeat for facts with 8 and 9 as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will multiply related fractions by whole numbers. We will use different fractions than yesterday. We will compare the answers to see which is bigger.
2. **Write** on the board $4 \times \frac{1}{5}$. Read the multiplication problem with pupils.
3. **Ask:** How do I solve $4 \times \frac{1}{5}$? Raise your hand to answer. (Answer: Write 5 for the denominator of the answer. Multiply 4×1 . Write 4 for the top number of the answer.)
4. **Write** on the board: $4 \times \frac{1}{5} = \frac{4}{5}$
5. **Ask:** How many fifths are in our answer? Raise your hand to answer. (Answer: 4).
6. **Ask:** How many rectangles do I need to draw to show $\frac{4}{5}$? Raise your hand to answer. (Answer: 1)
7. **Draw** a rectangle. Divide it into fifths. Shade $\frac{4}{5}$.



8. **Ask:** Is $\frac{4}{5}$ less than 1, equal to 1 or more than 1? Point your finger down if it is less than 1. Point 2 fingers sideways if it is equal to 1. Point your finger up if it is more than 1. (Answer: It is less than 1. Pupils point their fingers down.)
9. **Write** on the board $4 \times \frac{1}{10}$. Read the multiplication problem with pupils.
10. **Ask:** How do I solve $4 \times \frac{1}{10}$? Raise your hand to answer. (Answer: Write 10 for the denominator of the answer. Multiply 4×1 . Write 4 for the top number of the answer.)
11. **Write** on the board: $4 \times \frac{1}{10} = \frac{4}{10}$
12. **Say:** Now I want to use my picture to show $4 \times \frac{1}{10} = \frac{4}{10}$.
13. **Ask:** How can I make fifths into tenths? (Answer: Draw a line down the middle of each fifth.)
14. Draw a line down the middle of each fifth. Count the tenths in the rectangle. Then, count $\frac{4}{10}$.

15. **Say:** Now I will show: $4 \times \frac{1}{10} = \frac{4}{10}$



16. **Ask:** Which is less, $\frac{4}{5}$ or $\frac{4}{10}$? Raise your hand to answer. (Answer: $\frac{4}{10}$)

17. **Write** on the board $\frac{4}{10} < \frac{4}{5}$. Read aloud with pupils as 'four-tenths is less than four-fifths.'

Guided Practice (10 minutes)

1. Read with pupils the problems and directions written on the board.

Directions: Solve each set of problems. Draw 1 picture to show both answers. Compare the answers using $>$, $<$ or $=$.

a. $3 \times \frac{2}{5} =$ $3 \times \frac{2}{10} =$ b. $2 \times \frac{5}{5} =$ $2 \times \frac{5}{10} =$ c. $6 \times \frac{3}{5} =$ $6 \times \frac{3}{10} =$

2. Have pupils copy problem set a. into their exercise books.
3. Tell pupils to talk with a partner for 1 minute about how to solve problem set a.
4. Remind pupils to do all 3 things in the directions:
 - a) Solve the problems.
 - b) Draw 1 picture to show both answers.
 - c) Compare the answers using $>$, $<$ or $=$.
5. Have pupils solve problem set a.
6. Go over the answers with the class. (Answer: a. $3 \times \frac{2}{5} = \frac{6}{5}$, $3 \times \frac{2}{10} = \frac{6}{10}$, $\frac{6}{5} > \frac{6}{10}$)




Independent Practice (10 minutes)

1. Have pupils complete problem sets b. and c. on their own.
2. Tell pupils to check their drawings and answers with a partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: b. $2 \times \frac{5}{5} = \frac{10}{5}$, $2 \times \frac{5}{10} = \frac{10}{10}$, $\frac{10}{5} > \frac{10}{10}$ c. $6 \times \frac{3}{5} = \frac{18}{5}$, $6 \times \frac{3}{10} = \frac{18}{10}$, $\frac{18}{5} > \frac{18}{10}$)
2. **Say:** Good job today, pupils! You used a model to compare related fractions multiplied by a whole number.

Lesson Title: Multiplication of Related Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-086	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to multiply related fractions with denominators up to 12 by a whole number up to 12.</p>		<p>Teaching Aids None</p>		<p>Preparation 1. Write on the board the 2 problems from Lesson 84, with answers. 2. Write on the board the problems and directions for guided and independent practice.</p>
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Opening (3 minutes)

- Ask:** Would you rather have $\frac{1}{2}$ of a biscuit or $\frac{1}{4}$ of a biscuit?
- Tell pupils to turn to a partner and talk about their ideas for about 30 seconds.
- Choose pupils to share their ideas with the class. (Example answers: I would rather have $\frac{1}{2}$ of a biscuit because it is bigger. I would rather have $\frac{1}{4}$ of a biscuit because it is smaller, and I don't like biscuits.)

Introduction to the New Material (10 minutes)

- Say:** Today we will multiply related fractions by a whole number. We will learn to compare the answers without pictures.
- Write** on the board $\frac{1}{5} > \frac{1}{10}$. Read it aloud with pupils: 'one-fifth is more than one-tenth'.
- Say:** I know $\frac{1}{5}$ is more than $\frac{1}{10}$. The top number is the same for both fractions. I am counting 1 part for each fraction. The denominator tells me how big the parts are. Fifths are bigger than tenths. So, $\frac{1}{5}$ is more than $\frac{1}{10}$.
- Say:** Here are 2 problems we solved with related fractions. We used pictures to help us compare the answers.
- Read aloud with pupils the problems written on the board. $2 \times \frac{1}{3} = \frac{2}{3}$ $2 \times \frac{1}{6} = \frac{2}{6}$
- Write** on the board: $\frac{2}{3}$ and $\frac{2}{6}$
- Ask:** What is the same about both fractions? Raise your hand to answer. (Answer: They both have 2 as the top number.)
- Say:** The top number of both fractions is the same. So, I am counting the same number of parts for each fraction.
- Ask:** Which is the bigger part, thirds or sixths? Raise your hand to answer. (Answer: Thirds are bigger.)
- Say:** Thirds are bigger than sixths, so 'two-thirds' are more than 'two-sixths'.
- Write** on the board $\frac{2}{3} > \frac{2}{6}$. Read aloud with pupils.
- Say:** Now we will multiply 2 new related fractions and compare the answers.
- Write** on the board: $6 \times \frac{2}{8}$ and $6 \times \frac{2}{4} =$

14. **Ask:** How do I solve $6 \times \frac{2}{8}$? Raise your hand to answer. (Answer: Write '8' as the denominator for the answer. Multiply $6 \times 2 = 12$. Write 12 for the top number of the answer.)
15. **Write** on the board: $6 \times \frac{2}{8} = \frac{12}{8}$
16. **Ask:** How do I solve $6 \times \frac{2}{4}$? Raise your hand to answer. (Answer: Write '4' as the denominator for the answer. Multiply $6 \times 2 = 12$. Write 12 for the top number of the answer.)
17. **Write** on the board: $6 \times \frac{2}{4} = \frac{12}{4}$
18. **Say:** $\frac{12}{8}$ and $\frac{12}{4}$ both have the same top number. We are counting the same number of parts for each fraction.
19. **Ask:** Which is the smaller part, eighths or fourths? Raise your hand to answer. (Answer: Eighths)
20. **Say:** Eighths are smaller than fourths, so 'twelve-eighths' are less than 'twelve-fourths'.
21. **Write** on the board $\frac{12}{8} < \frac{12}{4}$. Read aloud with pupils.

Guided Practice (10 minutes)

1. Read with pupils the problems and directions written on the board:
 - a. $7 \times \frac{3}{8} =$ $7 \times \frac{3}{4} =$ b. $2 \times \frac{2}{9} =$ $2 \times \frac{2}{3} =$ c. $8 \times \frac{5}{6} =$ $8 \times \frac{5}{12} =$
2. Have pupils copy problem set a. into their exercise books.
3. Tell pupils to talk with a partner for 1 minute about how to solve problem set a.
4. Ask 2 or 3 pupils to tell the class how to solve problem set a.
5. Remind pupils to do both things in the directions:
 - a) Solve the problems.
 - b) Compare the answers using $>$, $<$ or $=$.
6. Have pupils solve problem set a.
7. Go over the answer with the class. (Answer: a. $7 \times \frac{3}{8} = \frac{21}{8}$, $7 \times \frac{3}{4} = \frac{21}{4}$, $\frac{21}{8} < \frac{21}{4}$)
8. **Ask:** How do you know $\frac{21}{8}$ is less than $\frac{21}{4}$? (Answer: We are counting the same number of parts for each fraction. Eighths are smaller than fourths. So $\frac{21}{8}$ is less than $\frac{21}{4}$.)




Independent Practice (10 minutes)

1. Have pupils complete problem sets b. and c. on their own.
2. Go over answers with pupils. (Answer: b. $2 \times \frac{2}{9} = \frac{4}{9}$, $2 \times \frac{2}{3} = \frac{4}{3}$, $\frac{4}{9} < \frac{4}{3}$ c. $8 \times \frac{5}{6} = \frac{40}{6}$, $8 \times \frac{5}{12} = \frac{40}{12}$, $\frac{40}{6} > \frac{40}{12}$)

Closing (2 minutes)

1. Ask pupils to explain to their partner how to compare 2 fractions with the same top number.
2. Invite 2-3 pupils to share. (Example answers: If the numerators or top numbers are the same, we look at the denominators and see which one is bigger. The one with the bigger denominator is smaller because the parts are smaller. If the denominators are the same, we look at the numerators or the top number. The one with the bigger numerator is the bigger number because you have more total parts.)
3. **Say:** Good job today, pupils! You compared answers to multiplication problems with related fractions without using pictures.

Lesson Title: Multiplication of Proper Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-087	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply proper fractions with denominators up to 12 by a whole number up to 6.		Teaching Aids Two biscuits or coconut cakes (or a picture of these if none are available)		Preparation 1. Gather 2 biscuits or coconut cakes. 2. Write on the board the problems and directions for guided and independent practice.
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Opening (3 minutes)

1. Show pupils 1 biscuit or coconut cake.
2. **Ask:** How can 3 friends share the cake? Each friend gets the same amount of cake. x Raise your hand to answer. (Answer: Tear or cut the biscuit/cake into 3 equal pieces)
3. Show pupils 2 biscuits or coconut cakes.
4. **Ask:** How can 3 friends share 2 cakes? Each friend gets the same amount of cake.
5. Tell pupils to talk about their ideas with a partner.
6. Tell pupils that today they will learn how to figure out how to share 2 cakes among 3 people.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to multiply a proper fraction and a whole number to find the fraction of the whole number.
2. **Write** on the board 'What is $\frac{1}{3}$ of 2?' Read it aloud with pupils. **Say:** A few minutes ago, I asked how 3 friends could share 2 cakes. First, we will estimate.
3. **Ask:** Does each friend get more than 1 whole cake or less than 1 whole cake? Raise your hand to answer. (Answer: Less)
4. **Say:** Each friend gets less than 1 whole cake because there are more friends than cakes.
5. **Say:** 'What is $\frac{1}{3}$ of 2?' is another way of asking how much cake 1 of the friends gets. There are 3 friends. Each friend gets $\frac{1}{3}$ of the 2 cakes.
6. **Write** on the board

$$\begin{array}{c} \frac{1}{3} \text{ of } 2 \\ \downarrow \\ \frac{1}{3} \times 2 \end{array}$$

7. **Say:** $\frac{1}{3}$ of 2 means the same thing as $\frac{1}{3} \times 2$. We multiply to solve $\frac{1}{3}$ of 2.
8. **Ask:** What is $\frac{1}{3} \times 2$? Raise your hand to answer. (Answer: $\frac{2}{3}$)
9. **Say:** $\frac{1}{3} \times 2 = \frac{2}{3}$. That means $\frac{1}{3}$ of 2 is $\frac{2}{3}$. Each friend gets $\frac{2}{3}$ of a cake.
10. **Say:** We estimated that each friend would get less than 1 cake.
11. **Ask:** Is $\frac{2}{3}$ less than 1? Raise your hand to answer. (Answer: Yes)
12. **Write** on the board $\frac{2}{3} < 1$. Read it aloud with pupils: 'two-thirds is less than one'.

13. Tell pupils this story: Five friends bought 4 cakes. They want to share the cakes. How much cake does each friend get?
14. **Say:** First, we will estimate.
15. **Ask:** Does each friend get more than 1 whole cake or less than 1 whole cake? Raise your hand to answer. (Answer: Less)
16. **Say:** Each friend gets less than 1 whole cake because there are more friends than cakes.
17. **Write** on the board 'What is $\frac{1}{5}$ of 4?' Read it aloud with pupils.
18. **Ask:** What multiplication problem can I write to solve $\frac{1}{5}$ of 4? Raise your hand to answer.
(Answer: $\frac{1}{5} \times 4$)
19. **Ask:** What is $\frac{1}{5} \times 4$? Raise your hand to answer. (Answer: $\frac{4}{5}$)
20. **Say:** $\frac{1}{5} \times 4 = \frac{4}{5}$. That means $\frac{1}{5}$ of 4 is $\frac{4}{5}$. Each friend gets $\frac{4}{5}$ of a cake.
21. **Say:** We estimated that each friend would get less than 1 cake.
22. **Ask:** Is $\frac{4}{5}$ less than 1? Raise your hand to answer. (Answer: Yes)
23. **Write** on the board $\frac{4}{5} < 1$. Read it aloud with pupils.

Guided Practice (10 minutes)

1. Read aloud with pupils the problems and directions written on the board:

Directions: Write a multiplication problem for each. Solve the problem. Compare the answer to 1 using $>$, $<$ or $=$.

a. $\frac{2}{10}$ of 4 b. $\frac{1}{5}$ of 5 c. $\frac{3}{8}$ of 2 d. $\frac{1}{9}$ of 3 e. $\frac{1}{6}$ of 6 f. $\frac{3}{10}$ of 3 g. $\frac{1}{4}$ of 2

2. Have pupils copy the problems a. and b. into their exercise books.
3. Remind pupils to follow all 3 directions:
 - a) Write the multiplication problem.
 - b) Solve the problem.
 - c) Compare the answer to 1 using $>$, $<$ or $=$.
4. Have pupils solve problems a. and b with a partner.
5. Go over answers with pupils. (Answers: **a.** $\frac{2}{10} \times 4 = \frac{8}{10}$, $\frac{8}{10} < 1$ **b.** $\frac{1}{5} \times 5 = \frac{5}{5}$, $\frac{5}{5} = 1$)




Independent Practice (10 minutes)

1. Have pupils complete the last 5 problems on their own.
2. Have pupils check their answers with a partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. $\frac{3}{8} \times 2 = \frac{6}{8}$, $\frac{6}{8} < 1$ d. $\frac{1}{9} \times 3 = \frac{3}{9}$, $\frac{3}{9} < 1$ e. $\frac{1}{6} \times 6 = \frac{6}{6}$, $\frac{6}{6} = 1$ f. $\frac{3}{10} \times 3 = \frac{9}{10}$, $\frac{9}{10} < 1$ g. $\frac{1}{4} \times 2 = \frac{2}{4}$, $\frac{2}{4} < 1$)
2. **Say:** Good job today, pupils! You multiplied whole numbers by proper fractions and compared the answer to 1 whole.

Lesson Title: Multiplication of Proper Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-088	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to multiply proper fractions with denominators up to 12 by a whole number up to 12.		Teaching Aids 3 biscuits or coconut cakes (or a picture of these if none are available)		Preparation 1. Gather 3 biscuits or coconut cakes. 2. Write on the board the problems and directions for guided and independent practice.
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Opening (3 minutes)

1. Show pupils 3 biscuits or coconut cakes.
2. **Ask:** How can 2 friends share 3 cakes? Each friend gets the same amount of cake.
3. Tell pupils to talk about their ideas with a partner.
4. Invite 1 or 2 pupils to share their ideas. (Answer: Each friend gets 1 whole cake. Tear the third cake in half. Each friend gets 1 whole cake plus another $\frac{1}{2}$ cake.)

Introduction to the New Material (10 minutes)

1. **Say:** Yesterday, we learned to multiply a proper fraction and a whole number when the answer is less than 1 or equal to 1. Today we will learn to multiply a proper fraction and a whole number when the answer is more than 1.
2. **Write** on the board 'What is $\frac{1}{2}$ of 3?' Read it aloud with pupils.
3. **Say:** A few minutes ago, I asked how 2 friends could share 3 cakes. First, we will estimate.
4. **Ask:** Does each friend get more than 1 whole cake or less than 1 whole cake? Raise your hand to answer. (Answer: More)
5. **Say:** Each friend gets more than 1 whole cake because there are more cakes than friends.
6. **Say:** 'What is $\frac{1}{2}$ of 3?' is another way of asking how much cake 1 of the friends gets. There are 2 friends. Each friend gets $\frac{1}{2}$ of the 3 cakes.
7. **Write** on the board $\frac{1}{2} \times 3$.
8. **Ask:** What is $\frac{1}{2} \times 3$? Raise your hand to answer. (Answer: $\frac{3}{2}$)
9. **Write** on the board $\frac{1}{2} \times 3 = \frac{3}{2}$.
10. **Say:** I know $\frac{3}{2}$ is more than 1, because $\frac{2}{2} = 1$. $\frac{3}{2}$ is the same as 1 whole cake plus $\frac{1}{2}$ more cake.
11. **Write** on the board $\frac{3}{2} > 1$. Read it aloud with pupils as 'three-halves is more than one'
12. Tell pupils this story: Five friends bought 6 cakes. They want to share the cakes. How much cake does each friend get?
13. **Say:** First, we will estimate.
14. **Ask:** Does each friend get more than 1 whole cake or less than 1 whole cake? Raise your hand to answer. (Answer: More)
15. **Say:** Each friend gets more than 1 whole cake because there are more friends than cakes.
16. **Write** on the board 'What is $\frac{1}{5}$ of 6?' Read it aloud with pupils.

17. **Ask:** What is $\frac{1}{5} \times 6$? Raise your hand to answer. (Answer: $\frac{6}{5}$)
18. **Write** on the board $\frac{1}{5} \times 6 = \frac{6}{5}$.
19. **Ask:** How do we know $\frac{6}{5}$ is more than 1? Raise your hand to answer. (Answer: $\frac{5}{5} = 1$)
20. **Say:** $\frac{6}{5}$ is the same as 1 whole and $\frac{1}{5}$ more. Each friend gets 1 whole cake plus $\frac{1}{5}$ more cake.
21. **Say:** We estimated that each friend would get more than 1 cake. **Ask:** Are we correct? Raise your hand to answer. (Answer: Yes)
22. **Write** on the board $\frac{6}{5} > 1$. Read it aloud with pupils.

Guided Practice (10 minutes)

1. Read aloud with pupils the problems and directions written on the board.

Directions: Write a multiplication problem for each. Solve the problem. Compare the answer to 1 using $>$, $<$ or $=$.

- a. $\frac{4}{10}$ of 8 b. $\frac{1}{12}$ of 12 c. $\frac{3}{4}$ of 2 d. $\frac{2}{3}$ of 6 e. $\frac{5}{8}$ of 7 f. $\frac{3}{9}$ of 3 g. $\frac{2}{11}$ of 2

2. Have pupils copy the problems a. and b. into their exercise books.
3. Remind pupils to follow all 3 directions:
- Write the multiplication problem.
 - Solve the problem.
 - Compare the answer to 1 using $>$, $<$ or $=$.
4. Have pupils solve problems a. and b. with a partner.
5. Go over answers with pupils. (Answers: a. $\frac{4}{10} \times 8 = \frac{32}{10}$, $\frac{32}{10} > 1$ b. $\frac{1}{12} \times 12 = \frac{12}{12}$, $\frac{12}{12} = 1$)




Independent Practice (10 minutes)

1. Have pupils complete the last 5 problems on their own.
2. Have pupils check their answers with a partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. $\frac{3}{4} \times 2 = \frac{6}{4}$, $\frac{6}{4} > 1$ d. $\frac{2}{3} \times 6 = \frac{12}{3}$, $\frac{12}{3} > 1$ e. $\frac{5}{8} \times 7 = \frac{35}{8}$, $\frac{35}{8} > 1$ f. $\frac{3}{9} \times 3 = \frac{9}{9}$, $\frac{9}{9} = 1$ g. $\frac{2}{11} \times 2 = \frac{4}{11}$, $\frac{4}{11} < 1$)
2. **Say:** Good job today, pupils! You multiplied a whole number by a proper fraction to determine how to share the whole number and then compared it to 1 whole.

Lesson Title: Word Problems Involving Proper Fractions with Denominators up to 6	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-089	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of this lesson, pupils will be able to solve word problems involving multiplication and proper fractions with denominators up to 6.		Teaching Aids None		Preparation Write on the board the word problems for the lesson.
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Opening (3 minutes)

1. Review making equivalent fractions.
2. Tell pupils to work with a partner to find as many fractions equivalent to 1 as they can in 1 minute.
3. Remind pupils that a fraction equivalent to 1 has the same number on the top and bottom.
4. Choose 1 or 2 pupils to come to the board and write the equivalent fractions they found.
(Example answers: $1 = \frac{2}{2} = \frac{3}{3} = \frac{10}{10}$ etc.)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will solve word problems by multiplying fractions and whole numbers. We will learn to change the answers into whole numbers.
2. Read all 4 problems aloud with pupils:

<p>a. The football club makes 6 goals in all. Joseph makes $\frac{2}{3}$ of the goals. How many goals does Joseph make?</p>	<p>b. A recipe needs $\frac{1}{3}$ of a tablespoon of chile. How many tablespoons of chile do 6 recipes need?</p>
<p>c. Fatu gets 4 biscuits. She gives $\frac{1}{2}$ of the biscuits to her sister. How many biscuits does Fatu give?</p>	<p>d. Fatmata reads $\frac{1}{5}$ of her book each day. How much does she read in 5 days?</p>

3. Read problem a. again with pupils.
4. Ask pupils to tell the problem to a partner to ensure they understand it.
5. Invite a pupil to retell the problem to the class in his or her own words.
6. **Say:** Joseph makes $\frac{2}{3}$ of the goals. There are 6 goals in all. We need to find $\frac{2}{3}$ of 6.
7. **Ask:** What is the multiplication problem for $\frac{2}{3}$ of 6? Raise your hand to answer. (Answer: $\frac{2}{3} \times 6$)
8. **Write** on the board $\frac{2}{3} \times 6$.
9. **Ask:** What is $\frac{2}{3} \times 6$? Raise your hand to answer. (Answer: $\frac{12}{3}$)

10. **Write** on the board $\frac{2}{3} \times 6 = \frac{12}{3}$. Read it aloud with pupils.
11. **Say:** The problem asks 'How many goals does Joseph make?' My answer is $\frac{12}{3}$. Joseph cannot make $\frac{12}{3}$ goals. I need to make the answer into a whole number.
12. **Say:** The top number in $\frac{12}{3}$ is bigger than the denominator. I can make it into a whole number by dividing. I divide 12 by 3. $12 \div 3 = 4$. So $\frac{12}{3} = 4$. Therefore, Joseph makes 4 goals.

Guided Practice (10 minutes)

1. Read problem b. again with pupils.
2. Ask pupils to tell the problem to a partner to ensure they understand it.
3. **Say:** The recipe needs $\frac{1}{3}$ of a tablespoon of chile.
4. **Ask:** How many recipes? Raise your hand to answer. (Answer: 6)
5. **Ask:** What is the multiplication problem to show $\frac{1}{3}$ six times? Raise your hand to answer. (Answer: $6 \times \frac{1}{3}$)
6. Have pupils write in their exercise books $6 \times \frac{1}{3}$.
7. Tell pupils to solve the problem and write the answer.
8. **Ask:** What is $6 \times \frac{1}{3}$? Raise your hand to answer. (Answer: $\frac{6}{3}$)
9. **Say:** The top number in $\frac{6}{3}$ is bigger than the denominator. You can make it into a whole number by dividing.
10. Tell pupils to divide 6 by 3.
11. **Ask:** What is $6 \div 3$? Raise your hand to answer. (Answer: 2)
12. Tell pupils to write $\frac{6}{3} = 2$ in their exercise book.
13. **Ask:** How many tablespoons of chile do 6 recipes need? Raise your hand to answer. (Answer: 6)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. Remind pupils to:
 - a) Write the multiplication problem.
 - b) Solve the multiplication problem. Write the answer.
 - c) Divide the top number of the answer by its denominator to get a whole number.
 - d) Write the whole number the answer is equal to.
3. Tell pupils to check their answers in groups of 3.

Closing (2 minutes)

1. Go over problems and answers with pupils. (Answers: c. $\frac{1}{2} \times 4 = \frac{4}{2}$, $4 \div 2 = 2$, $\frac{4}{2} = 2$, Fatu gives 2 biscuits. d. $5 \times \frac{1}{5} = \frac{5}{5}$, $5 \div 5 = 1$, $\frac{5}{5} = 1$, Fatmata reads 1 whole book in 5 days.)
2. **Say:** Good job today, pupils! You solve word problems involving multiplying whole numbers by proper fractions.

Lesson Title: Word Problems Involving Proper Fractions with Denominators up to 12	Theme: Everyday Arithmetic Multiplication of Fractions	
Lesson Number: M-04-090	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to solve word problems involving multiplication and proper fractions with denominators up to 12.		Teaching Aids None		Preparation 1. Write on the board the fractions for the Opening. 2. Write on the board the word problems for the lesson.
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Opening (3 minutes)

1. Read aloud with pupils the fractions written on the board: $\frac{3}{5}$ $\frac{5}{5}$ $\frac{10}{5}$.
2. **Ask:** Which fraction is less than 1? Raise your hand to answer. (Answer: $\frac{3}{5}$)
3. **Ask:** Which fraction is equal to 1? Raise your hand to answer. (Answer: $\frac{5}{5}$)
4. **Ask:** Which fraction is equal to 2? Raise your hand to answer. (Answer: $\frac{10}{5}$)
5. Have pupils write the fractions in their exercise books. Tell them to draw a picture of each fraction.
6. Invite 3 pupils to draw the fractions on the board.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will solve word problems by multiplying fractions and whole numbers again. We will change the answers into whole numbers. We will write a sentence about our answers.
2. Read all 4 problems aloud with pupils:

<p>a. Joseph has 9 litres of water. He uses $\frac{1}{3}$ of his water. Foday has 10 litres of water. He uses $\frac{2}{5}$ of his water. Who uses more water?</p>	<p>b. A recipe for banana akara needs $\frac{2}{3}$ of a cup of sugar. How many cups of sugar are needed for 12 recipes?</p>
<p>c. Fatu gets 12 biscuits. She gives $\frac{3}{4}$ of the biscuits her sister. Mariatu gets 10 biscuits. She gives $\frac{3}{5}$ of the biscuits her sister. Who gives more biscuits?</p>	<p>d. Hassan reads for $\frac{4}{6}$ of an hour each day. How many hours does he read over 9 days?</p>
3. Read problem a. again with pupils.
4. **Say:** This problem tells us to find 3 things. We need to find how much water Joseph uses. We need to find how much water Foday uses. We need to find which boy uses more water.
5. **Ask:** What is the multiplication problem to find how much water Joseph uses? Raise your hand to answer. (Answer: $\frac{1}{3} \times 9$)

6. **Write** on the board $\frac{1}{3} \times 9$.
7. **Ask:** What is $\frac{1}{3} \times 9$? Raise your hand to answer. (Answer: $\frac{9}{3}$)
8. **Write** on the board $\frac{1}{3} \times 9 = \frac{9}{3}$. Read it aloud with pupils.
9. **Say:** We need to find how much water Joseph uses. My answer is $\frac{9}{3}$. We do not say $\frac{9}{3}$ litres of water. We need to make the answer into a whole number.
10. **Ask:** How do I make $\frac{9}{3}$ into a whole number? Raise your hand to answer. (Answer: Divide 9 by 3.)
11. **Ask:** What is $9 \div 3$? Raise your hand to answer. (Answer: 3)
12. **Write** on the board $\frac{9}{3} = 3$ 'Joseph uses 3 litres'. Read it aloud with pupils.
13. Repeat steps 5 – 12 for Foday. (Answers: The multiplication problem is $\frac{2}{5} \times 10$. $\frac{2}{5} \times 10 = \frac{20}{5}$, $20 \div 5 = 4$. Foday uses 4 litres of water.)
14. **Say:** Foday uses 4 litres of water. Joseph uses 3 litres of water. Foday uses more.
15. **Write** on the board 'Foday uses more water'. Read it aloud with pupils.

Guided Practice (10 minutes)

1. Read problem b. again with pupils.
2. Have pupils tell the problem to a partner to ensure they understand it.
3. **Write** on the board '12 recipes need ____ cups of sugar'.
4. Tell pupils to work with a partner to solve problem b. and complete the sentence.
5. Remind pupils to:
 - a) Write and solve the multiplication problem.
 - b) Change their answer into a whole number.
 - c) Copy the sentence on the board. Fill in the correct number.
6. Go over the answer. (Answer: b. $\frac{2}{3} \times 12 = \frac{24}{3}$, $24 \div 3 = 8$. $\frac{24}{3} = 8$. 12 recipes need 8 cups of sugar.)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. Remind pupils to:
 - a) Solve the problems.
 - b) Change their answers into whole numbers.
 - c) Write a sentence about their answer.

Closing (2 minutes)

1. Go over problems and answers with pupils. (Answers: **c.** $12 \times \frac{3}{4} = \frac{36}{4}$, $36 \div 4 = 9$, $\frac{36}{4} = 9$, Fatu gives 9 biscuits. $\frac{3}{5} \times 10 = \frac{30}{5}$, $30 \div 5 = 6$, $\frac{30}{5} = 6$, Maraitu gives 6 biscuits. Fatu gives more. **d.** $9 \times \frac{4}{6} = \frac{36}{6}$, $36 \div 6 = 6$, $\frac{36}{6} = 6$, Hassan reads for 6 hours in 9 days.)
2. **Say:** Good job today, pupils, you solved word problems involving multiplying whole numbers with proper fractions. You then compared the answers!

Lesson Title: Counting Numbers Forward and Backwards in Multiples of 10 and 100 up to 100,000	Theme: Numbers and Numeration Knowing and Understanding Numbers up to 100,000	
Lesson Number: M-04-091	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> Count numbers forward in multiples of 10 and 100 up to 100,000. Count numbers backwards in multiples of 10 and 100 up to 100,000. 	 <p>Teaching Aids Ball or object for passing</p>	 <p>Preparation</p> <ol style="list-style-type: none"> Gather a small ball or other object for pupils to pass during Opening. Draw on the board or a poster sheet a vertical place value chart. This will be used in Lessons 91 to 95.
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Opening (3 minutes)

- Review counting forward and backwards in 10s and 100s.
- Have pupils pass the ball and count in 100s from 1400 to 2400. (Answer: 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400)
- Say:** Change! Count back in 100s.
- Have pupils pass the ball and count back from 2400 to 1000 in 100s. (Answer: 2400, 2300, 2200, 2100, 2000, 1900, 1800, 1700, 1600, 1500, 1400)
- Say:** Change! Count in 10s. Start at 1000 up to 1100)
- Have pupils pass the ball and count in 10s from 1000 to 1100. (Answer: 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100)
- Say:** Change! Count back in 10s.
- Have pupils pass the ball and count backwards in 10s from 1100 to 1000. (Answer: 1100, 1090, 1080, 1070, 1060, 1050, 1040, 1030, 1020, 1010, 1000)

Introduction to the New Material (10 minutes)

- Say:** Today we will use multiples of 10 and 100 to count forward and backwards to 100,000.
- Show the pupils the vertical place value chart written on the board.

Ten Thousands	Thousands	Hundreds	Tens	Ones
10,000	1,000	100	10	1
20,000	2,000	200	20	2
30,000	3,000	300	30	3
40,000	4,000	400	40	4
50,000	5,000	500	50	5
60,000	6,000	600	60	6
70,000	7,000	700	70	7
80,000	8,000	800	80	8
90,000	9,000	900	90	9

- Read the heading for each column. Explain that the chart shows place values and numbers.
- Count aloud in 10,000s with pupils from 10,000 up to 90,000. Point at each number as it is said.
- Point to 1 number from each column to show 54,321.

6. Have pupils write the 5-digit number. Tell pupils the class will count in 10s from 54,321.
7. **Ask:** What digit changes when we count in 10s? Raise your hand to answer. (Answer: the '2' in the tens place)
8. Tell pupils to underline the '2' in 54,321.
9. Count aloud with pupils in 10s from 54,321 up to 54,391.
10. **Ask:** What number comes after 54,391 when we count in 10s? Raise your hand to answer. (Answer: 54,401)
11. Count aloud with pupils in 10s from 54,401 up to 54,491.
12. **Ask:** What number comes after 54,491 when we count in 10s? (Answer: 54,501)
13. Point to 1 number from each column to show 12,563.
14. Have pupils write the 5-digit number. Tell pupils the class will count in 100s from 12,563.
15. **Ask:** What digit changes when we count in 100s? Raise your hand to answer. (Answer: The '5' in the hundreds place)
16. Tell pupils to circle the '5' in 12,563.
17. Count aloud with pupils in 100s from 12,563 up to 12,963.
18. **Ask:** What number comes after 12,963 when we count in 100s? Raise your hand to answer. (Answer: 13,063)
19. **Say:** I want to add 300 to 13,063. **Ask:** What digit changes? Raise your hand to answer. (Answer: The 0 in the hundreds place changes to 3.)
20. **Say:** I want to subtract 30 from 13,063. **Ask:** What digit changes? Raise your hand to answer. (Answer: The 6 in the tens place changes to 3.)

Guided Practice (10 minutes)

1. **Write** on the board '22,022'.
2. **Say:** I want to make this number have a '2' in every place.
3. **Ask:** What place needs a '2'? Raise your hand to answer. (Answer: the hundreds place)
4. **Ask:** What number do I add? Raise your hand to answer. (Answer: 200)
5. Have pupils write ' $22,022 + 200 = 22,222$ '.
6. Repeat steps 2 to 5 to change 44,484. (Answer: $44,484 - 40 = 44,444$)
7. **Write** on the board '77,977' and '99,919'.
8. Have pupils work with a partner to change these so they have the same digit in every place.
9. Tell pupils to write the addition or subtraction problem.
10. Go over answers. (Answers: $77,977 - 200 = 77,777$; $99,919 + 80 = 99,999$)

Independent Practice (10 minutes)




1. Write on the board:

a. 33,533	b. 33,353	c. 55,055	d. 88,588	e. 11,911	f. 11,101
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2. Have pupils write addition or subtraction problems to make the digits all the same for each number.
3. Some pupils may not be able to finish all 6 problems in 10 minutes.

Closing (2 minutes)

1. Go over problems and answers with pupils. (Answers: **a.** $33,533 - 200 = 33,333$ **b.** $33,353 - 20 = 33,333$ **c.** $55,055 + 500 = 55,555$ **d.** $88,588 + 300 = 88,888$ **e.** $11,911 - 800 = 11,111$ **f.** $11,101 + 10 = 11,111$)
2. **Say:** Good job today, pupils, you learned how to count in multiples of 10 and 100 up to very large numbers and use the place value chart. Remember, we will use this chart for the next 4 lessons.

Lesson Title: Reading and Writing Whole Numbers up to 100,000 in Numerals	Theme: Numbers and Numeration Knowing and Understanding Numbers up to 100,000	
Lesson Number: M-04-092	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of this lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Read whole numbers up to 100,000 in numerals. 2. Write whole numbers up to 100,000 in numerals. 	 <p>Teaching Aids Vertical place value chart from Lesson 91</p>	 <p>Preparation 1. Gather a small ball or other object for pupils to pass during Opening.</p>
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Opening (3 minutes)

1. Review counting forward and backwards in 10s and 100s.
 - a) Have pupils pass the ball and count in 100s from 12,400 to 13,400. (Answer: 12,400, 12,500, 12,600, 12,700, 12,800, 12,900, 13,000, 13,100, 13,200, 13,300, 13,400)
 - b) **Say:** Change! Count back in 100s.
 - c) Have pupils pass the ball and count back from 13,400 to 12,400 in 100s. (Answer: 13,400, 13,300, 13,200, 13,100, 13,000, 12,900, 12,800, 12,700, 12,600, 12,500, 12,400)
 - d) **Say:** Change! Count in 10s. Start at 10,000.
 - e) Have pupils pass the ball and count in 10s from 10,000 to 10,100. (Answer: 10,000, 10,010, 10,020, 10,030, 10,040, 10,050, 10,060, 10,070, 10,080, 10,090, 10,100)
 - f) **Say:** Change! Count back in 10s.
 - g) Have pupils pass the ball and count backwards in 10s from 10,100 to 10,000. (Answer: 10,100, 10,090, 10,080, 10,070, 10,060, 10,050, 10,040, 10,030, 10,020, 10,010, 10,000)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to read and write numbers up to 100,000.
2. Show the pupils the vertical place value chart written on the board.

Ten Thousands	Thousands	Hundreds	Tens	Ones
10,000	1,000	100	10	1
20,000	2,000	200	20	2
30,000	3,000	300	30	3
40,000	4,000	400	40	4
50,000	5,000	500	50	5
60,000	6,000	600	60	6
70,000	7,000	700	70	7
80,000	8,000	800	80	8
90,000	9,000	900	90	9

3. Review the heading for each column. Explain that the chart shows place values and numbers.
4. Count aloud in 10,000s with pupils from 10,000 up to 90,000. Point at each number as it is said.
5. **Ask:** What is the biggest number in the ten-thousands place? Raise your hand to answer. (Answer: 90,000)

6. Continue to ask pupils what the biggest number for each place value is. (Answers: 9,000; 900, 90; 9)
7. **Write** on the board ' $90,000 + 9000 + 900 + 90 + 9 = 99,999$ '.
8. Have pupils write the number.
9. Explain to pupils how to read the number.
 - a) Read the digits to the left of the comma together as '99'.
 - b) Read the comma as 'thousand'.
 - c) Read the rest of the number.
10. Read 99,999 aloud as a class as 'ninety-nine thousand, nine hundred ninety-nine'.
11. **Ask:** What is the smallest number in the ten-thousands place on the chart? Raise your hand to answer. (Answer: 10,000)
12. Continue to ask pupils what the smallest number for each place value is on the chart. (Answers: 1,000; 100, 10; 1)
13. **Write** on the board ' $10,000 + 1000 + 100 + 10 + 1 = 11,111$ '.
14. Have pupils write the number.
15. Explain to pupils how to read the number.
 - a) Read the digits to the left of the comma together as '11'.
 - b) Read the comma as 'thousand'.
 - c) Read the rest of the number.
16. Read 11,111 aloud as a class as 'eleven thousand, one hundred eleven'.
17. Repeat with other 5-digit numbers from Lesson 91, as time allows.

Guided Practice (10 minutes)

1. **Write** on the board '1, 5, 4, 0, 8'.
2. **Write** on the board '1, _ , _ , _ , _'.
3. Tell pupils they will be working with a partner to use all 5 digits to make as many numbers as they can with a '1' in the ten-thousands place.
4. Guide pupils to make an organised list of numbers.
5. Give pupils time to complete the activity with their partners. Allow quiet talking and discussion among pupils.
6. After 5 minutes, invite 4-5 pupils to come to the board and write a number they made.
7. Read the numbers aloud with the class. (Example answers: 10,458; 10,548; 18,054; 15,408; etc.)




Independent Practice (10 minutes)

1. **Write** on the board '3, 6, 7, 0, 9'.
2. **Write** on the board '3, _ , _ , _ , _'.
3. Tell pupils to use all 5 digits to make as many 5-digit numbers as they can with a '3' in the ten-thousands place.
4. After 7 minutes, have pupils read their numbers with a partner.

Closing (2 minutes)

1. Choose pupils to come to the board and write a number they made.
2. Read the numbers aloud with the class. (Example answers: 30,679; 36,970; 37,096; etc.)
3. Say: Good job today, pupils! You learned how to read and write numbers up to 100,000.

Lesson Title: Reading and Writing Whole Numbers up to 100,000 in Words	Theme: Numbers and Numeration Knowing and Understanding Numbers up to 100,000	
Lesson Number: M-04-093	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Read whole numbers up to 100,000 in words. 2. Write whole numbers up to 100,000 in words. 		<p>Teaching Aids Vertical place value chart</p>		<p>Preparation</p> <ol style="list-style-type: none"> 1. Write on the board the matrix with number names. 2. Write on the board the numbers for guided and independent practice.
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Opening (3 minutes)

1. Read aloud with the class the number names written on the board.

1 one	2 two	3 three	4 four	5 five
6 six	7 seven	8 eight	9 nine	10 ten
11 eleven	12 twelve	13 thirteen	14 fourteen	15 fifteen
16 sixteen	17 seventeen	18 eighteen	19 nineteen	20 twenty
30 thirty	40 forty	50 fifty	60 sixty	70 seventy
80 eighty	90 ninety			

2. Write on the board the number 71.
3. Spell it aloud with pupils.
4. Ask pupils to write the number 71 in words.
5. Repeat with other numbers.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to read and write numbers up to 100,000 as words.
2. Show the pupils the vertical place value chart written on the board.

Ten Thousands	Thousands	Hundreds	Tens	Ones
10,000	1,000	100	10	1
20,000	2,000	200	20	2
30,000	3,000	300	30	3
40,000	4,000	400	40	4
50,000	5,000	500	50	5
60,000	6,000	600	60	6
70,000	7,000	700	70	7
80,000	8,000	800	80	8
90,000	9,000	900	90	9

3. Review the heading for each column. Count with pupils forward and backward in each column.

4. **Write** on the board the number 88,888.
5. Review with pupils how to read the number.
6. Read the digits to the left of the comma together as '88'.
7. Read the comma as 'thousand'.
8. Read the rest of the number.
9. Read 88,808 aloud as a class as 'eighty-eight thousand, eight hundred eight'.
10. **Ask:** What place value words do you hear when we say 88,808? Raise your hand to answer. (Answer: thousand, hundred)
11. **Write** on the board '88,808 = eighty-eight thousand, eight hundred eight'. Read it aloud with pupils.
12. **Say:** We do not write or say the zero in 88,808 in words. We write it in numerals to show the correct place value.
13. **Ask:** Do the numbers and words mean the same thing? Raise your hand to answer. (Answer: Yes)
14. **Write** on the board '13,004'.
15. Read 13,004 aloud as a class as 'thirteen thousand, four'.
16. **Write** on the board '13,004 = thirteen thousand, four'.
17. **Ask:** Do we say the zeroes in 13,004? Raise your hand to answer. (Answer: No)
18. **Ask:** Do we write the zeroes in words? Raise your hand to answer. (Answer: No)
19. **Ask:** Why do we need the zeros when we write 13,004 in numerals? Raise your hand to answer. (Answer: to show the correct place value)
20. Repeat with other 5-digit numbers from Lesson 92, as time allows.

Guided Practice (10 minutes)

1. Show pupils the numbers written on the board.
 - a. 33,003 = b. 17,100 = c. 15,050 = d. 70,020 e. 50,911
2. Read aloud each number with the class 2 times.
3. Make sure pupils understand the difference in saying 'fifteen' and 'fifty'. Say the last sound strongly.
4. Make sure pupils understand the difference in saying 'seventeen' and 'seventy'.
5. Tell pupils they are going to write each number in words.
6. **Ask:** What can you use to spell the words correctly? Raise your hand to answer. (Answer: the number matrix from the Opening, the column headings in the place value chart for thousands and hundreds)
7. Have pupils copy: 33,003 = _____
8. Tell pupils to write the number 33,003 in words on the other side of the equal sign.
9. After a few minutes, write on the board '33,003 = thirty-three thousand, three'.
10. Tell pupils to check that their number words are the same as the words on the board.




Independent Practice (10 minutes)

1. Tell pupils to write the other 4 numbers in words.
2. Have pupils check their work in groups of 3.

Closing (2 minutes)

1. Write the number words on the board and ask pupils to check their work.
2. Read the numbers aloud with the class. (Answers: **b.** seventeen thousand, one hundred **c.** fifteen thousand, fifty **d.** seventy thousand twenty **e.** fifty thousand, nine hundred eleven)
3. **Say:** Good job today, pupils! You learned how to read and write numbers in words up to 100,000.

Lesson Title: Comparing and Ordering Whole Numbers up to 100,000	Theme: Numbers and Numeration Knowing and Understanding Numbers up to 100,000	
Lesson Number: M-04-094	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to:</p> <ol style="list-style-type: none"> 1. Compare and order whole numbers up to 100,000. 2. Locate whole numbers on a number line up to 100,000. 		<p>Teaching Aids</p> <ol style="list-style-type: none"> 1. Vertical place value chart 2. Number line 		<p>Preparation</p> <ol style="list-style-type: none"> 1. Write on the board the number line. 2. Write on the board the numbers for pupils to compare and order.
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Opening (3 minutes)

1. Point to 1 number in each column of the place value chart to make '74,921'.
2. **Write** on the board '74, 921 = 70,000 + 4000 + 900 + 20 + 1'. Read aloud with pupils.
3. Choose a pupil to come to the board and point to 1 number in each column of the place value chart to make '41,567'.
4. Ask pupils to write the number and the addition problem that shows place value for each digit. (Answer: 40,000 + 1,000 + 500 + 60 + 7)
5. Repeat with other numbers.

Introduction to the New Material (10 minutes)

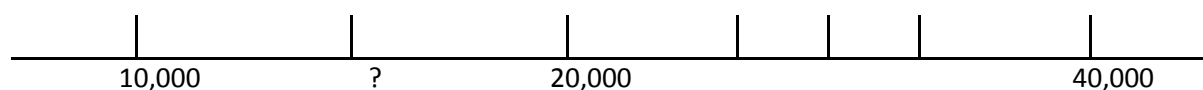
1. **Say:** Today we will compare and order numbers up to 100,000.
2. **Ask:** Which is worth more, 10,000Le or 13,000Le? Raise your hand to answer. (Answer: 13,000Le)
3. **Write** on the board '13,000 > 10,000'. Read it aloud with pupils: 'thirteen thousand is more than ten thousand'.
4. **Write** on the board '10,000 < 13,000'. Read it aloud with pupils: 'ten thousand is less than thirteen thousand'.
5. Review with pupils that the open part of the arrow is always near the bigger number. The small part of the arrow always is near the smaller number.
6. Ask pupils if they remember comparing numbers using place value at the beginning of the year. Ask pupils to point their thumb up if they remember.
7. Tell pupils they are going to use the place value to compare numbers today. They will line up the numbers by place value.
8. **Write** on the board '13,002 _____ 9,862'. Read each number aloud with pupils.
9. **Ask:** Which number has more place values? Raise your hand to answer. (Answer: 13,002)
10. **Say:** The number with more place values is always more.
11. **Write** on the board '13,002 > 9,862'. Read aloud with pupils.
12. **Write** on the board '45,782' and '45,952'.
13. Show pupils how to write the numbers 1 on top of the other, with the place values lined up.

$$\begin{array}{cccccc}
 4 & 5, & 7 & 8 & 2 & \\
 \downarrow & \downarrow & & & & \\
 4 & 5, & 9 & 5 & 2 &
 \end{array}$$

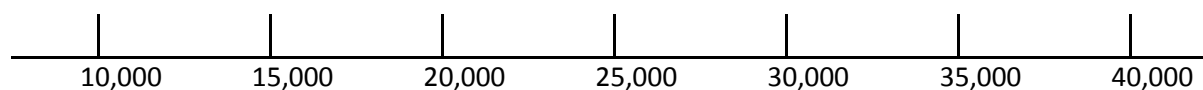
14. **Say:** Compare the numbers starting in the ten-thousands place. When the digits are the same, we move to the next place value. When the digits are different, we stop.
15. **Ask:** Are the digits in the ten-thousands place the same? Raise your hand to answer. (Answer: Yes. Both digits are 4.)
16. **Ask:** Are the digits in the thousands place the same? (Answer: Yes. Both digits are 5.)
17. **Ask:** Are the digits in the hundreds place the same? Raise your hand to answer. (Answer: No.)
18. **Say:** The digits in the hundreds place are different, so we stop.
19. **Ask:** Which way should the arrow point to show the smaller number? Raise your hand to answer. (Answer: The small part of the arrow points at 45,782 because it is smaller.)
20. **Write** on the board '45,782 < 45,952'. Read it aloud with pupils.
21. Use the place chart to make other numbers to compare, as time allows.

Guided Practice (10 minutes)

1. Show pupils the number line written on the board.



2. Tell pupils to talk with a partner for 1 minute about what number goes at the question mark.
3. After 1 minute, ask pupils what the number is. Raise your hand to answer. (Answer: 15,000)
4. **Ask:** How are we counting, in 500s or 5000s? Raise your hand to answer. (Answer: 5,000s)
5. Have pupils count aloud along the number line in 5000s from 10,000 to 40,000.
6. **Write** the numbers on the number line as pupils count.



7. **Say:** We will use the place value chart to make other numbers that can go on this number line.
8. Show pupils how to use the place value chart to make other numbers between 10,000 and 40,000.
9. Use the place value chart to make '34,592'.
10. Ask pupils to talk with a partner about which 2 numbers 34,592 goes between on the number line.
11. Invite a pupil to share his or her answer. (Answer: 34,592 goes between 30,000 and 35,000.)




Independent Practice (10 minutes)

1. Tell pupils to use the place value chart to create 5 more numbers that can go on the number line.
2. Tell them to write the numbers from smallest to largest.
3. Have pupils check their work with a partner. (Example answers: Any 5-digit number with a 1, 2 or 3 in the ten-thousands place is correct.)

Closing (2 minutes)

1. Invite pupils to share with the class the numbers they made.

Lesson Title: Rounding Whole Numbers up to 100,000 to the Nearest 10 or 100	Theme: Numbers and Numeration Knowing and Understanding Numbers up to 100,000	
Lesson Number: M-04-095	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to round whole numbers up to 100,000 to the nearest 10 or 100.	 Teaching Aids Vertical place value chart	 Preparation Write on the board the numbers for the Opening.
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Opening (3 minutes)

- On the board, write pairs of numbers for pupils to compare using the $<$ and $>$ signs.
 - 12,376 ____ 12,336 (Answer: $12,376 > 12,336$)
 - 21,451 ____ 21,458 (Answer: $21,453 < 21,458$)
- Have pupils copy the numbers and write the correct sign between them.
- Ask pupils to identify the place value they used to compare the numbers. (Answer: The tens place is used to compare $12,376 > 12,336$. The ones place is used to compare $21,453 < 21,458$.)

Introduction to the New Material (10 minutes)

- Say:** Today we will round off 5-digit numbers to the nearest 10 or 100.
- Say:** We rounded off 4-digit numbers to the nearest 10 and 100 earlier this year. Rounding off 5-digit numbers to the nearest 10 or 100 is the same.
- Say:** First we will round off 61,253 to the nearest 10. Let's chant to remember how to do this.
- Say the chant to pupils. Then, have pupils chant it with you twice.
 - Circle the digit in the tens place. Underline the digit in the ones place. Circle the digit in the tens place, when you round off to 10.
 - Look at the digit in the ones place. Look at the digit in the ones place. 5, 6, 7, 8, 9 in the ones place makes the tens place change.
 - Look at the digit in the ones place. Look at the digit in the ones place. 4, 3, 2, 1 in the ones place means the tens place stays the same.
 - Write a 0 in the ones place. Write a 0 in the ones place. Write a 0 in the ones place, when you round off to 10.
- Write** on the board '61,253 \approx '. Have pupils write this in their exercise books.
- Ask:** What do I do first to round off to 10? Raise your hand to answer. (Answer: Circle the digit in the tens place. Circle the 5.)
- Tell pupils to circle the number 5.
- Ask:** What do I do next? Raise your hand to answer. (Answer: Underline the digit in the ones place. Underline the 3.)
- Tell pupils to underline the number 3.
- Ask:** Does 3 make the tens place change? Raise your hand to answer. (Answer: No)
- Write** on the board '61,253 \approx 61,250'. Review that \approx is read 'about'. Read the numbers aloud with pupils.
- Say:** Now we will round off 61,253 to the nearest 100. Let's chant to remember how to do this.

13. Say the chant to pupils. Then, have pupils chant it with you twice.
 - a) Circle the digit in the hundreds place. Underline the digit in the tens place. Circle the digit in the hundreds place, when you round off to 100.
 - b) Look at the digit in the tens place. Look at the digit in the tens place. 5, 6, 7, 8, 9 in the tens place makes the hundreds place change.
 - c) Look at the digit in the tens place. Look at the digit in the tens place. 4, 3, 2, 1 in the tens place means the hundreds place stays the same.
 - d) Write a 0 in the ones place. Write a 0 in the tens place. The number ends with two zeros when you round off to 100.
14. **Write** on the board '61,253 \approx '. Have pupils write this in their exercise books.
15. **Ask:** What do I do first to round off to 100? Raise your hand to answer. (Answer: Circle the digit in the hundreds place. Circle the 4.)
16. Tell pupils to circle the number 4.
17. **Ask:** What do I do next? Raise your hand to answer. (Answer: Underline the digit in the tens place. Underline the 5.)
18. Tell pupils to underline the number 5.
19. **Ask:** Does 5 make the hundreds place change? Raise your hand to answer. (Answer: Yes)
20. Write on the board '61,253 \approx 61,300'. Remind pupils that the \approx means 'about'.
21. **Ask:** Which is closer to the real number, rounding off to 10 or rounding off to 100? (Answer: 10)

Guided Practice (10 minutes)

1. Tell pupils to work with a partner to make four 5-digit numbers using the place value chart.
2. Tell pupils to round off each number to the nearest 10 and 100.
3. Tell pairs of pupils to check one another's work.

Independent Practice (10 minutes)

1. Show the pupils the matrix on the board (without answers).




Number	Rounded to nearest 10	Rounded to nearest 100
12,376	(Answer: 12,380)	(Answer: 12,400)
12,336	(Answer: 12,340)	(Answer: 12,300)
21,453	(Answer: 21,450)	(Answer: 21,500)
21,458	(Answer: 21,560)	(Answer: 21,500)

2. Have pupils draw the matrix.
3. Tell pupils to write the numbers from the Opening in the matrix.
4. Tell pupils to round off each number to the nearest 10 and nearest 100.
5. Go over answers.

Closing (2 minutes)

1. **Ask:** Why does 21,453 and 21,548 round off to different tens, but the same hundred. (Answer: They have the same number in the tens place, so they round to the same hundred. They have different numbers in the ones place, so they round to different tens.)
2. **Say:** Good job today, pupils! You rounded off large numbers to the 10s and 100s place.

Lesson Title: Adding Numbers up to 5000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-096	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of this lesson, pupils will be able to add numbers up to 5000.	 Teaching Aids None	 Preparation Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

1. Review place value with pupils. Write on the board 3303. Read it aloud with pupils.
2. **Say:** I will write 3333 as an addition problem to show place value. This is also called expanding the number.
3. **Write** on the board $3000 + 300 + 3 = 3303$. Read it aloud with pupils.
4. Talk with pupils about why you do not write the zero in the addition problem.
5. **Write** on the board 5006 and 506.
6. Tell pupils to write 5006 and 506 as addition problems to show place value.
7. Go over answers. (Answers: $5000 + 6 = 5006$, $500 + 6 = 506$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will review adding numbers to 5000. We will use place value to line up the numbers to add.
2. **Write** on the board $3427 + 815$. Read it aloud with pupils.
3. **Ask:** How do I write this problem so I can solve it? Raise your hand to answer. (Answer: Write 3457 on top. Write 815 under 3457. Line up the numbers by place value.)
4. **Write** on the board:

$$\begin{array}{r} 3427 \\ + 815 \\ \hline \end{array}$$

5. **Say:** We begin by adding the numbers in the ones place.
6. **Ask:** Which numbers do we add first? Raise your hand to answer. (Answer: $7 + 5$)
7. **Say:** $7 + 5 = 12$. I cannot write 2 digits in the ones place. I write the 2 in the answer space. I carry the 1. I write it on top of the tens place.

$$\begin{array}{r} 1 \\ 3427 \\ + 815 \\ \hline 2 \end{array}$$

8. **Say:** Next we add all the digits in the tens place.
9. **Ask:** What is $1 + 2 + 1$? Raise your hand to answer. (Answer: 4)

10. **Say:** I write 4 in the answer space.

$$\begin{array}{r} 1 \\ 3\ 4\ 2\ 7 \\ +\ 8\ 1\ 5 \\ \hline 4\ 2 \end{array}$$

11. **Ask:** What do we add next? Raise your hand to answer. (Answer: Add the 4 and 8 in the hundreds place.)

12. **Say:** $4 + 8 = 12$. I cannot write 2 digits in the hundreds place. I write 2 in the answer space. I carry the 1 to the thousands place.

$$\begin{array}{r} 1\ 1 \\ 3\ 4\ 2\ 7 \\ +\ 8\ 1\ 5 \\ \hline 2\ 4\ 2 \end{array}$$

13. **Say:** Last we add the digits in the thousands place. $2 + 1 = 3$.

$$\begin{array}{r} 1\ 1 \\ 3\ 4\ 2\ 7 \\ +\ 8\ 1\ 5 \\ \hline 4\ 2\ 4\ 2 \end{array}$$

14. Read the problem and answer aloud with pupils.

15. Solve $3650 + 289$ with the class. (Answer: 3939)

Guided Practice (10 minutes)

1. Read with pupils the problems on the board:

a. $31 + 1872 =$ b. $135 + 2007 =$ c. $419 + 4500 =$ d. $205 + 3795 =$ e. $3720 + 1280 =$

2. Guide pupils to write problem a. so the bigger number is on top and the place values are lined up.

3. Guide pupils through each step of solving problem a.

$$\begin{array}{r} 1 \\ 1\ 8\ 7\ 2 \\ +\ 3\ 1 \\ \hline 1\ 9\ 0\ 3 \end{array}$$

4. Tell pupils to work with a partner to solve problem b.

a) Remind pupils to write the bigger number on top.

b) Remind pupils to line up the numbers by place value.

5. Go over the problems and answer to problems b. (Answer below)

$$\begin{array}{r} 1 \\ 2\ 0\ 0\ 7 \\ +\ 1\ 3\ 5 \\ \hline 2\ 1\ 4\ 2 \end{array}$$




Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.
2. Tell pupils to check their problems and answers with their partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: c. 4919, d. 4000, e. 5000)
2. **Say:** Good job today, pupils! You used place value to add numbers up to 5000.

Lesson Title: Adding Numbers up to 10,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-097	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to add numbers to 10,000.	 Teaching Aids None	 Preparation Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

1. **Write** on the board $4000 + 40$. Read it aloud with pupils.
2. Ask the class to tell all together what the number is. (Answer: 4040)
3. **Write** on the board 5026 and 5206.
4. Tell pupils to make addition problems to show the place value of the numbers.
5. Go over answers. (Answers: $5000 + 20 + 6 = 5026$, $5000 + 200 + 6 = 5206$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will review adding numbers to 10,000. We will use place value to line up the numbers to add.
2. **Write** on the board $6357 + 984$.
3. Tell pupils to write the problem in their exercise books with the bigger number on top.
4. Remind pupils to line up the place values.
5. **Ask:** Which numbers do we add first? Raise your hand to answer. (Answer: $7 + 4$).
6. Tell pupils to add $7 + 4 = 11$. Tell pupils to write the digits in the correct places.
7. Then solve the first step of the problem on the board.

$$\begin{array}{r}
 1 \\
 6 \ 3 \ 5 \ 7 \\
 + \ 9 \ 8 \ 4 \\
 \hline
 1
 \end{array}$$

8. **Say:** Check the first step of your problem. Point your thumb up if your problem looks like the problem on the board. Point your thumb down if it looks different. (Answer: Pupils point their thumbs up. If many pupils point their thumbs down, they do not understand. Guide them through the problem step by step.)
9. **Ask:** What digits do we add next? Raise your hand to answer. (Answer: $1 + 5 + 8$ in the tens place).
10. Tell pupils to add $1 + 5 + 8$. Tell pupils to write the digits in the correct places. Give them time to do this.
11. **Ask:** What is $1 + 5 + 8$? Raise your hand to answer. (Answer: 14)
12. **Ask:** Which digit did you write in the answer space? Raise your hand to answer. (Answer: 4)
13. **Ask:** Which digit did you carry to the hundreds place? Raise your hand to answer. (Answer: 1)
14. Tell pupils to check their problems and answers in table groups. Give them time to do this.
15. Tell pupils to correct any mistakes they find.

16. **Ask:** What digits do we add next? Raise your hand to answer. (Answer: 1 + 3 + 9 in the hundreds place).
17. Tell pupils to add 1 + 3 + 9. Tell pupils to write the digits in the correct places. Give them time to do this.
18. **Ask:** What is 1 + 3 + 9? Raise your hand to answer. (Answer: 13)
19. **Ask:** Which digit did you write in the answer space? Raise your hand to answer. (Answer: 3)
20. **Ask:** Which digit did you carry to the thousands place? Raise your hand to answer. (Answer: 1)
21. Tell pupils to complete the problem.
22. **Write** on the board the completed problems and answer.
23. Tell pupils to check their problem and answer with the problem and answer on the board.
24. Tell pupils to correct any mistakes they made.

$$\begin{array}{r}
 1 \ 1 \ 1 \\
 6 \ 3 \ 5 \ 7 \\
 + \ 9 \ 8 \ 4 \\
 \hline
 7 \ 3 \ 4 \ 1
 \end{array}$$

25. Solve $2365 + 6289$ with the class, if there is time. (Answer: 8654)

Guided Practice (10 minutes)

1. Read with pupils the problems on the board:
 - a. $8315 + 1685$ b. $810 + 8190$ c. $4139 + 3861$ d. $139 + 6861$ e. $1280 + 4720$
2. Tell pupils to work with a partner to solve problems a. and b.
3. Choose pupils to come to the board and work out problems a. and b.
4. Go over problems and answers as a class. (Answers below)

$$\begin{array}{r}
 1 \ 1 \\
 8 \ 3 \ 1 \ 5 \\
 + \ 1 \ 6 \ 8 \ 5 \\
 \hline
 1 \ 0, \ 0 \ 0 \ 0
 \end{array}
 \qquad
 \begin{array}{r}
 1 \ 1 \\
 8 \ 1 \ 9 \ 0 \\
 + \ 1 \ 8 \ 1 \ 0 \\
 \hline
 9 \ 0 \ 0 \ 0
 \end{array}$$




Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.
2. Tell pupils to check their problems and answers with their partner.
3. Go over answers with pupils. (Answers: c. 8000, d. 7000, e. 6000)

Closing (2 minutes)

1. **Ask:** What pattern do you see in the answers? Raise your hand to answer. (Example answers: Each answer is 1000 less. The digit in the thousands place goes down by 1.)
2. **Ask:** What are the next 3 numbers in the pattern. Raise your hand to answer. (Answer: 5000, 4000, 3000)
3. **Say:** Good job today, pupils! You added numbers using place value up to 10,000.

Lesson Title: Addition of Money up to Le 5,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-98	Class/Level: Primary 4	Time: 35 minutes

 <p>Learning Outcomes By the end of the lesson, pupils will be able to add money up to Le 5000.</p>	 <p>Teaching Aids 1. Le 500, Le 1000, Le 2000 and Le 5000 notes or drawings 2. Items or pictures for the 'Class Store'</p>	 <p>Preparation 1. Gather Le 500, Le 1000, Le 2000 and Le 5000. You may draw these on the board if you prefer. 2. Gather small items for a 'Class Store'. You may gather or draw pictures on the board, if you prefer. The Class Store is used in Lessons 98, 99, 102 and 103.</p>
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Opening (3 minutes)

1. **Ask:** What are some things you can buy with money? Raise your hand to answer. (Example answer: school supplies; food; clothes; gifts; bus fare)
2. Tell pupils to talk with a partner about things they can buy.
3. Choose 5 or 6 pupils to share their ideas with the class.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will add money up to Le 5000.
2. Show pupils Le 500, Le 1000, Le 2000 and Le 5000 notes or the drawings.
3. Identify the value of each one with pupils.
4. Show pupils the 'Class Store'. Use objects or pictures. Mark the prices as below.
5. Read the prices with pupils.

Class Store
Sugar – Le 1500
Orange – Le 500
Bottle of Soda – Le 3000
Package of Biscuits – Le 500
Mango – Le 1000
Soap – Le 2000

6. **Say:** We are going to see what we can buy for exactly Le 5000.
7. **Say:** I buy 1 mango and 1 bar of soap.
8. **Write** on the board: $1000 + 2000 =$
9. **Ask:** How much is $1000 + 2000$? Raise your hand to answer. (Answer: 3000)
10. **Say:** I must use exactly Le 5000. I need to buy more.
11. **Say:** I buy 1 mango, 1 bar of soap and 2 packages of biscuits.
12. **Write** on the board: $1000 + 2000 + 500 + 500 =$
13. **Ask:** How much is $1000 + 2000 + 500 + 500$? Raise your hand to answer. (Answer: 4000)
14. **Say:** I must use exactly Le 5000. I need to buy more.
15. **Say:** I buy 2 mangoes, 1 bar of soap and 2 packages of biscuits.

16. **Write** on the board: $1000 + 1000 + 2000 + 500 + 500 =$
17. **Ask:** How much is $1000 + 1000 + 2000 + 500 + 500$? Raise your hand to answer. (Answer: 5000)
18. **Ask:** Did I use exactly Le 5000? Point your thumb up if I used exactly Le 5000. Point your thumb down if I did not. (Answer: It is exactly Le 5000. Pupils point their thumbs up.)
19. Repeat steps 7 to 18 with other objects, as time allows. Write addition problems that equal exactly Le 5000.

Guided Practice (10 minutes)

1. **Say:** There are many ways to use exactly Le 5000 in the class store.
2. Assign pupils to groups of 3.
3. **Say:** Work with your group to find 7 more ways to use Le 5000. Write your addition problems in your exercise books. Make sure you note which items you buy for each addition problem.
4. Make sure pupils understand they must write different addition problems.
5. Make sure pupils understand they need to use Le 5000 in all their addition problems.
6. After 5 minutes, choose pupils from different groups to share their addition problems. (Example answers: any addition problem that equals 5000 and uses the numbers from the Class Store)




Independent Practice (10 minutes)

1. Tell pupils they have only Le 4000 to use at the Class Store.
2. Tell pupils to find 7 ways to use exactly Le 4000 at the Class Store.
3. Tell pupils to write the addition problems.

Closing (2 minutes)

1. Choose pupils to share their answers. (Example answers: any addition problem that equals 4000 and uses the numbers from the Class Store)
2. **Say:** Good job today, pupils! You spent money up to Le5000 in the Class Store.

Lesson Title: Addition of Money up to Le 10,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-99	Class/Level: Primary 4	Time: 35 minutes

	<p>Learning Outcomes By the end of the lesson, pupils will be able to add money up to Le 10,000.</p>		<p>Teaching Aids 1. Le 500, Le 1000, Le 2000, Le 5000 and Le 10,000 notes or drawings 2. Items or pictures for the 'Class Store'</p>		<p>Preparation 1. Gather Le 500, Le 1000, Le 2000, Le 5000 and Le 10,000. You may draw these on the board if you prefer. 2. Gather small items for a 'Class Store.' You may gather or draw pictures on the board, if you prefer. The Class Store is used in Lessons 98, 99, 102 and 103.</p>
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Opening (3 minutes)

1. Ask pupils to find their addition problems from yesterday.
2. Choose 5 or 6 pupils to share addition problems they wrote that equal Le 5000 or Le 4000.

Introduction to the New Material (10 minutes)

1. **Say:** Today we will add money up to Le 10,000.
2. Show pupils Le 500, Le 1000, Le 2000, Le 5000 and Le 10,000 notes or drawings on the board.
3. Identify the value of each 1 with pupils.
4. Review the items and prices in the Class Store. Have pupils note that there are 2 new items.
5. Read the prices with pupils.

Class Store
Bag of Sugar – Le 1500
Orange – Le 500
Bottle of Soda – Le 3000
Package of Biscuits – Le 500
Mango – Le 1000
Soap – Le 2000
Rice – Le 1000
Plantains – Le 5000

6. **Say:** We are going to see what we can buy for exactly Le 10,000.
7. **Say:** I buy 1 bunch of plantains and 1 package of biscuits.
8. **Ask:** What is the addition problem? Raise your hand to answer. (Answer: $5000 + 500$)
9. **Write** on the board: $5000 + 500 =$
10. **Ask:** How much is $5000 + 500$? Raise your hand to answer. (Answer: 5500)
11. **Say:** I must use exactly Le 10,000. I need to buy more.
12. **Say:** I buy 1 bunch of plantains, 1 package of biscuits and 1 bag of sugar.
13. **Ask:** What is the addition problem? Raise your hand to answer. (Answer: $5000 + 500 + 1500$)
14. **Write** on the board: $5000 + 500 + 1500 =$

15. **Say:** I know $5000 + 500 = 5500$. I want to add 1500 more. I want to do this in my head, without pencil or paper.
16. **Say:** It is easy to add 1000 to 5500. In my head, I add $1000 + 5500 = 6500$. Then I add 500 more. $6500 + 500 = 7000$.
17. **Ask:** How much is $5000 + 500 + 1500$? Raise your hand to answer. (Answer: 7000)
18. **Say:** I used Le 7000. I need to use Le 10,000. I buy 1 more item to make exactly 10,000. Think. The turn to a partner and tell what 1 more item I buy.
19. Give pupils 1 minute to think and talk.
20. **Ask:** What is the 1 item? Raise your hand to answer. (Answer: a bottle of soda)
21. **Write** on the board $5000 + 500 + 1500 + 3000 = 10,000$. Read it aloud with pupils.
22. Repeat steps 7 to 18 with other objects, as time allows. Write addition problems that equal exactly Le 10,000.

Guided Practice (10 minutes)

1. **Say:** There are many ways to use exactly Le 10,000 in the class store.
2. Assign pupils to groups of 3.
3. **Say:** Work with your group to find 7 more ways to use Le 10,000. Write your addition problems in your exercise books. Make sure you write what items you purchased for each addition problem. (5 minutes)
4. Make sure pupils understand they must write different addition problems.
5. Make sure pupils understand they need to use Le 10,000 in all their addition problems.
6. After 5 minutes, choose pupils from different groups to share their addition problems. (Example answers: any addition problem that equals 10,000 and uses the numbers from the Class Store)




Independent Practice (10 minutes)

1. Tell pupils they have only Le 7500 to use at the Class Store.
2. Tell pupils to find 7 ways to use exactly Le 7500 at the Class Store.
3. Tell pupils to write the addition problems.

Closing (2 minutes)

1. Choose pupils to share their answers. (Example answers: any addition problem that equals 7500 and uses the numbers from the Class Store)
2. **Say:** Good job today, pupils! You solved addition problems involving money by purchasing goods from the Class Store.

Lesson Title: Subtracting Numbers up to 50,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-100	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to subtract numbers up to 50,000.		Teaching Aids None		Preparation Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

- Write** on the board: $__ + __ = 29$ $__ \times __ = 100$
- Tell pupils to work with a partner to find 2 numbers that make both problems true.
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Choose 1 or 2 pupils to share with the class.
- Go over answers. (Answers: 25 and 4, $25 + 4 = 29$, $25 \times 4 = 100$)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn to subtract numbers up to 50,000.
- Write** on the board the problem. Read it aloud with pupils.

$$\begin{array}{r} 23,000 \\ - 1530 \\ \hline \end{array}$$

- Say:** There are 3 zeroes in 23,000. I am going to tell you a story to help you remember how to subtract when there are 3 zeroes in the top number.
- Say:** One day 23,000 needs to subtract 1530. 23,000 starts in the ones place. $0 - 0 = 0$.

$$\begin{array}{r} 23,000 \\ - 1530 \\ \hline 0 \end{array}$$

- Say:** Next 23,000 goes to the tens place. The digit in tens place is 0. 0 is not big enough to subtract 3. It goes to its neighbour the hundreds place to borrow.
- Say:** 'May I borrow?' asks the 0 in the tens place. The 0 in the hundreds place says, 'I am also a 0. I have nothing for you to borrow.' Both zeros are sad.
- Say:** 'Maybe my neighbour in the thousands place will let us borrow,' says the 0 in the hundreds place.
- Say:** The 3 in the thousands place says, 'The 0 in the hundreds place can borrow from me.'
- Write** on the board:

$$\begin{array}{r} 2 \quad 10 \\ 2 \quad \cancel{3}, \quad \cancel{0} \quad 0 \quad 0 \\ - 1 \quad 5 \quad 3 \quad 0 \\ \hline 0 \end{array}$$

10. **Say:** The 0 in the tens place is still sad. ‘Do not be sad,’ says the hundreds place. ‘I have 10 now. You can borrow from me.’

11. **Write** on the board:

$$\begin{array}{r}
 \phantom{} \phantom{} \\
 \cancel{10} \\
 2 \cancel{0} \phantom{} \phantom{} \\
 - 1 5 3 0 \\
 \hline

 \end{array}$$

12. **Say:** Now we can subtract the tens place. **Ask:** What is $10 - 3$? Raise your hand to answer. (Answer: 7)

13. Write 7 in the answer space.

14. **Say:** Next we subtract the hundreds place. **Ask:** What is $9 - 5$? Raise your hand to answer. (Answer: 4)

15. Write 4 in the answer space.

16. Use question and answer to subtract the thousands and ten-thousands place with pupils.

$$\begin{array}{r}
 \phantom{} \phantom{} \\
 \cancel{10} \\
 2 \cancel{0} \phantom{} \phantom{} \\
 - 1 5 3 0 \\
 \hline
 2 1, 4 7 0
 \end{array}$$

17. Read the problem and answer aloud with pupils.

18. Solve $43,000 - 2180$ with the class if there is time. (Answer: 40,820)

Guided Practice (10 minutes)

1. Read with pupils the problems on the board.

a. $34,000 - 11,470 =$ b. $49,000 - 2750 =$ c. $25,000 - 3250 =$ d. $18,000 - 6820$

2. Tell pupils to write problem a. Remind pupils to line up the place values.

3. Tell the story again. It will help pupils to remember the process to borrow twice.

4. Guide pupils through each step of solving problem a.

$$\begin{array}{r}
 \phantom{} \phantom{} \\
 \cancel{10} \\
 3 \cancel{0} \phantom{} \phantom{} \\
 - 1 1, 4 7 0 \\
 \hline
 2 2, 5 3 0
 \end{array}$$

5. Tell pupils to work with a partner to solve problem b.

Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.




2. **Say:** Make sure you line the problems up vertically by the place value and start in the ones place.

3. Tell pupils to check their problems and answers with their partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: **b.** 46,250 **c.** 21,750 **d.** 11,180)
2. **Say:** Good job today, pupils! You subtracted large numbers up to 50,000 and learned how to borrow place value from your neighbour to do this.

Lesson Title: Subtracting Numbers up to 100,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-101	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to subtract numbers up to 100,000.		Teaching Aids None		Preparation Write on the board the problems for guided and independent practice.
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Opening (3 minutes)

1. **Write** on the board: $__ + __ = 11$ $__ \times __ = 24$
2. Tell pupils to work with a partner to find 2 numbers that make both problems true.
3. **Say:** Remember, they must be the same two numbers that make the first and second problem true.
4. Go over answers. (Answers: 3 and 8, $3 + 8 = 11$, $3 \times 8 = 24$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we will learn to subtract numbers to 100,000.
2. **Write** on the board the problem. Read it aloud with pupils.

$$\begin{array}{r} 50,000 \\ - 1530 \\ \hline \end{array}$$

3. **Say:** There are 4 zeroes in 50,000. We are going to use the story from yesterday to help subtract.
4. **Say:** One day 50,000 needs to subtract 1530. 50,000 starts in the ones place. $0 - 0 = 0$.

$$\begin{array}{r} 50,000 \\ - 1530 \\ \hline 0 \end{array}$$

5. **Say:** Next 50,000 goes to the tens place. The digit in tens place is 0. 0 needs to borrow to subtract 3. It goes to its neighbour the hundreds place to borrow.
6. **Say:** 'May I borrow?' asks the 0 in the tens place. The 0 in the hundreds place says, 'I am also a 0. I have nothing for you to borrow.' Both zeros are sad.
7. **Say:** 'Maybe my neighbour in the thousands place will let us borrow,' says the 0 in the hundreds place.
8. **Say:** The 0 in the thousands place says, 'I am also a 0. I have nothing for you to borrow.' We need to borrow from the ten-thousands place.
9. **Say:** The 5 in the ten-thousands place says, 'The 0 in the thousands place can borrow from me.'
10. **Write** on the board:

$$\begin{array}{r} 4 \ 10 \\ \cancel{5} \ 0, \ 0 \ 0 \ 0 \\ - 1 \ 5 \ 3 \ 0 \\ \hline 0 \end{array}$$

11. **Say:** The other zeros are still sad. 'Do not be sad,' says the thousands place. 'I have 10 now. The hundreds can borrow from me.'

12. **Write** on the board:

$$\begin{array}{r}
 9 10 \\
 4 \cancel{10} \\
 \cancel{5} , \cancel{0} 0 \\
 - 1 5 3 0 \\
 \hline
 0
 \end{array}$$

13. **Say:** Now the 0 in the tens place can borrow.

14. **Write** on the board:

$$\begin{array}{r}
 9 10 \\
 9 \cancel{10} \\
 4 \cancel{10} \\
 \cancel{5} , \cancel{0} 0 \\
 - 1 5 3 0 \\
 \hline
 0
 \end{array}$$

15. Use question and answer to subtract each digit with pupils. (Answer: 48,470)

16. Solve $40,000 - 2180$ with the class if there is time. (Answer: 37,820)

Guided Practice (10 minutes)

1. Read with pupils the problems on the board:

a. $80,000 - 11,470 =$ b. $90,000 - 27,150 =$ c. $20,000 - 3250 =$ d. $30,000 - 26,820$

2. Tell pupils to write problem a. Remind pupils to line up the place values.

3. Guide pupils through each step of solving problem a.

$$\begin{array}{r}
 9 10 \\
 9 \cancel{10} \\
 7 \cancel{10} \\
 \cancel{8} , \cancel{0} 0 \\
 - 1 1, 4 7 0 \\
 \hline
 6 8, 5 3 0
 \end{array}$$

4. Tell pupils to work with a partner to solve problem b.

Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.

2. **Say:** Make sure you line the problems up vertically by the place value and start in the ones place.




3. Tell pupils to check their problems and answers with their partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: **b.** 62,850 **c.** 16,750 **d.** 3,180)

2. **Say:** Good job today, pupils! You subtracted large numbers up to 100,000 and learned how to borrow place value from your neighbour to do this.

Lesson Title: Subtracting of Money up to Le 20,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-102	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of this lesson, pupils will be able to subtract money up to Le 20,000.		Teaching Aids Class Store from Lesson 99		Preparation Write on the board the word problems for guided and independent practice.
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Opening (3 minutes)

- Write** on the board: $__ + __ = 30$ $__ - __ = 20$
- Tell pupils to work with a partner to find 2 numbers that make both problems true.
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answers: 25 and 5, $25 + 5 = 30$, $25 - 5 = 20$)

Introduction to the New Material (10 minutes)

- Say:** Today will learn how to make change from Le 20,000.
- Draw on the board 2 banknotes of Le 10,000.
- Review the items and prices in the Class Store.

Class Store	
Bag of Sugar – Le 1500	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Le 10,000</div>
Orange – Le 500	
Bottle of Soda – Le 3000	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Le 10,000</div>
Package of Biscuits – Le 500	
Mango – Le 1000	
Soap – Le 2000	
Rice – Le 1000	
Plantains – Le 5000	

- Say:** Today we have Le 20,000 to use.
- Tell the pupils this story: A family is having a party. Mother gives Le 20,000 to buy 5 sodas. How much change does she get back?
- Say:** There are 3 steps to solve this problem:
 - Add to find how much 5 sodas cost.
 - Subtract to find the change from Le 20,000.
 - Write the amount of change in leones.
- Ask:** What is the addition problem for 5 sodas? Raise your hand to answer. (Answer: $3000 + 3000 + 3000 + 3000 + 3000$)
- Write** on the board: $3000 + 3000 + 3000 + 3000 + 3000 =$
- Ask:** How much is $3000 + 3000 + 3000 + 3000 + 3000$? Raise your hand to answer. (Answer: 15,000)

10. **Say:** Now I must subtract to find the change from Le 20,000.
11. **Ask:** What is $20,000 - 15,000$? Raise your hand to answer. (Answer: 5000)
12. **Ask:** How much change will Mother get back from Le 20,000? Raise your hand to answer. (Answer: Le 5000)
13. **Write** on the board 'Change: Le 5000.'
14. Show pupils the word problems written on the board. Read them aloud with pupils.
 - a) Maraitu buys 1 bunch of plantains, 2 bags of rice, 1 bag of sugar and 1 bar of soap. She pays with Le 20,000. How much change does she get back?
 - b) Foday buys 2 oranges, 1 package of biscuits and 2 bunches of plantains. He pays with Le 20,000. How much change does he get back?
 - c) Amadu buys 2 bunches of plantains, 1 bag of rice, 1 mango and 1 package of biscuits. He pays with Le 20,000. How much change does he get back?
 - d) Aminata buys 1 of each item in the Class Store. She pays with Le 20,000. How much change does she get back?

Guided Practice (10 minutes)

1. Read problem a. again with pupils. Remind pupils that there are 3 steps to solve this problem.
 - a) Add to find how much all the items cost.
 - b) Subtract to find the change from Le 20,000.
 - c) Write the amount of change in leones.
2. Use question and answer to guide pupils to solve problem a. in their exercise books. (Answer: a. $5000 + 1000 + 1000 + 1500 + 2000 = 10,500$. $20,000 - 10,500 = 9500$. Change: Le 9500)
3. Tell pupils to solve problem b. with a partner.
4. Remind them to write 'Change: Le _____' for the answer.
5. Go over the problems and answer: (Answer: b. $500 + 500 + 500 + 5000 + 5000 = 11,500$. $20,000 - 11,500 = 8500$. Change: Le 8500)




Independent Practice (10 minutes)

1. Tell pupils to solve problems c. and d. on their own.
2. Tell pupils to check their problems and answers with a partner.

Closing (2 minutes)

1. Go over answers. (Answer: c. $5000 + 5000 + 1000 + 1000 + 500 = 12,500$, $20,000 - 12,500 = 7,500$. Change: Le 7500; d. $1500 + 500 + 3000 + 500 + 1000 + 2000 + 1000 + 5000 = 14,500$, $20,000 - 14,500 = 5,500$. Change: Le 5500)
2. **Say:** Good job today, pupils! You made change from a Le20,000 note after buying items from the Class Store.

Lesson Title: Subtracting of Money up to Le 50,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-103	Class/Level: 4	Time: 35 minutes

	Learning Outcomes By the end of this lesson, pupils will be able to subtract money up to Le 50,000.		Teaching Aids Class Store from Lesson 99		Preparation Write on the board the word problems for guided and independent practice.
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Opening (3 minutes)

- Write** on the board: $__ + __ = 50$ $__ - __ = 30$
- Tell pupils to work with a partner to find 2 numbers that make both problems true.
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answers: 40 and 10, $40 + 10 = 50$, $40 - 10 = 30$)

Introduction to the New Material (10 minutes)

- Say:** Today we will learn how to find how much money is left after buying items.
- Draw on the board 5 banknotes of Le 10,000.
- Review the items and prices in the Class Store. Tell pupils there is 1 new item in the store.

Class Store
Bag of Sugar – Le 1500
Orange – Le 500
Bottle of Soda – Le 3000
Package of Biscuits – Le 500
Mango – Le 1000
Soap – Le 2000
Rice – Le 1000
Plantains – Le 5000
Plastic bucket - Le 10,000

Le 10,000
Le 10,000
Le 10,000
Le 10,000
Le 10,000

- Tell the pupils this story: Mother has Le 50,000. She buys 1 plastic bucket and 2 bars of soap. How much money does she have left?
- Say:** There are 3 steps to solve this problem.
 - Add to find how much the items cost.
 - Subtract from Le 50,000.
 - Write how much money is left in leones.
- Ask:** What is the addition problem for 1 bucket and 2 bars of soap? Raise your hand to answer. (Answer: $10,000 + 2000 + 2000$)
- Write** on the board: $10,000 + 2000 + 2000 =$
- Ask:** How much is $10,000 + 2000 + 2000$? Raise your hand to answer. (Answer: 14,000)
- Say:** Now I must subtract to find how much is left from Le 50,000.
- Write the subtraction problem on the board.

11. Solve the subtraction problem step by step with pupils.

$$\begin{array}{r}
 4 \ 10 \\
 \cancel{5} \ \cancel{0}, \ 0 \ 0 \ 0 \\
 - \ 1 \ 4, \ 0 \ 0 \ 0 \\
 \hline
 3 \ 6, \ 0 \ 0 \ 0
 \end{array}$$

12. **Ask:** How much money does Mother have left from Le 50,000? Raise your hand to answer.

(Answer: Le 36,000)

13. **Write** on the board: There is Le 36,000 left.

14. Show pupils the word problems written on the board. Read them aloud with pupils.

- Maraitu has Le 40,000. She buys 3 bunches of plantains, 1 bag of rice, and 2 oranges. How much money does she have left?
- Foday has Le 21,500. He buys 1 plastic bucket, 1 orange, 1 package of biscuits and 1 mango. How much money does he have left?
- Amadu has Le 33,000. She buys 1 bag of rice, 1 mango and 1 package of biscuits. He pays with Le 20,000. How much money does she have left?
- Aminata has Le 50,000. She buys 1 of each item in the Class Store. How much money does she have left?

Guided Practice (10 minutes)

- Ask pupils to see that each problem uses a different amount of money.
- Ask:** How much money does Maraitu have? Raise your hand to answer. (Answer: Le 40,000)
- Ask:** How much money does Foday have? Raise your hand to answer. (Answer: Le 21,500)
- Ask:** How much money does Amadu have? Raise your hand to answer. (Answer: Le 33,000)
- Ask:** How much money does Aminata have? Raise your hand to answer. (Answer: Le 50,000)
- Remind pupils to use the correct amount of money to solve the subtraction problems.
- Remind pupils that there are 3 steps to solve this problem.
 - Add to find how much all the items cost.
 - Subtract to find the change.
 - Write the amount left in leones.
- Tell pupils to solve problem a. with a partner.
- Remind them to write 'There is Le _____ left.' for the answer.
- Go over the problems and answer. (Answer: a. $5000 + 5000 + 5000 + 1000 + 500 + 500 = 17,000$
 $40,000 - 17,000 = 23,000$. There is Le 23,000 left.)




Independent Practice (10 minutes)

- Tell pupils to solve problems b., c. and d. on their own.
- Tell pupils to check their problems and answers with a partner.

Closing (2 minutes)

- Go over answers. (Answer: b. $10,000 + 500 + 500 + 1,000 = 12,000$; $21,500 - 12,000 = 9,500$. There is Le 9500 left. c. $1,000 + 1,000 + 500 = 2,500$. $33,000 - 2,500 = 30,500$. There is Le 30,500 left. d. $1500 + 500 + 3000 + 500 + 1000 + 2000 + 1000 + 5000 + 10000 = 24,500$. $50,000 - 24,500 = 25,500$. There is Le 25,500 left.)
- Say:** Good job today, pupils! You made change from a certain amount of leones after buying items from the Class Store.

Lesson Title: Adding and Subtracting Numbers up to 50,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-104	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of this lesson, pupils will be able to add and subtract numbers up to 50,000.	 Teaching Aids None	 Preparation Write the problems on the board.
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Opening (3 minutes)

- Write on the board: $__ + __ = 17$ $__ - __ = 1$
- Tell pupils to work with a partner to find 2 numbers that make both problems true.
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answers: 9 and 8, $9 + 8 = 17$, $9 - 8 = 1$)

Introduction to the New Material (10 minutes)

- Say:** Today we will add and subtract numbers up to 50,000.
- Read aloud with pupils the problems on the board:
 - $30,000 - 134 =$
 - $30,000 - 1340 =$
 - $30,000 - 13,400 =$
 - $30,000 + 134 =$
 - $30,000 + 1340 =$
 - $30,000 + 13,400 =$
- Say:** There are 6 problems on the board.
- Ask:** How many are subtraction problems? Raise your hand to answer. (Answer: 3)
- Ask:** How many are addition problems? Raise your hand to answer. (Answer: 3)
- Say:** I want you to guess which problem will have the biggest answer. Think. Then, turn and talk with a partner.
- Give pupils 1 minute to think and talk.
- Ask:** Which problem will have the biggest answer? Raise your hand to answer. (Answer: $30,000 + 13,400$)
- Ask:** How do you know the answer is biggest? Raise your hand to answer. (Answer: It is addition. It adds the biggest numbers.)
- Say:** I want you to guess which problem will have the smallest answer. Think. Then, turn and talk with a partner.
- Give pupils 1 minute to think and talk.
- Ask:** Which problem will have the smallest answer? Raise your hand to answer. (Answer: $30,000 - 13,400$)
- Ask:** How do you know the answer is smallest? Raise your hand to answer. (Answer: It is subtraction. It subtracts the biggest number from 30,000.)
- Review the steps for subtracting with 4 zeroes from Lesson 101.
- Use question and answer to solve problem a. step by step with pupils. (Answer: 29,866)

16. **Write:**

$$\begin{array}{r}
 9 \quad 10 \\
 9 \quad \cancel{10} \\
 9 \quad \cancel{10} \\
 2 \quad \cancel{10} \\
 \cancel{3} \quad \cancel{0}, \quad \cancel{0} \quad \cancel{0} \quad \cancel{0} \\
 - \quad \quad \quad 1 \quad 3 \quad 4 \\
 \hline
 2 \quad 9, \quad 8 \quad 6 \quad 6
 \end{array}$$

Guided Practice (10 minutes)

1. **Write** on the board: $\underline{\quad} + \underline{\quad} = 50,000$
2. Assign pupils to groups of 5.
3. Tell pupils to work with their groups to make different addition problems with an answer of 50,000.
4. Have groups share with the class 1 addition problem they made.
5. Tell groups they may not share the same problem as another group. (Example answers: any 2 numbers that add to make 50,000)




Independent Practice (10 minutes)

1. Have pupils solve problems b., c., d., e. and f. on their own.
2. **Say:** Make sure you line the problems up vertically by the place value and start in the ones place.
3. Tell pupils to check their problems and answers with their partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: b. 28,660, c. 16,600, d. 30,134, e. 31,340, f. 43,400)
2. **Say:** Good job today, pupils! You added and subtracted many large numbers!

Lesson Title: Adding and Subtracting Numbers up to 100,000	Theme: Everyday Arithmetic Addition and Subtraction up to 100,000, Including Money	
Lesson Number: M-04-105	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes By the end of the lesson, pupils will be able to add and subtract numbers up to 100,000.	 Teaching Aids None	 Preparation Write the problems on the board.
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Opening (3 minutes)

- Write** on the board: $\underline{\quad} + \underline{\quad} = 25$ $\underline{\quad} - \underline{\quad} = 1$
- Tell pupils to work with a partner to find 2 numbers that make both problems true.
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answer: 13 and 12. $13 + 12 = 25$. $13 - 12 = 1$)

Introduction to the New Material (10 minutes)

- Say:** Today we will add and subtract numbers to 100,000.
- Read aloud with pupils the problems on the board.
 - $49,875 + 32,125 =$
 - $75,000 - 25,000 =$
 - $26,450 + 24,550 =$
 - $95,450 - 85,041 =$
 - $94,250 + 750 =$
 - $62,104 - 49,759 =$
- Say:** There are 6 problems on the board.
- Ask:** How many are subtraction problems? Raise your hand to answer. (Answer: 3)
- Ask:** How many are addition problems? Raise your hand to answer. (Answer: 3)
- Say:** I want you to guess which problem will have an answer more than 90,000. Think. Then, turn and talk with a partner.
- Give pupils 1 minute to think and talk.
- Ask:** Which problem will have an answer more than 90,000? Raise your hand to answer. (Answer: $94,250 + 750$)
- Ask:** How do you know the answer is more than 90,000? Raise your hand to answer. (Answer: It is addition. It adds 750 to 94,250, so the answer will be more than 90,000.)
- Say:** I want you to guess which problem will have an answer close to 10,000. Think. Then, turn and talk with a partner.
- Give pupils 1 minute to think and talk.
- Ask:** Which problem will have an answer close to 10,000? Raise your hand to answer. (Answer: $95,450 - 85,041$)
- Ask:** How do you know the answer is close to 10,000? Raise your hand to answer. (Answer: It is subtraction. 85,041 is about 10,000 less than 95,450.)
- Review the steps for addition with regrouping from Lesson 97.
- Use question and answer to solve problem a. step by step with pupils. (Answer: 82,000)

16. **Say:** Remember, when you add large numbers, you might have to carry over the extra place value in the next column over. Let's practice a. so you can remember and see this.

17. **Write:**

$$\begin{array}{r} 1 \ 1 \ 1 \ 1 \\ 4 \ 9, \ 8 \ 7 \ 5 \\ + \ 3 \ 2 \ 1 \ 2 \ 5 \\ \hline 8 \ 2, \ 0 \ 0 \ 0 \end{array}$$

Guided Practice (10 minutes)

1. **Write** on the board: $\underline{\quad} + \underline{\quad} = 75,000$
2. Assign pupils to groups of 5.
3. Tell pupils to work with their groups to make different addition problems with an answer of 75,000.
4. Have groups share with the class 1 addition problem they made. Tell groups they may not share the same problem as another group. (Example answers: any 2 numbers that add to make 75,000)




Independent Practice (10 minutes)

1. Have pupils solve problems b., c., d., e. and f. on their own.
2. Tell pupils to check their problems and answers with their partner.

Closing (2 minutes)

1. Go over answers with pupils. (Answers: b. 50,000, c. 51,000, d. 10,409, e. 95,000, f. 12,345)
2. **Say:** Good job today, pupils! You added and subtracted a number of very large numbers!

Lesson Title: Fractions with a Denominator of 10	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Point	
Lesson Number: M-04-106	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write equivalent fractions with 10 as denominator.		Teaching Aids None		Preparation 1. Draw on the board a rectangle. Shade $\frac{1}{2}$. 2. Write on the board a grid with fractions for guided and independent practice.
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Opening (3 minutes)

- Write** on the board:
 - $\underline{\quad} \times 1 = 50$
 - $\underline{\quad} \div 1 = 50$
 - $26 \times \underline{\quad} = 26$
 - $26 \div \underline{\quad} = 26$
- Tell pupils to talk with a partner about the answers to the problems.
- Invite 2 pupils to share their answers. (Answers: $50 \times 1 = 50$, $50 \div 1 = 50$; $26 \times 1 = 26$, $26 \div 1 = 26$)
- Ask:** What is the rule when we multiply or divide with 1? Raise your hand to answer. (Answer: The number does not change.)

Introduction to the New Material (10 minutes)

- Say:** Today we will review finding equivalent fractions. We will find fractions we can make into tenths.
- Say:** Try to remember how to find equivalent fractions. Think. Then tell a partner how to find equivalent fractions.
- Give pupils 1 minute to think and talk.
- Ask:** How do we find equivalent fractions? Raise your hand to answer. (Example answers: They are the same place on a number line. They show the same amount in a picture. Multiply by a fraction equal to 1, like $\frac{2}{2}$ or $\frac{3}{3}$.)

- Show pupils the rectangle on the board.



- Ask:** What fraction does this show? Raise your hand to answer. (Answer: $\frac{1}{2}$)
- Say:** I want the rectangle to show $\frac{1}{2} = \frac{\quad}{10}$.
- Ask:** How can I divide this rectangle to show tenths? Raise your hand to answer. (Answer: Draw lines to show 10 equal parts.)

- Divide the rectangle into tenths.



- Ask:** How much is shaded? Raise your hand to answer. (Answer: $\frac{5}{10}$)
- Write** on the board: $\frac{1}{2} = \frac{5}{10}$

12. **Say:** We showed $\frac{1}{2} = \frac{5}{10}$ with a picture. Now I want to multiply $\frac{1}{2}$ by a fraction equal to 1 to get $\frac{5}{10}$.
When we multiply by a fraction equal to 1, it gives us an equivalent fraction.
13. **Write** on the board: $\frac{1}{2} \times \frac{?}{?} = \frac{5}{10}$
14. **Ask:** What fraction do I use? Raise your hand to answer. (Answer: $\frac{5}{5}$)
15. **Write** on the board $\frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$. Read it aloud with pupils.
16. **Say:** We know how to multiply by fractions equal to 1 to get equivalent fractions. We can also divide by fractions equal to 1 to get equivalent fractions.
17. **Write** on the board: $\frac{10}{20} \div \frac{?}{?} = \frac{1}{2}$
18. **Say:** I look at the denominators to find out what fraction to use.
19. **Ask:** 20 divided by what number equals 10? Raise your hand to answer. (Answer: 2)
20. **Ask:** What fraction equal to 1 can I make with 2? The top number and denominator must be the same. Raise your hand to answer. (Answer: $\frac{2}{2}$)
21. **Write** on the board $\frac{10}{20} \div \frac{2}{2} = \frac{5}{10}$. Read it aloud with pupils.
22. Use steps 18 to 21 to find equivalent tenths for $\frac{6}{30}$. (Answer: $\frac{6}{30} \div \frac{?}{?} = \frac{1}{5}$, $\frac{6}{30} \div \frac{3}{3} = \frac{2}{10}$)

Guided Practice (10 minutes)

- Show pupils the grid with fractions on the board (without answers).
- Say:** You will make each of these fractions into an equivalent fraction with tenths.
- Read each fraction one at a time.
- Say with the class aloud together how to make equivalent tenths for each fraction.
- For example: $\frac{1}{5}$. Multiply by $\frac{2}{2}$, $\frac{10}{50}$. Divide by $\frac{5}{5}$, $\frac{20}{100}$. Divide by $\frac{10}{10}$.

$\frac{1}{5}$ (Answer: = $\frac{2}{10}$)	$\frac{3}{5}$ (Answer: = $\frac{6}{10}$)	$\frac{10}{100}$ (Answer: = $\frac{1}{10}$)	$\frac{50}{100}$ (Answer: = $\frac{5}{10}$)
$\frac{10}{50}$ (Answer: = $\frac{2}{10}$)	$\frac{30}{50}$ (Answer: = $\frac{6}{10}$)	$\frac{20}{100}$ (Answer: = $\frac{2}{10}$)	$\frac{60}{100}$ (Answer: = $\frac{6}{10}$)
$\frac{2}{5}$ (Answer: = $\frac{4}{10}$)	$\frac{4}{5}$ (Answer: = $\frac{8}{10}$)	$\frac{30}{100}$ (Answer: = $\frac{3}{10}$)	$\frac{70}{100}$ (Answer: = $\frac{7}{10}$)
$\frac{20}{50}$ (Answer: = $\frac{4}{10}$)	$\frac{40}{50}$ (Answer: = $\frac{8}{10}$)	$\frac{40}{100}$ (Answer: = $\frac{4}{10}$)	$\frac{80}{100}$ (Answer: = $\frac{8}{10}$)

- Tell pupils to copy the fractions into their exercise books.




Independent Practice (10 minutes)

- Have pupils find the equivalent tenths for all the fractions in the grid.

Closing (2 minutes)

- Go over problems and answers with pupils. (Answer: See above for answers.)
- Say:** Good job today, pupils! You learned how to find equivalent fractions with denominators of 10.

Lesson Title: Fractions with a Denominator of 10 on a Number Line	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-107	Class/Level: Primary 4	Time: 35 minutes

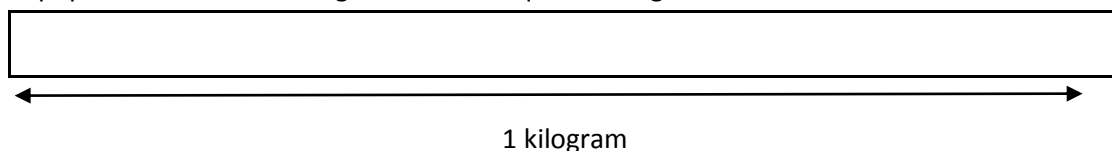
 Learning Outcomes By the end of the lesson, pupils will be able to locate fractions with a denominator of 10 on a number line.	 Teaching Aids Ten 100g bags of sugar or spice	 Preparation 1. Gather 10 small 100g bags of sugar or spice. The bags are used in Lessons 108 – 114. 2. Draw a long rectangle. 3. Draw a number line from 0-1.
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Opening (3 minutes)

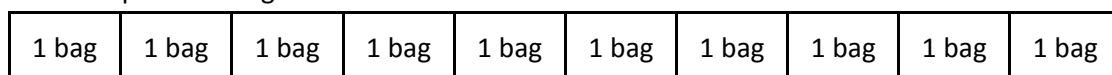
- As a class, count aloud in tenths from 0 to $\frac{10}{10}$: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$.
- Ask:** How many tenths is equal to 1? Raise your hand to answer. (Answer: $\frac{10}{10}$)
- Say:** We will count in tenths again. This time, when we come to 1, say '1'.
- As a class, count aloud in tenths from 0 to 1: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, 1$.
- Say:** Now we will count backwards in tenths from 1 down to 0.
- As a class, count backwards in tenths from 1 to 0: $1, \frac{9}{10}, \frac{8}{10}, \frac{7}{10}, \frac{6}{10}, \frac{5}{10}, \frac{4}{10}, \frac{3}{10}, \frac{2}{10}, \frac{1}{10}, 0$.

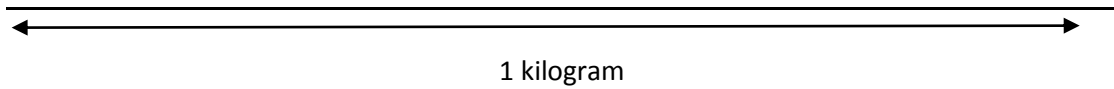
Introduction to the New Material (10 minutes)

- Say:** Today we will find tenths on a number line.
- Show pupils 10 small bags of sugar.
- Say:** Here are 10 equal bags of sugar. These bags weigh 1 kilogram in all.
- Say:** I want to draw a picture to show all 10 bags are equal. I want to show they weigh 1 kilogram in all.
- Draw on the board a long rectangle.
- Have pupils draw a long rectangle in their exercise books.
- Ask:** How much do the 100g bags of sugar weigh in all? Raise your hand to answer. (Answer: 1 kilogram)
- Tell pupils to label the rectangle to show it equals 1 kilogram.



- Say:** Now the picture shows 1 kilo. We need to show 10 equal bags of sugar.
- Ask:** How can we divide the rectangle into 10 equal parts? (Answer: Draw lines inside to show 10 equal parts.)
- Divide the rectangle on the board into 10 equal parts.
- Tell pupils to divide their rectangles into 10 equal parts.
- Label each part as 1 bag.

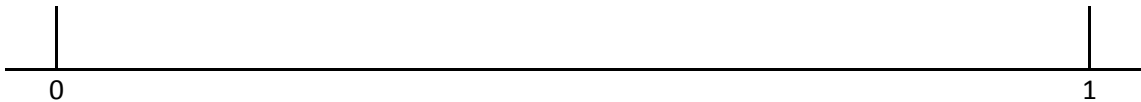




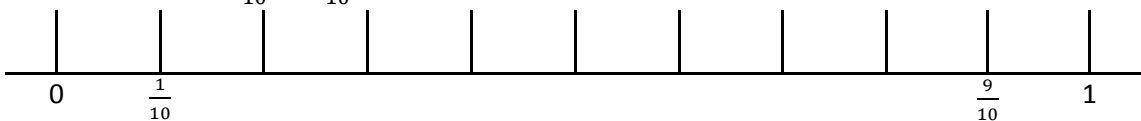
14. **Say:** The rectangle shows the bags are 10 equal parts. Each bag is equal to $\frac{1}{10}$ of 1 kilogram.
15. **Ask:** What fraction of the rectangle is 1 bag? Raise your hand to answer. (Answer: $\frac{1}{10}$)
16. **Ask:** What fraction of the rectangle is 2 bags? Raise your hand to answer. (Answer: $\frac{2}{10}$)
17. **Ask:** What fraction of the rectangle is 3 bags? Raise your hand to answer. (Answer: $\frac{3}{10}$)
18. **Say:** Now we will count all the bags, starting at $\frac{1}{10}$. When we come to 1, we say '1' instead of $\frac{10}{10}$.
19. As a class, count aloud: $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, 1$.

Guided Practice (10 minutes)

1. Show pupils the number line drawn on the board.
2. Have pupils draw a number line in their exercise book.
3. Tell pupils to label the beginning of the number line '0' and the end of the number line '1'.



4. **Ask:** What is the smallest number on the number line? Raise your hand to answer. (Answer: 0)
5. **Ask:** What is the biggest number on the number line? Raise your hand to answer. (Answer: 1)
6. **Say:** Show me 1. Raise 1 hand. (Answer: All pupils raise 1 hand)
7. **Say:** Now show me 0. Raise 0 hands. (Answer: Pupils put their hands down. They do not raise a hand.)
8. **Ask:** How can I show tenths on this number line? Raise your hand to answer. (Answer: Divide it into 10 equal parts.)
9. Guide pupils to divide the number line into 10 equal parts:
 - a) Divide the number line in half.
 - b) Divide each half into 5 equal parts.
10. Guide pupils to write $\frac{1}{10}$ and $\frac{9}{10}$ on the number line.

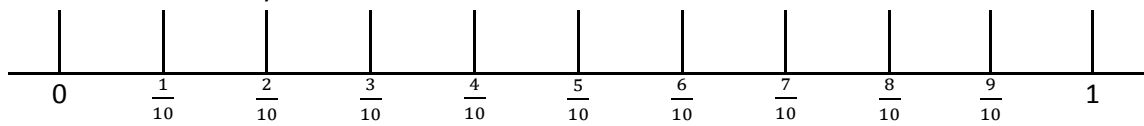


Independent Practice (10 minutes)




1. Have pupils write the rest of the tenths on their number line.
2. Have pupils check their number line with a partner.
3. Choose pupils to write the rest of the tenths on the number line on the board.
4. Challenge Problem: Have pupils label any equivalent fractions they can remember from previous lesson. (Example answers: $\frac{5}{10} = \frac{1}{2}, \frac{4}{10} = \frac{2}{5}$)

Closing (2 minutes)

1. Have pupils check their number lines with the number line on the board.
2. Tell them to correct any mistakes.



Lesson Title: Fractions as Decimals	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-108	Class/Level: Primary 4	Time: 35 minutes

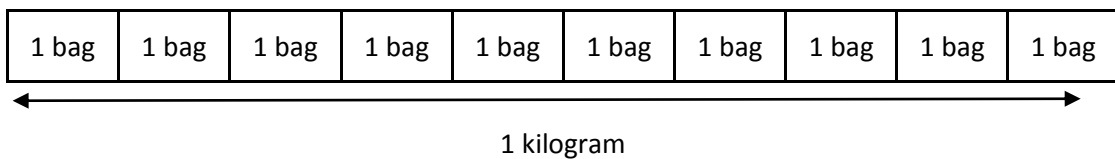
	Learning Outcomes By the end of the lesson, pupils will be able to write fractions with a denominator of 10 as decimals.		Teaching Aids Ten 100g bags of sugar or spice from Lesson 107		Preparation 1. Draw a long rectangle on the board. 2. Draw a number line from 0-1 on the board. 3. Draw the grid with fractions from the independent practice.
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Opening (3 minutes)

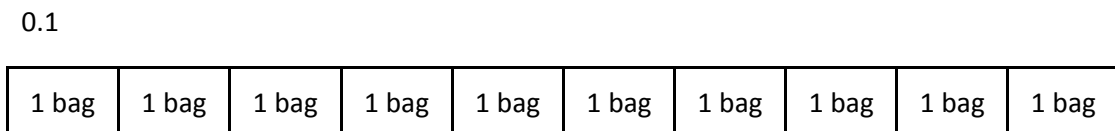
- As a class, count aloud in tenths from 0 to 1: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, 1$.
- Ask:** How many tenths is 1? Raise your hand to answer. (Answer: $\frac{10}{10}$)
- Ask:** How many tenths is 2? Raise your hand to answer. (Answer: $\frac{20}{10}$)
- Say:** Now we will count from 1 to 2 in tenths. We count 'one and one-tenth, one and two-tenths, one and three-tenths, and so on. When we come to 2 we say '2'.
- As a class, count in tenths from 1 to 2: $1, 1\frac{1}{10}, 1\frac{2}{10}, 1\frac{3}{10}, 1\frac{4}{10}, 1\frac{5}{10}, 1\frac{6}{10}, 1\frac{7}{10}, 1\frac{8}{10}, 1\frac{9}{10}, 2$.
- As a class, count backwards in tenths from 2 down to 1.

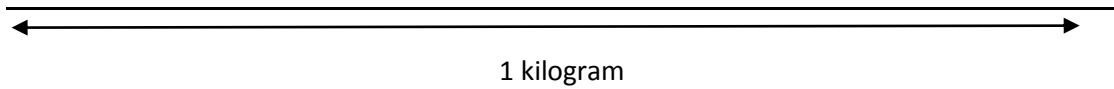
Introduction to the New Material (10 minutes)

- Say:** Today we will learn about decimals and how to write them.
- Show pupils 10 small bags of sugar.
- Show pupils the long rectangle on the board marked with the 10 bags of sugar.
- Say:** Find in your exercise book the rectangle you drew yesterday for the 10 bags of sugar.

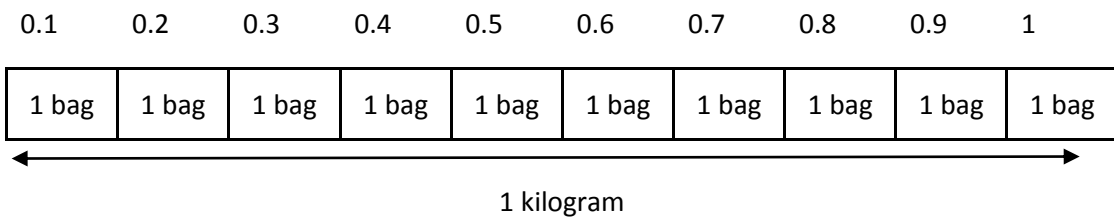


- Ask:** What does the whole rectangle show? Raise your hand to answer. (Answer: 10 bags equal 1 kilogram)
- Ask:** What fraction of the rectangle is 4 bags? Raise your hand to answer. (Answer: $\frac{4}{10}$)
- Ask:** What fraction of the rectangle is 5 bags? Raise your hand to answer. (Answer: $\frac{5}{10}$)
- Ask:** What fraction of the rectangle is 7 bags? Raise your hand to answer. (Answer: $\frac{7}{10}$)
- Say:** We know how to write tenths as fractions. We can also write tenths as decimals.
- Write** above the first tenth of the rectangle '0.1'.



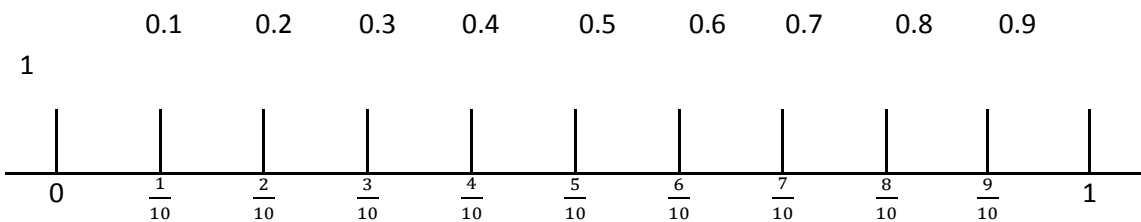


11. **Say:** We write the decimal 'one-tenth' as 'zero point one'. We say 'one-tenth'.
12. Have pupil write '0.1' above the first tenth of their rectangles.
13. Have pupils point to '0.1' and say 'one-tenth'.
14. **Ask:** How do you think we write $\frac{2}{10}$ as a decimal? Raise your hand to answer. (Answer: 0.2)
15. **Write** '0.2' above the second tenth of the rectangle.
16. Have pupils write '0.2' above the second tenth of their rectangle and say 'two-tenths'.
17. Continue writing and saying with pupils each decimal from 0.3 to 0.9.
18. **Say:** We write $\frac{10}{10}$ as '1' for decimals.
19. **Write** with pupils '1' above the last tenth of the rectangle.



Guided Practice (10 minutes)

1. Show pupils the number line drawn on the board.
2. **Say:** Find in your exercise book the number line you drew yesterday that shows tenths.
3. **Say:** You will mark decimals to show tenths above the number line.
4. **Ask:** Where do you write 'zero point one'? Raise your hand to answer. (Answer: at the top of the line that shows $\frac{1}{10}$)
5. **Write** '0.1' at the top of the line that shows $\frac{1}{10}$ on the number line on the board.
6. Have pupils write the decimals 0.2 - 0.9 on the number line.
7. Tell pupils to check their number lines with a partner.
8. Choose pupils to write the decimals above the number line on the board.



Independent Practice (10 minutes)

1. Show pupils the grid with fractions on the board (without answers). Tell them to copy the fractions and write the correct decimal for each.




$\frac{4}{10} =$ (Answer: 0.4)	$\frac{3}{10} =$ (Answer: 0.3)	$\frac{7}{10} =$ (Answer: 0.7)	$\frac{6}{10} =$ (Answer: 0.6)
$\frac{5}{10} =$ (Answer: 0.5)	$\frac{2}{10} =$ (Answer: 0.2)	$\frac{1}{10} =$ (Answer: 0.1)	$\frac{10}{10} =$ (Answer: 1)

2. Have pupils check their answers with a partner.

Closing (2 minutes)

1. Go over answers with pupils.
2. Read the fractions and decimals aloud with pupils. (Example answer: $\frac{1}{10} = 0.1$ is read 'one-tenth equals one-tenth'.)
3. **Say:** Good job today, pupils! You wrote tenths or a fractions with a denominator of 10 as a decimal.

Lesson Title: Decimals as Fractions	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-109	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes By the end of the lesson, pupils will be able to write decimals with 1 decimal place as fractions with a denominator of 10.		Teaching Aids Ten 100g bags of sugar or spice from Lesson 107		Preparation Draw 2 long rectangles, each divided into 10 equal parts.
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Opening (3 minutes)

- Review with pupils that the next tenth after 1 is said 'one and one-tenth'.
- As a class, count aloud in tenths from 0 to 2: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, 1, 1\frac{1}{10}, 1\frac{2}{10}, 1\frac{3}{10}, 1\frac{4}{10}, 1\frac{5}{10}, 1\frac{6}{10}, 1\frac{7}{10}, 1\frac{8}{10}, 1\frac{9}{10}, 2$.
- Ask:** How do you write $\frac{3}{10}$ as a decimal? Raise your hand to answer. (Answer: 0.3, 'zero point three')
- Ask pupils how to write other fractions from $\frac{1}{10}$ to $\frac{9}{10}$ as decimals.

Introduction to the New Material (10 minutes)

- Say:** Today we will learn to write decimals as fractions with a denominator of 10.
- Show pupils the rectangles divided into 10 equal parts.
- Write** 0.1 – 1 in the first rectangle.

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
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- Read aloud each decimal with pupils from 0.1 to 1.
- Show the pupils the bags of sugar. **Say:** The bags of sugar equal 1 kilogram. They are the same as 1 whole rectangle.
- Say:** We are going to count the second rectangle now.
- Ask:** What comes next when we count in tenths from 1 to 2? Raise your hand to answer. (Answer: one and one-tenth)
- Say:** We write 'one and one-tenth' in decimals as '1 point 1'.
- Write** '1.1' in the box after '1'.
- Say:** We say '1.1' as 'one and one-tenth'.
- Count with pupils from 0 up to 1.1.
- Ask:** How do you think we write the decimal after 1.1? Raise your hand to answer. (Answer: 1.2, 'one point two')
- Write** in the next box '1.2'.
- Say:** We say '1.2' as 'one and two-tenths'.
- Count with pupils from 0 up to 1.2.

16. Use question and answer ask pupils how to write the decimals 1.3 – 1.9.
17. Count up to each decimal with pupils as you write it.

Guided Practice (10 minutes)

1. Point to 1.1.

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
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1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2
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2. **Ask:** Is 1.1 more than 1 or less than 1? Raise your hand to answer. (Answer: more than 1)
3. **Write** on the board: 1.1
4. **Say:** The first '1' means '1 whole'. The '1' after the point means 'one-tenth.'
5. **Write** on the board ' $1.1 = 1\frac{1}{10}$ '. Read it aloud with pupils as 'one and one-tenth equals one and one tenth'.
6. **Write** $1\frac{1}{10}$ below 1.1.
7. **Write** on the board: $1.2 = 1\frac{?}{10}$
8. **Ask:** What number goes at the top of the fraction? Raise your hand to answer. (Answer: 2)
9. **Write** on the board $1.2 = 1\frac{2}{10}$. Read it aloud with pupils as 'one and two-tenths equal one and two-tenths'.
10. **Say:** You are going to write all the decimals as fractions. Write the fraction under the decimal.
11. Tell pupils to copy the rectangles and decimals in them.

Independent Practice (10 minutes)

1. Have pupils write a fraction for each decimal on the number line.
2. Tell them to check their number lines with a partner.




Closing (2 minutes)

1. Go over answers with pupils.

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2
$1\frac{1}{10}$	$1\frac{2}{10}$	$1\frac{3}{10}$	$1\frac{4}{10}$	$1\frac{5}{10}$	$1\frac{6}{10}$	$1\frac{7}{10}$	$1\frac{8}{10}$	$1\frac{9}{10}$	2

Lesson Title: Ordering Fractions and Decimals	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-110	Class/Level: Primary 4	Time: 35 minutes

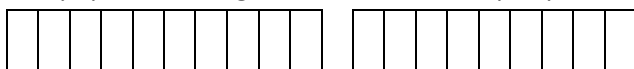
	Learning Outcomes By the end of the lesson, pupils will be able to order decimals with 1 decimal place and fractions with a denominator of 10.		Teaching Aids None		Preparation 1. Draw on the board blank rectangles divided into tenths. 2. Write on the board fractions and decimals with missing numbers for guided and independent practice.
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Opening (3 minutes)

- Review with pupils that the next tenth after 1 is said 'one and one-tenth'.
- As a class, count aloud in tenths from 0 to 3: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, 1, 1\frac{1}{10}, 1\frac{2}{10}, 1\frac{3}{10}, 1\frac{4}{10}, 1\frac{5}{10}, 1\frac{6}{10}, 1\frac{7}{10}, 1\frac{8}{10}, 1\frac{9}{10}, 2, 2\frac{1}{10}, 2\frac{2}{10}, 2\frac{3}{10}, 2\frac{4}{10}, 2\frac{5}{10}, 2\frac{6}{10}, 2\frac{7}{10}, 2\frac{8}{10}, 2\frac{9}{10}, 3$.
- Ask:** How do you write $1\frac{3}{10}$ as a decimal? Raise your hand to answer. (Answer: 1.3, 'one point three')
- Ask pupils how to write other fractions from $1\frac{1}{10}$ to $1\frac{9}{10}$ as decimals.

Introduction to the New Material (10 minutes)

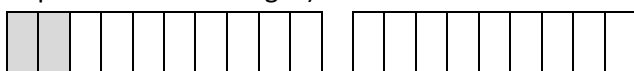
- Say:** Today we will learn how to order decimals and fractions with a denominator of 10.
- Show pupils 2 rectangles divided into 10 equal parts.



- Write** on the board: 1.2
- Say:** I want to shade in the rectangles to show 1.2. Think. Then turn to a partner and tell how I can shade in 1.2.
- Give pupils 1 minute to think and talk.
- Ask:** How can I shade in the rectangles to show 1.2? Raise your hand to answer. (Answer: Shade in 1 whole rectangle. Shade in 2 parts of the second rectangle.)



- Show pupils 2 more rectangles divided into 10 equal parts.
- Write** on the board: 0.2
- Say:** I want to shade in the rectangles to show 0.2. Think. Then turn to a partner and tell how I can shade in 0.2.
- Give pupils 1 minute to think and talk.
- Ask:** How can I shade in the rectangles to show 0.2? Raise your hand to answer. (Answer: Shade in 2 parts of one rectangle.)



12. **Ask:** Which is more 1.2 or 0.2? Raise your hand to answer. (Answer: 1.2)
 13. Repeat steps 2 – 12 with other pairs of decimals: 2 and 1.4, 1.3 and 0.9.

Guided Practice (10 minutes)

1. Show pupils the fractions and decimals with missing numbers written on the board.

$\frac{1}{10}$	0.2	0.3	$\frac{4}{10}$	0.5	0.6	$\frac{7}{10}$	0.8	$\frac{9}{10}$	1
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1.1	$1\frac{\quad}{10}$	1. $_$	1. $_$	$1\frac{\quad}{10}$	1. $_$	$1\frac{\quad}{10}$	$1\frac{\quad}{10}$	$_$.9	2
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2.1	$2\frac{\quad}{10}$	$2\frac{\quad}{10}$	2. $_$	2.5	2. $_$	2. $_$	2. $_$	$2\frac{\quad}{10}$	3
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2. **Say:** These numbers use fractions and decimals to count. Decimals in tenths and fractions in tenths mean the same thing. They are just different ways of writing tenths.
 3. As a class, count aloud the tenths with pupils from $\frac{1}{10}$ to 1.
 4. Assign pupils to groups of 3.
 5. Tell pupils to work with their group to complete the second rectangle or second row with the correct decimal or fraction.
 6. Choose pupils to write the answers on the rectangle on the board. (Answers below.)

1.1	$1\frac{2}{10}$	1.3	1.4	$1\frac{5}{10}$	1.6	$1\frac{7}{10}$	$1\frac{8}{10}$	1.9	2
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7. Read aloud with pupils as 'one and one-tenth, one and two-tenths, one and three-tenths' and so on.

Independent Practice (10 minutes)




1. Have pupils copy and complete the third rectangle.

Closing (2 minutes)

1. Fill in the third rectangle on the board.
 2. Go over answers with pupils. (Answers below.)

2.1	$2\frac{2}{10}$	$2\frac{3}{10}$	2.4	2.5	2.6	2.7	2.8	$2\frac{9}{10}$	3
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Lesson Title: Addition of Decimals with 1 Decimal Place	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-111	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes: By the end of this lesson pupils will be able to solve simple addition problems of decimals with 1 decimal place.		Teaching Aids None		Preparation Write the problems for independent practice on the board.
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Opening (3 minutes)

1. **Write** on the board:

$$\frac{?}{10} + \frac{?}{10} = \frac{6}{10} \quad \text{and} \quad \frac{?}{10} - \frac{?}{10} = \frac{4}{10}$$

2. Tell pupils to work with a partner to find 2 fractions that make both problems true. (1 minute)
3. **Say:** Remember, they must be the same 2 fractions you use for problem 1 and problem 2.
4. Go over the answers. (Answers: $\frac{5}{10}$ and $\frac{1}{10}$. $\frac{5}{10} + \frac{1}{10} = \frac{6}{10}$. $\frac{5}{10} - \frac{1}{10} = \frac{4}{10}$)

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going learn to add decimals.
2. Read this aloud with pupils the completed addition problem from the opening, ' $\frac{5}{10} + \frac{1}{10} = \frac{6}{10}$ '.
3. **Say:** We can write $\frac{5}{10} + \frac{1}{10} = \frac{6}{10}$ in decimals.
4. **Ask:** How do we write $\frac{5}{10}$ as a decimal? Raise your hand to answer. (Answer: Zero point five)
5. **Write** on the board: 0.5
6. **Ask:** How do we write $\frac{1}{10}$ as a decimal? Raise your hand to answer. (Answer: Zero point one)
7. **Write** on the board: $0.5 + 0.1$
8. **Ask:** What is five-tenths plus one-tenth? (Answer: Six-tenths)
9. **Write** on the board: $0.5 + 0.1 = 0.6$. Read this aloud with pupils as five tenths plus one tenth equals six tenths.
10. **Write** on the board: $0.4 + 0.4$. Read this aloud with pupils as 'four-tenths plus four-tenths'.
11. **Ask:** What is four-tenths plus four-tenths? Raise your hand to answer. (Answer: Eight-tenths)
12. **Ask:** How do I write eight-tenths as a decimal? Raise your hand to answer. (Answer: Zero point eight)
13. **Write** on the board $0.4 + 0.4 = 0.8$. Read this aloud with pupils as four-tenths plus four-tenths equals eight-tenths.
14. **Write** on the board ' $\frac{5}{10} + \frac{5}{10} = \frac{10}{10}$ ' . Read this aloud with pupils.
15. **Say:** $\frac{10}{10}$ is equal to 1. So $\frac{5}{10} + \frac{5}{10} = 1$.
16. **Write** on the board $0.5 + 0.5 = 1$. Read this aloud with pupils as five-tenths plus five-tenths equal one.
17. **Write** on the board ' $\frac{6}{10} + \frac{4}{10} = \frac{10}{10}$ ' . Read this aloud with pupils.

18. **Ask:** What number is $\frac{10}{10}$ equal to? Show me the answer by raising your finger. (Answer: $\frac{10}{10} = 1$. Pupils should raise 1 finger.)
19. **Ask:** How do I write $\frac{6}{10} + \frac{4}{10}$ in decimals? Raise your hand to answer. (Answer: Zero point 6 plus zero point 4)
20. **Write** on the board $0.6 + 0.4 =$. Read this aloud with pupils.
21. **Ask:** What is $0.6 + 0.4$? Please show me the answer by raising your finger. (Answer: 1. Pupils should raise 1 finger.)
22. **Write** on the board $0.6 + 0.4 = 1$.

Guided Practice (10 minutes)

1. Assign pupils into groups of 3.
2. **Say:** There are 9 ways to add decimal tenths to make 1. We added $0.5 + 0.5 = 1$. We added $0.6 + 0.4 = 1$.
3. **Say:** You will work with your group to find the other ways to add decimal tenths to make 1.
4. **Say:** I will help you with one more way to add decimal tenths to make 1.
5. Write on the board ' $0.9 + \underline{\quad} = 1$ '.
6. **Ask:** What decimal tenth do I write? Raise your hand to answer. (Answer: 0.1)
7. **Write** on the board ' $0.9 + 0.1 = 1$ '. Read this aloud with pupils.
8. Tell pupils to copy ' $0.5 + 0.5 = 1$, $0.6 + 0.4 = 1$, and $0.1 + 0.9 = 1$ ' into their exercise books.
9. Tell pupils to work in their groups to find the other 6 ways to add decimal tenths to make 1. Tell pupils to write the problems in their exercise books.
10. Go over the answers.
 - a) Write each problem and answer on the board.
 - b) Tell pupils to check their work.
 - c) Tell pupil to write any problems they do not have.

(Answers: $0.1 + 0.9 = 1$, $0.2 + 0.8 = 1$, $0.3 + 0.7 = 1$, $0.4 + 0.6 = 1$, $0.7 + 0.3 = 1$, $0.2 + 0.8 = 1$)

Independent Practice (10 minutes)

1. Have pupils copy and solve the following problems.
 - a. $0.2 + 0.2 =$
 - b. $0.3 + 0.6 =$
 - c. $0.8 + 0.1 =$
 - d. $0.5 + 0.4 =$
 - e. $0.1 + 0.7 =$
2. Tell pupils to check their answers in their groups.
3. Challenge Problem: If pupils finish early, have them rewrite the problems using fractions with a denominator of 10.




Closing (2 minutes)

1. Go over the answers with pupils.
 - a) Write each answer on the board.
 - b) Tell pupils to check their work.
 - c) Tell pupil to correct any mistakes.

(Answers: a. $0.2 + 0.2 = 0.4$ b. $0.3 + 0.6 = 0.9$ c. $0.8 + 0.1 = 0.9$ d. $0.5 + 0.4 = 0.9$ e. $0.1 + 0.7 = 0.8$)

2. **Say:** Good job today, pupils! You added simple decimal problems with one place!

Lesson Title: Addition of Decimals with 1 Decimal Place	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-112	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes: By the end of the lesson, pupils will be able to solve more complex addition problems of decimals with 1 decimal place.		Teaching Aids None		Preparation Write the problems for guided and independent practice on the board.
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Opening (3 minutes)

- Write** on the board:
a) $0._ + 0._ = 0.5$ $0._ - 0._ = 0.1$
- Tell pupils to work with a partner to find 2 decimals that make both problems true. (1 minute)
- Say:** Remember, they must be the same 2 decimal you use for problem 1 and problem 2.
- Go over the answers. (Answers: 0.3 and 0.2. $0.3 + 0.2 = 0.5$, $0.3 - 0.2 = 0.1$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn to add decimals using place value to line up the numbers.
- Write** on the board $1.2 + 0.3$. Read this aloud with the pupils.
- Say:** To add with place value we write the bigger number on top. We then line up the place values. We line up place values by lining up the decimal point.
- Write** the problem on the board. Draw big decimal points to help pupils learn to line them up.

$$\begin{array}{r} 1.2 \\ + 0.3 \\ \hline \end{array}$$

- Say:** First we write a decimal point in the answer space. We line it up with the other decimal points.
- Say:** Next we add. Start in the tenths place. 2 tenths + 3 tenths = 5 tenths.

$$\begin{array}{r} 1.2 \\ + 0.3 \\ \hline .5 \end{array}$$

- Say:** Next we add digits in the 1's place. $1 + 0 = 1$.

$$\begin{array}{r} 1.2 \\ + 0.3 \\ \hline 1.5 \end{array}$$

- Read the problem aloud and answer with the pupils.
- Say:** Now we will add and carry over.
- Write the problem on the board. Draw big decimal points to help pupils learn to line them up.

11. Read the problem aloud with pupils.

$$\begin{array}{r} 2 \bullet 8 \\ + 0 \bullet 4 \\ \hline \bullet \end{array}$$

12. **Say:** First we write a decimal point in the answer space. We line it up with the other decimal points.

13. **Say:** Next we add. Start in the tenths place. 8 tenths + 4 tenths = 12 tenths. I cannot write 2 digits in the tenths place. I write the 2 in the answer space. I then carry the 1. I write it on top of the 1's place.

$$\begin{array}{r} 1 \\ 2 \bullet 8 \\ + 0 \bullet 4 \\ \hline \bullet 2 \end{array}$$

14. **Say:** Next we add all the digits in the 1's place. $1 + 2 + 0 = 3$.

$$\begin{array}{r} 1 \\ 2 \bullet 8 \\ + 0 \bullet 4 \\ \hline 3 \bullet 2 \end{array}$$

15. Read the problem and answer aloud with the pupils.

Guided Practice (10 minutes)

1. Read the problems with the pupils on the board.

a. $0.6 + 0.7 =$ b. $1.6 + 1.7 =$ c. $0.8 + 2.1 =$ d. $4.3 + 2.9$ e. $1.5 + 1.5 =$

2. Guide pupils to write problem a. so the place values are lined up.

3. Guide pupils through each step of solving problem a.

$$\begin{array}{r} 1 \\ 0 \bullet 6 \\ + 0 \bullet 7 \\ \hline 1 \bullet 3 \end{array}$$

4. Tell pupils to work with a partner to solve problem b.

5. Go over the answer to problem b. Line up the problem on the board and solve it. Tell pupils to check their answers for the decimal point.

$$\begin{array}{r} 1 \\ 1 \bullet 6 \\ + 1 \bullet 7 \\ \hline 3 \bullet 3 \end{array}$$

Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.




2. Tell pupils to check their problems and answers with a partner.

Closing (2 minutes)

1. Go over the answers with the pupils. (Answers: c. 2.9, d. 7.2, e. 3.0)

2. **Say:** Good job today, pupils! You solved more complex problems adding decimals with 1 decimal.

Lesson Title: Subtraction of Decimals with 1 Decimal Place	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-113	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes: By the end of the lesson, pupils will be able to solve simple subtraction problems of decimals with 1 decimal place.	 Teaching Aids None	 Preparation Write on the board the problems for independent practice.
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Opening (3 minutes)

- Say:** Remember, they must be the same 2 fractions you use for problem 1 and problem 2.
- on the board:
 - $\frac{?}{10} + \frac{?}{10} = \frac{8}{10}$ $\frac{?}{10} - \frac{?}{10} = \frac{4}{10}$
- Tell pupils to work with a partner to find 2 fractions that make both problems true. (1 minute)
- Say:** Remember, they must be the same 2 fractions you use for problem 1 and problem 2.
- Go over the answers. (Answers: $\frac{6}{10}$ and $\frac{2}{10}$. $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$. $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going learn to subtract decimals.
- Read the completed subtraction problem aloud with pupils from the opening, ' $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$ '.
- Say:** We can write $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$ in decimals.
- Ask:** How do we write $\frac{6}{10}$ as a decimal? Raise your hand to answer. (Answer: Zero point six)
- Write** on the board: 0.6
- Ask:** How do we write $\frac{2}{10}$ as a decimal? Raise your hand to answer. (Answer: Zero point two)
- Write** on the board: 0.6 – 0.2
- Ask:** What is six-tenths minus two-tenths? Raise your hand to answer. (Answer: Four-tenths)
- Write** on the board 0.6 – 0.2= 0.4. Read this aloud with pupils as 'six-tenths minus two-tenths equals four-tenths'.
- Write** on the board 0.5 – 0.4. Read this aloud with pupils as 'five-tenths minus four-tenths'.
- Ask:** What is five-tenths minus four-tenths? Raise your hand to answer. (Answer: One-tenth)
- Ask:** How do I write one-tenth as a decimal? Raise your hand to answer. (Answer: Zero point one)
- Write** on the board: 0.5 - 0.4= 0.1. Read this aloud with pupils as 'five-tenths minus four-tenths equals one-tenth'.
- Write** on the board ' $\frac{10}{10} - \frac{5}{10} = \frac{5}{10}$ ' . Read this aloud with pupils.
- Say:** $\frac{10}{10}$ is equal to 1. So $1 - \frac{5}{10} = \frac{5}{10}$.
- Write** on the board: 1 – 0.5 = 0.5. Read this aloud with pupils as 'one minus five-tenths equals five-tenths'.
- Write** on the board ' $\frac{10}{10} - \frac{6}{10} = \frac{4}{10}$ ' . Read this aloud with pupils.

18. **Ask:** What number is $\frac{10}{10}$ equal to? Please show me the answer by raising your finger. (Answer: $\frac{10}{10} = 1$. Pupils should raise 1 finger.)
19. **Ask:** How do I write $\frac{10}{10} - \frac{6}{10} = \frac{4}{10}$ in decimals? Raise your hand to answer. (Answer: One minus zero point six equals zero point four.)
20. **Write** on the board: $1 - 0.6 = 0.4$. Read this aloud with pupils as 'one minus six-tenths equals four-tenths'.

Guided Practice (10 minutes)

- Assign pupils into groups of 3.
- Say:** There are 9 decimal tenths you can subtract from 1. We subtracted $1 - 0.5 = 0.5$. We also subtracted $1 - 0.6 = 0.4$.
- Say:** You will work with your group to find other decimal tenths you can subtract from 1.
- Say:** I will help you with one more decimal tenth you can subtract from 1.
- Write** on the board: $1 - 0.9 = \underline{\quad}$
- Ask:** What decimal tenth do I write? Raise your hand to answer. (Answer: 0.1)
- Write** on the board: $1 - 0.9 = 0.1$. Read this aloud with pupils.
- Tell pupils to copy ' $1 - 0.5 = 0.5$, $1 - 0.6 = 0.4$, and $1 - 0.9 = 0.1$ ' into their exercise books.
- Tell pupils to work in their groups to find the other 6 decimal tenths you can subtract from 1. Tell pupils to write the problems in their exercise books.
- Go over answers.
 - Write each problem and answer on the board.
 - Tell pupils to check their work.
 - Tell pupils to write any problems they do not have.
 (Answers: $1 - 0.1 = 0.9$, $1 - 0.2 = 0.8$, $1 - 0.3 = 0.7$, $1 - 0.4 = 0.6$, $1 - 0.7 = 0.3$, $1 - 0.8 = 0.2$)




Independent Practice (10 minutes)

- Have pupils copy and solve the following problems:
 - $0.7 - 0.2 =$
 - $0.6 - 0.3 =$
 - $0.8 - 0.1 =$
 - $0.9 - 0.4 =$
 - $0.4 - 0.2 =$
- Tell pupils to check their answers in their groups.

Closing (2 minutes)

- Go over the answers with pupils.
 - Write each answer on the board.
 - Tell pupils to check their work.
 - Tell pupil to correct any mistakes.
 (Answers: a. $0.7 - 0.2 = 0.5$ b. $0.6 - 0.3 = 0.3$ c. $0.8 - 0.1 = 0.7$ d. $0.9 - 0.4 = 0.5$ e. $0.4 - 0.2 = 0.2$)
- Say:** Good job today, pupils! You solved simple subtraction problems with numbers with one decimal place.

Lesson Title: Subtraction of Decimals with 1 Decimal Place	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-114	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes: By the end of the lesson, pupils will be able to solve more complex subtraction problems of decimals with 1 decimal place.	 Teaching Aids None	 Preparation Write the problems for guided and independent practice on the board.
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Opening (3 minutes)

- Write** on the board:
a) $0._ + 0._ = 0.8$ $0._ - 0._ = 0.2$
- Tell pupils to work with a partner to find 2 decimals that make both problems true. (1 minute)
- Say:** Remember, they must be the same 2 decimals you use for problem 1 and problem 2.
- Go over the answers. (Answers: 0.5 and 0.3. $0.5 + 0.3 = 0.8$, $0.5 - 0.3 = 0.2$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to learn to subtract decimals using place value to line up the numbers.
- Write** on the board: $1.3 - 0.2$. Read this aloud with pupils.
- Say:** To subtract with place value we write the bigger number on top. We line up the place values. Then, we line up place values by lining up the decimal points.
- Write** the problem on the board. Draw big decimal points to help pupils remember to line them up.

$$\begin{array}{r} 1.3 \\ - 0.2 \\ \hline \end{array}$$

- Say:** First we write a decimal point in the answer space. We line it up with the other decimal points.
- Say:** Next we subtract. Start in the tenths place. 3 tenths – 2 tenths = 1 tenth.

$$\begin{array}{r} 1.3 \\ - 0.2 \\ \hline .1 \end{array}$$

- Say:** Next we subtract the digits in the 1's place. $1 - 0 = 1$.

$$\begin{array}{r} 1.3 \\ - 0.2 \\ \hline 1.1 \end{array}$$

- Read aloud the problem and answer with pupils.
- Say:** Now we will subtract and regroup.
- Write** the problem on the board. Draw big decimal points to help pupils remember to line them up.

11. Read the problem aloud with pupils.

$$\begin{array}{r} 2.4 \\ - 1.8 \\ \hline \end{array}$$

12. **Say:** First we write a decimal point in the answer space. We line it up with the other decimal points.

13. **Say:** Next we subtract. Start in the tenths place. I cannot subtract 4 tenths – 8 tenths. I need to make 4 tenths into a bigger number than 8 tenths. I can borrow from the 2 in the ones place.

$$\begin{array}{r} 1 \quad 14 \\ \cancel{2}.\cancel{4} \\ - 1.8 \\ \hline 0.6 \end{array}$$

14. **Say:** I cross out the 2 and make it a 1. I cross out the 4 tenths and make it 14 tenths. $14 - 8 = 6$.

15. **Say:** Next we subtract the digits in the ones place. $1 - 1 = 0$. I write 0 in the answer space.

$$\begin{array}{r} 1 \quad 14 \\ \cancel{2}.\cancel{4} \\ - 1.8 \\ \hline 0.6 \end{array}$$

16. Read the problem and answer aloud with pupils.

Guided Practice (10 minutes)

1. Read the problems on the board with pupils.

a. $3.6 - 0.7 =$ b. $2.3 - 1.5 =$ c. $2.1 - 1.8 =$ d. $4.3 - 2.9$ e. $1.6 - 1.2 =$

2. Guide pupils to write problem a. so the place values are lined up.

3. Guide pupils through each step of solving problem a.

$$\begin{array}{r} 2 \quad 16 \\ \cancel{3}.\cancel{6} \\ - 0.7 \\ \hline 2.9 \end{array}$$

4. Tell pupils to work with a partner to solve problem b.

5. Go over the answer to problem b. Line up the problem on the board and solve it. Tell pupils to check their answers for the decimal point.

$$\begin{array}{r} 1 \quad 13 \\ \cancel{2}.\cancel{3} \\ - 1.5 \\ \hline 0.8 \end{array}$$

Independent Practice (10 minutes)

1. Have pupils solve problems c., d. and e. on their own.




2. Tell pupils to check their problems and answers with a partner.

Closing (2 minutes)

1. Go over the answers with pupils. (Answers: c. 0.3 d. 1.4 e. 0.2)

2. **Say:** Good job today, pupils! You used place value and lined up decimals to subtract them.

Lesson Title: Word Problems Involving Addition and Subtraction of Numbers with 1 Decimal Place	Theme: Everyday Arithmetic Addition and Subtraction of Decimals with 1 Decimal Place	
Lesson Number: M-04-115	Class/Level: Primary 4	Time: 35 minutes

 Learning Outcomes: By the end of the lesson, pupils will be able to solve word problems involving addition and subtraction of numbers with 1 decimal place.	 Teaching Aids None	 Preparation Write the word problems from the lesson on the board.
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Opening (3 minutes)

- Write** on the board:
a) $0._ + 0._ = 1.1$ $0._ - 0._ = 0.1$
- Tell pupils to work with a partner to find 2 decimals that make both problems true. (1 minute)
- Say:** Remember, they must be the same 2 decimals you use for problem 1 and problem 2.
- Go over the answers. (Answers: 0.6 and 0.5. $0.6 + 0.5 = 1.1$, $0.6 - 0.5 = 0.1$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to solve word problems by adding and subtracting decimals. We will read and solve the problems.
- Read all 4 problems aloud with pupils.
 - Amadu walks 1.3 kilometres.
Joseph walks 0.5 kilometres.
How much further does Amadu walk than Joseph?
 - Amadu walks 1.3 kilometres.
Joseph walks 0.5 kilometres.
How much further does Amadu walk than Joseph?
 - Fatmata drinks 0.4 litres of water.
Marai drinks 0.6 litres of water.
How much water do they drink in all?
 - Fatmata drinks 0.4 litres of water.
Marai drinks 0.6 litres of water.
How much water do they drink in all?
- Read problem a. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: 1.3 and 0.5)
- Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Subtract. Pupils should raise 2 fingers.)
- Ask:** What is the subtraction problem? Raise your hand to answer. (Answer: $1.3 - 0.5$)
- Read problem b. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: 0.4 and 0.6)
- Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Add. Pupils should raise 1 finger.)
- Ask:** What is the addition problem? Raise your hand to answer. (Answer: $0.4 + 0.6$)
- Read problem c. again with pupils.

12. **Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: 1.9 and 1.9)
13. **Ask:** Do we add or subtract to solve this problem? Raise 1 finger if we add. Raise 2 fingers if we subtract. (Answer: Add. Pupils should raise 1 finger.)
14. **Ask:** What is the addition problem? Raise your hand to answer. (Answer: $1.9 + 1.9$)

Guided Practice (10 minutes)

1. Read problem a. again with pupils.
2. **Ask:** What is the question in the word problem? Raise your hand to answer. (Answer: How much further does Amadu walk than Joseph?)
3. **Say:** We know we need to answer the question in a word problem with a sentence.
4. **Write** on the board 'Amadu walks ____ kilometres further'.
5. Tell pupils to work with a partner to solve problem a. and complete the sentence.
6. Remind pupils to:
 - a) Line up the decimals points and write a decimal point in the answer space.
 - b) Solve the subtraction problem.
 - c) Copy the sentence on the board. Fill in the correct number.
7. Go over the problem and answer. (Answer: a. $1.3 - 0.5 = 0.8$. Amadu walks 0.8 kilometres further.)
8. **Write:**

$$\begin{array}{r}
 0.13 \\
 - 0.5 \\
 \hline
 0.8
 \end{array}$$




Independent Practice (10 minutes)

1. Have pupils complete the last 3 problems on their own.

Closing (2 minutes)

1. Go over the answers with pupils. (Answers: b. $0.4 + 0.6 = 1.0$. They drink 1 litre in all; c. $1.9 + 1.9 = 3.8$. He walks 3.8 kilometres in all; d. $1 - 0.8 = 0.2$. There are 0.2 kilos left.)
2. **Say:** Good job today, pupils! You solved word problems involving adding and subtracting decimals!

Lesson Title: Multiplication of Decimals with 1 Decimal Place by a Whole Number	Theme: Everyday Arithmetic Multiplication of Decimals with 1 Decimal Place	
Lesson Number: M-04-116	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes: By the end of the lesson, pupils will be able to solve simple multiplication problems of decimals with 1 decimal by a whole number.		Teaching Aids None		Preparation 1. Write the 3 steps to multiply a whole number and a decimal on the board. 2. Write the problems for guided and independent practice on the board.
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Opening (3 minutes)

1. Revise the multiplication facts with 6, 7 and 8 with pupils.
2. As a class, chant the facts aloud chorally. Begin with 6×1 , up to 6×9 .
3. Repeat with the facts for 7 and 8 as time permits.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to multiply decimal tenths by whole numbers.
2. Tell pupils this story: A big bucket filled with water weighs about 3.2 kilos. How much do 4 buckets weigh?
3. **Say:** We can multiply to solve this problem. Think. Then turn and tell a partner the multiplication problem.
4. Give pupils a minute to think and talk.
5. **Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 3.2×4)
6. **Write** on the board: $3.2 \times 4 = \underline{\quad}$. Read aloud with pupils as 'one and two-tenths times four'.
7. **Say:** When we multiply a decimal by a whole number, we do not write the bigger number on top. We write the number with 'more digits' on top.
8. **Say:** 3.2 has 2 digits. It has 3 in the ones place and 2 in the tenths place.
9. **Ask:** How many digits does 4 have? Raise your hand to answer (Answer: It has 1 digit.)
10. **Say:** 3.2 has 2 digits and 4 has 1 digit. I write 3.2 on top.
11. **Write** on the board:

$$\begin{array}{r} 3.2 \\ \times 4 \\ \hline \end{array}$$

12. Read the 3 steps to multiply decimals and whole numbers aloud with pupils.
 - a) Step 1: Multiply right to left.
 - b) Step 2: Count the decimal places in the problem.
 - c) Step 4: Put the same number of decimal places in the answer.
13. **Say:** The first step says to multiply right to left.
14. **Ask:** What is 4×2 ? Raise your hand to answer (Answer: 8) Raise your hand to answer What is 4×3 ? (Answer: 12)

15. **Write** on the board:

$$\begin{array}{r} 3 \cdot 2 \\ \times \quad 4 \\ \hline 1 \ 2 \ 8 \end{array}$$

16. **Say:** Step 2 says to count the decimal places in the problem. Decimal place means the digits after the decimal.

17. **Say:** I am going to underline the number of decimal places in the problem.

18. Underline the 2.

$$\begin{array}{r} 3 \cdot \underline{2} \\ \times \quad 4 \\ \hline 1 \ 2 \ 8 \end{array}$$

19. **Ask:** How many decimal places are underlined? Please show me by raising the same number of fingers as the decimal places. (Answer: There is 1 decimal place. Pupils should raise 1 finger.)

20. **Say:** There is 1 decimal place in the problem. So, there is 1 decimal place in the answer. I put the decimal point in the answer to show 1 decimal place.

21. **Write** on the board:

$$\begin{array}{r} 3 \cdot \underline{2} \\ \times \quad 4 \\ \hline 1 \ 2 \cdot 8 \end{array}$$

22. Read the problem and answer aloud with pupils.

23. Repeat steps 6 -24 to solve '5.4 x 2' with pupils. (Answer: 10.8)

Guided Practice (10 minutes)

1. Show pupils the problems on the board.

a. $3.1 \times 8 =$ b. $3.1 \times 7 =$ c. $3.1 \times 6 =$ d. $6.1 \times 2 =$ e. $6.2 \times 2 =$
f. $8.1 \times 2 =$ g. $8.1 \times 3 =$ h. $8.1 \times 4 =$ i. $8.1 \times 6 =$ j. $8.1 \times 7 =$

2. Have pupils write problem a. vertically in their exercise books.

3. Guide pupils to solve the first problem.

a) Have pupils read each step aloud from the board.

b) Have pupils carry out each step.

c) Ensure that pupils check their answer to make sure it has 1 decimal place.

4. Have pupils solve problems b. and c. with a partner.

5. Go over the answers. (Answers: a. 24.8, b. 21.7, c. 18.6)

Independent Practice (10 minutes)

1. Have pupils solve problems d. – j. (Some pupils may not finish all of the problems in 10 minutes.)

Closing (2 minutes)




1. Go over answers. (Answers: d. 12.2 e. 12.4 f. 16.2 g. 24.3 h. 32.4 i. 48.6 j. 56.7)

2. Tell pupils to check their answers and correct any mistakes.

3. If there is time, have pupils talk about any patterns they see in the problems and answers.

4. **Say:** Good job today, pupils! You multiplied numbers with 1 decimal place!

Lesson Title: Multiplication of Decimals with 1 Decimal Place by a Whole Number	Theme: Everyday Arithmetic Multiplication of Decimals with 1 Decimal Place	
Lesson Number: M-04-116	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes: By the end of the lesson, pupils will be able to solve more complex multiplication problems of decimals with 1 decimal place by a whole number.		Teaching Aids None		Preparation 1. Write the 3 steps to multiply a whole number and a decimal on the board. 2. Write the problems for guided and independent practice on the board.
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Opening (3 minutes)

1. Revise the multiplication facts with 4 and 9 with pupils.
2. As a class, chant the facts aloud chorally. Begin with 4×1 , up to 4×9 .
3. Chant the facts backwards from 4×9 down to 4×1 .
4. Repeat with the facts for 9 as time allows.

Introduction to the New Material (10 minutes)

1. **Say:** Today we are going to learn to multiply decimal tenths by whole numbers with renaming.
2. Tell pupils this story: A bag of sugar weighs about 0.4 kilos. How much do 5 bags weigh?
3. **Say:** 0.2 has more digits than 5, so I write 0.2 on top.
4. **Write** on the board:

$$\begin{array}{r} 0.2 \\ \times 5 \\ \hline \end{array}$$

5. Revise the 3 steps to multiply decimals and whole numbers with pupils.
 1. Step 1: Multiply right to left.
 2. Step 2: Count the decimal places in the problem.
 3. Step 4: Put the same number of decimal places in the answer.
6. **Say:** The first step says to multiply right to left.
7. **Ask:** What is 5×2 ? Raise your hand to answer (Answer: 10)
8. **Say:** 10 has 2 digits. I cannot write 2 digits in the answer space. So I write 0 in the answer space. I carry the 1 to the ones place. And then I write it over the 3.
9. **Write** on the board:

$$\begin{array}{r} 1 \\ 0.2 \\ \times 5 \\ \hline 0 \end{array}$$

10. **Say:** Next I multiply 5×0 .
11. **Ask:** What is 5×0 ? Raise your hand to answer (Answer: 0)
12. **Say:** I need to add the 1 that I carried into the ones place.
13. **Ask:** What is $0 + 1$? Raise your hand to answer (Answer: 1)

14. **Write** on the board:

$$\begin{array}{r} 1 \\ 0.2 \\ \times \quad 5 \\ \hline 1.0 \end{array}$$

15. **Say:** Step 2 says to count the decimal places in the problem. Decimal place means the digits after the decimal.

16. **Ask:** How many decimal places are in the problem? Show me by raising the same number of fingers as decimal places. (Answer: There is 1 decimal place. Pupils should raise 1 finger.)

17. **Say:** There is 1 decimal place in the problem. So, there is 1 decimal place in the answer. I put the decimal point in the answer to show 1 decimal place.

18. **Write** on the board:

$$\begin{array}{r} 1 \\ 0.2 \\ \times \quad 5 \\ \hline 1.0 \end{array}$$

19. **Say:** The answer is '1 and 0 tenths'. Zero-tenths means there are no tenths. $1.0 = 1$

20. **Write** on the board '5 bags weigh 1 kilo'. Read the sentence aloud with pupils.

21. Repeat steps 4 -24 to solve '5.4 x 3' with pupils. (Answer: 16.2)

Guided Practice (10 minutes)

1. Show pupils the problems on the board.

a. $4.5 \times 9 =$ b. $4.6 \times 9 =$ c. $4.7 \times 9 =$ d. $0.5 \times 4 =$ e. $0.8 \times 4 =$
f. $1.9 \times 5 =$ g. $1.9 \times 4 =$ h. $3.9 \times 3 =$

2. Have pupils write problem a. vertically in their exercise books.

3. Guide pupils to solve the first problem.

a) Have pupils read each step aloud from the board.

b) Have pupils carry out each step.

c) Ensure pupils check their answer to make sure it has 1 decimal place.

4. Have pupils solve problems b. and c. with a partner.

5. Go over the answers. (Answers: a. 40.5, b. 41.4, c. 42.3)

Independent Practice (10 minutes)

1. Have pupils solve problems d. – h.

2. Tell them to check their answers with their partner.




Closing (2 minutes)

1. Go over the answers. (Answers: d. 2.0 or 2 e. 4.0 or 4 f. 9.5 g. 7.6 h. 11.7)

2. Tell pupils to check their answers and correct any mistakes.

3. **Say:** Good job today, pupils! You solved more complex problems with decimals!

Lesson Title: Word Problems Involving Multiplication of Numbers with 1 Decimal Place	Theme: Everyday Arithmetic Multiplication of Decimals with 1 Decimal Place
Lesson Number: M-04-118	Class/Level: Primary 4 Time: 35 minutes

 Learning Outcomes: By the end of this lesson, pupils will be able to solve simple word problems involving multiplication of numbers with 1 decimal place.	 Teaching Aids None	 Preparation Write the word problems on the board.
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Opening (3 minutes)

- Write** on the board: $4 + 0.__ = 4.3$ $0.__ \times 4 = 1.2$
- Tell pupils to work with a partner to find the decimal that makes both problems true. (1 minute)
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answers: 0.3 . $4 + 0.3 = 4.3$, $0.3 \times 4 = 1.2$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to solve word problems by multiplying a decimal and a whole number. We will read and solve the problems.
- Read all 4 problems aloud with pupils.
 - Amadu walks 1.3 kilometres each day for 3 days.
How far does Amadu walk in all?
 - A fish swims 2.1 kilometres every day.
How far does the fish swim in 5 days?
 - A market woman sells 4 bags of chillies. Each bag weighs 0.2 kilos.
How much do the bags weigh in all?
 - Aminata has 3 pieces of string. Each piece is 0.2 metres long. How long are the pieces of string in all?
- Read problem a. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: 1.3 and 3)
- Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 1.3×3)
- Ask:** What is the question in the word problem? Raise your hand to answer. (Answer: How far does Amadu walk in all?)
- Say:** We need to answer the question in a word problem with words and numbers. Please think about the question. Also think about the words we need in the answer.
- Give pupils 30 seconds to think.
- Write** on the board 'Amadu walks ____'. Read aloud with pupils.
- Say:** We need to write the words 'Amadu walks' in the answer.
- Read problem b. again with pupils.
- Ask:** What numbers do we use to solve this problem? Raise your hand to answer. (Answer: 2.1 and 5)
- Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 2.1×5)

14. **Ask:** What is the question in the word problem? Raise your hand to answer. (Answer: How far does the fish swim?)
15. **Say:** We need to answer the question in a word problem with words and numbers. Think about the question. Think silently about the words we need in the answer. Turn and tell a partner the words.
16. Give pupils 1 minute to think and talk.
17. **Write** on the board 'The fish swims ____'. Read aloud with pupils.
18. **Say:** Point your thumb up if those are the same words you had. Point your thumb down if you had different words. (Answer: Give some help during guided or independent practice to pupils who point their thumbs down. Work with them to help them understand how to answer the problem.)

Guided Practice (10 minutes)

1. Tell pupils to work with a partner to solve problems a. and b.
2. Remind pupils to:
 - a) Multiply.
 - b) Count the decimal places in the problem.
 - c) Write the decimal point in the answer.
 - d) Write a sentence to answer the word problem.
3. Go over the problems and answers. (Answers: a. $1.3 \times 3 = 3.9$. Amadu walks 3.9 kilometres; b. $2.1 \times 5 = 10.5$. The fish swims 10.5 kilometres.)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. Tell them to check their multiplication problems and sentences with a partner.

Closing (2 minutes)

1. Go over the answers with pupils. (Answers: c. $0.2 \times 4 = 0.8$. The bags weigh 0.8 kilos; d. $0.2 \times 3 = 0.6$. The pieces of string are 0.6 metres in all.)
2. **Say:** Good job today, pupils! You solved word problems involving multiplication with decimals.

Lesson Title: Word Problems Involving Multiplication of Numbers with 1 Decimal Place	Theme: Everyday Arithmetic Multiplication of Decimals with 1 Decimal Place
Lesson Number: M-04-119	Class/Level: Primary 4 Time: 35 minutes

 Learning Outcomes: By the end of this lesson, pupils will be able to solve more complex word problems involving multiplication of numbers with 1 decimal place.	 Teaching Aids None	 Preparation Write the word problems on the board.
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Opening (3 minutes)

- Write** on the board: $__ + 0.__ = 5.3$ $0.__ \times __ = 1.5$
- Tell pupils to work with a partner to find the decimal and whole number that make both problems true. (1 minute)
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answer. (Answers: 5 and 0.3. $5 + 0.3 = 5.3$, $0.3 \times 5 = 1.5$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to solve harder word problems by multiplying a decimal and a whole number that requires renaming.
- Read all 4 problems aloud with pupils.
 - Amadu walks 1.3 kilometres every day for a week.
How far does Amadu walk in all?
 - One bicycle wheel weighs 0.9 kilograms.
How much do both the wheels on the bicycle weigh?
 - Fatu makes rings for each finger on 1 hand with pieces of string. Each piece of string is 0.7 centimetres long. How much string does she use?
 - A poda poda driver drives 8.7 kilometres each day. How far does he drive in a week?
- Read problem a. again with pupils.
- Say:** This problem only has 1 number in it. We need 2 numbers to solve the multiplication problem.
- Ask:** How far does Amadu walk every day? Raise your hand to answer. (Answer: 1.3 kilometres)
- Say:** Amadu walks 1.3 kilometres every day. He walks every day for a week.
- Ask:** How many days are in a week? Raise your hand to answer. (Answer: 7)
- Say:** There are 7 days in a week. That means Amadu walks 1.3 kilometres 7 times.
- Say:** What is the multiplication problem? Raise your hand to answer. (Answer: 1.3×7)
- Read problem b. again with pupils.
- Say:** This problem also has 1 number in it. We need 2 numbers to solve the multiplication problem.
- Ask:** How much does 1 bicycle wheel weigh? Raise your hand to answer. (Answer: 0.9 kilograms)
- Say:** One wheel weighs 0.9 kilograms.

14. **Ask:** How many wheels on a bicycle? Raise your hand to answer. (Answer: 2)
15. **Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 0.9×2)
16. Read problem c. again with pupils.
17. **Say:** This problem also has 1 number in it.
18. **Ask:** How many numbers do we need to solve the multiplication problem? Raise your hand to answer. (Answer: 2 numbers)
19. **Ask:** How much string does Fatu use for 1 finger? Raise your hand to answer. (Answer: 0.7 centimetres)
20. **Ask:** How many fingers do we have on 1 hand? Show me by raising the number of fingers. (Answer: 5. Pupils should raise 5 fingers.)
21. **Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 0.7×5)

Guided Practice (10 minutes)

1. Tell pupils to work with a partner to solve problems a. and b.
2. Remind pupils to:
 - a) Find the missing number.
 - b) Multiply.
 - c) Count the decimal places in the problem.
 - d) Write the decimal point in the answer.
 - e) Write a sentence to answer the word problem.
3. Go over the problems and answers. (Answers: a. $1.3 \times 7 = 9.1$. Amadu walks 9.1 kilometres in a week; b. $0.9 \times 2 = 1.8$. Both wheels weigh 1.8 kilograms.)




Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. Tell them to check their multiplication problems and sentences with a partner.

Closing (2 minutes)

1. Go over the answers with pupils. (Answers: c. $0.7 \times 5 = 3.5$. She uses 3.5 centimetres of string; d. $8.7 \times 7 = 60.9$. He drives 60.9 kilometres in a week.)
2. **Say:** Good job today, pupils! You solved more complex word problems with multiplying decimals!

Lesson Title: Word Problems Involving Addition, Subtraction and Multiplication of Numbers with 1 Decimal Place	Theme: Everyday Arithmetic Multiplication of Decimals with 1 Decimal Place	
Lesson Number: M-04-120	Class/Level: Primary 4	Time: 35 minutes

	Learning Outcomes: By the end of this lesson pupils will be able to solve word problems involving addition, subtraction and multiplication of numbers with 1 decimal place.		Teaching Aids None		Preparation Write the word problems for the lesson on the board.
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Opening (3 minutes)

- Write** on the board: $_ + 0._ = 1.3$ $0._ \times _ = 0.3$ $_ - 0._ = 0.7$
- Tell pupils to work with a partner to find the decimal and whole number that make all 3 problems true. (1 minute)
- Say:** Remember, they must be the same two numbers that make the first and second problem true.
- Go over the answers. (Answers: 1 and 0.3. $1 + 0.3 = 1.3$, $0.3 \times 1 = 0.3$, $1 - 0.3 = 0.7$)

Introduction to the New Material (10 minutes)

- Say:** Today we are going to solve word problems by adding, subtracting and multiplying with a decimal and a whole number.
- Read all 4 problems aloud with pupils.
 - Mother needs 2.1 kilos of rice for a party. She has 1.3 kilos. How much more rice does she need?
 - Aminata needs 7.2 centimetres of string. She has 5.8 centimetres. How much more string does she need?
 - Mohamed reads for 0.5 hours each day. How many hours does he read in 1 week?
 - Fatmata carries 0.8 litres of water home. Hassan carries 0.9 litres of water home. How much water do they carry in all?
- Read problem a. again with pupils.
- Say:** I want to make sure you understand this problem.
- Ask:** How much rice does Mother need for the party? Raise your hand to answer. (Answer: 2 kilos)
- Say:** Mother needs 2.1 kilos in all. She has 1.3 kilos.
- Ask:** Does she have enough rice? Raise 1 finger if you think she has enough rice. Raise 2 fingers if you think she needs more rice. (Answer: She needs more rice. Pupils should raise 2 fingers.)
- Say:** We know how much rice Mother needs in all. She needs 2.1 kilos. We know how much she has. She has 1.3 kilos. We can subtract $2.1 - 1.3$ to find out how much she needs.
- Read problem b. again with pupils.
- Say:** This problem is like the rice problem. Please think about it. Then tell a partner what subtraction problem we must solve.

11. Give pupils 1 minute to think and talk.
12. **Ask:** What is the subtraction problem? Raise your hand to answer. (Answer: $7.2 - 5.8$)
13. Read problem c. again with pupils.
14. **Ask:** How many numbers do we need to the multiplication problem? Raise your hand to answer. (Answer: 2 numbers)
15. **Ask:** How many hours does Mohamed read in a day? Raise your hand to answer. (Answer: 0.5 hours)
16. **Ask:** How many days in a week? Show me by raising the number of fingers. (Answer: 7. Pupils should raise 7 fingers.)
17. **Ask:** What is the multiplication problem? Raise your hand to answer. (Answer: 0.5×7)

Guided Practice (10 minutes)

1. Tell pupils to work with a partner to solve problems a. and b.
2. Remind pupils to:
 - a) Solve the problem.
 - b) Write a sentence to answer the word problem.
3. Go over the problems and answers. (Answers: a. $2.1 - 1.3 = 0.8$. Mother needs 0.8 kilos more; b. $7.2 - 5.8 = 1.4$. She needs 1.4 centimetres more.)

Independent Practice (10 minutes)

1. Have pupils complete the last 2 problems on their own.
2. Tell them to check their problems and sentences with a partner.

Closing (2 minutes)

1. Go over the answers with pupils. (Answers: c. $0.5 \times 7 = 3.5$. He reads 3.5 hours in a week; d. $0.9 + 0.8 = 1.7$. The carry 1.7 litres in all.)
2. **Say:** Good job today, pupils! You solved a number of word problems with decimals using addition, subtraction and multiplication.

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