

Mathematics Class 5

Term 1



Teacher's Guide

**Ministry of Education, Youth & Sports Development
Bikenibeu, Tarawa, Republic of Kiribati**

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UNIT 1: ADDITION

Lesson 1: Counting From One to a Thousand

Outcome

Count in twos and threes to a thousand.
Complete number patterns from a number chart.
Identify even and odd numbers.

Teaching Aids

A Number Chart (1-1000).

Teaching for Understanding

Have the children seated in a 'U' shape so that they can see the blackboard clearly. Put the number chart on a blackboard.

Allow the children to read in:

ones	(1 to 50)
twos	(2 to 50)
fives	(5 to 100)
tens	(10 to 500)
hundreds	(100 to 1000)

Children read by themselves.

Group Work

Divide the class in three groups.

Group 1: Write in twos from 2 to 100.

Group 2: Write in threes from 500 to 1000.

Group 3: Re-arrange in order of size.

400	950	600	1000	250
100	550	700	800	150
350	50	950	300	450
200	900	650	850	500

Individual Application

Fill in the blank spaces.

15, 18, 21, **24**, 27, 30, **33**, **36**, 39, 42, **45**, **48**, **51**,
54, **57**, **60**, **63**, **66**, 69, 72, 75, **78**, **81**, **84**, **87**.

Additional Exercise

Draw a circle round the even numbers and a square round the odd numbers.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

NOTE: Ask the children to prepare the materials shown below, which are needed for the next day's lesson.

- (a) 5 coconut midribs (*te noko*)
- (b) 1 soft drink can (30 cm. in height)
- (c) 40 round fruit (*te bero*)

Lesson 2: Place Value (Units or Ones to a Thousand)

Outcome

Demonstrate the value of a given number on an abacus.

Teaching Aids

Local abacus (your own invention)

Materials for making abacus (see previous page)

Teaching for Understanding

Put the abacus on the table. Demonstrate the number 1 852 by putting beads on the bars. Explain the value of every digit. Select one child to demonstrate another number on the abacus.

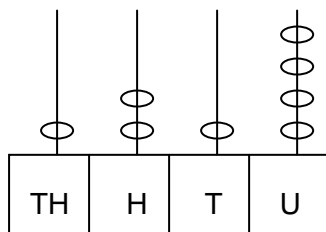
Group Work

Group the children into five or more. Each group makes an abacus and demonstrates one number on their abacus to the teacher.

Individual Application

Show these numbers on an abacus.

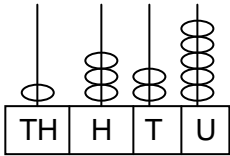
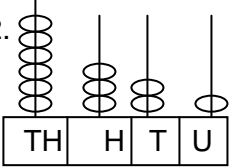
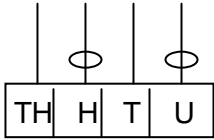
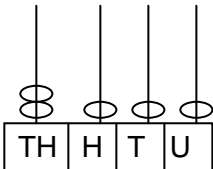
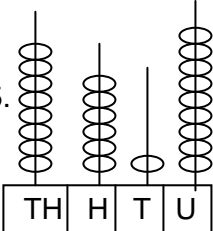
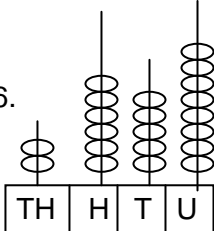
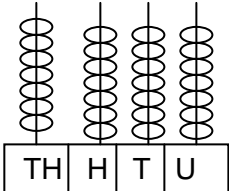
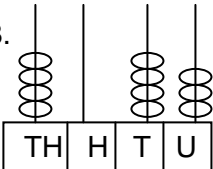
For example: → 1 214



- | | | | |
|----|-------|----|-------|
| 1. | 1 000 | 5. | 3 427 |
| 2. | 942 | 6. | 5 374 |
| 3. | 6 666 | 7. | 4 850 |
| 4. | 2 491 | 8. | 7 203 |

Additional Exercise

Write the number shown on the abacus.

1. 
(1 325)
2. 
(6 321)
3. 
(101)
4. 
(2 111)
5. 
(8 619)
6. 
(2 658)
7. 
(7 777)
8. 
(4 043)

Lesson 3: Addition Using Expanded Notation

Outcome

Add numbers of two to three digits using expanded form.

Teaching for Understanding

Explain the procedure of addition using expanded notation.

$$\begin{array}{rcl} \text{Example 1:} & 15 & \longrightarrow 10 + 5 \\ & + 32 & \longrightarrow \underline{30 + 2} \\ & & 40 + 7 = \mathbf{47} \end{array}$$

$$\begin{array}{rcl} \text{Example 2 :} & 364 & \longrightarrow 300 + 60 + 4 \\ & + 134 & \longrightarrow \underline{100 + 30 + 4} \\ & & 400 + 90 + 8 = \mathbf{498} \end{array}$$

Group Work

In groups of five or six the children solve the following additions 1 to 10, using expanded notation.

1.	$\begin{array}{r} 18 \\ + 21 \\ \hline (39) \end{array}$	2.	$\begin{array}{r} 142 \\ + 555 \\ \hline (697) \end{array}$	3.	$\begin{array}{r} 240 \\ + 86 \\ \hline (326) \end{array}$	4.	$\begin{array}{r} 65 \\ + 314 \\ \hline (379) \end{array}$	5.	$\begin{array}{r} 547 \\ + 102 \\ \hline (649) \end{array}$
6.	$\begin{array}{r} 147 \\ + 254 \\ \hline (401) \end{array}$	7.	$\begin{array}{r} 213 \\ + 146 \\ \hline (359) \end{array}$	8.	$\begin{array}{r} 305 \\ + 111 \\ \hline (415) \end{array}$	9.	$\begin{array}{r} 849 \\ + 200 \\ \hline (1049) \end{array}$	10.	$\begin{array}{r} 625 \\ + 143 \\ \hline (768) \end{array}$

Individual Application

Fill in the empty boxes.

$$\begin{array}{r}
 1. \quad 432 \rightarrow \boxed{400} + 30 + \boxed{2} \\
 + \boxed{465} \quad \underline{400 + 60 + 5} \\
 \quad \quad \quad 800 + 90 + 7 = \boxed{897}
 \end{array}$$

$$\begin{array}{r}
 2. \quad 64 \rightarrow \boxed{6} + \boxed{4} \\
 + 127 \quad \boxed{100} + \boxed{20} + \boxed{7} \\
 \hline
 \quad \quad \boxed{100} + \boxed{90} + \boxed{1} = 191
 \end{array}$$

$$\begin{array}{r}
 3. \quad \boxed{3} \boxed{4} \boxed{7} \rightarrow 300 + 40 + 7 \\
 + \boxed{4} \boxed{3} \boxed{2} \rightarrow \underline{400 + 30 + 2} \\
 \quad \quad \quad \boxed{700} + \boxed{70} + \boxed{9} = 779
 \end{array}$$

$$\begin{array}{r}
 4. \quad \boxed{3} \boxed{6} \boxed{5} \rightarrow 300 + \boxed{60} + \boxed{5} \\
 + 236 \rightarrow \underline{200 + 30 + 6} \\
 \quad \quad \quad 600 + 00 + 1 = 601
 \end{array}$$

$$\begin{array}{r}
 5. \quad 789 \rightarrow \boxed{700} + \boxed{80} + \boxed{9} \\
 + \boxed{1} \boxed{2} \boxed{1} \rightarrow \underline{100 + 20 + 1} \\
 \quad \quad \quad 900 + 10 + 0
 \end{array}$$

Additional Exercise

Solve the problems using expanded notation.

- Jimmy received 55 cents from his mother and 50 cents from his father. How many cents did he receive altogether? **(105¢)**
- At Taaken Bairiki there are 152 children in Class 4 and 143 in Class 5. How many children are there altogether? **(295)**
- Find the sum of 246 and 153. **(399)**
- The distance from Tarawa to Nonouti is 399 km and from Nonouti to Tamana is 278 km. How many kilometres is the distance from Tarawa to Tamana? **(677)**

Lesson 4: Adding Using the Column Approach

Outcome

Add two or three digits using the column approach.

Teaching Aids

Teaching for Understanding

Demonstrate how to add using the column approach.

Example 1:

$$43 + 19 + 162 \rightarrow$$

	H	T	U
		4	3
		1	9
1	6	2	
2	2	4	

$$= 224$$

Example 2 :

$$26 + 278 + 5 \rightarrow$$

	H	T	U
		2	6
2	7	8	
		5	
3	0	9	

$$= 309$$

Group Work

Put the children into groups of five or six. Each group does the exercises using the column approach.

- | | |
|------------------------------------|------------------------------------|
| 1. $115 + 43 + 92 =$ (250) | 4. $101 + 205 + 12 =$ (318) |
| 2. $111 + 63 + 215 =$ (389) | 5. $54 + 48 + 100 =$ (202) |
| 3. $83 + 147 + 10 =$ (240) | 6. $19 + 19 + 199 =$ (237) |

Individual Application

Work out the sums of the following, remembering to use the column approach.

- | | |
|-----------------------------------|------------------------------------|
| 1. $64 + 3 + 145 =$ (212) | 5. $192 + 123 + 10 =$ (325) |
| 2. $91 + 24 + 133 =$ (248) | 6. $5 + 124 + 52 =$ (181) |
| 3. $743 + 12 + 43 =$ (798) | 7. $121 + 11 + 192 =$ (324) |
| 4. $76 + 23 + 109 =$ (208) | 8. $14 + 162 + 15 =$ (191) |

Additional Exercise

Find the answer using the column approach.

- | | |
|-------------------------------------|-------------------------------------|
| 1. $187 + 24 + 34 =$ (245) | 6. $24 + 42 + 244 =$ (310) |
| 2. $23 + 243 + 121 =$ (387) | 7. $321 + 123 + 23 =$ (467) |
| 3. $124 + 144 + 116 =$ (384) | 8. $100 + 300 + 11 =$ (411) |
| 4. $345 + 12 + 114 =$ (471) | 9. $532 + 22 + 54 =$ (608) |
| 5. $110 + 10 + 101 =$ (221) | 10. $37 + 386 + 123 =$ (546) |

Lesson 5: Assessment

Group Work

Put children into groups of five or six.

Each group uses the abacus already made or makes another one.

Display 3 042 on the abacus. Show it to the teacher.

Individual Application

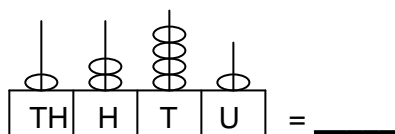
Circle the correct answer.

1. Complete the pattern below, by choosing the correct answer, a), b), c), or d).

5, 10, 15, __, 25, __, 35

a) 16, 26 b) 10, 20 **c) 20, 30** d) 20, 40

2. Is the value shown on the abacus a), b), c) or d)?



a) 1 231 **b) 1 241** c) 1 421 d) 1 412

3. Find the missing numbers.

$$\begin{array}{r}
 423 \rightarrow 400 + 20 + 3 \\
 + 124 \rightarrow \square + 20 + \square \\
 \hline
 500 + 40 + 7 = 547
 \end{array}$$

a) 100 1 b) 1 4 c) 4 1 **d) 100 4**

4. $43 + 142 + 9 =$

H	T	U
	4	3
1	4	2
		9
1	9	4

 = 194

The value of 1 is hundred.

The value of 9 is ____.

The value of 4 is ones/units.

a) tens b) ones/units c) hundreds d) thousands.

UNIT TWO: SUBTRACTION

Lesson 1: Subtraction Using the Column Approach

Outcome

Subtract numbers up to three digits using the column approach.
Calculate the difference between two figures.

Teaching for Understanding

Tell the children that today they will be doing subtraction using the column approach. Demonstrate on the blackboard how to do it.

Example :- $847 - 334 =$

	H	T	U
	8	4	7
-	3	3	4
	5	1	3

$= 513$

Group Work

Group members discuss the problem and calculate the answer together using the column approach.

- | | |
|-------------------------------|-------------------------------|
| 1. $431 - 223 =$ (208) | 4. $754 - 331 =$ (423) |
| 2. $863 - 662 =$ (201) | 5. $520 - 310 =$ (210) |
| 3. $948 - 492 =$ (456) | 6. $398 - 156 =$ (242) |

Individual Application

Calculate the difference using the column approach.

- | | |
|-------------------------------|-------------------------------|
| 1. $655 - 421 =$ (234) | 5. $386 - 149 =$ (237) |
| 2. $964 - 621 =$ (343) | 6. $720 - 610 =$ (110) |
| 3. $786 - 100 =$ (686) | 7. $645 - 312 =$ (333) |
| 4. $656 - 343 =$ (313) | 8. $135 - 114 =$ (21) |

Additional Exercise

Work out the difference using the column approach.

- | | |
|-------------------------------|-------------------------------|
| 1. $103 - 36 =$ (67) | 4. $625 - 341 =$ (284) |
| 2. $532 - 186 =$ (346) | 5. $882 - 568 =$ (314) |
| 3. $150 - 89 =$ (61) | 6. $777 - 497 =$ (280) |

Lesson 2: Subtraction Using Expanded Notation

Outcome

Subtract numbers of up to four digits using expanded notation.

Teaching for Understanding

Briefly review the idea of expanded notation. Write some examples on the board.

$$\begin{array}{rcl} \text{Example 1:} & 694 & \longrightarrow 600 + 90 + 4 \\ & - 342 & \longrightarrow - 300 + 40 + 2 \\ & & \hline & & 300 + 50 + 2 = 352 \end{array}$$

$$\begin{array}{rcl} \text{Example 2:} & 3\,875 & \longrightarrow 3\,000 + 800 + 70 + 5 \\ & - 1\,377 & \longrightarrow - 1\,000 + 300 + 70 + 7 \\ & & \hline & & 2\,000 + 400 + 90 + 8 = 2\,498 \end{array}$$

Group Work

In groups of five or six, children to do numbers 1 to 5. Group members work together to solve the problems, but record answers individually. Use expanded notation.

1. $\begin{array}{r} 567 \\ - 345 \\ \hline (222) \end{array}$	2. $\begin{array}{r} 2\,315 \\ - 112 \\ \hline (2\,203) \end{array}$	3. $\begin{array}{r} 6\,421 \\ - 3\,434 \\ \hline (2\,987) \end{array}$
4. $\begin{array}{r} 621 \\ - 142 \\ \hline (479) \end{array}$	5. $\begin{array}{r} 349 \\ - 158 \\ \hline (191) \end{array}$	

Individual Application

Find the answer using expanded notation.

1. $\begin{array}{r} 964 \\ - 621 \\ \hline (341) \end{array}$	2. $\begin{array}{r} 835 \\ - 416 \\ \hline (419) \end{array}$	3. $\begin{array}{r} 2\,774 \\ - 636 \\ \hline (2\,138) \end{array}$	4. $\begin{array}{r} 1\,555 \\ - 216 \\ \hline (1\,339) \end{array}$	5. $\begin{array}{r} 3\,649 \\ - 2\,421 \\ \hline (1\,228) \end{array}$
6. $\begin{array}{r} 2\,662 \\ - 1\,143 \\ \hline (1\,519) \end{array}$	7. $\begin{array}{r} 426 \\ - 311 \\ \hline (115) \end{array}$	8. $\begin{array}{r} 725 \\ - 333 \\ \hline (392) \end{array}$	9. $\begin{array}{r} 828 \\ - 717 \\ \hline (111) \end{array}$	10. $\begin{array}{r} 942 \\ - 739 \\ \hline (203) \end{array}$

Additional Exercise

Fill in the empty boxes.

$$1. \quad 1\,982 \longrightarrow 1\,000 + \boxed{900} + 80 + \boxed{2}$$

$$\begin{array}{r} - 1\,743 \longrightarrow 1\,000 + 700 + \boxed{40} + 3 \\ \hline 0 + 200 + 30 + 9 = 239 \end{array}$$

$$2. \quad 779 \longrightarrow 700 + \boxed{70} + 9$$

$$\begin{array}{r} - 465 \longrightarrow \boxed{400} + 60 + \boxed{5} \\ \hline 300 + 10 + 4 = 314 \end{array}$$

$$3. \quad \boxed{8} \boxed{1} 2 \longrightarrow 800 + 10 + \boxed{2}$$

$$\begin{array}{r} - 6\,94 \longrightarrow \boxed{600} + \boxed{90} + \boxed{4} \\ \hline 100 + 10 + 8 = 118 \end{array}$$

$$4. \quad 8 \boxed{3} 6 \longrightarrow \boxed{800} + 30 + 6$$

$$\begin{array}{r} - \boxed{5} 42 \longrightarrow 500 + \boxed{40} + 2 \\ \hline 200 + 90 + 4 = 294 \end{array}$$

Lesson 3: Problems Involving Subtraction

Outcome

Translate various problems into subtraction form using a problem solving approach.

Teaching Aids

Problems written on a chart.

Chart 1:

There were 150 boys at the game.
Then 89 boys went home.
How many boys were still at the game?

Chart 2:

There are 328 passengers on the aeroplane.
176 passengers are from China.
The rest of the passengers are from Japan.
How many Japanese on board the aeroplane?

Teaching for Understanding

Invite the children to sit in front. Put up a chart and do the demonstration using a **problem solving approach**.

Example on Chart 1:

1. Tell
2. Show
3. Solve
4. Answer.

Solution:

1. **Tell:** 328 = passengers
177 = Chinese
Rest = Japanese
How many Japanese?

2. **Show:**
$$\begin{array}{r} 328 \\ - 176 \\ \hline n \end{array}$$

3. **Solve:**
$$\begin{array}{r} 328 \\ - 176 \\ \hline 152 \end{array}$$

4. **Answer:** 152

❖ Do the same with Chart 2.

Group Work

Put children in groups of five or six. Let them solve the problems using the problem solving approach.

1. There are 865 students at Sea Bee Primary. 349 are boys. How many are girls? **(516)**
2. There are 1 026 people living on Nikunau and 841 on Arorae. How many more people are there on Nikunau than Arorae? **(185)**
3. I have a piece of string 248 m. long. I cut 124 m. off. How long is the piece of string I have left? **(124 m.)**

Individual Application

Solve these using a problem solving approach.

1. In a school there are 856 children. 392 of them are girls. How many are boys? **(464)**
2. There are 328 passengers on the aeroplane.
219 passengers got off. How many remained on the aeroplane? **(109)**
3. There are 9 421 apples inside a container. 598 are bad. How many apples are good? **(8 863)**
4. Tom has 456 marbles. He gave 149 to his friend Tiiman. How many marbles has Tom now? **(307)**

Additional Exercise

Use the problem solving approach to find the answers.

1. Aratibin put 739 coconuts in his cart. On his way home he gave 312 coconuts to his uncle Peter. How many coconuts were left in the cart? **(467)**
2. The distance from the High Court to the wharf is 387 metres. The distance from PUB to the wharf is 218 metres. PUB is between the High Court and the wharf. How far is it from the High Court to PUB? **(169 metres)**

Lesson 4: Problems Involving Subtraction

Outcome

Students solve subtraction problems using a variety of methods such as:

the expanded notation approach
the column approach
the problem solving approach

Teaching for Understanding

Revise with the children how to solve problems using the three approaches.
Write the following story on the board.

Rota has 361 marbles, Nei Reei has 241. How many more marbles has Rota?

a) Expanded Notation:

$$\begin{array}{rcl} 361 & \longrightarrow & 300 + 60 + 1 \\ - 241 & \longrightarrow & \underline{200 + 40 + 1} \\ & & 100 + 20 + 0 = 120 \end{array}$$

b) Column Approach:

$$361 - 241 = \begin{array}{|c|c|c|} \hline \text{H} & \text{T} & \text{U} \\ \hline 3 & 6 & 1 \\ - 2 & 4 & 1 \\ \hline 1 & 2 & 0 \\ \hline \end{array} = 120$$

c) Problem Solving Approach :

Tell: Rota has 361 marbles.
Nei Reei has 241 marbles.
How many more marbles has Rota?

Show : $361 - 241 = n$

Solve : $361 - 241 = n$

Answer = 120

Do these using the three approaches.

1. A crocodile is known to have been born in 1874 and died recently in 1987.
How old was the crocodile? **(113)**
2. The Evergreen Band held two shows over the weekend. On Friday night 4 278 people attended. On Saturday night 6 622 people attended. How many more people attended on Saturday than Friday? **(2344)**

Group Work

Solve these using the three approaches.

1. Tanioti had 785 marbles. Nabuti stole 362. How many marbles were left?
(423)
2. Mrs Naang Kauongo has \$ 345.00. She put \$ 150.00 in her bank account. How much money does she have left? **(\$195.00)**
3. A water container contains 1 840 litres. If I pour out 735 litres, how much water will be left? **(1105 litres)**

Individual Application

Use the method you like best to solve the problems below.

1. A train travelled with 948 soldiers. On the way 484 soldiers died. How many soldiers reached their destination? **(464)**
2. There are 1 565 warships using the Pacific Ocean. 749 of them are men-of-war. How many are carriers? **(816 carriers)**
3. A motorboat filled its tank with 600 litres of benzine. At the end of the journey the tank contained only 435 litres. How much benzine had been used? **(165 litres)**

Group Work

Put the children in three groups to work out the difference using the three approaches.

Group 1: Use the column approach.

Group 2: Use the problem solving approach.

Group 3: Use expanded notation.

Problem : Rotieta went to the store to buy 10 dozen of eggs. On her way back she dropped 5 dozen. How many eggs were left? **(5 dozen)**

Let the children choose another approach to work out their problem again.

Individual Application

Let the children to choose the approach they like the best.

Solve these:

1. The length of fence A is 492 m. The length of fence B is 150 m. How much longer is fence A? **(342 m)**
2. Mikaere has 124 coconut trees on his land. He cuts down 21 coconut trees. How many coconut trees are left? **(103 coconut trees)**
3. One day Aren and Maria collected 647 cans and 239 plastic bottles. How many more cans than plastic bottles are there? **(408 cans)**
4. The population of Bairiki was 2002. One year later it had decreased by 437. What was the population after the decrease? **(1565)**

Note: Remind the children to bring their own scissors, cardboard or thick paper for the next lesson.

UNIT 3: ANGLES

Lesson 1: Constructing Angles

Outcome

Construct angles.
Measure angles.

Teaching Aids

Pair of scissors, cardboard, maths set, 10 angles, protractor

Teaching for Understanding

Let the children sit in front in order to see you clearly when you do the demonstration of how to make an angle out of the cardboard. After doing this, the children will do the same thing. Help them while they do the cutting.

Group Work

Put the children in groups of five or more and let them construct an angle. They will use a protractor to construct a 10° angle.

Then let them use their 10° angle to construct

1. an angle of 10°
2. an angle of 20°
3. an angle of 30°
4. an angle of 40°
5. an angle of 50°

Individual Application

Let the children construct an angle using their own cardboard and a 10° angle.

- | | |
|----------------|----------------|
| 1. 90° | 4. 120° |
| 2. 100° | 5. 130° |
| 3. 110° | 6. 140° |

Additional Exercise

Make as many angles as you can from your cardboard.

Lesson 2: Using Angles to Measure A Given Angle

Outcome

Recognise that measuring angles is different from measuring length, height etc.
Construct angles of different sizes using a cardboard angle.

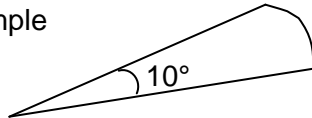
Teaching Aids

Cardboard 10° angles, ruler, protractor

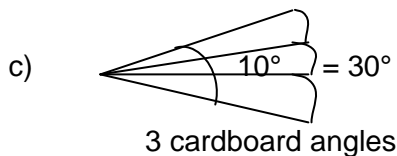
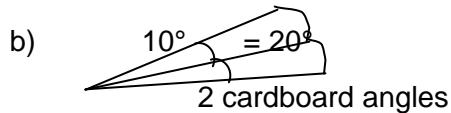
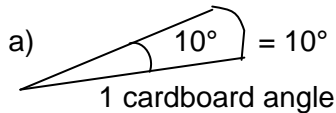
Teaching for Understanding

Put the children in front. Show them a ruler and explain the use of a ruler. Then show them a protractor and explain the use of it. Ask them to take their cardboard angle and demonstrate how to construct different angles.

Example



How to construct angles using a cardboard angle.



Group Work

Put the children in groups of five or more. Let them construct angles of:

- | | |
|---------------|---------------|
| 1. 80° | 4. 70° |
| 2. 40° | 5. 50° |
| 3. 20° | 6. 60° |

Individual Application

Each child works with his/her own cardboard angle constructing as many angles as he/she can. Help those who are finding it difficult.

Lesson 3: Using An Angle to Measure Given Angles

Outcome

Construct angles using a cardboard instead of a real protractor.

Teaching Aids

Cardboard 10° angle, cardboard, scissors

Teaching for Understanding

Put the children in groups of five or more. Tell them that they have already made an angle of 10° from the cardboard. Tell them that today they will make an angle of 20° from the cardboard. Do the demonstration first then let the children do their own. Help those who need help.

Group Work

Put them in groups of five or more. Using their own 20° angles, they draw angles of:

- | | |
|--------|---------|
| 1. 20° | 4. 80° |
| 2. 40° | 5. 100° |
| 3. 60° | 6. 120° |

Individual Application

Draw the following angles using their own 20° angle.

- | | |
|---------|---------|
| 1. 140° | 4. 200° |
| 2. 160° | 5. 220° |
| 3. 180° | 6. 240° |

Additional Exercise

Let them use their two angles, that is, their 10° angle and their 20° angle, to draw angles of:

- | | |
|---------|---------|
| 1. 30° | 4. 130° |
| 2. 90° | 5. 150° |
| 3. 110° | 6. 170° |

Lesson 4: Further Practice in Using An Angle to Measure Given Angles

Outcome

Know how to make an angle for measuring a given angle.

Identify the difference between two or three different angles.

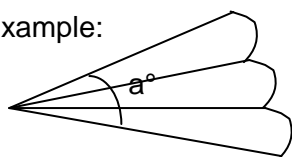
Use the symbol $>$ or $<$ to show the difference between angles.

Teaching for Understanding

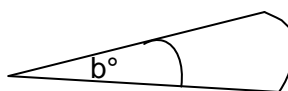
Refer to yesterday's work on how to draw an angle. Draw on the blackboard two or more different angles and demonstrate to the children how to measure them.

Show them the differences between the angles. Use the symbol $>$ or $<$.

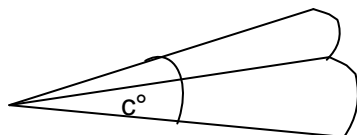
Example:



angle 'a' = 30°



angle 'b' = 10°



angle 'c' = 20°

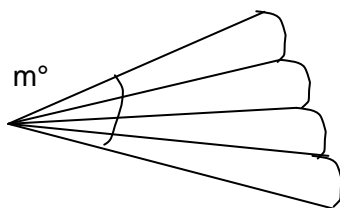
angle 'a' $>$ angle 'b' and 'c'.

angle 'b' $<$ angle 'a' and 'c'.

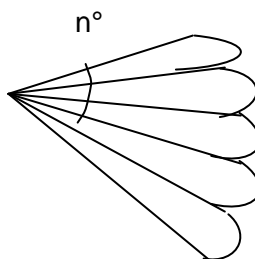
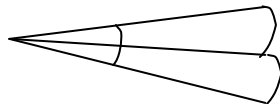
angle 'c' $<$ angle 'a' but $>$ angle 'b'.

Group Work

Put the children in groups of five or six and let them compare the angles below using the symbol $<$ or $>$.



s°



1. $m^\circ < n^\circ$

4. $n^\circ > m^\circ$

2. $n^\circ > s^\circ$

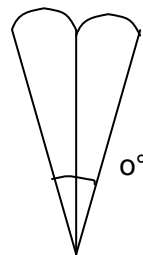
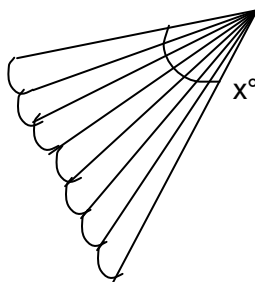
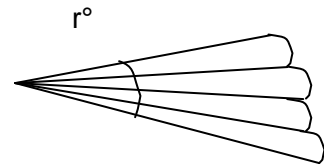
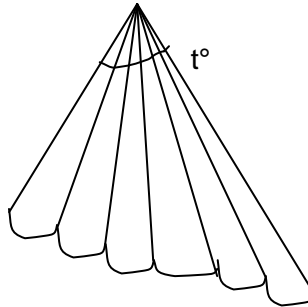
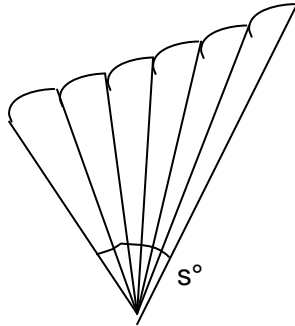
5. $s^\circ < m^\circ$

3. $s^\circ < n^\circ$

6. $m^\circ > s^\circ$

Individual Application

Let the whole class do the exercise using the symbols $<$, $>$ or $=$.



1. s° ___ r° ($>$)

2. s° ___ t° ($=$)

3. s° ___ x° ($<$)

4. s° ___ o° ($>$)

5. t° ___ s° ($=$)

6. t° ___ r° ($>$)

7. t° ___ x° ($<$)

8. t° ___ o° ($>$)

9. r° ___ o° ($>$)

10. x° ___ t° ($>$)

11. o° ___ s° ($<$)

12. o° ___ r° ($<$)

Additional Exercise

As homework, ask the children to draw their own sets of angles and to compare them using a symbol $<$ or $>$.

Lesson 5: Assessment

Group Work

Put the children in their usual groups to do the following:

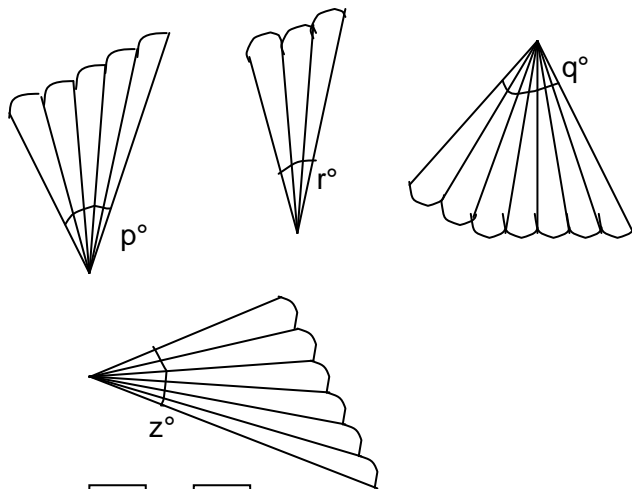
1. Draw an angle of 70° .
2. Draw an angle of 180° .
3. Identify the difference between two using the symbol $>$ or $<$.
 - a) 70° ___ 40° ($>$)
 - b) 180° ___ 360° ($<$)
 - c) 270° ___ 180° ($>$)

Individual Application

Let them solve the activities below.

1. True and False.

a) $70^\circ < 90^\circ =$ ___ (True)	d) $90^\circ > 45^\circ =$ ___ (True)
b) $180^\circ < 120^\circ =$ ___ (False)	e) $170^\circ > 165^\circ =$ ___ (True)
c) $70^\circ < 60^\circ =$ ___ (False)	f) $10^\circ < 30^\circ =$ ___ (True)
2. Put the symbol $>$ or $<$ in the box.



- | | |
|--|---|
| 1. p° <input type="text"/> r° <input type="text"/> z°
2. r° <input type="text"/> q° <input type="text"/> z°
3. p° <input type="text"/> z°
4. q° <input type="text"/> z° <input type="text"/> r°
5. q° <input type="text"/> p° | 6. z° <input type="text"/> q°
7. z° <input type="text"/> p° <input type="text"/> r°
8. r° <input type="text"/> z°
9. r° <input type="text"/> p°
10. z° <input type="text"/> p° |
|--|---|

UNIT 4: LINES AND ANGLES

Lesson 1: Parallel Lines and Intersecting Lines

Outcome

Know that parallel lines have the same distance between them.

Know that parallel lines will never meet.

Identify the difference between parallel lines and lines that bisect each other.

Teaching Aids

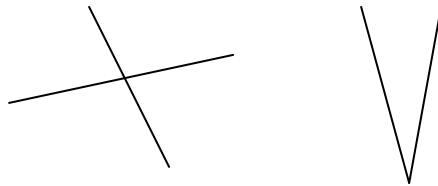
A chart of parallel lines and intersecting lines.

Teaching for Understanding

Let the children sit in the front. Show to the children lines on the chart which are called parallel lines and intersecting lines. Point to each parallel line and explain that parallel lines are lines which have same distance between them all the way along and they never meet each other. _____

Intersecting lines are lines that meet or cross one another at any point on their paths.

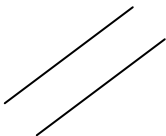
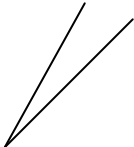
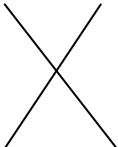


For example



Group Work


Put the children into five groups.


Group these lines under these sub-headings.

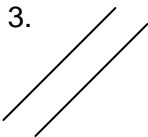
	Parallel Lines	Intersecting Lines
1. 	1, 5	2, 3, 4
2. 		
3. 		
4. 		
5. 		

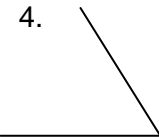
Individual Application

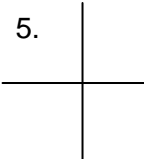
Circle the letters which are intersecting lines.

1. 

2. 

3. 

4. 

5. 

(Answers : 1, 4, 5)

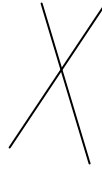
Additional Exercise

Put a ✓ in the box if the lines are parallel and X if the lines are intersecting.

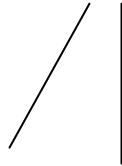
1.



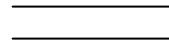
4.



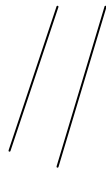
2.



5.



3.



Lesson 2: Parallel Lines and Intersecting Lines (continued)

Outcome

Identify the difference between parallel lines and intersecting lines.

Teaching Aids

A chart as in Lesson 1.

Teaching for Understanding

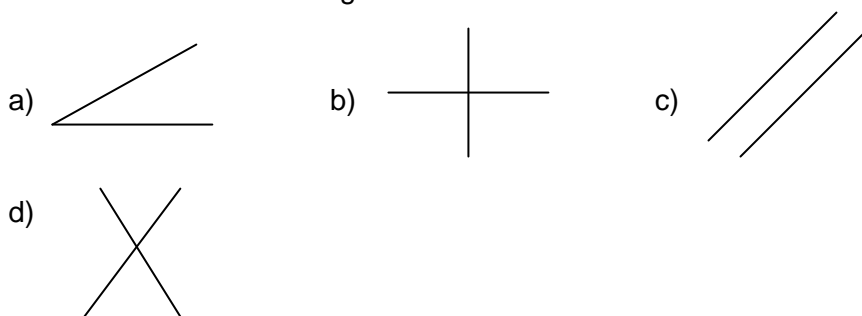
Invite the children to sit in front. Put up a chart of parallel lines and intersecting lines. Point to each pair of lines and ask the children, What kind of lines are those ? Encourage everyone to call out the names of the lines to which you pointed. Then praise them for their participation.

Group Work

Let the children go into two groups. The teams will play a look and say game. Children sit in a straight line in their teams. The first child from each team stands up and faces the back. The two turn back and call out the name of the lines to which you are pointing. The person who gives the correct name for that line first will score a point for his/her team. Whoever is beaten will be replaced by the next child in the line. The game will continue until everyone has had a turn to answer.

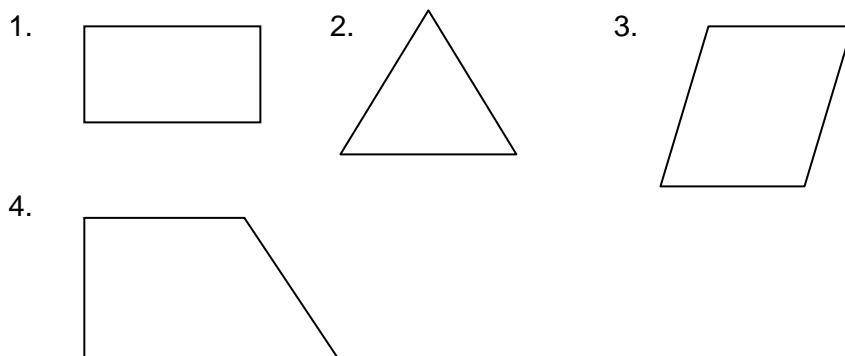
Individual Application

1. Draw two different pairs of intersecting lines.
2. Circle the intersecting lines.



Additional Exercise

Show lines which are parallel and intersecting from these shapes. Write P beside the parallel lines and X beside the intersecting lines.



Lesson 3: Acute Angles and Obtuse Angles

Outcome

Distinguish between acute and obtuse angles.


Teaching Aids


Chart with angles drawn on it.

Big sheets of paper and charts.

Teaching for Understanding

Introduce the two kinds of angles with their names and degrees written on the chart.

eg. a)  = An acute angle is greater than 0° but less than 90° .

b)  = An obtuse angle is greater than 90° but less than 180° .

Point to each angle, and read out its name. Then read with the children and allow them to ask any questions they may have.

Group Work

Put the children into four groups. Give each group a chart.

Draw three acute and three obtuse angles.

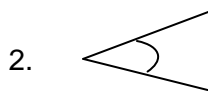
Write the names and degrees of each angle.

Individual Application

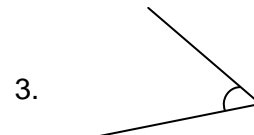
Name these angles.



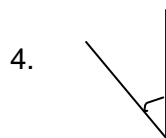
obtuse



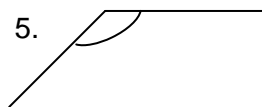
acute



acute



acute



obtuse



obtuse

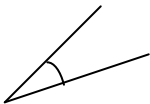
Additional Exercise

Circle the acute angles.

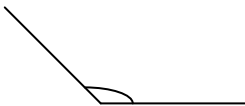
1.



2.



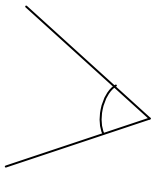
3.



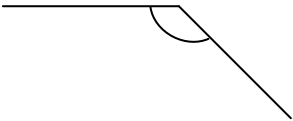
4.



5.



6.



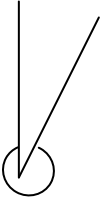
7.



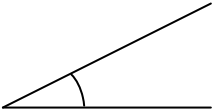
8.



9.



10.



Lesson 4: Straight Angles and Right Angles

Outcome


Identify a straight angle and a right angle.


Teaching Aids

Chart with angles written on it.

Teaching for Understanding

Introduce the two kinds of angles with their names and degrees written on the chart.

eg. a)  A right angle is 90° .

b)  A straight angle is 180° .

Point to each angle and read out its name. Then read with the children and allow them to ask any questions they may have.


Ask children to look around the room and point to a 90° and 180° angle.

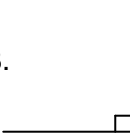
Group Work

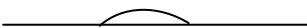
Put the children into four groups.

Name each of these angles.

1. 

2. 

3. 

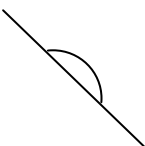
4. 

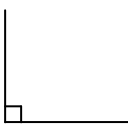
5. 

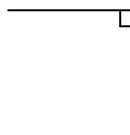
Groups present their work.

Individual Application

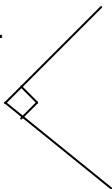
Name these angles.

1. 

2. 

3. 

4. 

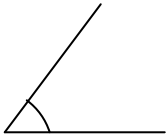
5. 

6. 

Additional Exercise

Circle the right angles.

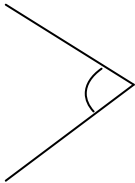
1.



4.



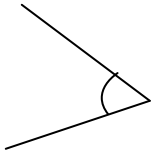
2.



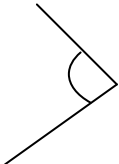
5.



3.



6.



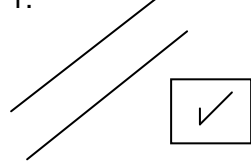
Group Work

In groups of five children will be given angles written on a chart. Each group will name each of the angles.

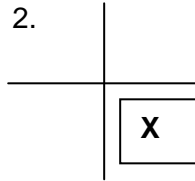
Individual Application

A. Put a \checkmark tick in the box if the lines are parallel and X if the lines are intersecting.

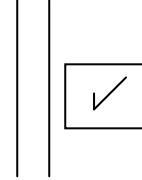
1.



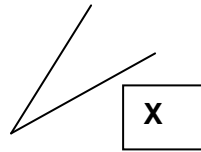
2.



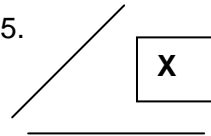
3.



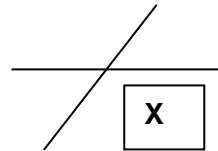
4.



5.

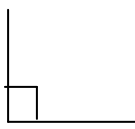


6.



B. Match these angles with their correct names and degrees.

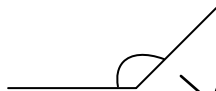
1.



2.



3.



4.



a)

A straight angle which is 180° .

b)

A right angle which is 90° .

c)

An acute angle which is greater than 0° but less than 90° .

d)

An obtuse angle which is greater than 90° but less than 180° .

C. Draw these angles.

1. an acute angle
2. an obtuse angle
3. a straight angle
4. a right angle

UNIT 5: TIME

Lesson 1: Introducing the Calendar

Outcome

Identify days in a month, for example January = 31 days.
February = 28/29 days.
Identify special occasions, for example Independence = 12th July.
Youth Day = 1st August.
Produce wall calendar.

Teaching Aids

Wall calendar

Teaching for Understanding

Bring the children to the front of the classroom. Put up the wall calendar where they can all see it. Read all the months from January to December, then discuss with them the number of days in each month, lastly brainstorm on special occasions. Record the special dates on the blackboard. For example: World Teachers Day is 6th Oct, Christmas Day is 25th December, Independence Day is 12th July, Health Day is 7th April.

Group Work

Divide the children into twelve groups. Each group makes a calendar for one month. Identify special occasions during the month they are doing. Then a reporter reports the group's work.

Individual Application

Each child should draw/write his/her calendar for the month of his/her birthday. Shade the date he/she was born. For example:

MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Bob was born on June 27th.

Additional Exercise

Answer these questions using information from group work.

1. When is World Teacher's Day?
2. When is Christmas Day?
3. When is Independence Day?
4. When is National Health Day?

Lesson 2: Converting Time

Outcome

Convert hours to minutes, minutes to seconds, minutes to hours and seconds to minutes.

Teaching Aids

Chart of Table of Converting Time,
Problem cards.

Table Converting Time	
60 sec. = 1 min.	60 mins. = 1 hr.
120 sec. = 2 mins.	120 mins. = 2 hrs.
180 sec. = 3 mins.	180 mins. = 3 hrs.
240 sec. = 4 mins.	240 mins. = 4 hrs.

Teaching for Understanding

Assemble all the children to sit in front. Explain the time conversion table.

Allow children to read aloud and understand the conversion table.

Ask questions based on the converting table, for example, How many seconds are there in one minute? (60) and so on, until everyone can follow the table.

Group Work

The children sit in groups of six. Give each group a problem card to solve, such as those below.

Card 1

Fill in the blanks	
1. 30 sec. = $\frac{1}{2}$ min.	4. 30 mins. = $\frac{1}{2}$ hr.
2. 90 sec. = $1\frac{1}{2}$ min.	5. 90 mins. = $1\frac{1}{2}$ hr.
3. 150 sec. = $2\frac{1}{2}$ min.	6. 150 mins. = $2\frac{1}{2}$ hr.

Card 2

Fill in the blanks	
1. 70 sec. = 1 mins 10 sec.	4. 70 mins. = 1 hr 10 mins.
2. 75 sec. = 1 mins 15 sec.	5. 80 mins. = 1 hr 20 mins.
3. 80 sec. = 1 mins 20 sec.	6. 85 mins. = 1 hr 25 mins.

Individual Application

Answer the following.

- How many minutes are there in an hour? **(60 mins.)**

2. How many seconds are there in a minute? **(60 secs.)**
3. How many minutes are there in $1\frac{1}{2}$ hours? **(90 mins.)**
4. How many seconds are there in 2 minutes? **(120 secs.)**
5. How many minutes are there in 2 hours? **(120 mins.)**

Additional Exercise

Fill in the blanks.

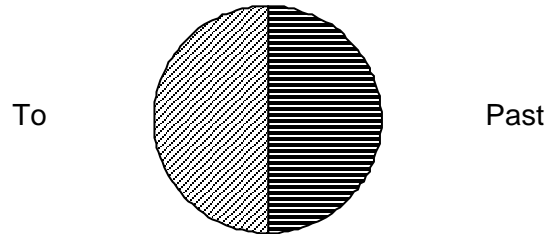
1. $\frac{1}{2}$ hr. = **30 mins.**
2. $\frac{1}{4}$ hr. = **15 mins.**
3. 1 hr. = **60 mins.**
4. $1\frac{1}{2}$ mins. = **90 sec.**
5. $\frac{1}{2}$ min. = **30 sec.**
6. $\frac{1}{4}$ min. = **15 sec.**

Lesson 3: Past / To the Hour

Outcome

Count the distance between the numbers on the clock face in minutes.
Count and identify the sector of the clock for “to” and “past”.

Eg:



Teaching Aids

A chart of a clock face or a picture of a clock on the blackboard
Clock faces

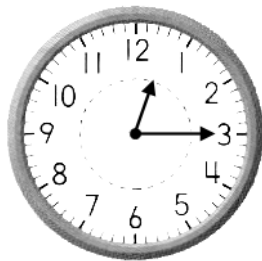
Teaching for Understanding

Invite children to sit in the middle. Brainstorm on how to draw a clock face with numbers. Explain how many numbers there are on the clock face, what these numbers and where their positions on the clock face are. Explain distance between each number on the clock face, using a minute hand. Discuss which numbers are on the “past” sector and on the “to” sector on the clock face.

Draw these clock faces on the blackboard and discuss them with the children.

The minute hand is in the ‘past’ sector.
The time is 15 minutes past 12.

The minute hand is in the ‘to’ sector.
The time is 10 minutes to 6.



Group Work

Put the children into groups of five. Each group should draw or show these times on the clock face.

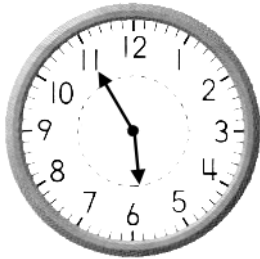
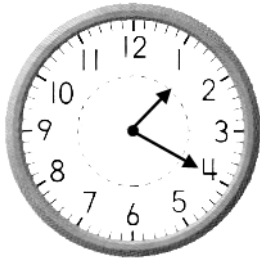
1. 20 mins past 8
2. 20 mins to 3

The group that finishes first will get a point if their work is correct.

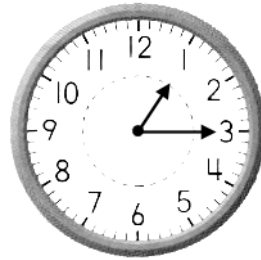
Individual Application

Show these times on a clock face.

1. 20 mins past 1.
2. 5 mins to 6.



3. 15 mins past 1.
4. 20 mins to 8.



Additional Exercise

Write the time shown on each clock face in the box below.



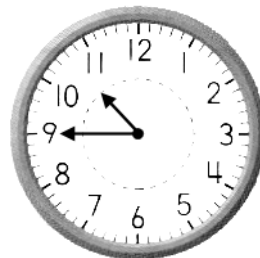
3:05



1:25



9:35



10:45

Lesson 4: a.m. / p.m.

Outcome

Identify a.m. and p.m. time.

Teaching Aids

Teaching for Understanding

The children sit in middle of the classroom, while you introduce a.m. and p.m., that is, a.m. starts after 12 o'clock in the middle of the night and goes on to 12 o'clock in the day time, then p.m. starts after 12 o'clock day time and goes on to 12 o'clock in the middle of the night. Ask questions based on a.m. and p.m. events. For example, the teacher tells a story about an accident that occurred at Takoronga in the afternoon. Then the children think about the story and decide whether the event is a.m. or p.m. Then tell other stories and ask the children to state whether it was a.m. or p.m. time, until everyone understands.

Group Work

Put children in groups of five or six.

They draw one a.m. event and one p.m. event.

A reporter explains the group's drawings to the class.

Individual Application

Write a.m. or p.m. in the space provided.

MV Temanraoi arrived Betio at 3 o'clock in the morning. (a.m.)

Koruu ate his breakfast at 9:30 in the morning. (a.m.)

Teangiua came back from school at 2:30 in the afternoon. (p.m.)

Bob wakes up at 4:15, when the sun rises. (a.m.)

Katiata went to the party at 10:45 very late in the evening. (p.m.)

Additional Exercise

Write p.m. and a.m. in the box.

The student went to school at 7:45 and came back at 1:30.

7:45

a.m.

1:30

p.m.

The meeting began at 8:00 and finished at 2:00 during working hours.

8:00

a.m.

2:00

p.m.

Tom goes to sleep at 10:00 and wakes up at 10:00.

10:00

p.m.

7:00

a.m.

The church service begins at 10:00 and ends at 12:05.

10:00

a.m.

12:05

p.m.

Lesson 5 : Assessment

Group Work

Divide the children into groups of five. Each group should draw or show these times on the clock face.

1. 20 mins past 8



2. 10 mins to 7



Individual Application

1. Answer these questions

- How many days are there in the month of April ? **(30 days)**
- State the date of World Teacher's Day. **(6th October)**
- Write the month in which you were born.

2. Fill in the blanks.

$$1 \frac{1}{2} \text{ hours} = \mathbf{90} \text{ minutes.}$$

$$1 \frac{1}{4} \text{ hours} = \mathbf{75} \text{ minutes.}$$

$$1 \frac{3}{4} \text{ hours} = \mathbf{105} \text{ minutes.}$$

3. Show these times on a clock face.

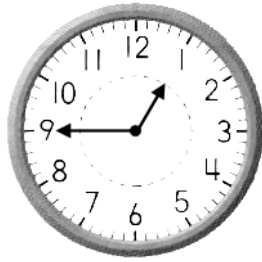
a) 10 minutes past 6



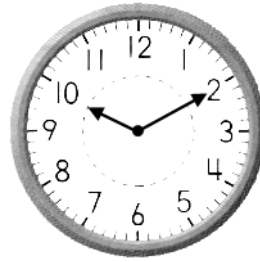
b) 10 minutes to 12



4. Write the time shown on each clock face.



12:45



10:10

5. Write p.m. or a.m. in the boxes.

They turn off the light at 12 :15 after midnight before they sleep. The next day they turn off the light at 9 :35 before they sleep.

12 :15 **a.m.**

9 : 35 **p.m.**

UNIT 6: FRACTIONS

Lesson 1: Types of Fractions (Proper, Improper and Mixed Fractions)

Outcome

Identify types of fractions such as proper, improper and mixed fractions.

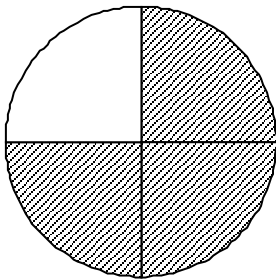
Teaching Aids

Chart

Teaching for Understanding

Write $\frac{3}{4}$ on the blackboard. Show to the children that $\frac{3}{4}$ is a proper fraction. This is because the numerator is always less than the denominator. Other proper fractions are $\frac{1}{2}, \frac{4}{6}, \frac{7}{10}, \frac{3}{5}$ etc.

Draw this on the blackboard :



Explain to the children that 3 stands for the shaded regions. This is the numerator. 4 stands for whole part of shape/region. That is the denominator.

But if this fraction $\frac{3}{4}$ is reversed to $\frac{4}{3}$, it is called an improper fraction because the numerator is now bigger than the denominator.

But you can change $\frac{4}{3}$ (an improper fraction) into a mixed fraction like this:

$$\frac{4}{3} = 3 \overline{) 4} \begin{array}{r} 1 \\ 4 \\ -3 \\ \hline 1 \end{array} = 1 \frac{1}{3} \text{ (mixed fraction)}$$

Group Work

Put the children in groups of five.

They put these fractions in the correct column below.

$2\frac{1}{3}, \frac{6}{5}, \frac{2}{3}, \frac{4}{2}$

$10\frac{1}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{8}$

$9\frac{3}{4}, \frac{7}{5}$

Proper Fractions	Improper Fraction	Mixed Fraction
$(\frac{2}{3}, \frac{3}{4}, \frac{5}{8})$	$(\frac{6}{5}, \frac{4}{2}, \frac{4}{5}, \frac{7}{3})$	$(2\frac{1}{3}, 10\frac{1}{3}, 9\frac{3}{4})$

Individual Application

Write True or False

1. $1\frac{1}{3}$ is a mixed fraction. **(True)**

2. $\frac{2}{5}$ is a improper fraction. **(False)**

3. $\frac{3}{4}$ is a improper fraction. **(False)**

4. $2\frac{2}{3}$ is a improper fraction. **(False)**

5. $\frac{3}{2}$ is a improper fraction. **(True)**

Additional Exercise

Write 2 proper fractions, 2 improper fractions and 2 mixed fractions.

Lesson 2: Parts of a Whole as Fractions

Outcome

Express parts of a whole as fractions.

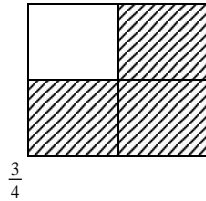
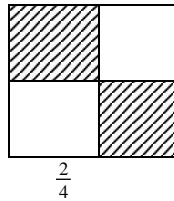
Teaching Aids

Square cards

Teaching for Understanding

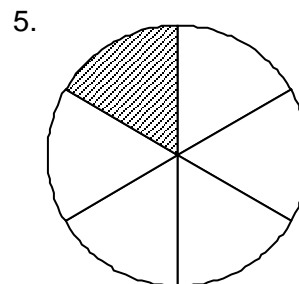
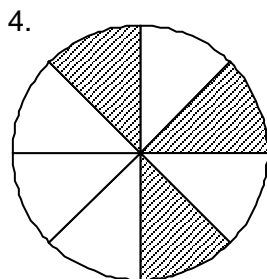
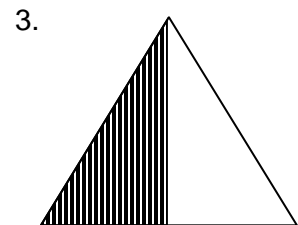
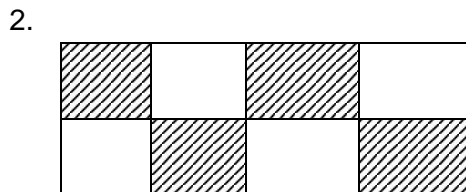
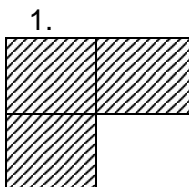
Let the children sit in a big circle. Share out square cards to everyone. Tell them to fold the paper into half and then half again. Ask them, How many squares are there in that shape as you unfold it?

Then tell them to shade 3 of the squares. Then ask them, What is the fraction of that shape? Allow them to give their answers. If they can't give an answer, give them more examples, drawing shapes on the board and demonstrating how to relate shapes to fractions. For example:



Group Work

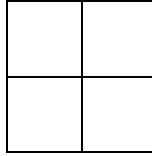
Put the children into groups of five or six. Give out cards to each group, for them to copy the shapes and write the fractions of the shaded shapes.



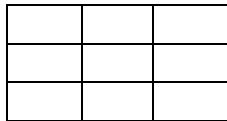
Individual Application

Shade these fractions.

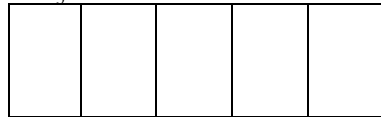
1. $\frac{1}{4} =$



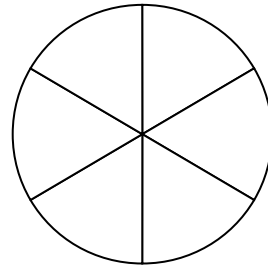
2. $\frac{2}{9} =$



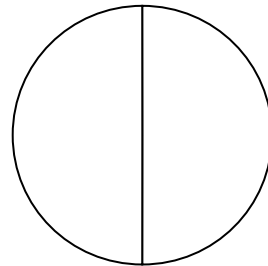
3. $\frac{3}{5} =$



4. $\frac{2}{6} =$



5. $\frac{1}{2} =$



Additional Exercise

Draw and shade these fractions.

1. $\frac{1}{2} =$

2. $\frac{3}{4} =$

3. $\frac{5}{6} =$

4. $\frac{1}{3} =$

5. $\frac{2}{5} =$

6. $\frac{3}{8} =$

Lesson 3: Comparing Fractions Using <, > or =

Outcome

State whether a fraction is less than, greater than, or equal to, another fraction.

Teaching Aids

A fraction table

Teaching for Understanding

Put the table on the blackboard for everyone to see. Read through and explain the table of fractions.

1 WHOLE									
$\frac{1}{2}$					$\frac{1}{2}$				
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$	
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

Shade fractions which are equal such as :

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$$

As well as : $\frac{1}{5} = \frac{2}{10}$

Then write different fractions on the board.

Ask the children to compare the fractions and to state which fraction is greater than or less than the other in the pairs below.

$$\frac{1}{4}, \frac{1}{5}, \text{ or } \frac{2}{4}, \frac{8}{10}.$$

Demonstrate to the children how to refer back to the fraction table to find which fraction is less than or greater than the other. Looking at $\frac{1}{4}$ and $\frac{1}{5}$, it is obvious that $\frac{1}{4}$ is greater than $\frac{1}{5}$. $\frac{2}{4}$ is less than $\frac{8}{10}$. Remind the children of these symbols (>, <).

Group Work

Put <, > or = in the box.

1. $5\frac{1}{8}$ $3\frac{3}{8}$

2. $\frac{5}{10}$ $\frac{1}{2}$

3. $\frac{3}{5}$ $\frac{3}{8}$

4. $\frac{4}{5}$ $\frac{3}{4}$

5. $\frac{6}{10}$ $\frac{3}{5}$

6. $\frac{2}{6}$ $\frac{1}{8}$

Individual Application

Write True or False on the line.

a) $\frac{1}{5} > \frac{2}{10}$ _____

b) $\frac{3}{8} < \frac{1}{4}$ _____

c) $\frac{8}{10} = \frac{4}{5}$ _____

d) $\frac{3}{4} = \frac{5}{10}$ _____

e) $\frac{2}{5} > \frac{4}{10}$ _____

f) $\frac{1}{5} < \frac{4}{5}$ _____

Additional Exercise

Arrange these fractions from the smallest to the biggest.

$\frac{4}{5}$, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{9}{10}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{4}$, $\frac{1}{10}$.

Lesson 4: Adding Fractions

Outcome

Describe the steps to add fractions.

Perform addition of fractions.

Teaching for Understanding

Invite the children to sit in front. Write on the blackboard, $1\frac{1}{3} + 2\frac{2}{4}$.

Demonstrate how to work it out.

Example : $1\frac{1}{3} + 2\frac{2}{4}$

Add whole numbers

$$= 3 + \frac{1}{3} + \frac{2}{4}$$

Find lowest common multiple for 3 and 4.

$$\frac{4+6}{12}$$

Divide 3 in 12 and multiply by 1. Divide

4 in 12 and multiply by 2.

$$= 3 + \frac{10}{12}$$

$$= 3\frac{10}{12}$$

Do another example with $2\frac{1}{4} + 4\frac{3}{5}$. Involve children as much as possible in the working out.

Group Work

In groups of four or five, work out these :

1. $4\frac{1}{2} + 1\frac{2}{3}$ **($5\frac{1}{6}$)**

4. $2\frac{1}{6} + 5\frac{2}{3}$ **($8\frac{1}{4}$)**

2. $1\frac{4}{5} + 2\frac{1}{4}$ **($6\frac{1}{20}$)**

5. $6\frac{3}{4} + 1\frac{1}{2}$ **($7\frac{5}{6}$)**

3. $5\frac{1}{2} + 3\frac{2}{4}$ **(9)**

Individual Application

Circle the best answer.

1. $1\frac{2}{3} + 2\frac{1}{4}$ a) $3\frac{3}{7}$ b) $3\frac{1}{4}$ **c) $3\frac{11}{12}$** d) $2\frac{11}{12}$

2. $4\frac{1}{5} + 3\frac{2}{5}$ a) $7\frac{2}{10}$ b) $3\frac{2}{10}$ **c) $7\frac{3}{5}$** d) $7\frac{1}{5}$

3. $1\frac{2}{4} + \frac{1}{2}$ a) **2** b) $1\frac{1}{2}$ c) $1\frac{3}{4}$ d) $1\frac{2}{4}$

4. $10\frac{1}{3} + 2\frac{1}{2}$ **a) $12\frac{5}{6}$** b) $8\frac{3}{5}$ c) $10\frac{3}{12}$ d) $12\frac{3}{6}$

5. $2\frac{2}{5} + 1\frac{1}{4}$ a) $5\frac{3}{20}$ **b) $3\frac{13}{20}$** c) $3\frac{3}{9}$ d) $2\frac{2}{20}$

Additional Exercise

Fill in the missing number.

1. $2\frac{1}{4} + 4\frac{2}{3} = 6\frac{\square}{12}$ **($6\frac{11}{12}$)**

4. $1\frac{2}{3} + \frac{1}{2} = 2\frac{\square}{6}$ **($2\frac{1}{6}$)**

2. $1\frac{1}{3} + 1\frac{1}{4} = \square\frac{7}{12}$ **($2\frac{7}{12}$)**

5. $3\frac{1}{5} + 3\frac{3}{4} = \square\frac{19}{20}$ **($6\frac{19}{20}$)**

3. $2\frac{4}{5} + 3\frac{1}{2} = 6\frac{3}{\square}$ **($6\frac{3}{10}$)**

6. $1\frac{2}{3} + 2\frac{3}{5} = 4\frac{9}{\square}$ **($4\frac{4}{15}$)**

Lesson 5: Adding Fractions

Outcome

Add fractions more confidently.

Teaching Aids

Cards.

Teaching for Understanding

Write $1\frac{2}{5} + 2\frac{1}{3}$ on the board. Demonstrate how to work it out.

$$\begin{aligned} &1\frac{2}{5} + 2\frac{1}{3} && \text{Add whole numbers} \\ = &3 + \frac{2}{5} + \frac{1}{3} && \text{Find lowest common multiple for 5 and 4} \\ &\frac{6+5}{15} && \text{Divide 5 into 15 then multiply the answer by 2. Then} \\ &&& \text{divide 3 into 15 and multiply by 1.} \\ = &3 + \frac{11}{15} \\ = &3\frac{11}{15} \end{aligned}$$

You may do one or two more examples if required.

Group Work

Divide the children into 4 groups. Let them sit in their four lines. Choose anyone from each group to work out the addition of fraction already written on the flash cards you show to them. Whoever do his/her work correct will give a score to his/her team. The game will continue until everyone present or participate.

Individual Application

Add these fractions.

- | | | | |
|-----------------------------------|---------------------|-----------------------------------|----------------------|
| 1. $2\frac{1}{4} + 3\frac{3}{8}$ | ($5\frac{5}{8}$) | 4. $2\frac{2}{5} + 1\frac{7}{10}$ | ($4\frac{1}{10}$) |
| 2. $4\frac{3}{4} + 2\frac{5}{8}$ | ($7\frac{3}{8}$) | 5. $3\frac{2}{3} + 1\frac{1}{4}$ | ($4\frac{11}{12}$) |
| 3. $2\frac{3}{10} + 1\frac{4}{5}$ | ($4\frac{1}{10}$) | | |

Additional Exercise

Match the addition sum with its answer.

- | | |
|-----------------------------------|------------------|
| 1. $1\frac{1}{2} + 3\frac{3}{4}$ | $13\frac{3}{10}$ |
| 2. $4\frac{1}{5} + 2\frac{3}{4}$ | $5\frac{5}{6}$ |
| 3. $3\frac{1}{3} + 2\frac{1}{2}$ | $7\frac{11}{12}$ |
| 4. $10\frac{4}{5} + 2\frac{1}{2}$ | $6\frac{19}{20}$ |
| 5. $6\frac{2}{3} + 1\frac{1}{4}$ | $5\frac{1}{4}$ |
-

Lesson 6: Subtracting Fractions

Outcome

Subtract fractions

Teaching Aids

Cards

Teaching for Understanding

Let the children sit in front. Tell them that this time they are going to subtract fractions.

Write $3\frac{3}{4} - 1\frac{1}{8}$ on the board for everyone to see. Then demonstrate how to subtract fractions as follows :

$$\begin{aligned} & 3\frac{3}{4} - 1\frac{1}{8} && \text{Subtract whole numbers} \\ = & 2 + \frac{3}{4} - \frac{1}{8} && \text{Find lowest common multiple} \\ = & 2 + \frac{6-1}{8} && \begin{array}{l} \text{Divide 4 into 8 then multiply with 3.} \\ \text{Divide 8 into 8 then multiply by 1.} \end{array} \\ = & 2 + \frac{5}{8} \\ = & 2\frac{5}{8}. \end{aligned}$$

Do two or more examples if required.

Group Work

Divide the children into four groups. The teacher shows a subtraction statement such as $3\frac{1}{2} - 1\frac{2}{3}$. A member from each team works out the problem on the blackboard. The first one to get the answer correct gets point for the team. Continue the game until everyone has had a turn.

Individual Application

Subtract these fractions

- | | |
|--|---|
| 1. $3\frac{3}{4} - 2\frac{2}{5} = \square \frac{7}{20}$ (1 $\frac{7}{20}$) | 4. $3\frac{3}{4} - 2\frac{1}{2} = 1 \frac{\square}{4}$ (1 $\frac{1}{4}$) |
| 2. $6\frac{4}{5} - 4\frac{1}{2} = 2 \frac{\square}{10}$ (2 $\frac{3}{10}$) | 5. $4\frac{5}{8} - 2\frac{1}{4} = \square \frac{3}{8}$ (2 $\frac{3}{8}$) |
| 3. $3\frac{1}{2} - 1\frac{3}{8} = 2 \frac{1}{\square}$ (2 $\frac{1}{8}$) | 6. $9\frac{2}{3} - 6\frac{3}{5} = 3 \frac{1}{\square}$ (3 $\frac{1}{15}$) |

Lesson 7: More Practice at Subtracting Fractions

Outcome

Subtract fractions with more confidence.

Teaching for Understanding

Revise with the children the procedure for subtracting fractions. This time, ask them what they should do first when subtracting fractions. Then ask them about the other steps.

Write down the steps on the board as the children tell you what to do to reach an answer.

You may give more examples if they need more explanation.

Group Work

Repeat the game they did yesterday, but use different figures (fractions).

Individual Application

Write True or False.

1. $3\frac{3}{4} - 2\frac{1}{2} = 1\frac{1}{4}$ True / False

2. $3\frac{3}{8} - 1\frac{1}{2} = 1\frac{7}{8}$ True / False

3. $5\frac{2}{5} - 3\frac{2}{10} = 2\frac{2}{10}$ True / False

4. $4\frac{4}{8} - 2\frac{1}{4} = 3\frac{2}{8}$ True / False

5. $2\frac{2}{3} - 1\frac{4}{8} = 2\frac{5}{8}$ True / False

6. $3\frac{3}{4} - 2\frac{1}{8} = 1\frac{5}{8}$ True / False

Additional Exercise

Work out these.

1. $4\frac{3}{5} - 2\frac{1}{5} = (2\frac{2}{5})$

2. $6\frac{3}{5} - 4\frac{5}{10} = (2\frac{1}{10})$

3. $7\frac{1}{4} - 2\frac{1}{8} = (5\frac{1}{8})$

4. $5\frac{2}{3} - 3\frac{2}{5} = (2\frac{4}{15})$

5. $1\frac{9}{10} - 1\frac{3}{10} = (\frac{6}{10} = \frac{3}{5})$

Lesson 8: Adding and Subtracting Fractions

Outcome

Add and subtract fractions.

Teaching Aids

Cards

Teaching for Understanding

Revise addition and subtraction fractions on the board. Write $2\frac{1}{4} + 5\frac{2}{3}$. Choose one of the girls to do it, step by step. If she can't get the answer, then choose one of the boys to help to solve the problem.

Group Work

Let the children sit in groups of five or six.

Provide each group with a card on which to work out these addition and subtraction sums.

1. $3\frac{1}{2} + 2\frac{3}{4} = (6\frac{1}{4})$

3. $1\frac{4}{5} + 1\frac{2}{3} = (3\frac{7}{15})$

3. $4\frac{2}{5} - 2\frac{3}{8} = (2\frac{1}{40})$

4. $3\frac{1}{4} + 2\frac{1}{5} = (5\frac{9}{20})$

Individual Application

Put + or – in the box.

1. $5\frac{3}{4}$ + $2\frac{1}{2} = 8\frac{1}{4}$

4. $10\frac{2}{3}$ - $5\frac{3}{5} = 5\frac{1}{15}$

2. $4\frac{2}{5}$ - $2\frac{1}{3} = 2\frac{1}{15}$

5. $9\frac{1}{2}$ - $4\frac{2}{5} = 5\frac{1}{10}$

3. $6\frac{1}{3}$ + $2\frac{1}{4} = 8\frac{7}{12}$

6. $2\frac{4}{5}$ + $1\frac{1}{2} = 4\frac{3}{10}$

Additional Exercise

Fill in the boxes.

1. $\frac{1}{4} + \frac{2}{5} =$ 13

2. $4\frac{1}{5} + 2\frac{2}{5} =$ $6\frac{3}{5}$

3. $6\frac{3}{4} - 4\frac{7}{10} =$ $2\frac{1}{20}$

4. $2\frac{2}{3} - 1\frac{1}{4} =$ $1\frac{5}{12}$

5. $5\frac{1}{4} - 2\frac{1}{2} =$ $2\frac{3}{4}$

Lesson 9: Adding and Subtracting Fractions

Outcome

Add and subtract fractions with confidence.

Teaching Aids

Cards

Teaching for Understanding

In this lesson, revise again the addition and subtraction of fractions. Write $3\frac{4}{5} + 2\frac{1}{2}$ and $2\frac{3}{4} - 1\frac{1}{3}$ on the board. Ask for volunteers to solve the problems. Then go through those problems discussing the steps with them. Do more examples if they still have difficulty.

Group Work

Repeat yesterday's game. Use different whole numbers and fractions.

Individual Application

Work out the sums and differences.

1. $1\frac{2}{3} + 1\frac{1}{2} = (3\frac{1}{6})$

4. $5\frac{4}{5} - 2\frac{1}{3} = (3\frac{7}{15})$

2. $3\frac{5}{8} + 2\frac{2}{3} = (6\frac{7}{24})$

5. $2\frac{1}{3} + 6\frac{2}{5} = (8\frac{11}{15})$

3. $4\frac{1}{5} - 3\frac{1}{8} = (1\frac{3}{40})$

Additional Exercise

Put the correct sign + or – in the box.

1. $\frac{1}{4} \boxed{+} \frac{2}{5} = \frac{13}{20}$

4. $6\frac{2}{5} \boxed{+} 2\frac{1}{3} = 8\frac{11}{15}$

2. $\frac{4}{6} \boxed{-} \frac{3}{6} = \frac{1}{6}$

5. $4\frac{1}{2} \boxed{+} 3\frac{2}{3} = 8\frac{1}{6}$

3. $1\frac{2}{3} \boxed{-} \frac{3}{5} = 1\frac{1}{15}$

Lesson 10: Assessment

Group Work

Put the children in groups of four or five to list down these fractions under their correct sub-headings.

$3\frac{1}{2}$, $\frac{4}{3}$, $\frac{1}{2}$, $\frac{2}{5}$, $\frac{6}{4}$, $2\frac{1}{2}$, $4\frac{1}{5}$, $\frac{4}{3}$, $\frac{3}{4}$, $\frac{2}{3}$, $4\frac{4}{5}$, $\frac{9}{5}$

Proper Fractions	Improper Fractions	Mixed Fractions
$(\frac{4}{3}, \frac{1}{2}, \frac{2}{5}, \frac{3}{4})$	$(\frac{6}{4}, 2\frac{1}{2}, 4\frac{1}{5}, \frac{4}{3})$	$(\frac{3}{4}, \frac{2}{3}, 4\frac{4}{5}, \frac{9}{5})$

Individual Application

Write True or False.

1. $\frac{1}{4} < \frac{1}{8}$ True / **False**

2. $\frac{3}{4} < \frac{3}{8}$ True / **False**

3. $\frac{2}{5} = \frac{4}{10}$ True / **False**

4. $\frac{1}{5} > \frac{2}{3}$ True / **False**

5. $\frac{1}{2} < \frac{1}{4}$ True / **False**

6. Arrange these fractions from the smallest to the biggest.

$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{6}{10}, \frac{4}{5}, \frac{5}{8} \longrightarrow (\frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{6}{10}, \frac{5}{8}, \frac{4}{5})$

7. Do these additions and subtractions.

a) $2\frac{2}{3} + 6\frac{1}{5} = (8\frac{13}{15})$

c) $1\frac{1}{2} + 3\frac{3}{4} = (5\frac{1}{4})$

b) $9\frac{4}{5} - 3\frac{1}{4} = (6\frac{11}{20})$

d) $4\frac{2}{3} + 5\frac{1}{3} = (10)$

UNIT 7: LENGTH

Lesson 1: Centimetre, Metre and Millimetre Conversion

Outcome

Convert metres to centimetres and millimetres and vice versa.
Use m., cm., and mm. units of measurement.

Teaching Aids

Mm. / cm. rulers, metre rulers, conversion table, card for results table.

Teaching for Understanding

Let the children sit in the middle and distribute rulers. The teacher shows to children the length of 'mm', 'cm' and 'm' on the blackboard by drawing lines of 1 mm., 1 cm. and 1 m. Draw the length of a pen on the board and measure it using mm. units first and then cm. units.

Allow the children to construct the lengths (1 mm., 1 cm., 1 m.) using their rulers. In so doing children will have a good understanding of each length.

Then demonstrate how to convert metres to cm. and mm., as shown below. For example: the blackboard is 3 metres long. Convert it to other units. Clearly point out this rule: when converting a bigger unit into a smaller unit you have to multiply.

Object	Metre (m)	Centimetre (cm)	Millimetre (mm)
Blackboard	3 m.	$3 \text{ m.} \times \frac{100 \text{ cm.}}{1 \text{ m.}}$ = 300 cm.	$3 \text{ m.} \times \frac{1000 \text{ mm.}}{1 \text{ m.}}$ = 3000 mm.

Group Work

In their groups of four or five children draw lines of the following lengths.

- 1 mm.
- 1 cm.
- 1 m.

Individual Application

Answer these questions.

1. How many mm. are there in 1 metre? **(1000 mm.)**
2. How many cm. are there in 1 metre? **(100 cm.)**
3. How many mm. are there in 10 cm.? **(100 mm.)**
4. How many cm. are there in 2 m.? **(200 cm.)**
5. How many mm. are there in $\frac{1}{2}$ cm.? **(5 mm.)**

Additional Exercise

Fill in the blanks.

1. 1 m. = ____ mm. **(1000)**
2. 1 m. = ____ cm. **(100)**
3. 10 cm. = ____ mm. **(100)**
4. 10 m. = ____ cm. **(1000)**

Lesson 2: Converting Millimetres into Centimetres and Metres

Outcome

Convert millimetres to centimetres and metres.

Teaching Aids

Chart of different lines for measuring, cm./mm. And metre rulers

Teaching for Understanding

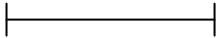
Explain to the children how to convert mm. to cm. and m. Demonstrate on the blackboard how to work it out. For example:

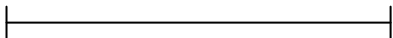
Object	mm.	cm.	m.
Length of a pen	15 mm.	$15 \text{ mm.} \div 10 = 1.5 \text{ cm.}$	$15 \text{ mm.} \div 1000 = 0.015 \text{ m.}$

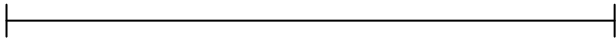
Unlike the rule learnt yesterday, converting a smaller unit into a bigger unit you have to divide.

Group Work

In the same group as yesterday, each child should do measure the length of these lines using a mm/cm ruler and a metre ruler.

 = ____ mm.

 = ____ cm.

 = ____ m.

Individual Application

Write the following.

1. 30 mm. as cm. **(3 cm.)**
2. 30 mm. as m. **(0.03 m.)**
3. 50 cm. as m. **($\frac{1}{2}$ m. or 0.5 m.)**
4. 100 mm. as cm. **(10 cm.)**
5. 160 cm. as m. **(1.6 m.)**

Additional Exercise

Answer these questions.

1. How many cm. must be added to 48 cm. to make 1 m? **(52 cm.)**
2. How many mm. must be added to 500 mm. to make 1 m.? **(500 mm.)**
3. How many mm. must be added to 5 mm. to make 2 cm? **(15 mm.)**

Lesson 3: Estimating and Measuring Length Using Cm. and Mm.

Outcome

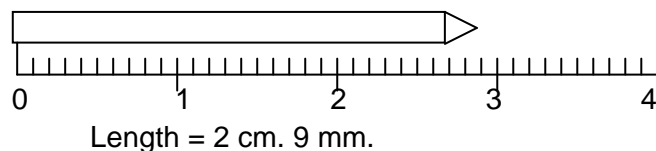
Estimate and measure lengths of objects.

Teaching Aids

cm/mm rulers, chart written in it table of measuring.

Teaching for Understanding

Using a cm. ruler, demonstrate how to measure lengths. For example, put a pencil on the table and place a ruler beside it, putting the zero at one end of the pencil:



Estimate the length first before measuring. Calculate the difference between the two measurements.

Record answers in table form as below:

Objects	Estimation	Measurement	Difference
Pen Exercise Book Chalk			

Group Work

In groups of five, children complete the table above. Encourage group members to contribute to group work.

A group reporter reports on what the group has done.

Individual Application

Estimate and measure the following. Record your results in a table.

Objects	Estimation		Measurement		Difference	
	mm.	cm.	mm.	cm.	mm.	cm.
Height of a coffee bottle Width of a duster Width of the teacher's table						

Show the difference at the end.

Additional Exercise

Complete this table.

Object	Estimation		Measurement		Different	
	mm.	cm.	mm.	cm.	mm.	cm.
1. Pen	80 mm.	_____	100 mm.	_____		
2. Ex-book	120 mm.	_____	200 mm.	_____		
3. Cupboard	450 mm.	_____	600 mm.	_____		
4. Table	800 mm.	_____	1600 mm.	_____		

Lesson 4: Estimating and Measuring Length in Metres

Outcome

Estimate and measure lengths, heights, widths using a 1 m. ruler.

Teaching Aids

cm. and metre rulers, charts for result tables

Teaching for Understanding

What did you do yesterday? You estimated lengths first then measured in centimetres. Today, we will do the same task but using a metre ruler. Demonstrate by estimating then measuring the length of the blackboard. Then allow some children to measure the length of the blackboard while the others watch. Write the answers on the blackboard in a table as.

Objects	Estimation	Measurement	Difference
Blackboard Table			

Group Work

In groups of five or six, children estimate then measure the lengths of objects. Record the results in a table.

Objects	Estimation	Measurement	Difference
Door Cupboard Window			

Individual Application

1. Estimate and measure in metres the length of:

- a) a desk
- b) a shelf

Calculate the difference of the two measurements.

Additional Exercise

Convert the lengths of the desk and the shelf into centimetres.

Lesson 5: Assessment

Group Work

In groups of five, children complete the table below. Estimate the lengths in cms. then measure them.

Calculate the difference.

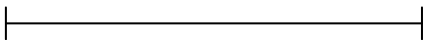
Object	Estimation	Measurement	Difference
1. Pen 2. Book 3. Blackboard 4. Table			

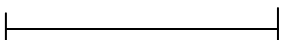
Individual Application

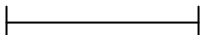
A. Answer these questions.

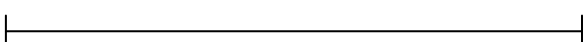
- How many cm. are there in $\frac{1}{2}$ m.?
- How many cm. are there in 4 m.?
- How many mm. are there in 10 cm.?
- How many m. are there in 25 cm.?
- How many cm. must be added to 121 cm. to make 2 m.?
- How many mm. must be added to 11 mm. to make 2 cm.?

B. Measure the lengths of lines in cm.

1.  = ____ cm **(6 cm.)**

2.  = ____ cm **(4 cm.)**

3.  = ____ cm **(2 $\frac{1}{2}$ cm.)**

4.  = ____ cm. **(8 $\frac{1}{2}$ cm.)**

C. Convert the following. Show your workings out.

- 3 metres to cm. **(3 x 100 = 300 cm.)**
- 40 metres to cm. **(40 x 100 = 4000 cm.)**
- 150 mm. to cm. **(150 ÷ 10 = 15 cm.)**
- 270 mm. to cm. **(270 ÷ 10 = 27 cm.)**

UNIT 8: MULTIPLICATION AND DIVISION OF FRACTIONS

Lesson 1: Multiplication of Fractions and Whole Numbers Using a Number Line

Outcome

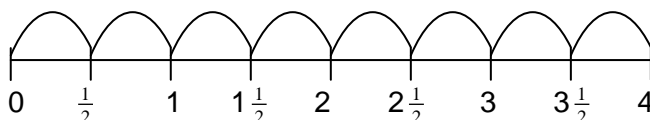
Multiply fractions using a number line.

Teaching Aids

Blackboard / chalk

Teaching for Understanding

The topic this week is fractions. Who can tell me what is fraction? Who can write one fraction on the blackboard? Examples of fractions are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$. Today we are going to multiply fractions using a number line. Work out $\frac{1}{2} \times 8$ using a number line on the blackboard.



$\frac{1}{2} \times 8 = 4$ — product.
The length of each jump. \downarrow
The number of jumps.

You may do one or two more examples.

Group Work

Put children in groups of five or six.

Solve these using a number line on a chart.

1. $\frac{1}{4} \times 8 = (2)$

2. $\frac{3}{10} \times 4 = (1\frac{2}{10} = 1\frac{1}{5})$

Groups present their work and display it.

Individual Application

Solve these using a number line.

1. $5 \times \frac{1}{10} = (\frac{5}{10} = \frac{1}{2})$

2. $6 \times \frac{1}{3} = (\frac{6}{3} = 2)$

Additional Exercise

Use a number line to solve these equations.

1. $8 \times \frac{2}{3} = (5\frac{1}{3})$

4. $6 \times \frac{1}{6} = (1)$

2. $4 \times \frac{3}{5} = (2\frac{2}{5})$

5. $\frac{2}{4} \times 5 = (2\frac{1}{2})$

3. $7 \times \frac{1}{2} = (3\frac{1}{2})$

Lesson 2: More Practice in Multiplication of Fractions and Whole Numbers Using a Number Line

Outcome

Show confidence in multiplying fractions using a number line.

Teaching Aids

Sheets of paper for group work

Teaching for Understanding

Write $\frac{2}{3} \times 7$ on the blackboard. Ask for a volunteer to come out to find the product on the blackboard using a number line. If he/she has difficulty others can help.

Group Work

Put children into groups of the size you prefer.

Provide each group with a chart or sheet of paper.

Group members work together to solve these using a number line.

1. $\frac{4}{5} \times 3 = (2\frac{2}{5})$

2. $\frac{2}{3} \times 9 = (6)$

3. $\frac{1}{8} \times 9 = (1\frac{1}{8})$

Individual Application

i. Use a number line to find the products.

a. $\frac{1}{2} \times 10 = (5)$

d. $\frac{1}{3} \times 7 = (2\frac{1}{3})$

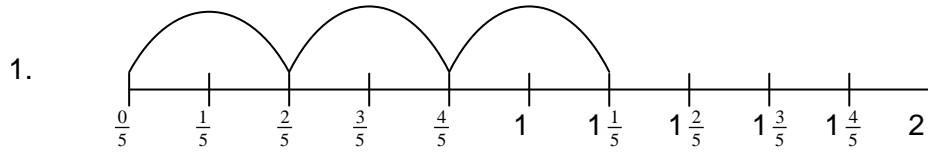
b. $\frac{2}{5} \times 6 = (2\frac{2}{5})$

e. $\frac{4}{6} \times 5 = (3\frac{2}{6})$

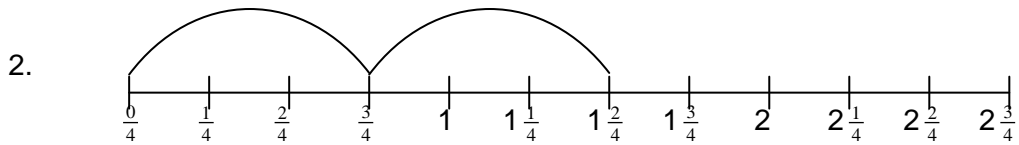
c. $\frac{3}{4} \times 5 = (3\frac{3}{4})$

Additional Exercise

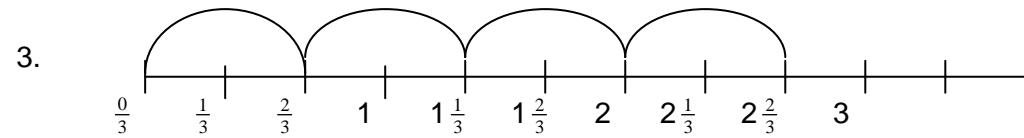
Write the equations shown on these number lines.



$$(3 \times \frac{2}{5} = 1\frac{1}{5})$$



$$(2 \times \frac{3}{4} = 1\frac{2}{4} = 1\frac{1}{2})$$



$$(4 \times \frac{2}{3} = 2\frac{2}{3})$$

Lesson 3: Multiplication of Whole Numbers and Fractions Using a Diagram

Outcome

Multiply whole numbers and fractions by shading diagrams.

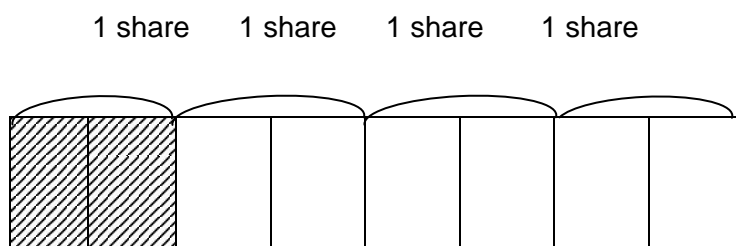
Teaching Aids

Blackboard / chalk

Teaching for Understanding

Children, yesterday you learnt how to multiply fractions and whole numbers using a number line. Today we will multiply using diagrams. For example:- $\frac{1}{4} \times 8$.

Draw a rectangle and divide it into 8 equal parts such as:



Share the 8 parts into 4 shares. Shade one share. One share consists of 2 parts. Therefore, the two shaded parts are the product.

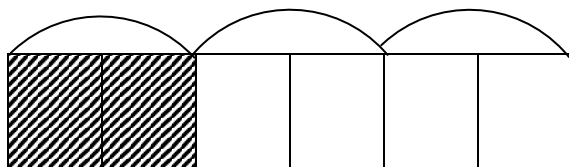
$$\frac{1}{4} \times 8 = 2$$

Group Work

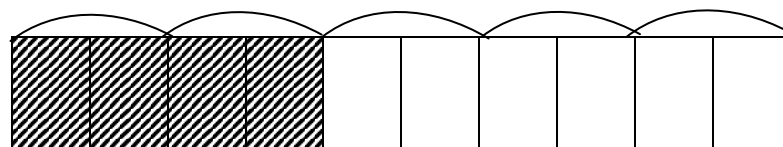
Put children into groups of five.
Provide each group with a chart.

Group members work together to find the products by using diagrams.

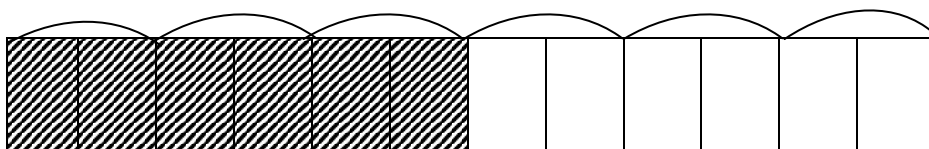
1. $\frac{1}{3} \times 6 =$ **(2)**



2. $\frac{2}{5} \times 10 =$ **(4)**



3. $\frac{1}{2} \times 12 =$ **(6)**

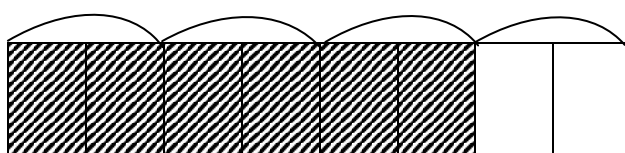


Display group work.

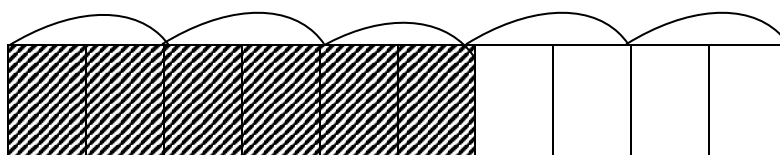
Individual Application

Use a diagram method to solve these:

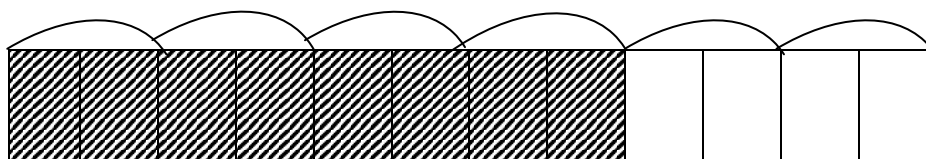
1. $\frac{3}{4} \times 8 =$ **(6)**



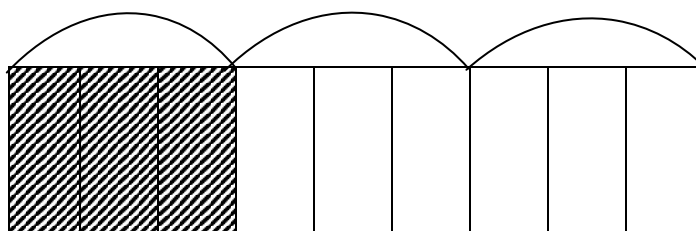
2. $\frac{3}{5} \times 10 =$ **(6)**



3. $\frac{4}{6} \times 12 =$ **(8)**



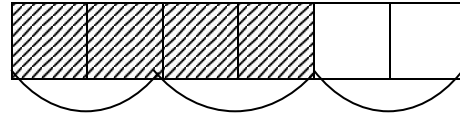
4. $\frac{1}{3} \times 9 =$ **(3)**



Additional Exercise

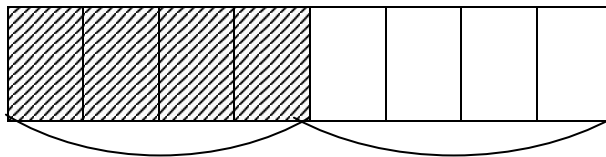
Write the equations for these diagrams.

Example:



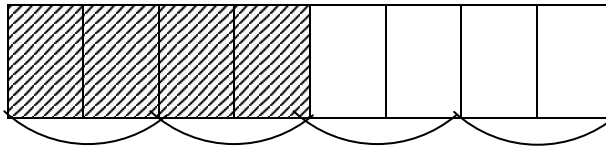
$$\frac{2}{3} \times 6 = 4$$

1.



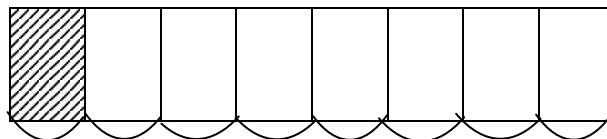
$$\left(\frac{1}{2} \times 8 = 4\right)$$

2.



$$\left(\frac{2}{4} \times 8 = 4\right)$$

3.



$$\left(\frac{1}{8} \times 8 = 1\right)$$

Lesson 4: Multiplication of Whole Numbers and Fractions Using Diagrams

Outcome

Use a diagram method to work out products.

Teaching Aids

Charts for each group

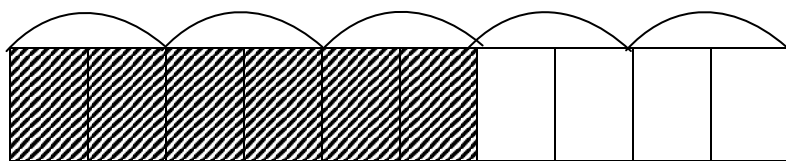
Teaching for Understanding

Invite a volunteer to work out the equation $\frac{5}{8} \times 8$ on the blackboard using a diagram. The rest of the class should watch and help where necessary.

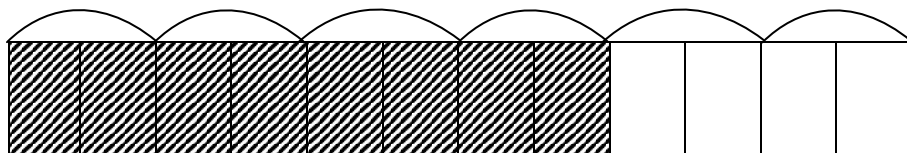
Group Work

Using the same group as yesterday, children to work out the products using diagrams on a chart.

1. $\frac{3}{5} \times 10 = (6)$



2. $\frac{4}{6} \times 12 = (8)$

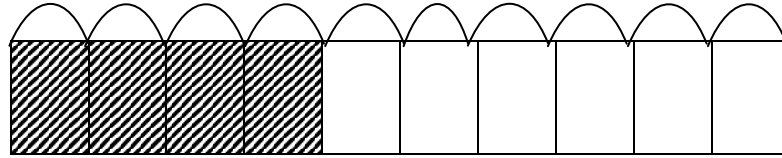


Groups present their work and display it.

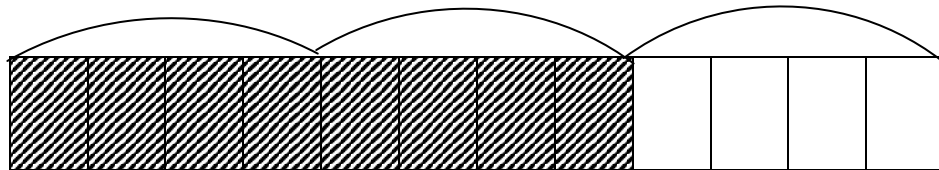
Individual Application

Solve these using a diagram.

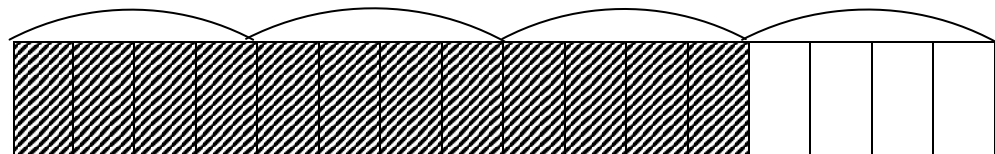
1. $\frac{4}{10} \times 10 = \mathbf{(4)}$



2. $\frac{2}{3} \times 12 = \mathbf{(8)}$



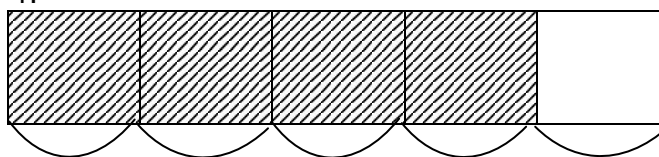
3. $\frac{3}{4} \times 16 = \mathbf{(12)}$



Additional Exercise

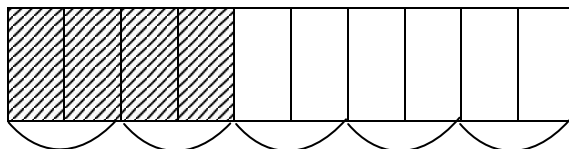
Write multiplication equations for these diagrams.

1.



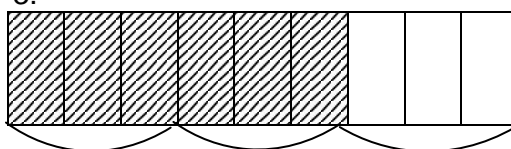
$(\frac{4}{5} \times 5 = 4)$

2.



$(\frac{2}{5} \times 10 = 4)$

3.



$(\frac{2}{3} \times 9 = 6)$

Lesson 5: Multiplication of Whole Numbers and Fractions Using Algorithms

Outcome

Use algorithms to multiply fractions and whole numbers.

Teaching Aids

Teaching for Understanding

Sit the children in front so that they can see the blackboard clearly.

Write $\frac{3}{4} \times 12 = \square$ on the blackboard. Demonstrate how to find the product.

For example.

1. $\frac{3}{4} \times 12$ Rename 12 as a fraction, so it becomes $\frac{12}{1}$.

$$\frac{3}{4} \times \frac{12}{1}$$

Simplify 4 and 12 by dividing by 4.
Multiply numerators together and denominators together.
Divide 1 into 9.

$$\frac{9}{1}$$

= 9

2. $\frac{3}{5} \times 10$ Rename 10 as a fraction, so it becomes $\frac{10}{1}$.

$$\frac{3}{5} \times \frac{10}{1}$$

Simplify 5 and 10 by dividing by 5.
Multiply numerators together and denominators together.
Divide 1 into 6.

$$\frac{6}{1}$$

= 6

Group Work

In groups of five, children solve these problems together but individual to record own answers. Discuss how to solve the problem, then individuals write the working out and answers in their books.

1. $\frac{3}{12} \times 24 =$ **(6)**

3. $\frac{3}{7} \times 14 =$ **(6)**

2. $\frac{2}{5} \times 30 =$ **(12)**

Individual Application

Use algorithms to solve these:

1. $\frac{4}{5} \times 15 =$ **(12)**

3. $\frac{4}{10} \times 20 =$ **(8)**

5. $\frac{1}{2} \times 9 =$ **(4 $\frac{1}{2}$)**

2. $\frac{8}{9} \times 72 =$ **(64)**

4. $\frac{3}{4} \times 44 =$ **(33)**

Additional Exercise

Work out the products.

1. $\frac{5}{6} \times 63 =$ **(52 $\frac{1}{2}$)**

3. $\frac{6}{15} \times 15 =$ **(6)**

5. $\frac{4}{9} \times 18 =$ **(8)**

2. $\frac{4}{5} \times 8 =$ **(6 $\frac{2}{5}$)**

4. $\frac{5}{12} \times 36 =$ **(15)**

Lesson 6: Multiplying Fractions

Outcome

Multiply fractions correctly.

Teaching Aids

Teaching for Understanding

Yesterday we multiplied whole numbers and fractions. Today we are going to multiply fractions by fractions. Demonstrate how to do it:

$$\begin{array}{ll} \frac{3}{4} \times \frac{4}{5} & \text{Look for numbers that need to be simplified and simplify.} \\ = \frac{3}{5} & \text{Multiply numerators together and denominators together.} \\ = \frac{3}{5} & \text{Answer} \end{array}$$

Do another example and involve the children as much as possible in the working out.

Group Work

Put children in groups of five.

Group members discuss the problems listed below together. Individuals write the working out and answers in their books.

Walk around and encourage group discussion.

$$\begin{array}{ll} 1. \quad \frac{5}{8} \times \frac{6}{8} = \left(\frac{15}{32}\right) & 4. \quad \frac{1}{4} \times \frac{4}{10} = \left(\frac{1}{10}\right) \\ 2. \quad \frac{1}{2} \times \frac{4}{5} = \left(\frac{2}{5}\right) & 5. \quad \frac{2}{5} \times \frac{3}{8} = \left(\frac{3}{20}\right) \\ 3. \quad \frac{3}{4} \times \frac{2}{6} = \left(\frac{1}{4}\right) & \end{array}$$

Individual Application

Calculate the products.

$$\begin{array}{lll} 1. \quad \frac{1}{2} \times \frac{4}{6} = \left(\frac{2}{6} = \frac{1}{3}\right) & 3. \quad \frac{3}{8} \times \frac{2}{5} = \left(\frac{3}{20}\right) & 5. \quad \frac{3}{5} \times \frac{1}{6} = \left(\frac{1}{30}\right) \\ 2. \quad \frac{1}{6} \times \frac{1}{8} = \left(\frac{1}{48}\right) & 4. \quad \frac{1}{8} \times \frac{1}{2} = \left(\frac{1}{16}\right) & 6. \quad \frac{1}{4} \times \frac{6}{10} = \left(\frac{3}{20}\right) \end{array}$$

Additional Exercise

Multiply these fractions.

$$\begin{array}{ll} 1. \quad \frac{8}{9} \times \frac{2}{3} = \left(\frac{16}{27}\right) & 4. \quad \frac{2}{8} \times \frac{1}{2} = \left(\frac{1}{8}\right) \\ 2. \quad \frac{4}{5} \times \frac{3}{5} = \left(\frac{12}{25}\right) & 5. \quad \frac{4}{6} \times \frac{3}{4} = \left(\frac{1}{2}\right) \\ 3. \quad \frac{10}{12} \times \frac{1}{5} = \left(\frac{10}{60} = \frac{1}{6}\right) & \end{array}$$

Lesson 7: More Practice in Multiplying Fractions

Outcome

Multiply fractions by fractions.

Multiply whole numbers by fractions and vice versa.

Teaching for Understanding

Briefly review the previous two topics by doing the following together with the children on the blackboard.

a) $\frac{3}{5} \times 20$

b) $\frac{4}{8} \times \frac{5}{12}$

Do more examples if required before doing group work.

Group Work

Put children in groups of five or six.

Group members discuss the problems together.

Individual members write the working out and answers in their exercise books.

1. $15 \times \frac{1}{3} = (5)$

4. $\frac{4}{5} \times \frac{3}{10} = (\frac{6}{25})$

2. $\frac{4}{7} \times 21 = (12)$

5. $\frac{1}{6} \times 12 = (2)$

3. $\frac{3}{5} \times \frac{5}{8} = (\frac{3}{8})$

Teacher marks individuals' work.

Individual Application

Do these.

1. $\frac{3}{4} \times 16 = (\frac{3}{4} \times \frac{16}{1} = 12)$

6. $\frac{1}{3} \times \frac{1}{4} = (\frac{1}{12})$

2. $\frac{3}{5} \times 20 = (\frac{3}{5} \times \frac{20}{1} = 12)$

7. $\frac{1}{2} \times \frac{2}{3} = (\frac{3}{6} = \frac{1}{3})$

3. $\frac{4}{5} \times 25 = (\frac{4}{5} \times \frac{25}{1} = 20)$

8. $\frac{3}{4} \times \frac{1}{2} = (\frac{3}{4} \times \frac{1}{2} = \frac{3}{8})$

4. $\frac{2}{3} \times 12 = (\frac{2}{3} \times \frac{12}{1} = 8)$

9. $\frac{2}{3} \times \frac{3}{4} = (\frac{2}{3} \times \frac{3}{4} = \frac{2}{4} = \frac{1}{2})$

5. $\frac{3}{10} \times 80 = (\frac{3}{10} \times 80 = 24)$

10. $\frac{4}{5} \times \frac{2}{3} = (\frac{8}{15})$

Additional Exercise

Solve:

1. $\frac{2}{5} \times \frac{7}{10} = (\frac{14}{50})$

4. $\frac{2}{3} \times \frac{3}{5} = (\frac{6}{15})$

2. $\frac{4}{10} \times \frac{1}{5} = (\frac{4}{50})$

5. $\frac{2}{5} \times \frac{3}{4} = (\frac{6}{20})$

3. $\frac{4}{10} \times \frac{3}{5} = (\frac{12}{50})$

Lesson 8: Division of Whole Numbers by Fractions

Outcome

Divide whole numbers by fractions.

Teaching for Understanding

So far, we have been doing multiplication of fractions. Today, we are going to divide whole numbers by fractions. Demonstrate how to divide whole numbers by fractions. For example:

$$\begin{array}{ll} 3 \div \frac{1}{2} & \text{Rename 3 as a fraction.} \\ \frac{3}{1} \div \frac{1}{2} & \text{Change the } \div \text{ into } \times \text{ and reverse } \frac{1}{2}. \\ \frac{3}{1} \times \frac{2}{1} & \text{Multiply numerators together and denominators together.} \\ = \frac{6}{1} & \text{Divide 1 into 6.} \\ = 6 & \end{array}$$

Do one or two examples.

Group Work

In groups of five or more, children do these exercises:

1. $4 \div \frac{1}{3} = (\frac{4}{1} \times \frac{3}{1} = 12)$
2. $3 \div \frac{4}{5} = (\frac{3}{1} \times \frac{5}{4} = 3\frac{3}{4})$
3. $6 \div \frac{1}{5} = (\frac{6}{1} \times \frac{5}{1} = 30)$
4. $4 \div \frac{1}{2} = (\frac{4}{1} \times \frac{2}{1} = 8)$
5. $10 \div \frac{1}{4} = (\frac{10}{1} \times \frac{4}{1} = 40)$

Visit each group and to make sure that all group members are actively involved in the discussion.

Individual Application

Calculate the quotient.

1. $6 \div \frac{3}{4} = (\frac{6}{1} \times \frac{4}{3} = 8)$
2. $9 \div \frac{3}{10} = (\frac{9}{1} \times \frac{10}{3} = 30)$
3. $9 \div \frac{2}{3} = (\frac{9}{1} \times \frac{3}{2} = \frac{27}{2} = 13\frac{1}{2})$
4. $4 \div \frac{6}{10} = (\frac{4}{1} \times \frac{10}{6} = \frac{20}{3} = 6\frac{2}{3})$
5. $12 \div \frac{3}{4} = (\frac{12}{1} \times \frac{4}{3} = \frac{16}{1} = 16)$

Additional Exercise

Do these.

1. $10 \div \frac{2}{5} = (\frac{10}{1} \times \frac{5}{2} = 25)$
2. $15 \div \frac{1}{3} = (\frac{15}{1} \times \frac{3}{1} = 45)$
3. $9 \div \frac{3}{4} = (\frac{9}{1} \times \frac{4}{3} = 12)$
4. $18 \div \frac{4}{9} = (\frac{18}{1} \times \frac{9}{4} = \frac{81}{2} = 40\frac{1}{2})$
5. $8 \div \frac{1}{4} = (\frac{8}{1} \times \frac{4}{1} = 32)$

Lesson 9: Division of Fractions by Fractions

Outcome

Divide fractions by fractions.

Teaching for Understanding

Write $\frac{1}{2} \div \frac{1}{3}$ on the blackboard. Demonstrate how to work it out. For example:

$$\frac{1}{2} \div \frac{1}{3}$$

Change \div into \times and reverse $\frac{1}{3}$.

$$\frac{1}{2} \times \frac{3}{1}$$

Multiply numerators together and denominators together.

$$\frac{3}{2}$$

Divide 2 into 3.

$$= 1 \frac{1}{2}$$

Do another example so that the children can follow the steps correctly.

Group Work

In groups of five, children solve these problems together.

$$1. \quad \frac{3}{5} \div \frac{4}{10} = \left(\frac{3}{5} \times \frac{10}{4} = \frac{30}{20} = 1 \frac{1}{2} \right)$$

$$4. \quad \frac{2}{3} \div \frac{1}{9} = \left(\frac{2}{3} \times \frac{9}{1} = 6 \right)$$

$$2. \quad \frac{7}{8} \div \frac{1}{4} = \left(\frac{7}{8} \times \frac{4}{1} = \frac{7}{2} = 3 \frac{1}{2} \right)$$

$$5. \quad \frac{1}{2} \div \frac{15}{20} = \left(\frac{1}{2} \times \frac{20}{15} = \frac{10}{15} \right)$$

$$3. \quad \frac{1}{6} \div \frac{3}{24} = \left(\frac{1}{6} \times \frac{24}{3} = \frac{4}{3} = 1 \frac{1}{3} \right)$$

The teacher makes sure group members are actively involved in the discussion.

Individual Application

Work out the quotient.

$$1. \quad \frac{1}{2} \div \frac{1}{3} = \left(\frac{1}{2} \times \frac{3}{1} = \frac{3}{2} = 1 \frac{1}{2} \right)$$

$$6. \quad \frac{3}{4} \div \frac{1}{2} = \left(\frac{3}{4} \times \frac{2}{1} = \frac{3}{2} = 1 \frac{1}{2} \right)$$

$$2. \quad \frac{1}{4} \div \frac{1}{2} = \left(\frac{1}{4} \times \frac{2}{1} = \frac{1}{2} \right)$$

$$7. \quad \frac{7}{10} \div \frac{7}{10} = \left(\frac{7}{10} \times \frac{10}{7} = 1 \right)$$

$$3. \quad \frac{1}{3} \div \frac{1}{2} = \left(\frac{1}{3} \times \frac{2}{1} = \frac{2}{3} \right)$$

$$8. \quad \frac{2}{3} \div \frac{4}{5} = \left(\frac{2}{3} \times \frac{5}{4} = \frac{5}{6} \right)$$

$$4. \quad \frac{1}{2} \div \frac{1}{4} = \left(\frac{1}{2} \times \frac{4}{1} = 2 \right)$$

$$9. \quad \frac{3}{10} \div \frac{3}{4} = \left(\frac{3}{10} \times \frac{4}{3} = \frac{2}{5} \right)$$

$$5. \quad \frac{2}{5} \div \frac{2}{3} = \left(\frac{2}{5} \times \frac{3}{2} = \frac{3}{5} \right)$$

$$10. \quad \frac{4}{5} \div \frac{7}{10} = \left(\frac{4}{5} \times \frac{10}{7} = \frac{8}{7} = 1 \frac{1}{7} \right)$$

Additional Exercise

Match the division statements with the answers.

1. $\frac{3}{10} \div \frac{1}{5}$	
2. $\frac{3}{10} \div \frac{3}{4}$	
3. $\frac{4}{8} \div \frac{1}{4}$	
4. $\frac{6}{15} \div \frac{3}{5}$	
5. $\frac{3}{4} \div \frac{3}{24}$	

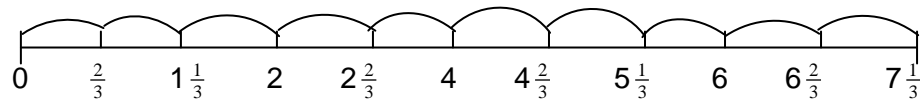
Lesson 10: Assessment

Group Work

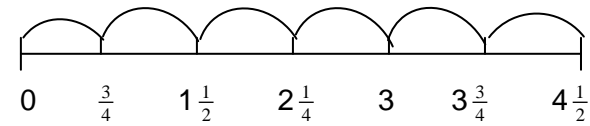
Put children in groups of five or more.

Using a number line solve these problems on a chart.

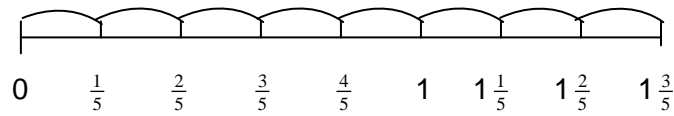
1. $\frac{2}{3} \times 8$



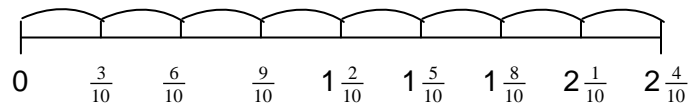
2. $\frac{3}{4} \times 4$



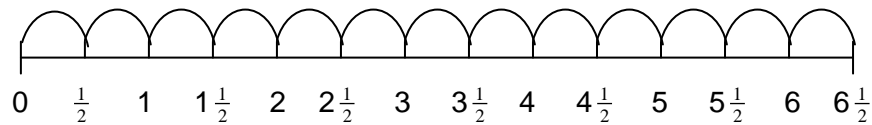
3. $\frac{1}{5} \times 6$



4. $\frac{3}{10} \times 5$



5. $\frac{1}{2} \times 9$



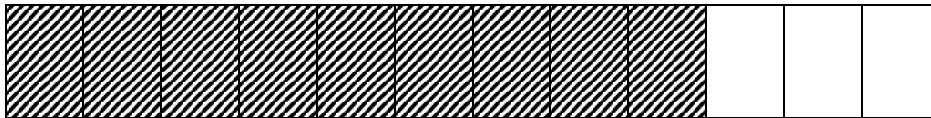
Individual Application

1. Use a diagram to find the product of.

a) $\frac{1}{3} \times 9 = \mathbf{(3)}$



b) $\frac{3}{4} \times 12 = \mathbf{(9)}$



2. Calculate.

a) $\frac{3}{5} \times 6 = \left(\frac{18}{5} = 3\frac{3}{5} \right)$

d) $\frac{8}{12} \times \frac{4}{10} = \left(\frac{8}{3} \times \frac{1}{10} = \frac{4}{15} \right)$

b) $\frac{2}{3} \times 12 = \mathbf{(8)}$

e) $\frac{5}{8} \times \frac{1}{5} = \left(\frac{1}{8} \right)$

c) $\frac{4}{10} \times \frac{1}{5} = \left(\frac{4}{50} \right)$

3. Find the quotient.

a) $5 \div \frac{2}{3} = \left(\frac{5}{1} \times \frac{3}{2} = \frac{15}{2} = 7\frac{1}{2} \right)$

b) $12 \div \frac{6}{20} = \left(\frac{12}{1} \times \frac{20}{6} = 40 \right)$

c) $\frac{4}{10} \div \frac{1}{4} = \left(\frac{4}{10} \times \frac{4}{1} = \frac{16}{10} = 1\frac{3}{5} \right)$

d) $\frac{8}{10} \div \frac{2}{5} = \left(\frac{8}{10} \times \frac{5}{2} = \frac{4}{10} \times \frac{5}{1} = \frac{4}{2} = 2 \right)$

e) $9 \div \frac{3}{16} = \left(\frac{9}{1} \times \frac{16}{3} = 48 \right)$

UNIT 9: CAPACITY AND MASS

Lesson 1: Measuring Capacity in Litres and Millilitres

Outcome

Identify a litre and a millilitre as units for measuring capacity.
Measure capacity.

Teaching Aids

Measuring containers, water, empty containers

Teaching for Understanding

Assemble children in the front. Introduce a litre container. Discuss the marks on the container. That is, millilitres and litre. Pass around the container for the children to have a close look at the marks or labels. Having looked at the containers, children should have a clear understanding that 1000 mls. = 1litre. Measure one litre of water and pour it into one container. Measure 10 mls. and pour it into another container. Allow the children to compare the two amounts of water.

Group Work

Put children in small groups of five or more.
Provide each group with a litre container, a container of water and empty containers.
Measure and pour into different containers the following amounts.

- | | | |
|-------------|------------|------------|
| 1. 1 litre. | 2. 50 mls. | 3. 10 mls. |
| 4. 70 mls. | 5. 30 mls. | |

Groups present their findings.

Individual Application

Using a litre measure, find out how much water these containers hold.

1. a coffee bottle (small)
2. a milk can (small)
3. a curried chicken tin

Additional Exercise

Answer these questions.

1. If one coffee jar holds 700 mls, of water, how much will two bottles hold?
(1 400 ml. = 1 litre 400 ml.)
2. If one milk tin holds 1litre 50 mls. of water, work out how much water two cans hold. **(2 litres, 100 ml.)**
3. If one curried chicken tin holds 550 mls. of water, how much do 5 tins hold?
(1 100 ml. = 1 litre, 100 ml.)
4. Mum had 3 litres of toddy. She filled 3 bottles with the toddy. How much toddy was there in one bottle? **(1 litre)**
5. If a container holds 1 litre and 30 mls., how much does half a container hold? **(515 ml.)**

Lesson 2: Converting Litres into Millilitres and Vice Versa

Outcome

Convert and express litres in millilitres and vice versa.

Teaching Aids

As in Lesson 1.

Teaching for Understanding

Briefly review yesterday's work by allowing 10 minutes for children in groups to measure water. By doing so, children will have a better understanding of the concept of litre and ml. Then invite children to sit together in front again. Show a litre measuring container and ask, how many mls. are there in this container? How many litres? Is 1000 mls. the same as 1 litre? How many mls. Are there in half a litre? How many mls. in 2 litres? and so on.

Group Work

Put children in their groups.

Group members work together to answer these questions.

1. How many mls. Are there in $2\frac{1}{2}$ litres? **(2 500)**
2. How many litres are there in 2500 mls.? **($2\frac{1}{2}$)**
3. How many litres are there in 2000 mls.? **(2)**
4. How many mls. Are there in half a litre? **(500)**
5. How many mls. Are there in 2 litres? **(2 000)**

Individual Application

Fill in the blanks.

$$1000 \text{ mls.} = \boxed{} \text{ litres. } \mathbf{(1)}$$

$$2\frac{1}{2} \text{ litres} = \boxed{} \text{ mls. } \mathbf{(2\ 500)}$$

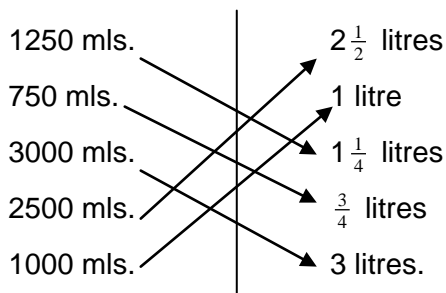
$$500 \text{ mls.} = \boxed{} \text{ litres. } \mathbf{(\frac{1}{2})}$$

$$1500 \text{ mls} = \boxed{} \text{ litres. } \mathbf{(1\frac{1}{2})}$$

$$4 \text{ litres} = \boxed{} \text{ mls. } \mathbf{(4\ 000)}$$

Additional Exercise

Match the litres with the correct number of millilitres.



Lesson 3: Measuring Mass with Grams and Kilograms

Outcome

Identify kilogram (kg) and grams (g) as units for measuring mass.
Measure mass.
Compare kilograms with pounds (lbs.).

Teaching Aids

Scales, objects to be weighed.

Teaching for Understanding

Invite the children to the front so that they can all see the scales properly. Put a scale on the table and ask, What is this called? (scales). What is it used for? (measuring mass). Have you seen one before? Good, how I want you to look closely at the marks and numbers on the scale face. What do you see? (Red and black marks and numbers.) The red marks show measurements in kilograms and the black marks show measurements in pounds. How many pounds equal 1 kg? (2.2 lbs).

Today we are going to weigh things in kg. and g. only. Put one object on the scale and let the children tell you the mass. Help if they are stuck. Record the answer on the blackboard. Measure the mass of two or more objects to help children become confident in using a scale.

Group Work

Put children in groups of five.
Ask them to measure and record the mass of any three objects.
If there is only one scale, groups can use the scale in turns.
Groups present their findings.

Individual Application

Find one object and weigh it.
Record the mass and show it to the teacher.
(Children may line up to the scale to avoid chaos).

Additional Exercise

Answer these questions.

1. If a book weighs 55 grams, what is the mass of 2 books of the same size?
2. A coconut weighs 1.5 kg. What is the mass of 3 coconuts of the same size?
3. 1 kg. = 2.2 lbs.
2 kg. = lbs. **(4.4 lbs.)**
4. kg. = 6.6 lbs. **(3 kg.)**
5. $\frac{1}{2}$ kg. = lbs. **(1.1 lb.)**

Lesson 4: Converting Kilograms into Grams and Vice Versa

Outcome

Express kilograms in grams and vice versa.
Measure the capacity and the mass of water and compare.

Teaching for Understanding

As in Lesson 3.

Teaching for Understanding

Ask, what is a unit of measurement for mass? (kg., g.) How many grams equals 1kg.? (1000) Who can work out the number of grams in $\frac{1}{2}$ kg.? How many grams are there in 2kg.? During the questioning make sure everyone is involved. Encourage the passive children to speak up. Just before group work, measure 1 litre of water and pour into the scale plate. Remove, then do the same with 10 mls. of water. What do you find? (1 litre of water weighs 1kg.), (10 mls. of water weighs 10 grams.) Then, what will 1 ml. of water weigh? (1g.).

Group Work

In the same group as yesterday, children prove the fact that 1ml. of water weighs 1 gram. Groups have the scale in turns. They report their findings.

Individual Application

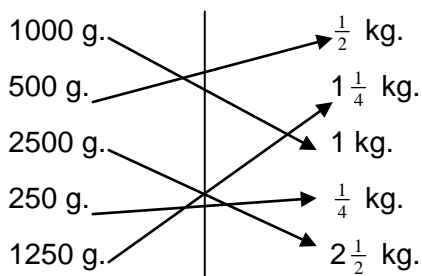
Fill in the blanks.

Example: 10 mls. of water = 10 gram

- 20 mls of water = gram **(20 grams)**
- mls. of water = 15 grams **(15 mls.)**
- 1 litre of water = kg. **(1 kg.)**
- litres of water = 2 kg. **(2 kg.)**
- 30 mls. of water = g. **(30 g.)**

Additional Exercise

Match the kilograms with the correct number of grams.



Lesson 5: Assessment

Group Work

Put children in groups of six.

Provide each group with a litre measurement and a container of water.

Measure these amounts of water.

1. 1 litre
2. $1\frac{1}{4}$ litres
3. $\frac{1}{2}$ litres

Check each measurement and give points to the groups.

Individual Application

A. Answer these questions.

1. How many grams are there in 1 kg.? **(1 000 grams)**
2. How many grams are there in $1\frac{1}{2}$ kg.? **(1 500 grams)**
3. How many millilitres are there in 2 litres? **(2 000 ml.)**
4. How many millilitres are there in $\frac{1}{2}$ litre? **(500 ml.)**
5. How many litres are there in 2500 mls.? **($2\frac{1}{2}$ litres)**

B. Fill in the blanks.

1. mls. of water = 10 grams. **(10)**
2. 35 mls. of water = grams. **(35)**
3. mls. of water = 700 grams. **(700)**
4. 750 mls. of water = grams. **(750)**
5. 800 mls. of water = grams. **(800)**

C. Find any one object.

Measure and record the mass.

Show the object and the mass to the teacher.

UNIT 10: MORE ON THE MULTIPLICATION AND DIVISION OF FRACTIONS

Lesson 1: Multiplication of Fractions

Outcome

Multiply fractions.
Simplify products.

Teaching Aids

Chart, fraction equation cards (multiplication)

Revision

Write $\frac{3}{5} \times \frac{1}{4}$ on the blackboard. Solve the problem together with the children on the blackboard following these steps.

Step 1: Look for figures to simplify and simplify.

Step 2: Multiply numerators together and denominators together.

For example: $\frac{5}{12} \times \frac{4}{5}$ Simplify – Divide 12 and 4 by 4.
Divide 5 and 5 by 5.
 $= \frac{1}{3} \times \frac{1}{1}$ Multiply numerator by numerator and
Multiply denominator by denominator.
 $= \frac{1}{3}$

Group Work

Put children into 3 groups or more if you have a big class.

Provide each group with a card with a fraction equation on it, such as $\frac{1}{3} \times \frac{2}{5}$.

Children sing 'Row, row, row your boat' and pass the cards from group to group.

When the song ends, each group works out the problem and writes the answer on blackboard. The first group to get the answer correctly gains a point.

Individual Application

Work out these.

1. $\frac{1}{3}$ of 27 ($\frac{1}{3} \times \frac{27}{1} = \frac{27}{3} = 9$)
2. $7 \times \frac{3}{10}$ ($\frac{7}{1} \times \frac{3}{10} = \frac{21}{10} = 2\frac{1}{10}$)
3. $6 \times \frac{2}{3}$ ($\frac{6}{1} \times \frac{2}{3} = \frac{4}{1} = 4$)
4. $\frac{3}{8} \times 24$ ($\frac{3}{8} \times \frac{24}{1} = \frac{9}{1} = 9$)
5. $5 \times \frac{2}{5}$ ($\frac{5}{1} \times \frac{2}{5} = \frac{2}{1} = 2$)

Additional Exercise

Solve:

1. $\frac{3}{4} \times 16$ ($\frac{3}{4} \times \frac{16}{1} = 3 \times 4 = 12$)
2. $\frac{2}{5} \times 45$ ($\frac{2}{5} \times \frac{45}{1} = 2 \times 15 = 30$)
3. $\frac{2}{3} \times 27$ ($\frac{2}{3} \times \frac{27}{1} = 2 \times 9 = 18$)
4. $\frac{3}{4} \times 24$ ($\frac{3}{4} \times \frac{24}{1} = 3 \times 6 = 18$)
5. $7 \times \frac{3}{5}$ ($\frac{7}{1} \times \frac{3}{5} = \frac{21}{5} = 4\frac{1}{5}$)
6. $5 \times \frac{7}{10}$ ($\frac{5}{1} \times \frac{7}{10} = \frac{7}{2} = 3\frac{1}{2}$)
7. $4 \times \frac{3}{5}$ ($\frac{4}{1} \times \frac{3}{5} = \frac{12}{5} = 2\frac{2}{5}$)
8. $8 \times \frac{4}{5}$ ($\frac{8}{1} \times \frac{4}{5} = \frac{32}{5} = 6\frac{2}{5}$)
9. $6 \times \frac{3}{4}$ ($\frac{6}{1} \times \frac{3}{4} = \frac{9}{2} = 4\frac{1}{2}$)
10. $9 \times \frac{4}{5}$ ($\frac{9}{1} \times \frac{4}{5} = \frac{36}{5} = 7\frac{1}{5}$)

Lesson 2: Division of Fractions

Outcome

Divide fractions according to the rule.

Teaching Aids

Teaching for Understanding

Sit children in front. Demonstrate how to divide fractions. Write on the blackboard $\frac{7}{8} \div \frac{3}{4}$.

Step 1: Change \div to \times and reverse the number after \div .

$$\rightarrow \frac{7}{8} \times \frac{4}{3}$$

Step 2: Look for numbers that can be simplified and simplify.

$$\rightarrow \frac{7}{8} \times \frac{4}{3} \quad \text{Divide 8 and 4 by 4.}$$

Step 3: Multiply numerators together and denominators together.

$$\rightarrow \frac{7}{2} \times \frac{1}{3} = \frac{7}{6}$$

Step 4: Change improper fraction to mixed number.

$$\rightarrow \frac{7}{6} = 1 \frac{1}{6}$$

Answer = $1 \frac{1}{6}$

You may do another example if needed.

Group Work

Put children in groups of five or any size you prefer.

Group members to work together to solve these problems.

1. $\frac{5}{8} \div \frac{1}{4} \quad \left(\frac{5}{8} \times \frac{4}{1} = \frac{5}{2} = 2 \frac{1}{2} \right)$

2. $\frac{3}{4} \div \frac{2}{3} \quad \left(\frac{3}{4} \times \frac{3}{2} = \frac{9}{8} = 1 \frac{1}{8} \right)$

3. $\frac{6}{7} \div \frac{2}{7} \quad \left(\frac{6}{7} \times \frac{7}{2} = \frac{6}{2} = 3 \right)$

4. $\frac{2}{5} \div \frac{4}{5} \quad \left(\frac{2}{5} \times \frac{5}{4} = \frac{2}{4} = \frac{1}{2} \right)$

Individual members write their own answers. Move around making sure all group members contribute to the discussion.

Individual Application

Solve and simplify.

$$1. \quad \frac{5}{8} \div \frac{1}{4} \quad \left(\frac{5}{8} \times \frac{4}{1} = \frac{5}{2} = 2\frac{1}{2} \right)$$

$$2. \quad \frac{5}{6} \div \frac{1}{3} \quad \left(\frac{5}{6} \times \frac{3}{1} = \frac{5}{2} = 2\frac{1}{2} \right)$$

$$3. \quad \frac{1}{6} \div \frac{1}{4} \quad \left(\frac{1}{6} \times \frac{4}{1} = \frac{2}{3} \right)$$

$$4. \quad \frac{1}{5} \div \frac{3}{4} \quad \left(\frac{1}{5} \times \frac{4}{3} = \frac{4}{15} \right)$$

$$5. \quad \frac{1}{2} \div \frac{3}{5} \quad \left(\frac{1}{2} \times \frac{5}{3} = \frac{5}{6} \right)$$

$$6. \quad \frac{4}{7} \div \frac{8}{14} \quad \left(\frac{4}{7} \times \frac{14}{8} = \frac{2}{2} = 1 \right)$$

Additional Exercise

Fill in the missing number.

$$1. \quad \frac{2}{3} \div \frac{4}{9}$$

$$= \frac{2}{3} \times \frac{9}{4}$$

$$= \frac{1 \times 3}{1 \times 2}$$

$$= \frac{2}{3}$$

$$= 1\frac{1}{2}$$

$$2. \quad \frac{15}{18} \div \frac{3}{9}$$

$$= \frac{15}{18} \times \frac{9}{3}$$

$$= \frac{5 \times 2}{1 \times 1}$$

$$= \frac{10}{1}$$

$$= 10$$

$$3. \quad \frac{3}{5} \div \frac{2}{5}$$

$$= \frac{3}{5} \times \frac{5}{2}$$

$$= \frac{3 \times 1}{1 \times 2}$$

$$= \frac{3}{2}$$

$$= 1\frac{1}{2}$$

Lesson 3: Division of Whole Numbers by Fractions

Outcome

Divide whole numbers by fractions.
Rename whole numbers as fractions.
Identify a reciprocal number.

Teaching Aids

Teaching for Understanding

Allow the children to sit in front where they can see the blackboard. Write $4 \div \frac{1}{2}$ on the blackboard. Demonstrate the steps involved such as:

$4 \div \frac{1}{2}$ Express 4 as an improper fraction.

$\frac{4}{1} \div \frac{1}{2}$ Change \div to \times and reverse $\frac{1}{2}$.

$\frac{4}{1} \times \frac{2}{1}$ Multiply numerators together and denominators together.

$\frac{8}{1}$ Divide numerator by denominator.

8 = Answer

Explain to the children that when reversing $\frac{2}{3}$ it becomes $\frac{3}{2}$. Thus, $\frac{3}{2}$ is the reciprocal of $\frac{2}{3}$. The reciprocal of $\frac{4}{7}$ is $\frac{7}{4}$ and so on.

Group Work

Put children in groups of five.
They will solve these problems together.

1. $3 \div \frac{1}{2}$ 2. $14 \div \frac{1}{5}$ 3. $5 \div \frac{1}{10}$

The teacher visits each group and assists.

Individual Application

1. Write the reciprocals of these numbers.

- a) $\frac{2}{8}$ $(\frac{8}{2})$ d) $\frac{1}{10}$ $(\frac{10}{1})$
b) $\frac{2}{13}$ $(\frac{13}{2})$ e) 4 $(\frac{1}{4})$
c) 9 $(\frac{1}{9})$

2. Solve

- a) $16 \div \frac{3}{4}$ $(\frac{16}{1} \times \frac{4}{3} = \frac{64}{3} = 21\frac{1}{3})$
b) $\frac{1}{10} \div \frac{1}{5}$ $(\frac{1}{10} \times \frac{5}{1} = \frac{5}{10} = \frac{1}{2})$
c) $12 \div \frac{1}{3}$ $(\frac{12}{1} \times \frac{3}{1} = 36)$
d) $\frac{3}{4} \div \frac{3}{8}$ $(\frac{3}{4} \times \frac{8}{3} = \frac{24}{12} = 2)$
e) $\frac{4}{10} \div \frac{1}{5}$ $(\frac{4}{10} \times \frac{5}{1} = \frac{4}{2} = 2)$

Additional Exercise

$$1. \quad 25 \div \frac{3}{4} \quad \left(\frac{25}{1} \times \frac{4}{3} = \frac{100}{3} = 33\frac{1}{3} \right)$$

$$2. \quad \frac{7}{8} \div \frac{2}{3} \quad \left(\frac{7}{8} \times \frac{3}{2} = \frac{21}{16} = 1\frac{5}{16} \right)$$

$$3. \quad 5 \div \frac{1}{2} \quad \left(\frac{5}{1} \times \frac{2}{1} = \frac{21}{16} \right)$$

$$4. \quad \frac{4}{5} \div \frac{2}{5} \quad \left(\frac{4}{5} \times \frac{5}{2} = 2 \right)$$

$$5. \quad \frac{9}{10} \div \frac{3}{5} \quad \left(\frac{9}{10} \times \frac{5}{3} = \frac{3}{2} = 1\frac{1}{2} \right)$$

Lesson 4: Problem Solving Involving Multiplication and Division of Fractions

Outcome

Solve simple problems.

Carry out multiplication and division of fractions.

Teaching Aids

Problem chart.

Teaching for Understanding

Invite the children to the front. Show a problem chart and allow children to read several times. For example:

The 20 pupils in Rutena's class voted to choose the day for a class picnic.
 $\frac{3}{4}$ voted for Saturday. How many voted for Saturday?

Demonstrate how to solve the problem using the four steps namely, tell, show, solve and answer.

Step 1: (Tell) 20 pupils
 $\frac{3}{4}$ voted for Saturday.
How many voted for Saturday?

Step 2: (Show) $\frac{3}{4} \times 20 = \square$

Step 3: (Solve) $\frac{3}{4} \times \frac{20}{1} = \frac{12}{1} = 12$

Step 4: (Answer) 12 pupils voted for Saturday.

Group Work

Put children in groups of five.

Using the prescribed steps to solve these problems.

1. The cost of renting a house is \$120.00. Tebao's friends paid $\frac{2}{3}$ of the cost.
How much did Tebao's friends pay?

Step 1: (Tell) Rent \$120.00
Tebao's friends paid $\frac{2}{3}$.
How much did they pay?

Step 2: (Show) $\frac{2}{3} \times 120$

Step 3: (Solve) $\frac{2}{3} \times \frac{120}{1} = \frac{80}{1} = 80$

Step 4: (Answer) Tebao's friends paid \$80.00.

3. Berebere made 2 apple cakes. She cut the cakes into quarters.

How many shares did she make?

- Step 1: (Tell) 2 apple cakes
 Cut into $\frac{1}{4}$
 How many shares?
- Step 2: (Show) $2 \div \frac{1}{4}$
- Step 3: (Solve) $\frac{2}{1} \times \frac{4}{1} = 8$
- Step 4: (Answer) There were 8 shares.

Individual Application

Follow the four steps to solve these problems.

1. Roiti made a custard-pie for her family. She had $\frac{3}{4}$ of it left. She decided to divide it into 9 equal parts to serve at morning tea. How big was one piece?

- Step 1: (Tell) $\frac{3}{4}$ custard pie
 Divide into 9 equal pieces.
 How big is one piece?
- Step 2: (Show) $\frac{3}{4} \div 9$
- Step 3: (Solve) $\frac{3}{4} \times \frac{1}{9} = \frac{3}{36} = \frac{1}{12}$
- Step 4: (Answer) One piece was $\frac{1}{12}$ of a custard pie.

2. There are 45 trees in Bitu's land. He decide to cut down $\frac{2}{3}$. How many were cut down?

- Step 1: (Tell) 45 trees
 Cut down $\frac{2}{3}$.
 How many cut down?
- Step 2: (Show) $45 \times \frac{2}{3}$
- Step 3: (Solve) $\frac{45}{1} \times \frac{2}{3} = \frac{15}{1} \times \frac{2}{1} = 30$
- Step 4: (Answer) 30 trees were cut down.

3. Myrose bought a book with 90 pages. She read $\frac{4}{9}$ of the pages. How many pages did she read?

- Step 1: (Tell) Book with 90 pages
 Read $\frac{4}{9}$
 How many pages read?
- Step 2: (Show) $90 \times \frac{4}{9}$
- Step 3: (Solve) $\frac{90}{1} \times \frac{4}{9} = 10 \times 4 = 40$
- Step 4: (Answer) She read 40 pages.

Additional Exercise

Do these.

1. Anturu worked $\frac{1}{2}$ an hour overtime every day for 5 days. How many hours overtime did he work?

Step 1: (Tell) **Worked $\frac{1}{2}$ hr. overtime**
 5 days
 How many hours overtime?

Step 2: (Show) $\frac{1}{2} \times 5$

Step 3: (Solve) $\frac{1}{2} \times \frac{5}{1} = 2\frac{1}{2}$

Step 4: (Answer) **Anturu worked $2\frac{1}{2}$ hours overtime.**

2. Nowi bought 6 cans of drink for her picnic. Each can contained $\frac{1}{4}$ litre. How many litres of drink did he have?

Step 1: (Tell) **6 cans of drink**
 1 can = $\frac{1}{4}$
 How many litres of drink?

Step 2: (Show) $6 \times \frac{1}{4}$

Step 3: (Solve) $\frac{6}{1} \times \frac{1}{4} = 1\frac{2}{4} = 1\frac{1}{2}$

Step 4: (Answer) **There were $1\frac{1}{2}$ litres of drink.**

3. Complete these.

- a. $3 \times \frac{3}{4} = \frac{\quad}{4}$ **($3 \times \frac{3}{4} = \frac{9}{4}$)**
 $= \dots\dots$ **$= 2\frac{1}{4}$**
- b. $5 \times \frac{4}{5} = \frac{\quad}{5}$ **($5 \times \frac{4}{5} = \frac{20}{5}$)**
 $= \dots\dots$ **$= 4$**
- c. $5 \times \frac{2}{3} = \frac{\quad}{3}$ **($5 \times \frac{2}{3} = \frac{10}{3}$)**
 $= \dots\dots$ **$= 3\frac{1}{3}$**

Lesson 5: Assessment

Group Work

Put children in groups of five or more.

Solve these problems together.

1. $8 \times \frac{4}{5}$ ($\frac{32}{5} = 6\frac{2}{5}$)

2. $7 \times \frac{1}{3}$ ($\frac{7}{3} = 2\frac{1}{3}$)

3. $9 \times \frac{1}{2}$ ($\frac{9}{2} = 4\frac{1}{2}$)

4. $\frac{3}{5} \times 60$ ($3 \times 12 = 36$)

5. $\frac{2}{3} \times 12$ ($2 \times 4 = 8$)

Make sure all group members contribute to the group work.

Individual Application

1. Work out the product.

a) $\frac{3}{4} \times 45$ ($\frac{135}{4} = 33\frac{3}{4}$)

b) $9 \times \frac{1}{3}$ (**3**)

c) $9 \times \frac{1}{2}$ ($\frac{9}{2} = 4\frac{1}{2}$)

d) $\frac{2}{3} \times 24$ (**$2 \times 8 = 16$**)

e) $\frac{3}{4} \times \frac{2}{5}$ ($\frac{6}{20} = \frac{3}{10}$)

2. Find the quotient.

a) $8 \div \frac{1}{4}$ (**$8 \times 4 = 32$**)

b) $\frac{4}{5} \div \frac{1}{5}$ ($\frac{4}{5} \times \frac{5}{1} = 4$)

c) $\frac{6}{10} \div 2$ ($\frac{6}{10} \times \frac{1}{2} = \frac{3}{10}$)

d) $10 \div \frac{3}{4}$ (**$10 \times \frac{4}{3} = \frac{40}{3} = 13\frac{1}{3}$**)

e) $\frac{3}{4} \div \frac{1}{2}$ ($\frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = 1\frac{1}{2}$)

3. Teebira and Teaau planted trees. They had 45 trees and only $\frac{2}{3}$ of the trees were planted. How many trees were planted?

Step 1: (Tell) **45 trees**
 $\frac{2}{3}$ were planted
 How many planted?

Step 2: (Show) **$45 \times \frac{2}{3}$**

Step 3: (Solve) **$\frac{45}{1} \times \frac{2}{3} = \frac{90}{3} = 30$**

Step 4: Answer) They planted 30 trees.

4. There were 24 bananas in the cupboard. $\frac{3}{4}$ were eaten by the cat. How

many were eaten?

- | | |
|--------------------------|---|
| Step 1 : (Tell) | 24 bananas
Cat ate
How many eaten ? |
| Step 2 : (Show) | $24 \times \frac{3}{4}$ |
| Step 3 : (Solve) | $\frac{24}{1} \times \frac{3}{4} = \frac{72}{4} = 18$ |
| Step 4 : (Answer) | The cat ate 18 bananas. |