OXFORD
UNIVERSITY PRESS

PRIMARY MATHEMATICS 4

STUDENTS' COURSE BOOK

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ADDENDUM

ARMY PUBLIC SCHOOLS & COLLEGES SYSTEM

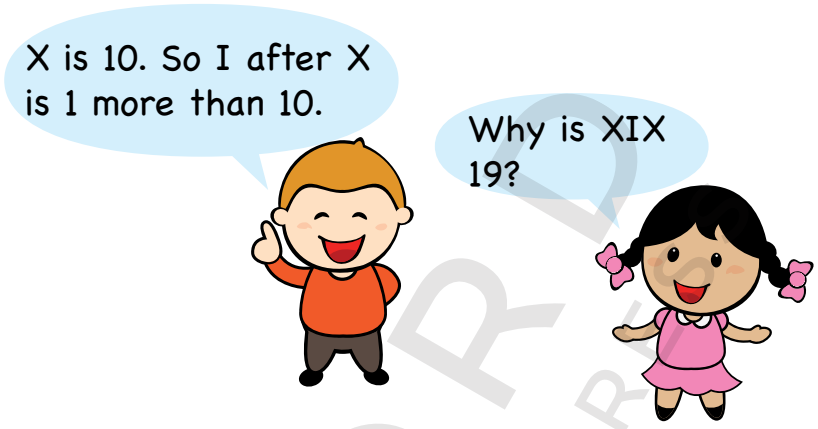
Contents

Students' Learning Outcome:
- Read and write Roman numbers up to 100.

ROMAN NUMBERS

1. Write the Roman numerals for 11 to 19.

XI	11
XII	12
XIII	13
XIV	14
XV	15
XVI	16
XVII	17
XVIII	18
XIX	19

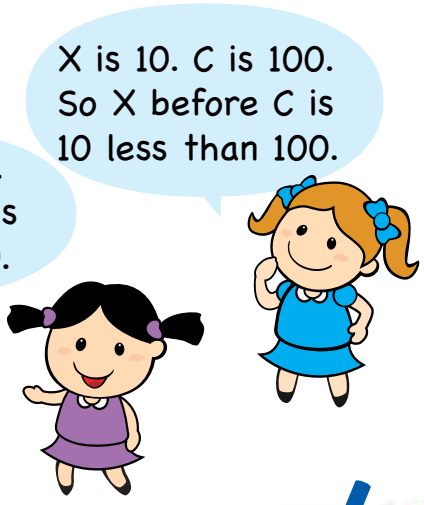


2. The Roman numerals for numbers to 100 make use of other letters.

XX	20
XXX	30

XL	40
L	50
LX	60
LXX	70
LXXX	80

XC	90
C	100



3. What number does XXXIX represent?

XXX = _____ and IX = _____

XXXIX represents _____.

PRACTICE

1. The Gregorian calendar is named after Pope Gregory XIII.
What number does XIII represent?

2. What numbers do these represent?

(a) XIV = _____ (b) XXV = _____ (c) LX = _____ (d) XCI = _____

3. Write the Roman numerals for these numbers.

(a) _____ = 19 (b) _____ = 43 (c) _____ = 75 (d) _____ = 99

Students' Learning Outcomes:

- Add and subtract up to 5 - digit numbers mentally and in written form (with and without regrouping) including:
  5 -digit numbers with 1-, 2-, 3- , 4 -0, and 5-digit numbers.
- Solve real-world word problems (including multi steps) involving addition and subtraction.

ADDITION AND SUBTRACTION

PRACTICE

1. Add.

(a)
$$\begin{array}{r} 36227 \\ +\quad\ 71 \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 82131 \\ +\quad\ 548 \\ \hline \end{array}$$

(c)
$$\begin{array}{r} 15421 \\ +80378 \\ \hline \end{array}$$

(d)
$$\begin{array}{r} 56927 \\ +43013 \\ \hline \end{array}$$

(e)
$$\begin{array}{r} 58232 \\ +\quad\ 95 \\ \hline \end{array}$$

(f)
$$\begin{array}{r} \quad\ 124 \\ +52466 \\ \hline \end{array}$$

(g)
$$\begin{array}{r} 32186 \\ +16045 \\ \hline \end{array}$$

(h)
$$\begin{array}{r} 38595 \\ +17657 \\ \hline \end{array}$$

2. Subtract.

(a)

$$\begin{array}{r} 85159 \\ -\quad\ 43 \\ \hline \end{array}$$

(b)

$$\begin{array}{r} 63215 \\ -\quad\ 104 \\ \hline \end{array}$$

(c)

$$\begin{array}{r} 59876 \\ -\ 47531 \\ \hline \end{array}$$

(d)

$$\begin{array}{r} 76274 \\ -\ 75087 \\ \hline \end{array}$$

3. Maleeha buys a mobile phone for Rs 36990 and a calculator for Rs 2600. She gives the cashier Rs 50000.
How much change will Maleeha receive?

4. A stamp collector has 8235 local stamps and 2505 foreign stamps. He sells 10330 of the stamps.
How many stamps does he have left?

5. There are 35150 fiction books in a school library.
There are 11500 more fiction books than non-fiction books.
How many fiction and non-fiction books are there in the library altogether?

Students' Learning Outcome:
- Differentiate among: proper fractions, improper fractions,and **mixed numbers**.

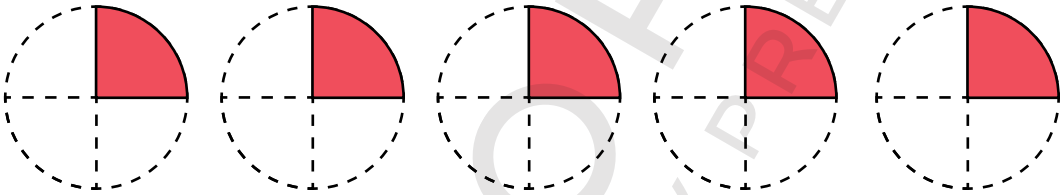
PROPER AND IMPROPER FRACTIONS

IN FOCUS

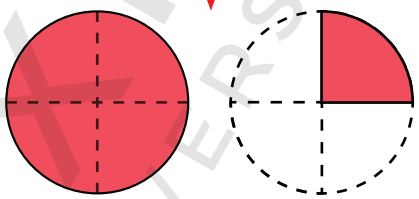
How many waffles are there?

LET'S LEARN

1.



$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$$



$$\frac{5}{4} = \frac{4}{4} + \frac{1}{4} = 1\frac{1}{4}$$

$\frac{5}{4}$ is an improper fraction.

Improper fractions are fractions where the numerator is greater than or equal to the denominator.

Proper fractions are fractions where the numerator is smaller than the denominator.

There are $\frac{5}{4}$ or 5 quarters of a waffle.

When we add a whole number to a fraction, we will get a **mixed number**.($1\frac{1}{4}$)

Students' Learning Outcome:
- Multiply two fractions and / or mixed numbers.

MULTIPLICATION OF TWO FRACTIONS AND/OR MIXED NUMBERS

1. Multiply.

(a) $3\frac{1}{2} \times 2\frac{1}{3}$

$\frac{7}{2} \times \frac{7}{3} = \frac{49}{6}$

$= 8\frac{1}{6}$

(b) $2\frac{2}{4} \times 1\frac{1}{2}$

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

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

(e) $\frac{2}{5} \times 1\frac{5}{6}$

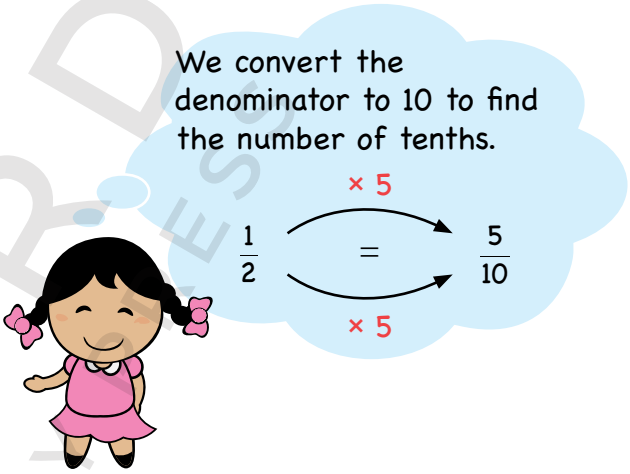
(f) $2\frac{1}{3} \times 5\frac{2}{4}$

Students' Learning Outcome:
- Recognise and write a quarter, a half, and three quarters to its decimal equivalents.

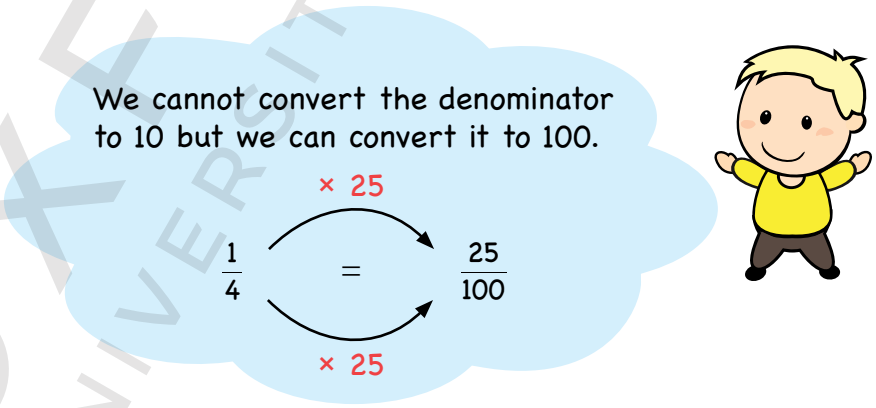
FRACTIONS AND DECIMALS

How do we write half, quarter, and three quarters as decimal?

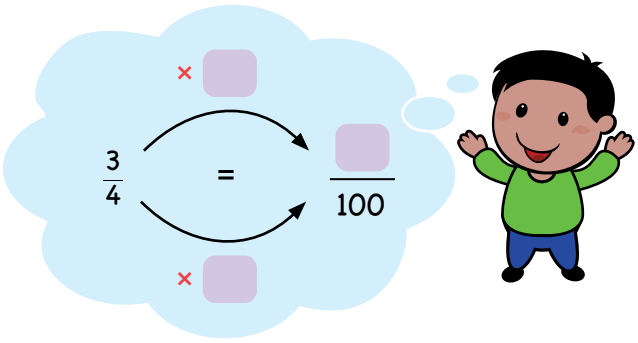
$$\text{half} = \frac{1}{2} = \frac{5}{10}$$
$$= 0.5$$



$$\text{quarter} = \frac{1}{4} = \frac{25}{100}$$
$$= 0.25$$



$$3 \text{ quarters} = \frac{3}{4} = \frac{\square}{100}$$
$$= \square$$

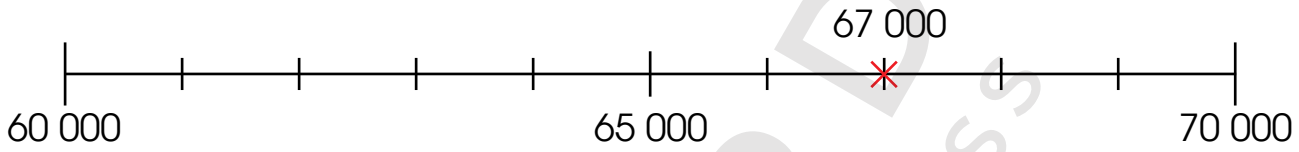


Students' Learning Outcome:
- Round off numbers to the nearest ten thousands.
- Round decimal numbers (with up to three decimal places to the nearest whole number and to one and two decimal places.

ROUNDING AND ESTIMATION

Rounding to nearest 10 000

1. Round 67 584 to the nearest ten thousand.

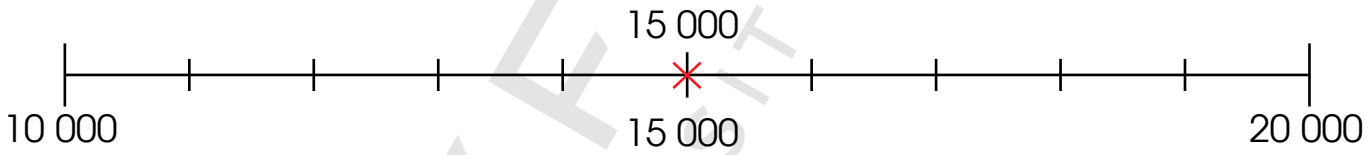


67 000 is between 60 000 and 70 000.

67 000 is nearer to _____ than to _____.

67 000 ≈ _____

2. Round 15 000 to the nearest thousand.



15 000 is exactly halfway between 10 000 and 20 000.

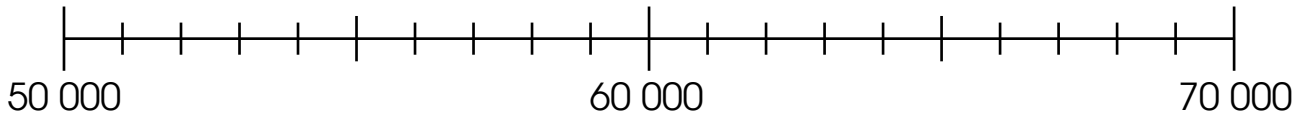
15 000 ≈ _____

3. Round each number to the nearest ten thousand.

(a) 38 562 ≈ _____

(b) 89 132 ≈ _____ (c) 79 860 ≈ _____

4. A number when rounded to the nearest ten thousand is 60 000.



(a) _____ is the smallest possible number.

(b) _____ is the greatest possible number.

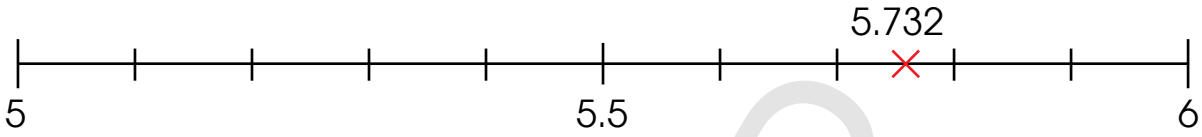
5. Round each number to the nearest ten thousand.

(a) 43 683 (b) 39 361

(c) 89 750 (d) 65 595

Rounding to nearest whole number

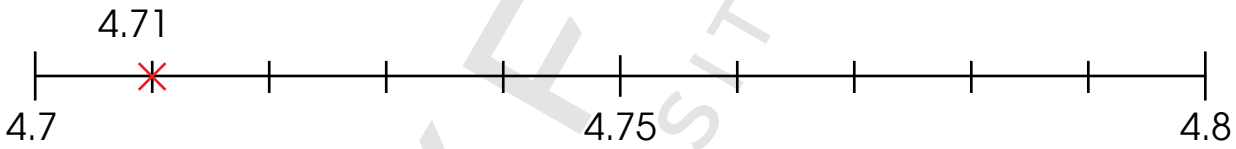
6. Round 5.732 to nearest whole number.



5.732 is between 5 and 6.
It is nearer to 6.
5.732 ≈ 6

Rounding to 1 decimal place

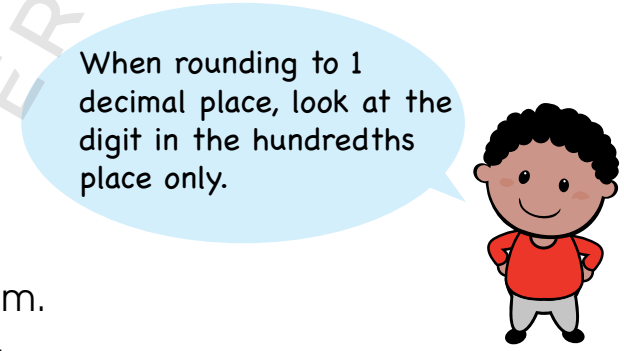
7. A giraffe has a height of 4.71 m.
What is its height when rounded to 1 decimal place?



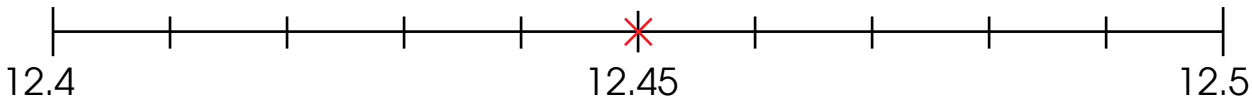
4.71 is between 4.7 and 4.8.
It is nearer to 4.7 than to 4.8.

4.71 ≈ 4.7

The giraffe's height is about 4.7 m.



8. Round 12.45 to the nearest tenth.



12.45 is exactly halfway between 12.4 and 12.5.

12.45 ≈ 12.5

9. Round 0.984 to 1 decimal place.

0.984 is between _____ and _____.

It is nearer to _____ than _____.

0.984 ≈ _____

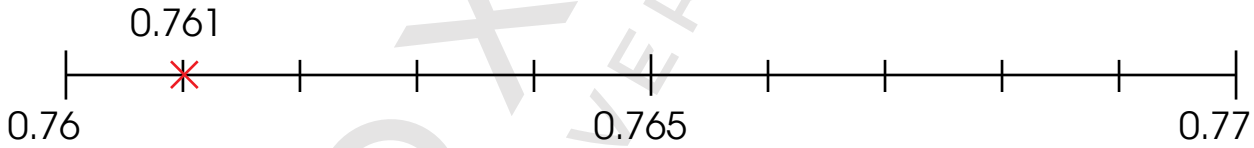
10. Round each decimal to the nearest tenth.

(a) 0.44 (b) 0.08

(c) 7.652 (d) 3.994

Rounding to 2 decimal places

11. A bottle contains 0.761 l of water.
Round the capacity to the nearest 0.01 l.

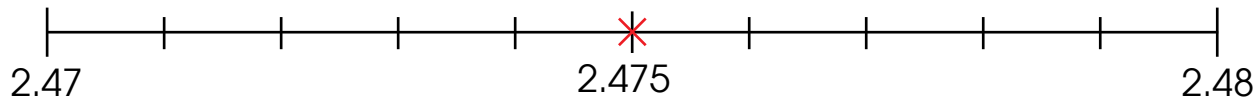


0.761 is between 0.76 and 0.77.
It is nearer to 0.76 than to 0.77.

0.761 ≈ 0.76

The capacity of water in the bottle is about 0.76 l.

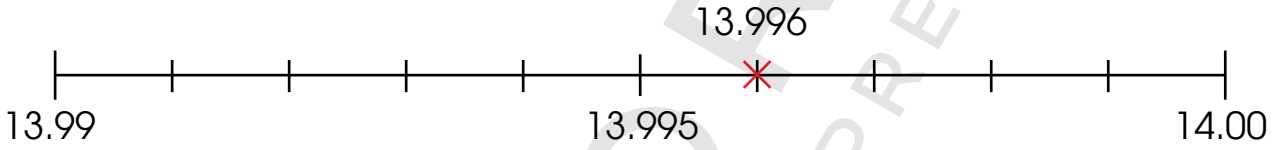
12. Round 2.475 to 2 decimal places.



2.475 is exactly halfway between 2.47 and 2.48.

2.475 ≈ 2.48

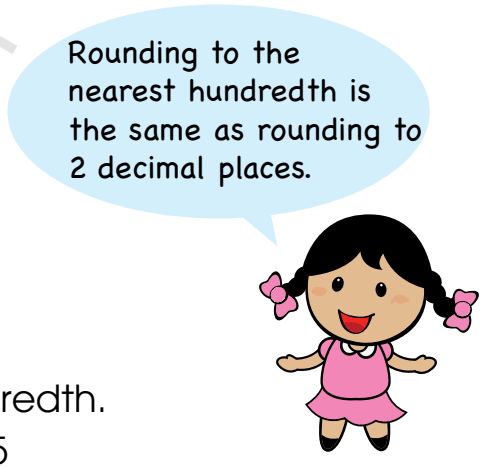
13. Round 13.996 to the nearest hundredth.



13.996 is between _____ and _____.

It is nearer to _____ than to _____.

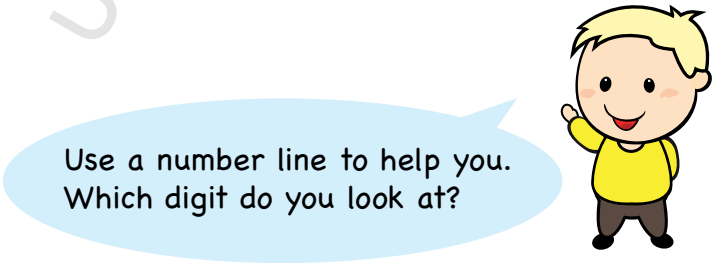
13.996 ≈ _____



14. Round each decimal to the nearest hundredth.

(a) 0.248 (b) 0.095

(c) 7.865 (d) 4.997



ACTIVITY TIME

Work in groups of 3 to 4.

What you need:

MEASURE IN CENTIMETRES

1. Measure small objects in your classroom with a  .
2. Record the reading to 1 decimal place.
3. Round each reading to the nearest centimetre.

MEASURE IN METRES

1. Measure large objects in your classroom with a  .
2. Record the reading to 2 decimal places.
3. Round each reading to 1 decimal place.

PRACTICE

1. Round each decimal to 1 nearest whole number.

(a) 3.044 (b) 2.814

(c) 7.316 (d) 8.843

2. Round each decimal to 1 decimal place.

(a) 45.04 (b) 9.95

(c) 2.567 (d) 1.049

3. Round each decimal to 2 decimal places.

(a) 16.986 (b) 2.185

(c) 4.504 (d) 3.916

Students' Learning Outcome:
- Multiply and divide a 2-digit number with one decimal place by: a 2-digit number

MULTIPLICATION AND DIVISION

1. Multiply.

(a) 2.5 x 12 = ____

(b) 3.2 x 27 = ____

(c) 5.7 x 34 = ____

(d) 9.4 x 65 = ____

2. Divide.

(a) 6.6 ÷ 22 = ____

(b) 6.4 ÷ 32 = ____

(c) 2.4 ÷ 12 = ____

(d) 8.4 ÷ 21 = ____

Students' Learning Outcome:
- Multiply and divide a 2-digit number with one decimal place by 10 and 100.

MULTIPLYING BY TENS AND HUNDREDS

Multiplying by tens

1.

0.1 × 10 = 1

0.01 × 10 = 0.1

0.001 × 10 = 0.01

Recall 1 × 10 = 10. How is this similar to finding the product of 0.1 and 10?

When a decimal is **multiplied by 10**, the decimal point moves **1 place to the right**.

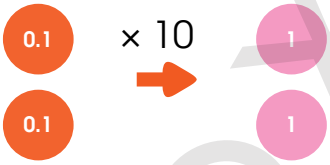
0 . 1 × 10 = 1

0 . 0 1 × 10 = 0.1

0 . 0 0 1 × 10 = 0.01

2. Find the product.

(a) 0.2 and 10



0.2 × 10 = 2

2 tenths × 10 = 2 ones

0 . 2 × 10 = 2.0

= 2

(b) 0.12 and 10

0.12 × 10 = 1.2

0 . 1 2 × 10 = 1.2

3. Multiply each decimal by 10. Use number discs to help you.

(a) 0.7 (b) 0.3
(c) 0.1 (d) 1.6
(e) 4.9 (f) 2.7

4. A drink was sold in small packets of 0.33 l each. Mrs Adil bought 20 such packets. What was the total capacity of drinks she bought?

$0.3 \times 20 = 0.3 \times 10 \times 2$
$= 3. \times 2$
$= 6\ \ell$

Mrs Adil bought 6 l of drinks in total.

5. The mass of a dictionary is 1.45 kg. Find the mass of 50 such dictionaries.

1.45 × 50 = ____ × 10
= ____ kg

The mass of 50 such dictionaries is ____ kg.

6. Multiply. Explain.

(a) 0.8 × 70 (b) 0.4 × 20
(c) 0.3 × 50 (d) 2.1 × 40
(e) 4.3 × 60 (f) 3.1 × 30

7. What are the missing numbers?

(a) 9.1 × ____ = 91 (b) ____ × 10 = 6
(c) 10 × ____ = 46

PRACTICE

Multiply.

(a) 0.1 × 10 (b) 0.2 × 10
(c) 1.7 × 10 (d) 2.9 × 10
(e) 4.1 × 20 (f) 1.2 × 40
(g) 2.1 × 80 (h) 3.8 × 90

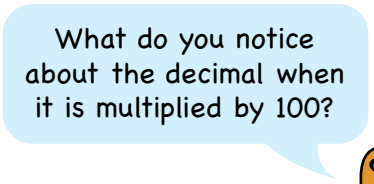
LET'S LEARN

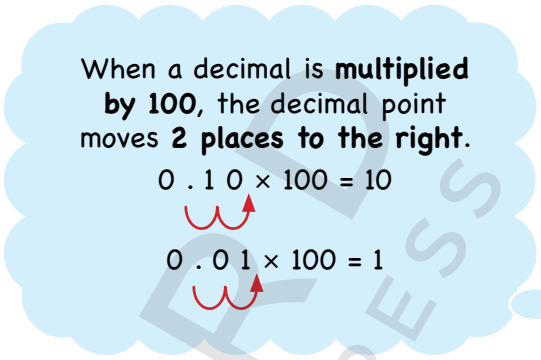
Multiplying by hundreds

1.

0.1 × 100 = 10

0.01 × 100 = 1

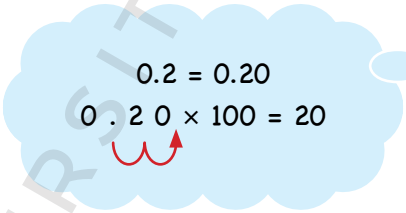




2. Find the product.

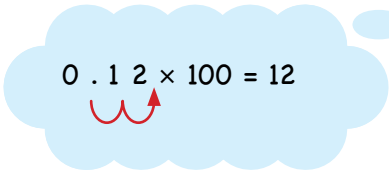
(a) 0.2 and 100

0.2 × 100 = 20



(b) 0.12 and 100

0.12 × 100 = 12



3. Multiply each decimal by 100. Use number discs to help you.

(a) 0.7 (b) 0.08

(c) 0.07 (d) 3.61

4. A tailor needs 0.13 m of ribbon for each dress. Find the length of ribbon
needed for 200 similar dresses.

$0.13 \times 200 = 0.13 \times 100 \times 2$
$= 13 \times 2$
$= 26$ m

0.13 × 100 = 13.

The length of ribbon needed is 26 m.

5. Multiply 0.94 by 300.

$0.94 \times 300 =$ ____ $\times 100$
$=$ ____

0.94 × 3 = ____

6. Multiply. Explain.

(a) 0.3×200
(b) 0.07×300
(c) 1.21×400
(d) 3.01×300
(e) 5.8×200
(f) 4.56×500

7. What are the missing numbers?

(a) $0.08 \times$ ____ $= 8$
(b) $100 \times$ ____ $= 54.2$
(c) ____ $\times 100 = 355$

Explain your answers.

PRACTICE

Multiply.

(a) 0.34×100
(b) 0.31×100
(c) 1.07×100
(d) 2.29×100
(e) 0.01×400
(f) 0.95×300
(g) 2.1×800
(h) 1.73×500

DIVIDING BY TENS AND HUNDREDS

IN FOCUS

The mass of 10 identical coins is about 0.01 kg.

Asma says that the mass of each coin is 1 g.
Is she correct? How do you know?

LET'S LEARN

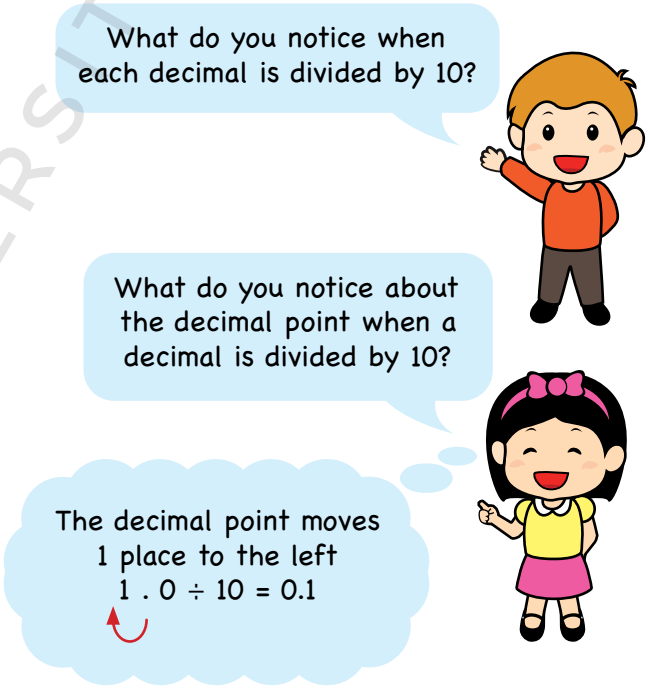
Dividing by tens

1.

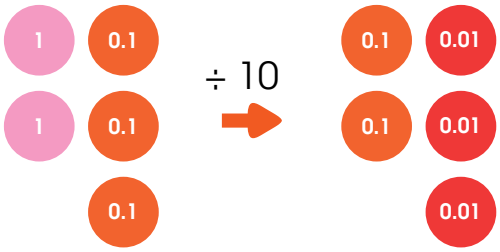
$1.0 \div 10 = 0.1$

$0.1 \div 10 = 0.01$

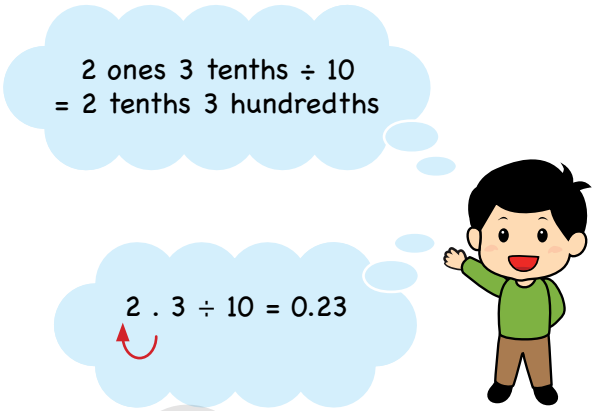
$0.01 \div 10 = 0.001$



2. Find the value of 2.3 ÷ 10.



2.3 ÷ 10 = 0.23



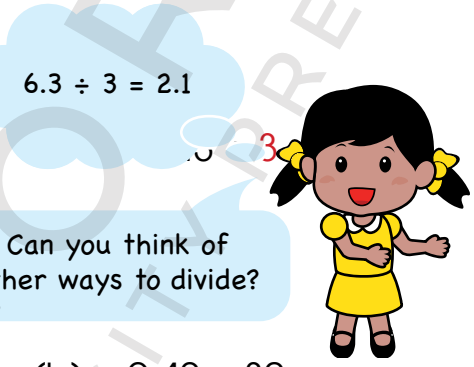
3. Divide. Use number discs to help you.

(a) 0.9 ÷ 10 (b) 0.37 ÷ 10

(c) 1.08 ÷ 10 (d) 6.5 ÷ 10

4. What is the value of 6.3 ÷ 30?

6.3 ÷ 30
= 2.1 ÷ 10
= 0.21



5. Divide. Explain.

(a) 0.8 ÷ 20 (b) 9.42 ÷ 30

(c) 7 ÷ 70 (d) 5.46 ÷ 60

6. What are the missing numbers?

(a) 18 ÷ ☐ = 1.8 (b) ☐ ÷ 10 = 4.9

(c) ☐ ÷ 10 = 0.103

PRACTICE

Divide.

(a) 0.4 ÷ 10 (b) 0.15 ÷ 10 (c) 1.21 ÷ 10

(d) 25.3 ÷ 10 (e) 4.2 ÷ 20 (f) 0.84 ÷ 40

(g) 2.1 ÷ 70 (h) 0.56 ÷ 80

LET'S LEARN

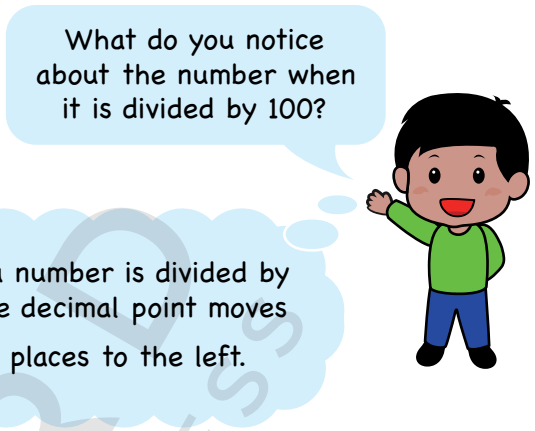
Dividing by hundreds

1.

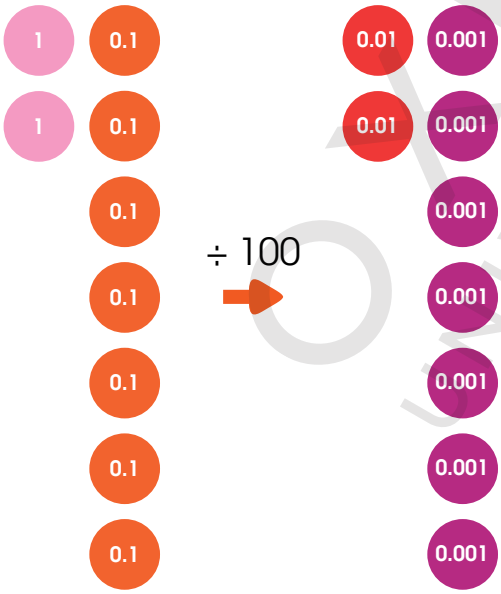
$10 \div 100 = 0.1$

$1 \div 100 = 0.01$

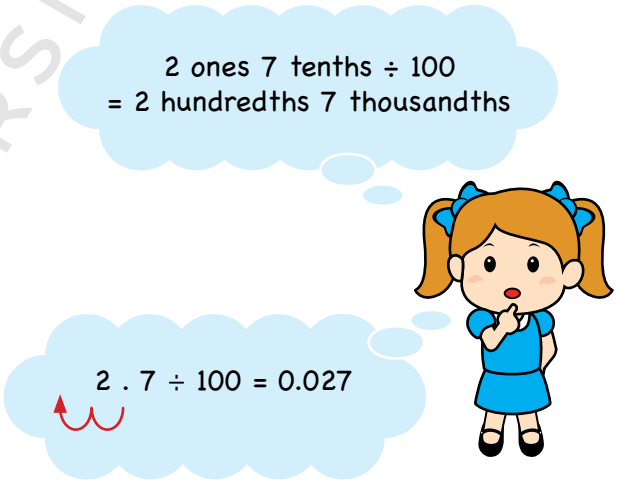
$0.1 \div 100 = 0.001$



2. Find the value of $2.7 \div 100$.



$2.7 \div 100 = 0.027$



3. Divide. Use number discs to help you.

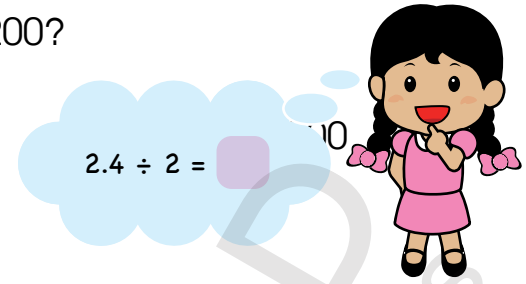
(a) 2.3 ÷ 100 (b) 1.4 ÷ 100

(c) 12.8 ÷ 100 (d) 22.7 ÷ 100

4. What is the value of 2.4 ÷ 200?

2.4 ÷ 200

= ☐



5. Divide. Explain.

(a) 0.8 ÷ 200 (b) 6.9 ÷ 300

(c) 1.2 ÷ 600 (d) 5.6 ÷ 400

6. Find the missing numbers.

(a) 335 ÷ ☐ = 3.35

(b) ☐ ÷ 100 = 0.21

(c) ☐ ÷ 100 = 0.049

PRACTICE

Divide.

(a) 0.4 ÷ 100 (b) 24.9 ÷ 100

(c) 3.1 ÷ 100 (d) 8.0 ÷ 100

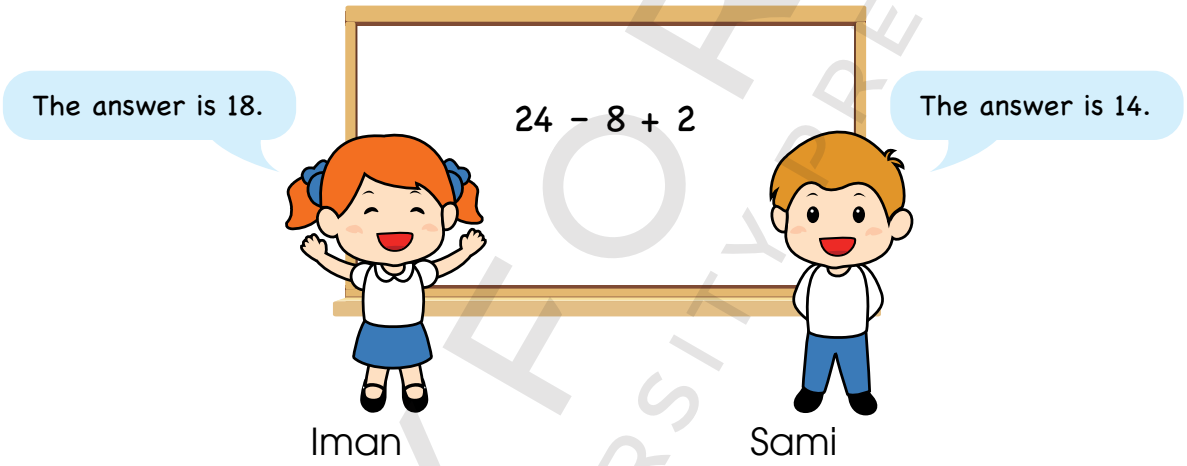
(e) 2.7 ÷ 300 (f) 33.6 ÷ 800

Students' Learning Outcome:
- Recognise the order of operations and use it to solve mathematical expressions involving whole numbers, decimals, and fractions.

ORDER OF OPERATIONS

IN FOCUS

Iman and Sami were asked to find the value of the expression 24 – 8 + 2.



Who is correct, Iman or Sami?

1. Find the value of 24 – 8 + 2.

When **only addition and subtraction** are involved, we work from **left to right**.

24 – 8 + 2 = 16 + 2
= 18

Iman is correct.

2. Find the value of $48 \div 4 \times 2$.

When **only multiplication and division** are involved, we work from **left to right**.

$48 \div 4 \times 2 = 12 \times 2$
$= 24$

3. Find the value of the following.

(a) $15 - 9 + 7$
(b) $46 - 28 + 12 - 10$
(c) $42 \div 7 \times 2$
(d) $64 \div 8 \times 4 \div 2$

4. Find the value of $32 - 6 \times 3$.

We work on **multiplication and division before addition and subtraction**.

$32 - 6 \times 3 = 32 - 18$
$= 14$

5. Find the value of $60 \div (3 + 2)$.

When there are brackets, we **work out the expression in the brackets first**.

$60 \div (3 + 2) = 60 \div 5$
$= 12$

6. Find the value of $8 + 2 \times 6 - (4 \times 5)$.

$8 + 2 \times 6 - (4 \times 5)$
$= 8 + 2 \times 6 - 20$
$= 8 + 12 - 20$
$= 20 - 20$
$= 0$

7. 1869 red apples and 1651 green apples were collected from an orchard. The apples were packed equally into some boxes. There were 22 apples in each box and each box was then sold for $13. How much was collected from the sale of all the boxes of apples?

(1869 + 1651) ÷ 22 × 13 = ?

Key in the following on the calculator.

(1 8 6 9 + 1 6 5 1) ÷ 2 2 × 1 3 =

(1869 + 1651) ÷ 22 × 13 = _____

$_____ was collected from the sale of all the boxes of apples.

8. Find the value of each of the following.

(a) $28 \div 4 + 3$

(b) $56 + 4 \times 9 \div 3$

(c) $20 - 6 \div 3 \times 2 + 5$

(d) $8 \times (10 - 6) + (15 \div 5)$

(e) $(3.2 - 2.3) \times 4$

(f) $72 \div (3 \times 4) + 16$

(g) $2 \times \left(\frac{1}{6} + \frac{3}{2}\right) - 1$

(h) $\left(\frac{5}{7} - \frac{2}{8}\right) \times 7 + 5.5$

Use your  to check your answers.

ACTIVITY TIME

Work in pairs.

What you need:

1. Copy the following onto .

$$100 + (\square \times \square) - \square = ?$$

Fill in each blank with a number that is smaller than 100.

2. Get your partner to find the value of the expression you have formed in 1.

3. Check your partner's answer with a .

4. Switch roles and repeat 1 to 3.

Try forming and solving your own expressions.

PRACTICE

1. Find the value of each of the following.

(a) $57 + 16 - 5 + 14$

(b) $11 \times 8 \div 4 \times 3$

(c) $35 - 15 \times 2$

(d) $64 - 40 \div 8 + 22$

(e) $17 + (3.1 - 1.8)$

(f) $100 - 4 \times \left(\frac{85}{5} - \frac{15}{3}\right)$

2. The admission fees to a space museum for adults and children are shown.

Adult	Rs 32
Child	Rs 20
Family Pass (2 adults and 2 children)	Rs 75

Mr Aun wants to bring his wife and 2 children to the museum. How much money will he save if he buys the family pass?

Students' Learning Outcome:

- Recognise the percent symbol (%) and understand that percent is the 'number of parts per hundred'.

What percentage of the books are red? What are some other percentages that you can see around you?

PERCENT

IN FOCUS

There are 100 books on the shelf and 60 books are red. How do we express the number of red books as a percentage of the total number of books?

LET'S LEARN

1. 60 out of 100 books are red.

$$60 \text{ out of } 100 = \frac{60}{100} = 60\%$$

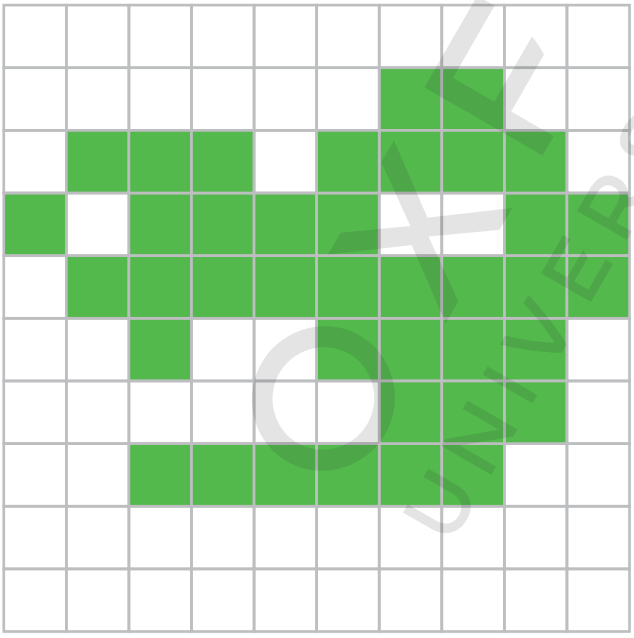
60% of the books are red.

2. What percentage of the books are blue?

40 out of 100 = $\frac{\square}{100}$ = $\square$%

$\square$% of the books are blue.

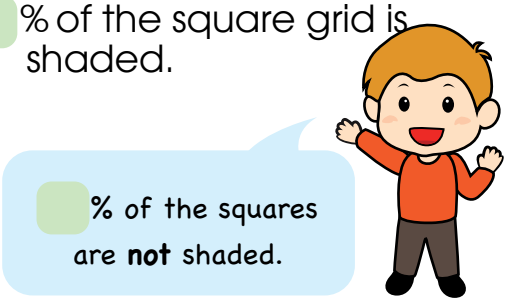
3. What percentage of the square grid is shaded?



$\square$ out of 100 squares are shaded.

$\frac{\square}{100}$ = $\square$%

$\square$% of the square grid is shaded.



Students' Learning Outcome:
- Using a pattern rule, describe the pattern found in a given table or chart.

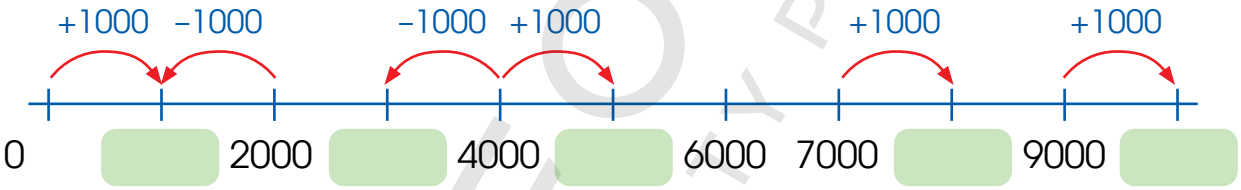
NUMBER PATTERNS

RECAP

Look at the number patterns.
What is the next number in each pattern?

177	277	377	477	577	677	777	?

830	825	820	815	810	805	800	?



18760	29760		48760	

4359	4450			4750	4850	4950	

9460	8460		6460	5460	4460		

320084	330084	340084		

Complete each banner by putting in the **missing values**. Then make your own **patterns**. Swap your book with a peer and solve each other's patterns.

NUMBER PATTERNS IN A CHART

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

- Write the number pattern in green and describe the rule.

_____

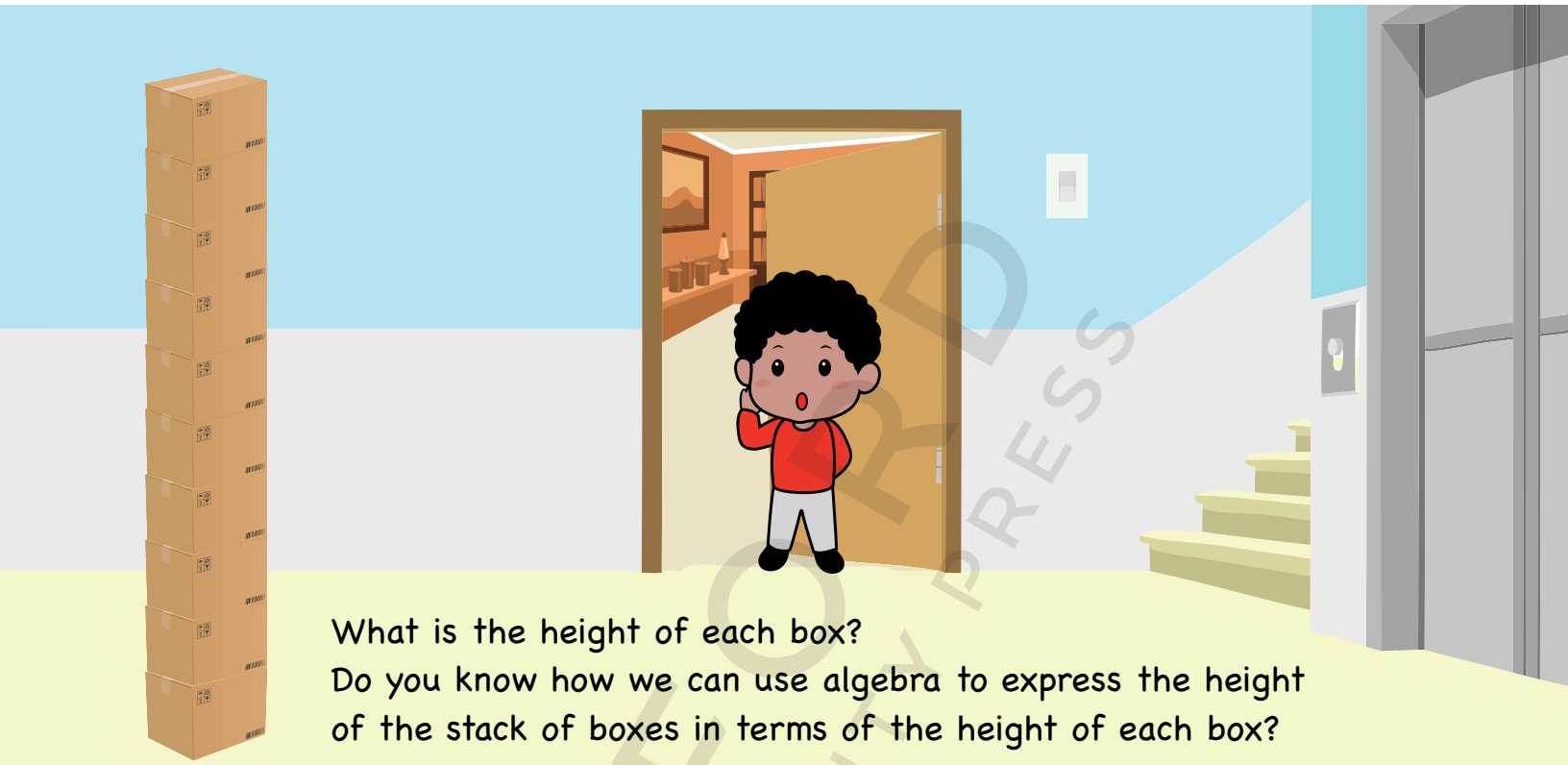
- Write the number pattern in blue and describe the rule.

_____

Ask the students to colour their own patterns and describe the rule.

Students' Learning Outcome:

- Identify and write expressions or number sentences to represent problems that may involve unknowns.



What is the height of each box?
Do you know how we can use algebra to express the height of the stack of boxes in terms of the height of each box?

USING LETTERS FOR UNKNOWN QUANTITIES

IN FOCUS

When Siti's younger sister is x years old, how old is Siti?

LET'S LEARN

1. The table below shows the ages of Siti and her sister.

	Siti's sister	Siti
Now	10 years old	12 years old
Last year	9 years old	11 years old
2 years ago	8 years old	10 years old

We can see that Siti is always 2 years older than her sister.

When Siti's younger sister is x years old, Siti is $(x + 2)$ years old.

We can use a letter to represent an unknown number.

We can also see that Siti's sister is 2 years younger than Siti.

When Siti is y years old, Siti's sister is $(y - 2)$ years old.

$(x + 2)$ and $(y - 2)$ are examples of **algebraic expressions**.

$x + 2$ means add 2 to x.
$y - 2$ means subtract 2 from y.

2. There are x coloured balls in a box. Some balls are added or removed from the box. Find the number of balls in the box in terms of x.

	Number of balls
At first	x
Add 1 ball	$x + 1$
Remove 1 ball	$x - 1$
Add 2 balls	
Add 5 balls	
Remove 3 balls	
Remove 8 balls	

Explain your answers.

3. Weiming is 12 years old and his mother is y years older than him. How old is his mother?

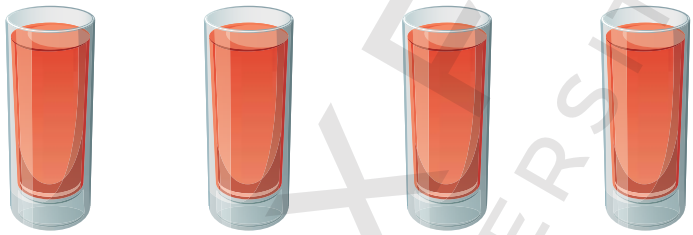
12 ◯ y = ▭

His mother is (▭) years old.

4. Write an algebraic expression for each of the following. Explain your answers.

(a) Add 5 to a.
(b) Add b to 1.
(c) 4 more than c.
(d) d more than 8.
(e) Subtract 3 from e.
(f) Subtract f from 7.
(g) 6 less than g.
(h) h less than 2.

5. There is p ml of juice in each glass. How much juice is there in 4 glasses?



p ml p ml p ml p ml

To find the amount of juice, we multiply the number of glasses by the amount of juice in each glass.

$2 \times p = 2p$

There are $2p$ ml of juice in 2 glasses.

$3 \times p = 3p$

There are $3p$ ml of juice in 3 glasses.

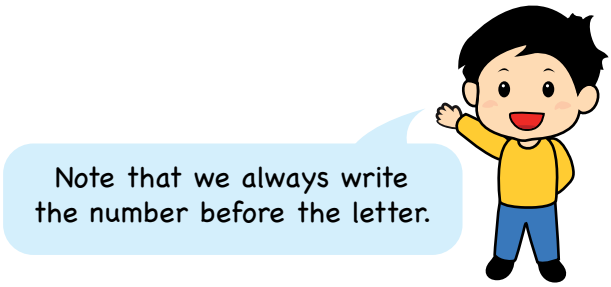
$4 \times p = 4p$

There are $4p$ ml of juice in 4 glasses.

$2p$, $3p$ and $4p$ are also examples of algebraic expressions.

6. In a basket, there are q apples and twice as many oranges as apples.
How many oranges are there?

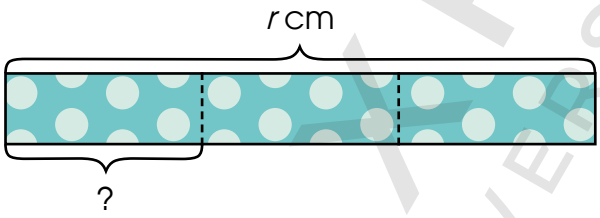
There are oranges.



7. Write an algebraic expression for each of the following.

(a) Multiply a by 7.
(b) Multiply 3 by b.
(c) 9 groups of c
(d) 5 times of d
(e) There are x peanuts in a packet. How many peanuts are there in 10 packets?

8. A ribbon is r cm long. It is cut into 3 equal parts. What is the length of each part?



To find the length of each part, we divide the length of the ribbon by the number of parts.

$r \div 3 = \frac{r}{3}$

The length of each part is $\frac{r}{3}$ cm.

$\frac{r}{3}$ is also an example of an algebraic expression.

9. Tom has t stamps. He puts an equal number of stamps in 5 albums. How many stamps are there in each album?

____ ÷ ____ = ____

There are ____ stamps in each album.

10. There are $2w$ cupcakes in a box. 7 children share the cupcakes equally.
How many cupcakes will each child receive?

____ ÷ ____ = ____

Each child will receive ____ cupcakes.

11. Write an algebraic expression for each of the following.

(a) Divide a by 2.
(b) Divide $5b$ by 7.
(c) Divide c into 5 equal groups.
(d) Divide $d + 1$ into 9 equal groups.
(e) 4 children share p chocolates equally. How many chocolates does each child get?

12. Bala is t years old now. Bala's cousin is twice as old as Bala. How old was Bala's cousin 2 years ago?

$t \times 2 = 2t$
Bala's cousin is $2t$ years old now.
2 years ago, he was $(2t - 2)$ years old.

Find their ages.

	Bala's age (years)	Cousin's age (years)
Now	t	$2t$
2 years ago		$2t - 2$
10 years ago		
In 5 years' time		
In 20 years' time		

13. In a box, there are u red beads. There are half as many blue beads as red beads. There are 5 more green beads than red beads and 3 fewer orange beads than blue beads. Find the number of blue, green and orange beads in terms of u.

Colour of beads	Number of beads
Red	u
Blue	
Green	
Orange	

PRACTICE

1. There are p cookies in a container. Write an algebraic expression for each of the following.

   (a) 15 cookies are added. How many cookies are there in the container?

   (b) 15 cookies are eaten. How many cookies are left?

   (c) How many cookies are there in 5 such containers?

   (d) All the cookies in 5 such containers are put equally into 12 bowls. How many cookies are there in each bowl?

2. Write an algebraic expression for each of the following.

   (a) Add a to 9.

   (b) Subtract b from 10.

   (c) Multiply c by 7.

   (d) Divide d by 8.

   (e) Subtract 12 from twice of e.

   (f) Add 2 to 4 times of f.

   (g) Divide the sum of 11 and g by 9.

   (h) Add 1 to half of h.

3. The table below describes the number of vehicles in a car park. Find the number of each vehicle in terms of q.

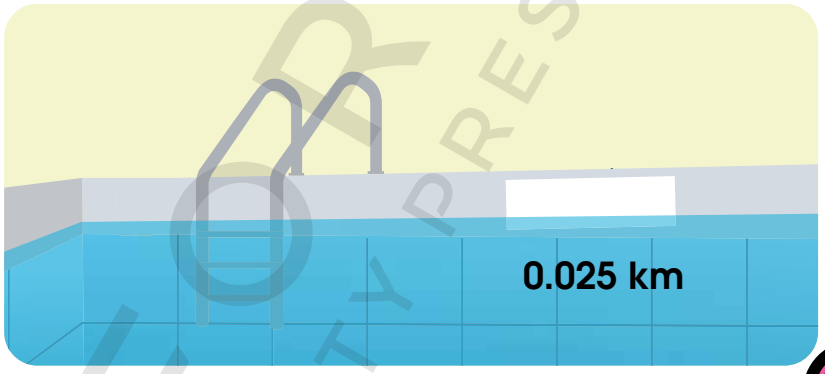
	Number of vehicles
There are q motorcycles.	
There are 10 times as many cars as motorcycles. How many cars are there?	
There are 3 times as many motorcycles as scooters. How many scooters are there?	
There are 51 more motorcycles than vans. How many vans are there?	

Students' Learning Outcomes:

- Convert units of length from larger to smaller units (Kilometre, metre, centimetre, and millimetre).
- Convert, add and subtract lengths to solve real-world word problems.
- Convert units of mass from larger to smaller units (Kilogram, and gram).
- Convert, add and subtract mass to solve real-world word problems.
- Convert units of capacity from larger to smaller units (litre and millilitre).
- Convert, add and subtract capacities to solve real-world word problems.

CONVERTING MEASUREMENTS: DISTANCE/LENGTH, MASS, AND CAPACITY

IN FOCUS



The swimming pool is 0.025 km long.
What is the distance between the touch pads at its both ends in metres?

Can you think of other examples of measurements that are written as decimals? Where can you find them?

Converting Distance/Length

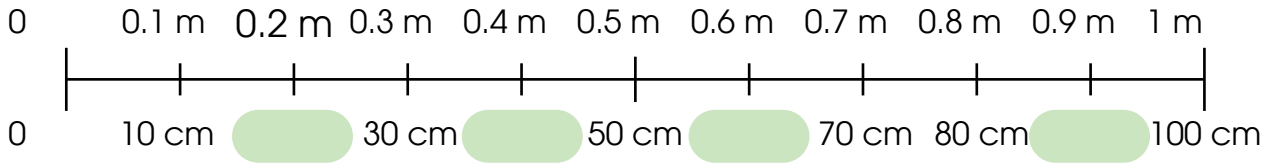
1. 1 km = 1000 m
   0.025 m = 0.025 × 1000
   = 25 m

Multiply by 100 to convert from km to m.

The distance between the touch pads at both ends of the swimming pool is 25 m deep.

1 km = 1000 m
1 m = 100 cm
1 cm = 10 mm

2. The measurements can be represented using a number line. What are the missing values on the number line?



3. Express 1.42 m in centimetres.

1.42 m = 1.42 × 100
= 142 cm

4. The height of a classroom door is 2.25 m.
(a) What is its height in metres and centimetres?

0.25 m = 0.25 × 100
= 25 cm

2.25 m = 2 m + 0.25 m
= 2 m 25 cm

The height of the door is 2 m 25 cm.
(b) If the height is increase by 30 cm, what is the new height?

m cm

5. Convert. Explain how you obtain your answers.

(a) 0.72 m = cm

(b) 4.5 m = cm

(c) 2.1 m = m cm

(d) 9.28 m = m cm

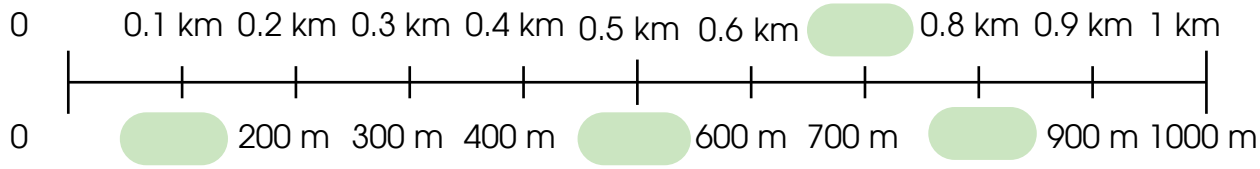
6. Iman ran 0.4 km round a track.
(a) What was the distance she ran in metres?

To convert km to m, multiply by 1000.

1 km = 1000 m
0.4 km = 0.4 × 1000
= 400 m

Iman ran 400 m.
(b) Next day she ran 35 m less. What was the distance she ran the next day? m

7. What are the missing measurements in the number line?



8. Express 2.3 km in metres.

2.3 km = 2.3 × 1000
= 2300 m

9. The distance between Sara's house and the train station is 3.856 km. What is this distance in kilometres and metres?

3.856 km = 3 km + 0.856 km
= 3 km 856 m

0.856 km = 0.856 × 1000
= 856 m

The distance between Sara's house and the train station is 3 km 856 m.

10. Convert. Explain how you obtain your answers.

(a) 0.29 km = m

(b) 3.608 km = m

(c) 6.41 km = km m

(d) 7.055 km = km m

LET'S LEARN

Converting Mass

1. A bunch of grapes weighs 0.5 kg.
(a) What is the mass of the grapes in grams?

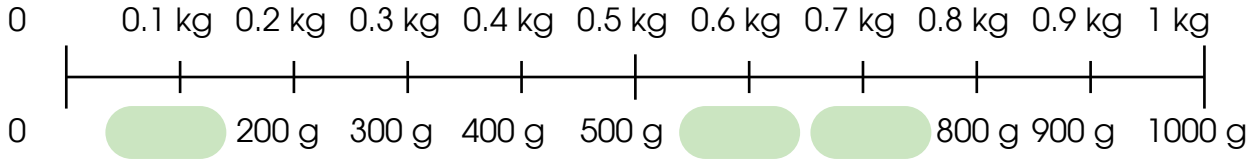
1 kg = 1000 g
0.5 kg = 0.5 × 1000
= 500 g

1 kg = 1000 g
1 g = 1000 mg

The bunch of grapes weighs 500 g.

(b) If 236 g grapes are added, what is the total mass? g

2. What are the missing measurements in the number line?



3. Write 3.25 kg in grams.

3.25 kg = 3.25 × 1000
= 3250 g

4. The mass of a bag of rice is 5.5 kg. What is its mass in kilograms and grams?

5.5 kg = 5 kg + 0.5 kg
= 5 kg 500 g

0.5 kg = 0.5 × 1000
= 500 g

The mass of the bag of rice is 5 kg 500 g.

5. Convert. Explain how you obtain your answers.

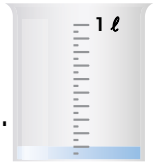
(a) 0.369 kg = _____ g (b) 2.28 kg = _____ g

(c) 6.805 kg = _____ kg _____ g (d) 3.04 kg = _____ kg _____ g

Converting capacity

1. A beaker contains 0.1 l of water.
How do we express the capacity of water in millilitres?

We can find out by pouring the water from the beaker into a measuring cylinder.



Beaker Measuring cylinder

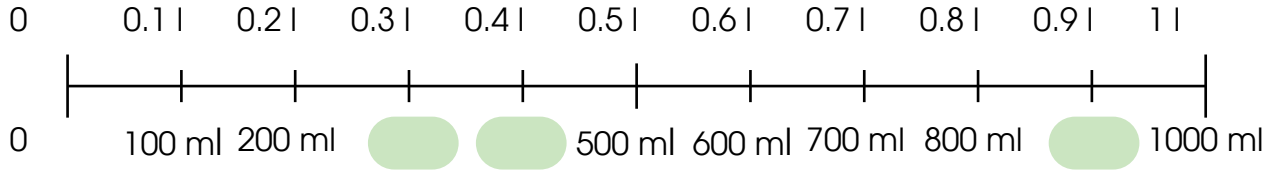
Looking at the reading on the measuring cylinder, there is 100 ml of water.

We can also multiply to express the capacity of water in millilitres.

1 l = 1000 ml
0.1 l = 100 ml

1 l = 1000 ml

2. What are the missing measurements?



3. Express 1.125 l in millilitres.

1.125 l = 1.125 × 1000
= 1125 ml

4. The capacity of a fish bowl is 2.85 l.

(a) Express this capacity in litres and millilitres.

2.85 l = 2 l + 0.85 l
= 2 l 850 ml

The capacity of the fish bowl is 2 l 850 ml.

(b) Another bowl has capacity of 3 l. How much more capacity this bowl has then the fish bowl?

_____ l _____ ml

5. Convert.

(a) 0.95 l = _____ ml

(b) 5.374 l= _____ ml

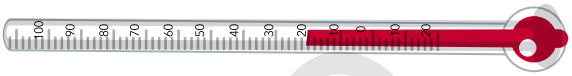
(c) 2.765 l= _____ l _____ ml

(d) 3.07 l= _____ l _____ ml

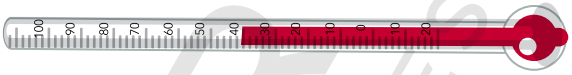
Students' Learning Outcome:
- Recognise the other temperature measuring scales; Kelvin, Celsius, and Fahrenheit.

TEMPERATURE

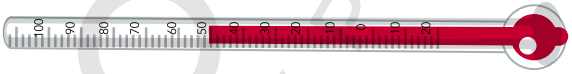
IN FOCUS



20°C



40°C

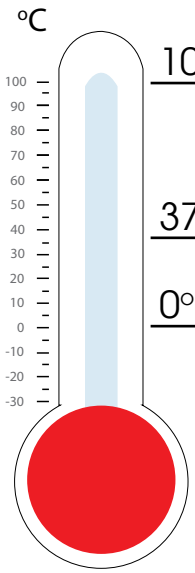


50°C

LET'S LEARN

All the thermometer have a scale on them, which we read to find the temperature, called a temperature scale. There a re three temperature scales in daily use, Celsius, Fahrenheit, and Kelvin

1.



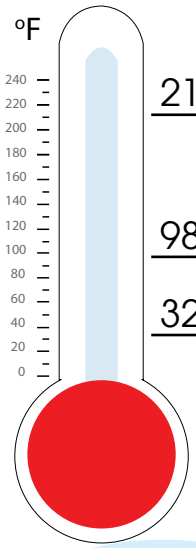
100°C → Boiling point of water

37°C → Normal body temperature

0°C → Freezing point of water

Celsius scale

Celsius scale was first introduced by the Swedish scientist Anders Celsius. It is abbreviated as °C.



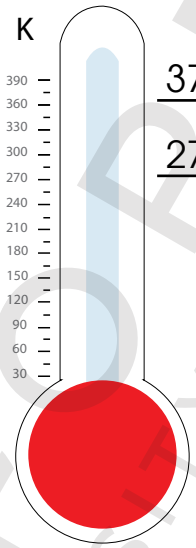
212°F → Boiling point of water

98.6°F → Normal body temperature

32°F → Freezing point of water

Fahrenheit scale

Fahrenheit scale was first proposed by the scientist Danial Gabriel Fahrenheit. Its abbreviation is °F.



373 K → Boiling point of water

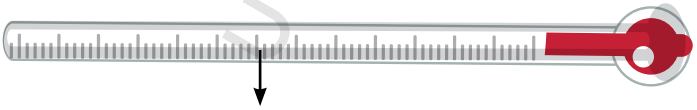
273 K → Freezing point of water

Kelvin scale

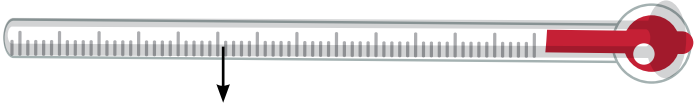
The Kelvin Scale is the primary unit of temperature. It is named after a physicist William Thomson, 1st Baron Kelvin. Its abbreviation is 'K'

PRACTICE

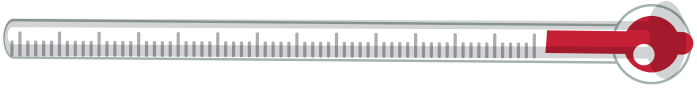
1. The boiling point of water is _____ K.
2. The freezing point of water is _____ °F.
3. Normal body temperature is _____ °C.
4. Name the thermometer scale.

(a) 

37° body temperature _____

(b) 

212° boiling point of water _____

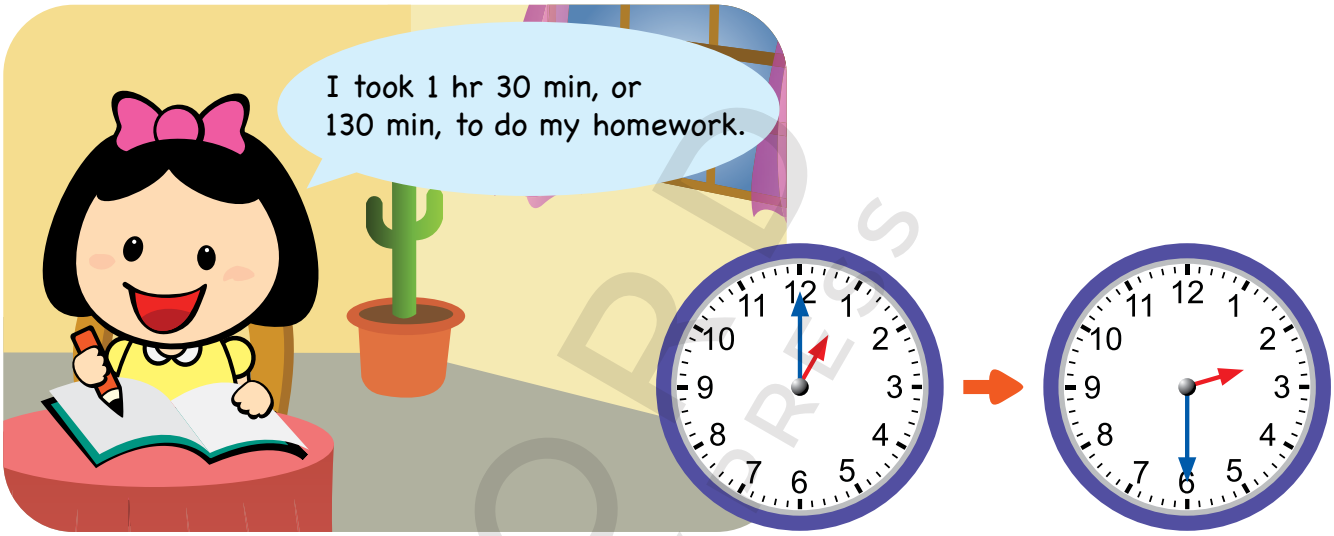
(c) 

273 freezing point of water _____

Students' Learning Outcomes:

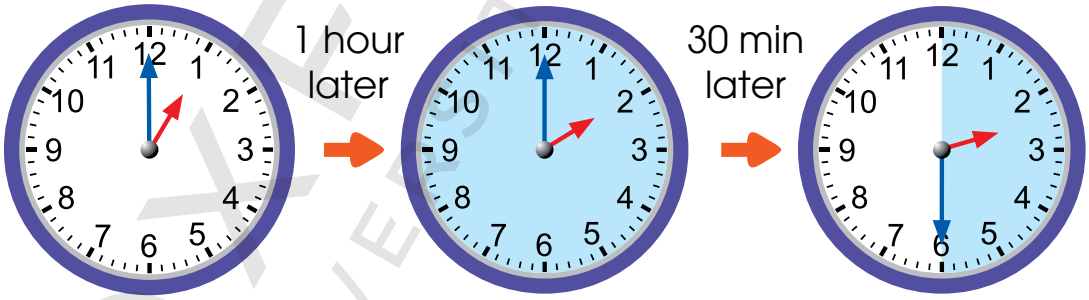
- Convert larger units to smaller units of time (hours, minutes, seconds, years, months, weeks, and days).
- Add, subtract, and convert measures of time to solve real-life word problems.

CONVERSION OF UNITS OF TIME



Is Asma correct?

1.

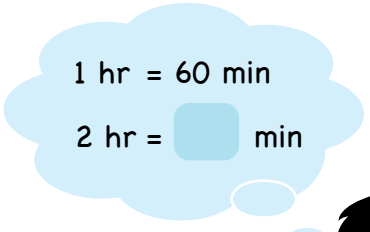


1 hr = 60 min

1 hr 30 min = 60 min + 30 min

= 90 min

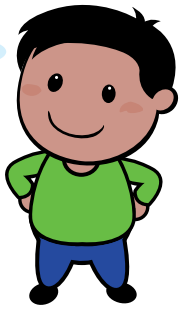
Asma took 90 minutes to do her homework.
She is wrong.



2. Mrs Ali spent 2 hr 25 min baking.
What was the duration in minutes?

2 hr 25 min = ☐ min + ☐ min

= ☐ min



3. The duration of a movie is 3 hr 15 min.
Write the duration in minutes.

1 min = 60 sec

2 min = ☐ sec

3 hr 15 min = ☐ min + ☐ min
= ☐ min

4. There are 7 days in a week.
Convert in to days.

2 weeks 4 days = ☐ days + ☐ days
= ☐ days

1 week = 7 days
2 weeks = ☐ days

1 year = 12 months
2 years = ☐ months

5. Ali went on a leave for 1month and 5 days.
Write the duration in days.

1 month 5 days = ☐ days + ☐ days
= ☐ days

6. Iman is 2 years and 5 months old.
Write her age in months.

2 years 5 months = ☐ months + ☐ months
= ☐ months

PRACTICE

1. Write in minutes.
(a) 2 hr 40 min
(b) 4 hr 35 min
(c) 3 hr 15 min

2. Write in seconds.
(a) 3 min
(b) 5 min 20 sec
(c) 27 min 8 sec

3. Write in days.
(a) 3 weeks
(b) 5 weeks 2 days
(c) 4 months 12 days

4. Write in months.
(a) 4 years
(b) 3 years 3 months
(c) 1 year 6 months

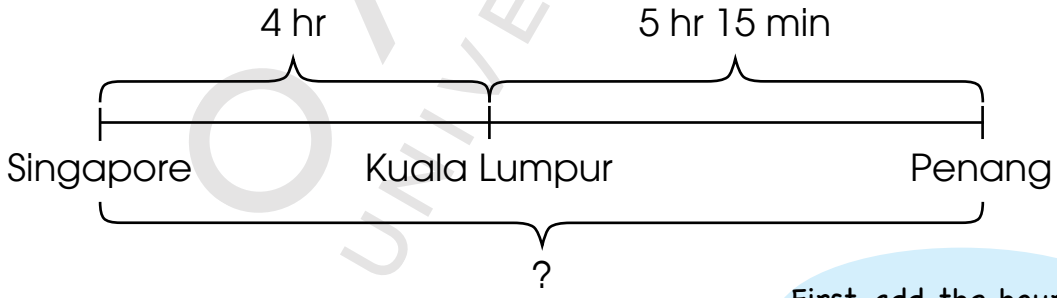
SOLVING REAL-LIFE STORIES

IN FOCUS

Asma and her family travelled from Singapore to Kuala Lumpur for 4 hr. They then travelled another 5 hr 15 min from Kuala Lumpur to Penang. How much time did they spend travelling?

LET'S LEARN

1.

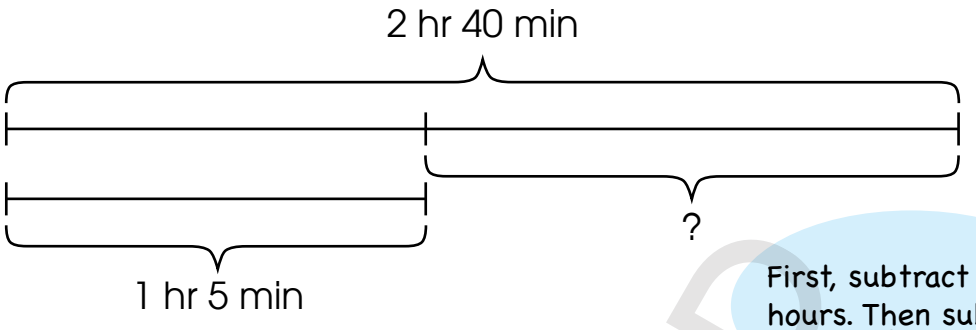


4 hr + 5 hr 15 min = ?

4 hr $\xrightarrow{+5\text{ hr}}$ 9 hr $\xrightarrow{+15\text{ min}}$ 9 hr 15 min

They spent 9 hr 15 min travelling.

2. Nora spent 2 hr 40 min reading.
She then spent 1 hr 5 min watching television.
How much longer did she spend reading than watching television?

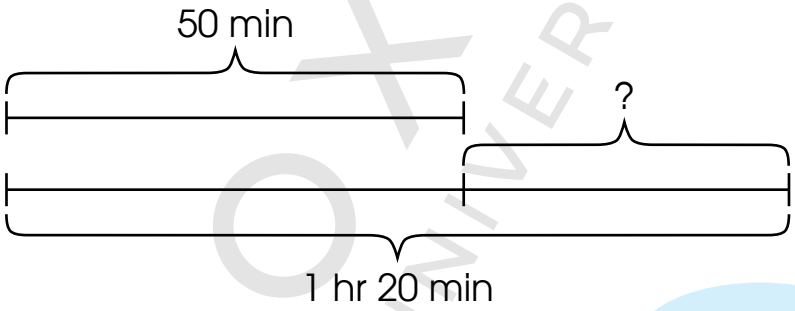


2 hr 40 min − 1 hr 5 min = ?

2 hr 40 min $\xrightarrow{-\ 1\ \text{hr}}$ ☐ hr ☐ min $\xrightarrow{-\ 5\ \text{min}}$ ☐ hr ☐ min

Nora spent ☐ hr ☐ min longer reading than watching television.

3. Farhan takes 50 minutes to travel to the library.
He takes 1 hr 20 min to travel to school.
How much longer does he take to travel to school than to the library?



1 hr 20 min − 50 min = ?

1 hr 20 min = ☐ min + ☐ min

= ☐ min

☐ min $\xrightarrow{-50\ \text{min}}$ ☐ min

Farhan takes ☐ min longer to travel to school than to the library.

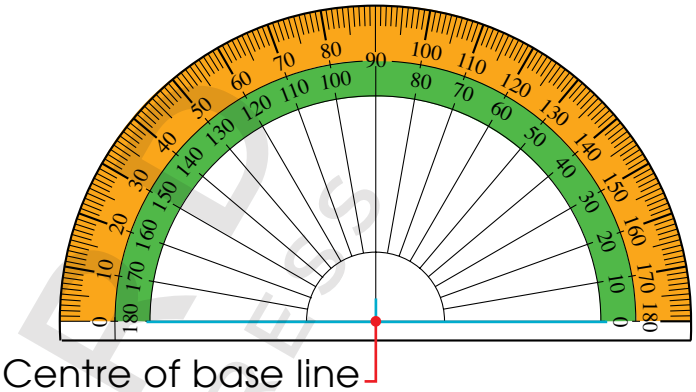
Students' Learning Outcome:
- Compare and order angles up to 180 degrees by size.

COMPARING ANGLES

We can measure angles using a protractor.

We measure angles in **degrees**.

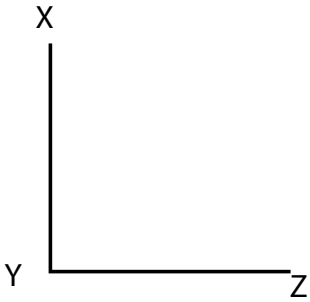
The symbol ° stands for degree.

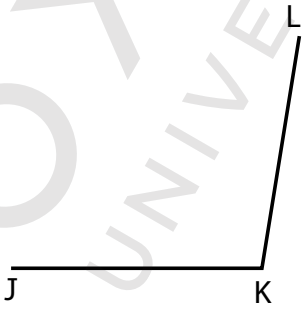


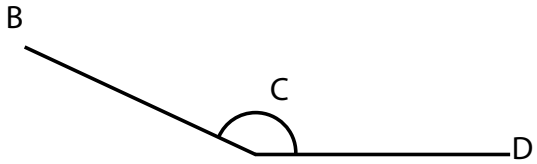
We read the scale from left to right to measure an angle using the outer scale.

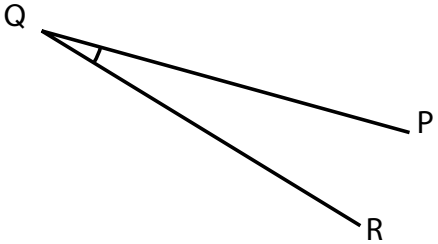
We read the scale from right to left to measure an angle using the inner scale.

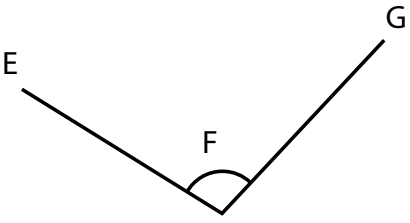
Measure the given angles and write them in ascending order.









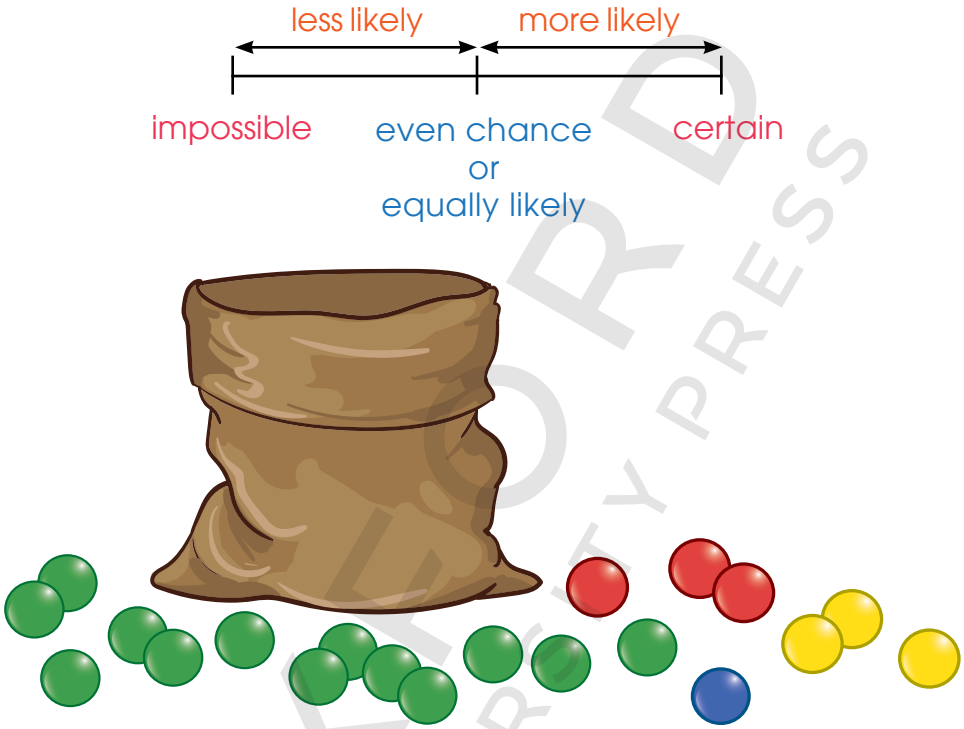


Students' Learning Outcome:

- Describe the outcome of a simple probability experiment (spinner and dice), using mathematical language (i.e., impossible less likely, more likely, equally likely, unlikely and certain).

PROBABILITY

The chance of an event occurring is called **probability**. It is the likelihood of an outcome happening.



It is **likely** that Sam will pick a green marble.

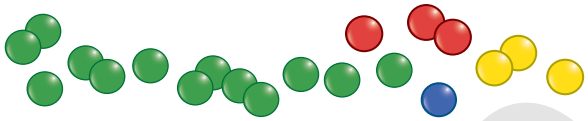
It is unlikely that Sam will pick a blue marble.The probability of picking a yellow marble or a red marble is the same. There is even chance of picking a yellow marble or a red marble.

Recall...

- If an event is sure to happen, then it has a **certain** probability.
- If an event is **more likely** to happen than not happen, then it has a likely probability.
- If the likelihood of two events happening is the same, then the two events are **equally likely** to happen.
- If an event is less likely to happen than not happen, then it has an **unlikely** probability.
- If an event is sure not happen, then it has an **impossible** probability.

PRACTICE

1. Look at the given balls and choose the correct option for each of the following events.



(a) The probability of picking a green ball is

less likely | most likely | impossible

(b) The probability of picking a yellow than a red ball is

impossible | most likely | equally likely

(c) The probability of picking a black ball is

less likely | impossible | more likely

(d) The probability of picking a green ball than a yellow ball is

more likely | less likely | impossible

2. A die is rolled once.

(a) What is the probability of getting a multiple of `3' than a multiple of '2'?

less likely | more likely | equally likely

(b) What is the probability of getting number '8'?

certain | impossible | unlikely

(c) What is the probability of getting a number less than '7'?

unlikely | certain | impossible