

Learning Area: Relationship between Percentage, Fraction and Decimals.  
 Learning Objective: Relate fractions and decimals to percentage.  
 Learning Outcome: Convert mixed numbers to percentage.

Teaching Aids

Duration: 1 hour

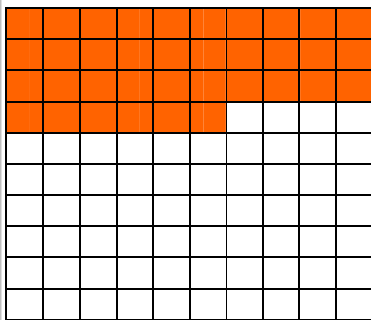
100 square (slide presentation in MS PowerPoint – File: Percentage1), worksheets and dominoes cards (Attachment 1).

Set Induction

1. Teacher shows a 100 square chart from slide 2 in the MS PowerPoint presentation. 36 of the squares are coloured. Let the pupils talk about what they see in the slide.

Pupils' Activity

Take turn to talk about what they see in the slide (Slide 2).



Notes To Teachers:

*Guide pupils by asking questions on how many squares are there altogether, how many coloured squares and how many uncoloured squares are there.*

*Guide pupils to relate fractions of hundredths to percentage*

*Teacher guide pupils say out in full sentences.*

Teacher's Instruction:

1. How many squares altogether?
2. How many of the squares are coloured?
3. How many of the squares are not coloured?
4. What fraction of the diagram is shaded?
5. What is the percentage of the fraction?

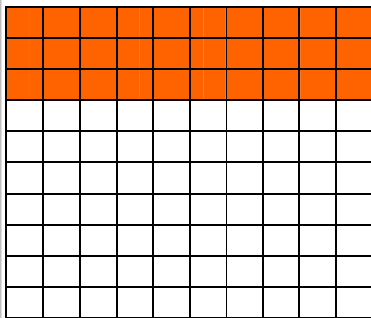
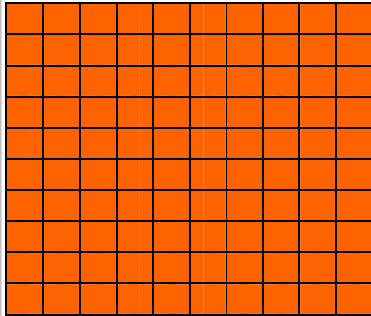
Expected answers from pupils:

1. 100 squares
2. 36 out of the 100 squares.
3. 64 out of the 100 squares.
4.  $\frac{36}{100}$
5. 36%

**Step 1:** With the aid of Slide 3, 4 and 5 in the MS PowerPoint presentation, the teacher guides pupils to convert mixed numbers (fractions of hundredths) to percentage.

Pupils' Activity

Pupils discuss and state the fractions and the percentages of the coloured squares orally.



$$1\frac{30}{100} = \frac{130}{100} = 130\%$$

Notes to Teachers:

*With the aid of the slide presentation (Slide 2), the teacher guides pupils to relate or convert mixed numbers to percentage; starting with a proper fraction to whole number and then mixed numbers.*

*Guide pupils to relate mixed number to percentage.*

*Stress that:*

- *Percentage is parts of a hundred. It is a fraction with 100 as its denominator.*
- *1 whole = 100%*

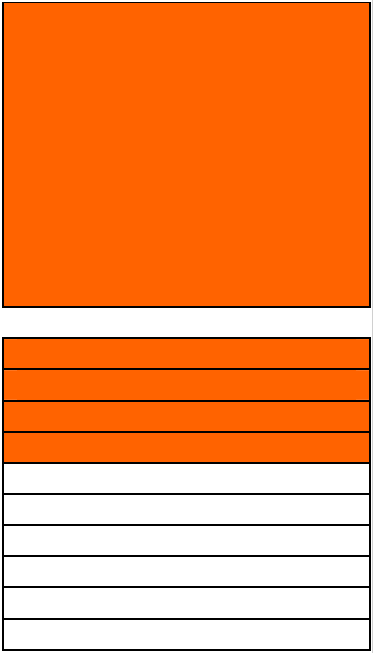
Teacher's Instruction:

1. *How many squares are colored?*
2. *What fraction of the hundred squares is coloured?*
3. *What percentage of the hundred squares is coloured?*

Expected answers from pupils:

1. *78 / 100 / 125 squares are coloured.*
2.  *$\frac{78}{100} / \frac{100}{100} / \frac{125}{100}$  of the hundred squares are coloured.*
3. *78% / 100% / 125% of the hundred squares are coloured.*

Step 2: With the aid of Slide 6 in the MS PowerPoint presentation, the teacher guides the pupils to convert mixed numbers (denominators of 10) to percentage.

<p><u>Pupils' Activity</u></p> <p>Pupils discuss and state the fractions and the percentages of the coloured parts orally.</p>  $1\frac{4}{10} = \frac{14 \times 10}{10 \times 10} = \frac{140}{100} = 140\%$	<p><u>Notes To Teachers:</u></p> <p><i>With the aid of the slide presentation (Slide 3), the teacher guides pupils to relate or convert mixed numbers to percentage; starting with fractions with denominators of 10, then 5, then 4 and then 2.</i></p> <p><i>Guide pupils to convert the fraction to an equivalent fraction with a denominator of 100.</i></p> <p><i>Stress that pupils should memorise:</i></p> <ul style="list-style-type: none"> <li>• <math>10 \times 10 = 100</math></li> <li>• <math>5 \times 20 = 100</math></li> <li>• <math>4 \times 25 = 100</math></li> <li>• <math>2 \times 50 = 100</math></li> </ul>
<p><u>Teacher's Instruction:</u></p> <ol style="list-style-type: none"> <li>1. Divide the diagram into 100 squares. How many squares are coloured?</li> <li>2. What fraction of the hundred squares is coloured? Convert the mixed number to an improper fraction.</li> <li>3. What percentage of the hundred squares is coloured?</li> </ol>	<p><u>Expected answers from pupils:</u></p> <ol style="list-style-type: none"> <li>1. 140 squares are coloured.</li> <li>2. <math>\frac{140}{100}</math> of the hundred squares is coloured.</li> <li>3. 140% of the hundred squares are coloured.</li> </ol>

Step 3: With the aid of Slide 7 in the MS PowerPoint presentation, repeat the process in step 2 to convert mixed numbers (denominators of 5, 4 and 2) to percentage.

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Teacher's Instruction:

1. Divide the diagram into 100 squares. How many squares are coloured?
2. What fraction of the hundred squares is coloured? Convert the mixed number to an improper fraction and then to a fraction of a hundredths.
3. What percentage of the hundred squares is coloured?
4. Remember. You need to:
  - I. Convert the mixed number to an improper fraction.
  - II. Then convert the improper fraction to fraction with a denominator of 100.
  - III. Lastly, convert it to percentage.

Expected answers from pupils:

1. 140.
2.  $1\frac{2}{5}$  or  $\frac{7}{5}$  or  $\frac{140}{100}$  of the hundred squares is coloured.
3. 140% of the hundred squares are coloured.

Consolidation

Worksheet 1 and Worksheet 2

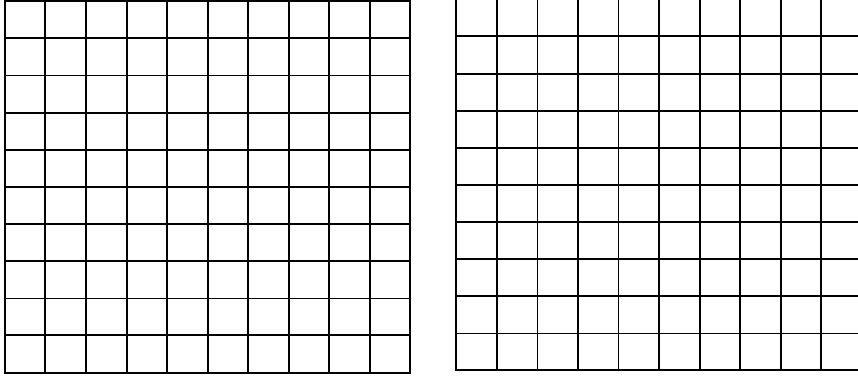
Further Activities

Games: Mixed Fraction and Percentage Dominoes.  
(Refer to Attachment 1).

- I. To be played in a group of 3 or 4 pupils.
- II. Shuffle the cards and then distribute the cards equally.
- III. The first player puts a card on the table.
- IV. The next player puts a card with equivalent value to the last card on the table. He misses turn if he has no card of equivalent value.
- V. The player who has played all his cards wins.

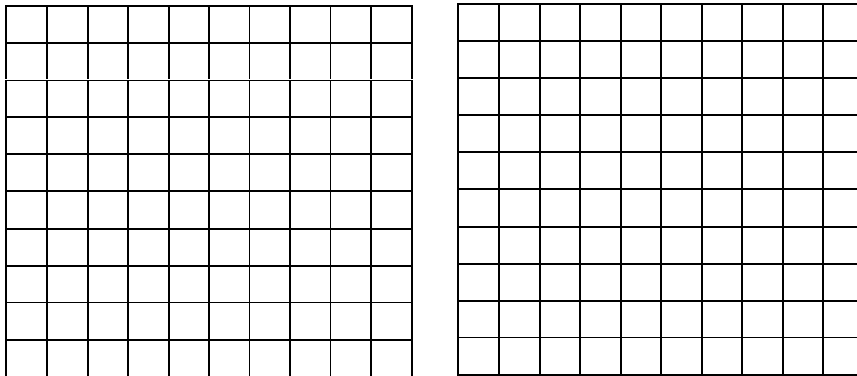
WORKSHEET 1

- 1) Shade  $1\frac{1}{10}$  of the diagram. Then convert it to percentage.



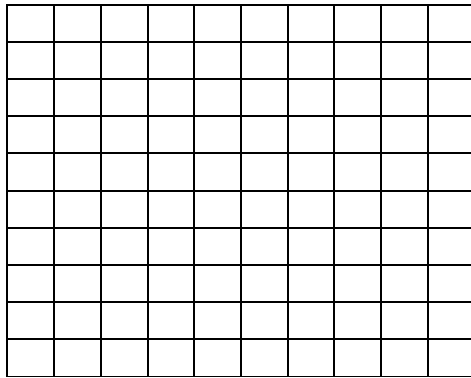
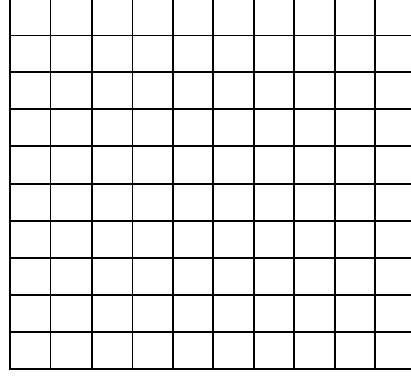
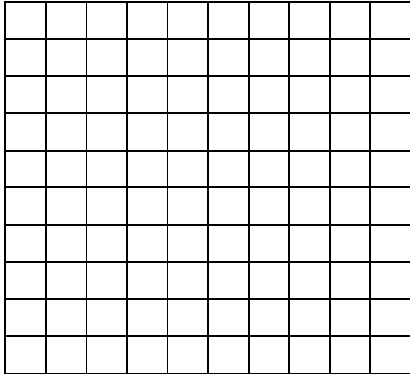
$$1\frac{1}{10} = \underline{\quad} \%$$

- 2) Shade  $1\frac{1}{2}$  of the diagram. Then convert it to percentage.



$$1\frac{1}{2} = \underline{\quad} \%$$

- 3) Shade  $2\frac{3}{4}$  of the diagram. Then convert it to percentage.



$$2\frac{3}{4} = \underline{\quad} \%$$

**WORKSHEET 2**

:

1. Fill in the blanks.

Mixed Number	Improper Fraction	Improper Fraction (Hundredth)	Percentage
$1\frac{7}{10}$	$\frac{17}{10}$	$\frac{170}{100}$	170%
$1\frac{2}{5}$			
$1\frac{1}{4}$			
$1\frac{1}{2}$			
$2\frac{3}{10}$			
$2\frac{4}{5}$			
$2\frac{2}{4}$			
$3\frac{1}{2}$			
$3\frac{9}{10}$			
$4\frac{3}{5}$			
$4\frac{3}{4}$			

2. Convert the mixed numbers to percentage.

Mixed Number	Percentage	Mixed Number	Percentage
$1\frac{35}{100}$		$1\frac{1}{2}$	
$2\frac{8}{100}$		$2\frac{4}{5}$	
$2\frac{8}{10}$		$2\frac{1}{4}$	
$3\frac{1}{5}$		$3\frac{3}{4}$	
$3\frac{1}{4}$		$3\frac{1}{2}$	

Attachment 1: Mixed Numbers and Percentage Dominoes Cards

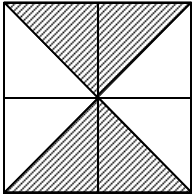
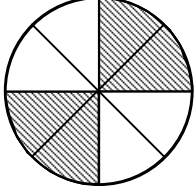
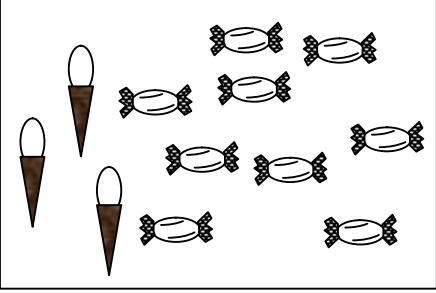
Note: Reproduce enough sets and cut the cards.

$1\frac{80}{100}$	250%	$2\frac{1}{2}$	$1\frac{8}{100}$
108%	$1\frac{1}{5}$	120%	$3\frac{1}{4}$
325%	170%	$1\frac{7}{10}$	340%
$3\frac{2}{5}$	$4\frac{3}{10}$	430%	450%
$4\frac{1}{2}$	260%	$2\frac{3}{5}$	175%
$1\frac{3}{4}$	317%	$3\frac{17}{100}$	180%



*Finding the percentage*

**Worksheet** (Extract from *Masmatics* pg 145 & 147)

<p>1</p>	<p>Diagram consists of equal squares.</p>  <p>What is the percentage of the shaded region from the whole diagram?</p>	<p>3</p>	<p>Diagram shows a circle.</p>  <p>Calculate the percentage of the shaded part from the whole circle.</p>
<p>2</p>	<p>Diagram shows a phrase.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>STAY HEALTHY ALWAYS JOG</p> </div> <p>What is the percentage of the letter A from the whole phrase?</p>	<p>4</p>	<p>Diagram shows some foods.</p>  <p>What is the percentage of the sweets from all the food?</p>

5 Table shows the number of eggs sold for four days.

Monday	○ ○ ○ ○
Tuesday	○ ○ ○
Wednesday	○ ○ ○ ○ ○
Thursday	○ ○ ○

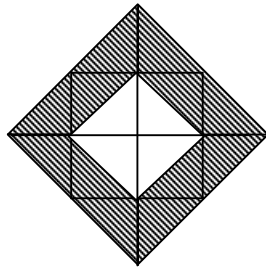
Calculate the percentage of eggs sold on Tuesday.

8 Diagram shows a word.

CONGRATULATIONS

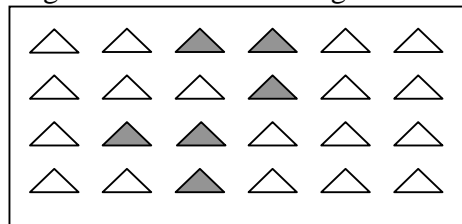
What is the percentage of the letter A compared to all the letters in the word?

6 Diagram consists of isosceles triangles of equal size.



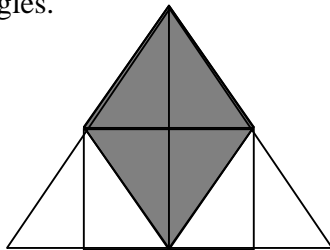
What is the percentage of the non-shaded part in the diagram?

9 Diagram shows some triangles.



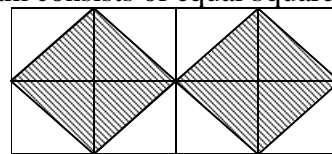
What is the percentage of the shaded triangles from the whole diagram?

7 Diagram consists of right-angled triangles.



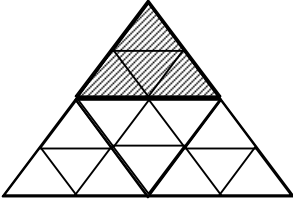
What is the percentage of the shaded parts in the diagram?

10 Diagram consists of equal squares.



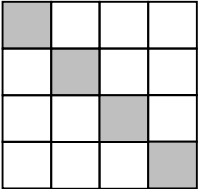
What is the percentage of the non-shaded parts from the whole diagram?

11 Diagram consists of isosceles triangles of equal size.



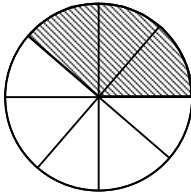
Calculate the percentage of the shaded parts of the whole diagram.

13 Diagram consists of equal squares.



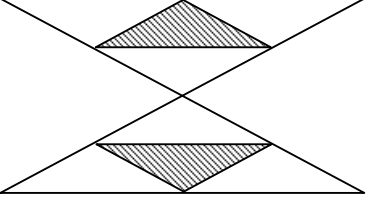
Find the percentage of the shaded parts of the whole diagram.

12 Diagram shows a circle.



What is the percentage of the non-shaded parts from the whole circle?

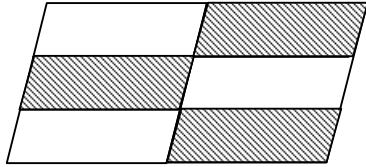
14 Diagram consists of isosceles triangles of equal size.



What is the percentage of the shaded parts from the whole diagram?

15

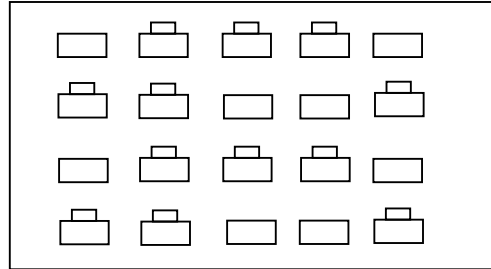
Diagram consists of some quadrilaterals.



Calculate the percentage of the shaded parts from the whole diagram.

18

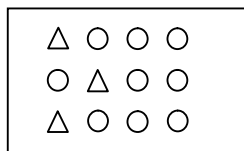
Diagram shows the position of desks and chairs in a classroom.



What is the percentage of desks without chairs in the classroom?

16

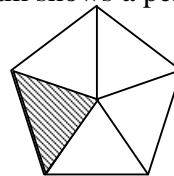
Diagram shows some circles and triangles.



What is the percentage of the triangles from the whole diagram?

19

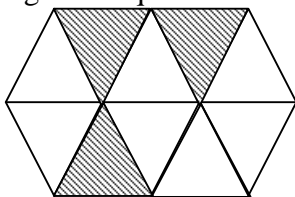
Diagram shows a pentagon.



Calculate the percentage of the shaded part from the whole diagram.

17

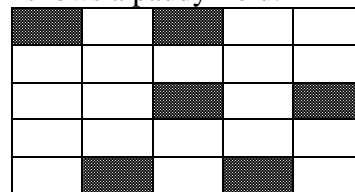
Diagram consists of isosceles triangles of equal size.



Calculate the percentage of the shaded parts from the whole diagram.

20

Diagram shows a paddy field.



Some sections of the paddy field is fill up with water. What is the percentage of the area filled up with water from the whole paddy field?