Year 6 Maths Home Learning Pack

Week Commencing Monday 6\textsuperscript{th} April 2020
Hello year 6! In this maths pack you will find five different activities for the week. Please complete the activities in the order given as they follow a learning journey. We hope you enjoy them! 😊

This week you are going to be learning about Ratio and Proportion. Please follow the link to access a guided teaching video for each lesson. We are following Week 1. If you are unable to access the videos, please see the ‘guidance sheets for each lesson’.

https://whiterosemaths.com/homelearning/year-6/

1. Week 1 Lesson 1- Using Ratio language (Guidance Sheet, Activity Sheet and Answers)
2. Week 1 Lesson 2- Ratio and Fractions (Guidance Sheet, Activity Sheet and Answers)
3. Week 1 Lesson 3- Introducing the Ratio Symbol (Guidance Sheet, Activity Sheet and Answers)
4. Week 1 Lesson 4- Calculating Ratio (Guidance Sheet, Activity Sheet and Answers)
5. Week 1 Lesson 5- Using Scale Factors (Guidance Sheet, Activity Sheet and Answers)
Lesson 1 - Guidance Sheet

For every 2 bananas there is 1 apple.
Which of the images represents this?

For every 3 eggs there are 2 slices of toast.
Which of the images represents this?

For every 2 bananas there is 1 apple.
Which of the images represents this?

For every 2 lollipops there are 3 sweets.
Which of the images represents this?

For every 4 squares there is 1 circle.
What does this look like?
1. Complete the sentences.

For every 3 sheep there are  ___ cows.

For every 2 cows there is  ___ sheeo.

2. Circle groups to match the statements.
   a) For every 1 football there are 3 tennis balls.

   b) For every 2 cars there are 5 bicycles.

3. Here are some shapes.

   Complete the sentences.
   For every 6 squares there are  ___ circles.
   For every 6 squares there are  ___ triangles.
   For every 1 square there is  ___ a circle.

4. a) Make a tower of cubes that has 3 green cubes for every 1 red cube.
   
   b) Compare your tower to a partner’s tower.

   What is the same and what is different about your tower?

5. For every 2 pencils there are 3 rulers.

   Draw a picture to show this.
6. Write three different 'For every ...' sentences for the cubes.


7. Teddy has 6 lollipops and 9 cookies.

8. Filip has some fish.
   For every 3 red fish he has 1 goldfish.
   Tommy counts at least 20 fish in the tank.
   Draw the fish in the tank.

9. In Class 6, for every 2 girls there is 1 boy.
   There are 12 girls in the class.
   How many boys are in the class?
   You can draw the children to help you.

   a) What mistake has Annie made?

   b) Write a sentence to match the picture.
Using ratio language

1. Complete the sentences.
   - For every 3 sheep there are 6 cows.
   - For every 2 cows there is 1 sheep.

2. Circle groups to match the statements.
   a) For every 1 football there are 3 tennis balls.
   b) For every 2 cars there are 5 bicycles.

3. Here are some shapes.
   - Complete the sentences.
     - For every 5 squares there are 3 circles.
     - For every 5 squares there are 9 triangles.
     - For every 1 square there is ⅔ a circle.

4. a) Make a tower of cubes that has 3 green cubes for every 1 red cube.
    b) Compare your tower to a partner’s tower.
    What is the same and what is different about your tower?

5. For every 2 pencils there are 3 rulers.
   Draw a picture to show this.
6. Write three different ‘For every ...’ sentences for the cubes.

For every 12 red cubes there are 1 yellow cube.
For every 6 red cubes there are 2 yellow cubes.
For every 3 red cubes there are 1 yellow cube.

7. Teddy has 6 lollipops and 9 cookies.

For every 3 lollipops there are 2 cookies.
I don't agree.

Annie
Teddy

a) What mistake has Annie made?

b) Write a sentence to match the picture.

For every 2 lollipops there are 3 cookies.

8. Filip has some fish.

For every 3 red fish he has 1 goldfish.
Tommy counts at least 20 fish in the tank.
Draw the fish in the tank.

9. In Class 6, for every 2 girls there is 1 boy.

There are 12 girls in the class.
How many boys are in the class?
You can draw the children to help you.

Girls Boys
Lesson 2 - Guidance Sheet

a) There are 5 bears altogether.
b) There are 3 yellow bears.
c) There are 2 purple bears.
d) 3 out of the 5 bears are yellow.
e) 2 out of the 5 bears are purple.

a) There are 12 pieces of fruit altogether.
b) There are 5 pears.
c) There are 7 apples.
d) 7 out of the 12 pieces of fruit are apples.
e) 5 out of the 12 pieces of fruit are pears.

a) What fraction of the fruit are apples? \(\frac{7}{12}\)
b) What fraction of the fruit are pears? \(\frac{5}{12}\)

For every 7 apples, there are 5 pears.
We can say the ratio of apples to pears is 7 to 5.
We can say the ratio of pears to apples is 5 to 7.

a) What fraction of the bar is shaded? \(\frac{3}{7}\)
b) What fraction of the bar is not shaded? \(\frac{4}{7}\)

For every 3 parts shaded, 4 parts are not shaded.
The ratio of shaded parts to non-shaded parts is 3 to 4.
1. Here are some counters.
   Complete the sentences to describe the counters.
   a) There are ______ counters altogether.
   b) There are ______ white counters.
   c) There are ______ black counters.
   d) 3 out of the 8 counters are ____________
   e) ______ out of the 8 counters are white.

2. Here are some animals.
   Complete the sentences.
   For every ______ cows there are ______ sheep.
   The ratio of cows to sheep is ______ to ______

3. Part of the bar has been shaded.
   a) What fraction of the bar is shaded?
   b) What fraction of the bar is not shaded?
   c) Write the ratio of shaded to non-shaded parts.
   d) Write the ratio of non-shaded to shaded parts.

4. Here are some shapes.
   a) What fraction of the shapes are circles?
   b) What fraction of the shapes are stars?
   c) What is the ratio of stars to circles?
   d) What is the ratio of circles to stars?
   Can you find a different answer to each of these questions?
   Compare with a partner.
5. The bar model shows the ratio 1 to 3 to 4

Talk to a partner about how it shows this.

a) What fraction of the bar is striped?

b) What fraction of the bar is fully shaded?

c) What fraction of the bar is blank?

6. The fraction of brown cubes is $\frac{2}{3}$ because the ratio of brown to yellow is 2 to 3

Jock: The fraction of brown cubes is $\frac{2}{3}$

Rosie: The fraction of brown cubes is $\frac{2}{3}$

Who is correct? _________________

Explain your answer.

7. Scott draws a bar and divides it into 8 equal parts.

He shades 25% of the bar.

What is the ratio of shaded to non-shaded parts? __________ to __________

8. A pencil case contains felt tips and pencils.

$\frac{3}{8}$ of the contents are pencils.

What is the ratio of felt tips to pencils? __________ to __________

9. Ron has some limes and strawberries.

The ratio of strawberries to limes is 5 to 1

a) How do you know he has more strawberries than limes?

__________________________

b) What fraction of the fruits are strawberries?

__________________________

c) What fraction of the fruits are limes?

__________________________
Ratio and fractions

1. Here are some counters.
   Complete the sentences to describe the counters.
   a) There are 8 counters altogether.
   b) There are 5 white counters.
   c) There are 3 black counters.
   d) 3 out of the 8 counters are black.
   e) 5 out of the 8 counters are white.

2. Here are some animals.

   Complete the sentences.
   For every 3 cows there are 2 sheep.
   The ratio of cows to sheep is 3 to 2

   \[ \frac{3}{5} \] of the animals are cows.
   \[ \frac{2}{5} \] of the animals are sheep.

3. Part of the bar has been shaded.

   a) What fraction of the bar is shaded?
   \[ \frac{5}{6} \]
   b) What fraction of the bar is not shaded?
   \[ \frac{1}{6} \]
   c) Write the ratio of shaded to non-shaded parts.
   5 to 1
   d) Write the ratio of non-shaded to shaded parts.
   1 to 5

4. Here are some shapes.

   a) What fraction of the shapes are circles?
   \[ \frac{4}{10} \]
   b) What fraction of the shapes are stars?
   \[ \frac{6}{10} \]
   c) What is the ratio of stars to circles?
   6 to 4
   d) What is the ratio of circles to stars?
   4 to 6

   Can you find a different answer to each of these questions?
   Compare with a partner.
5. The bar model shows the ratio 1 to 3 to 4

Talk to a partner about how it shows this.

a) What fraction of the bar is striped? \( \frac{1}{8} \)
b) What fraction of the bar is fully shaded? \( \frac{3}{8} \)
c) What fraction of the bar is blank? \( \frac{4}{8} \)

6. The fraction of brown cubes is \( \frac{2}{3} \) because the ratio of brown to yellow is 2 to 3.

Who is correct? Rosie

Explain your answer.

2 out of 5 cubes are brown.

7. Scott draws a bar and divides it into 8 equal parts.

He shades 25% of the bar.

What is the ratio of shaded to non-shaded parts? \( \frac{2}{6} \) (or 1 to 3)

8. A pencil case contains felt tips and pencils.

\( \frac{3}{8} \) of the contents are pencils.

What is the ratio of felt tips to pencils? \( \frac{5}{3} \)

9. Ron has some limes and strawberries.

The ratio of strawberries to limes is 5 to 1.

a) How do you know he has more strawberries than limes?

For every 1 lime, there are 5 strawberries.

b) What fraction of the fruits are strawberries? \( \frac{5}{6} \)
c) What fraction of the fruits are limes? \( \frac{1}{6} \)
Lesson 3 - Guidance Sheet

For every 3 red counters, there are 2 yellow counters.

The ratio of red counters to yellow counters is $3 : 2$.

The ratio of yellow counters to red counters is $2 : 3$.

Yes, for every boat there is 4 people in the boat.
1. The ratios show shaded parts to non-shaded parts. Match the ratios, statements and bar models.
   - 2:3 five to two
   - 5:2 three to two
   - 2:5 two to three
   - 3:2 two to five

2. The ratio of purple to yellow is 5:4
   - It is 4:5

   Mo
   Alex

   Who is correct? ________________
   Explain your answer.

3. Dani has some counters, cubes and marbles. Complete the sentences.
   - The ratio of counters to marbles is __ : __
   - The ratio of marbles to cubes is __ : __
   - The ratio of cubes to counters is __ : __
   - The ratio of counters to cubes is __ : __
   - The ratio of counters to cubes to marbles is __ : __ : __

4. Brett has drawn some triangles and squares.
   - The ratio of triangles to squares is 1:3
   a) Are there more triangles or more squares? ________________
      Explain how you know.

   ________________
   ________________

   b) Brett has drawn more than 10 shapes.
   Draw what Brett might have drawn.

   ___________________________
5. Here are some rulers and some pencils.

   a) What is the ratio of pencils to rulers? __________ : __________
   b) Here are some more rulers and pencils.

6. The ratio of horses to chickens in a field is 2:5
   Here are the horses. Draw the chickens.

7. Shade squares so that the ratio of shaded to non-shaded squares is 1:4
   a) __________
   b) __________
   c) __________

8. A box contains dark, white and milk chocolates.
   \( \frac{3}{8} \) of the box are dark chocolates.
   \( \frac{1}{2} \) of the box are milk chocolates.
   The rest are white chocolates.
   What does each ratio represent?
   a) 1:3
   b) 4:1
   c) 3:5

Who is correct? __________
Explain your answer.

__________________________
__________________________
Introducing the ratio symbol

1. The ratios show shaded parts to non-shaded parts. Match the ratios, statements and bar models.
   - 2:3
   - 5:2
   - 2:5
   - 3:2
   - five to two
   - three to two
   - two to three
   - two to five

2. The ratio of purple to yellow is 5:4.
   - Mo
   - Alex
   - It is 4:5

   Who is correct? __Mo_________
   Explain your answer.
   For every 5 purple cubes there are 4 yellow cubes.

3. Dani has some counters, cubes and marbles.
   Complete the sentences.
   - The ratio of counters to marbles is __5:4__
   - The ratio of marbles to cubes is __4:3__
   - The ratio of cubes to counters is __3:5__
   - The ratio of counters to cubes is __5:3__
   - The ratio of counters to cubes to marbles is __5:3:4__

4. Brett has drawn some triangles and squares.
   The ratio of triangles to squares is 1:3
   a) Are there more triangles or more squares? __Squares__
   Explain how you know.
   For every 1 triangle there are 3 squares.

   b) Brett has drawn more than 10 shapes.
   Draw what Brett might have drawn.
Here are some rulers and some pencils.

![Images of rulers and pencils]

a) What is the ratio of pencils to rulers? \[1:3\]

b) Here are some more rulers and pencils.

![Images of rulers and pencils]

The ratio of pencils to rulers is the same as in part a).

Ron

Ron is wrong because there are more pencils and more rulers.

Dara

Who is correct? **Ron**

Explain your answer. For every 1 pencil, there are still 3 rulers.

The ratio of horses to chickens in a field is \(2:5\)

Here are the horses. Draw the chickens.

![Images of horses and chickens]

Shade squares so that the ratio of shaded to non-shaded squares is \(1:4\)

\[
\begin{array}{c}
\text{a)} \quad & \\
\text{b)} \quad & \\
\text{c)} \quad & \\
\end{array}
\]

A box contains dark, white and milk chocolates.

\[
\begin{array}{c}
\frac{3}{8} \text{ of the box are dark chocolates.} \\
\frac{1}{2} \text{ of the box are milk chocolates.} \\
\text{The rest are white chocolates.} \\
\text{What does each ratio represent?} \\
\end{array}
\]

a) \(1:3\)

white : dark

b) \(4:1\)

milk : white

c) \(3:5\)

dark : milk or white
Lesson 4 - Guidance Sheet

A basket holds 6 bread rolls.
For every 1 basket, there are 6 bread rolls.

If you have 3 baskets, how many bread rolls do you have?

Baskets: 3

A basket holds 6 bread rolls.
For every 1 basket, there are 6 bread rolls.

If you have 24 bread rolls, how many baskets will you need?

Baskets: 4

For every 2 ladybirds, there are 3 spiders.
If there are 20 insects altogether, how many spiders and how many ladybirds are there?

Ladybirds: 8
Spiders: 12

Dexter and Rosie share 24 sweets in the ratio 3 : 5
How many more sweets will Rosie get than Dexter?

Dexter

Rosie

24

24 ÷ 8 = 3
3 × 2 = 6

Rosie gets 6 more sweets than Dexter.

Dexter and Rosie share some sweets in the ratio 3 : 5
Rosie gets 24 more sweets than Dexter.
How many sweets does Dexter get?

Dexter

Rosie

24 ÷ 2 = 12
12 × 3 = 36

Dexter gets 36 sweets.
1. Eva is baking cakes and cookies.
   For every 1 cake, she will bake 2 cookies.
   a) If Eva bakes 3 cakes, how many cookies will she bake?

2. The ratio of red to yellow counters is 2:3
   There are 20 counters in total.
   How many counters of each colour are there?
   You can colour the counters to help you.

3. Tom has 5 green cubes for every 3 yellow cubes.
   He has 16 cubes in total.
   Draw a diagram to represent this.

4. Esther is building a tower of cubes.
   The ratio of red to yellow cubes is 3:1
   The tower has 6 yellow cubes. How many red cubes are there?

   For every 2 games she wins, she loses 5 games.
   How many more games does she lose than win?
6. a) Huan is making a drink by mixing 1 part juice with 5 parts water. Complete the table to show the amounts he would need to use.

<table>
<thead>
<tr>
<th>Juice</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 litre</td>
<td>5 litres</td>
</tr>
<tr>
<td>2 litres</td>
<td></td>
</tr>
<tr>
<td>4 litres</td>
<td></td>
</tr>
<tr>
<td>100 ml</td>
<td></td>
</tr>
<tr>
<td>200 ml</td>
<td></td>
</tr>
<tr>
<td>300 ml</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 litres</td>
</tr>
<tr>
<td></td>
<td>750 ml</td>
</tr>
</tbody>
</table>

b) Huan makes 1 litre 500 ml of drink in total. How much juice and water does he need to use?

juice [ ] litre  water [ ] litre

7. A group of students study French or German in the ratio 3:7.
   a) Which subject has the most students? ______________
   b) Draw a diagram to represent this.

   [Diagram]

   c) There are 80 students in total. How many more students study German than French?

   [Answer]

8. Describe a situation for each bar model.
   a) green [ ] blue [ ]
      28

      [Situation]

   b) green [ ] blue [ ]
      28

      [Situation]

   c) green [ ] blue [ ]
      28

      [Situation]

 Compare answers with a partner. What is the same and what is different?
1. Eva is baking cakes and cookies.
   For every 1 cake, she will bake 2 cookies.

   a) If Eva bakes 3 cakes, how many cookies will she bake?

   b) If Eva bakes 10 cookies, how many cakes will she bake?

2. The ratio of red to yellow counters is 2:3.
   There are 20 counters in total.
   How many counters of each colour are there?
   You can colour the counters to help you.

   **yellow** 12  **red** 8

3. Tom has 5 green cubes for every 3 yellow cubes.
   He has 16 cubes in total.
   Draw a diagram to represent this.

4. Esther is building a tower of cubes.
   The ratio of red to yellow cubes is 3:1.
   The tower has 6 yellow cubes. How many red cubes are there?

   For every 2 games she wins, she loses 5 games.
   How many more games does she lose than win?

   \[
   \begin{align*}
   \text{Win} & : 2 \quad 3 \quad ? \\
   \text{Lose} & : 3 \quad 3 \quad 3 \quad 3 \quad 3
   \end{align*}
   \]
   \[21 \div 7 = 3 \quad 3 \times 3 = 9\]

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6 a) Huan is making a drink by mixing 1 part juice with 5 parts water.
   Complete the table to show the amounts he would need to use.

<table>
<thead>
<tr>
<th>Juice</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 litre</td>
<td>5 litres</td>
</tr>
<tr>
<td>2 litres</td>
<td>10 litres</td>
</tr>
<tr>
<td>4 litres</td>
<td>20 litres</td>
</tr>
<tr>
<td>100 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>200 ml</td>
<td>1 litre</td>
</tr>
<tr>
<td>300 ml</td>
<td>1.5 litres</td>
</tr>
<tr>
<td>6 litres</td>
<td>30 litres</td>
</tr>
<tr>
<td>150 ml</td>
<td>756 ml</td>
</tr>
</tbody>
</table>

b) Huan makes 1 litre 500 ml of drink in total.
   How much juice and water does he need to use?

   juice 250 ml      water 1250 ml

7 A group of students study French or German in the ratio 3:7
   a) Which subject has the most students? German
   b) Draw a diagram to represent this.

   French [diagram]
   German [diagram]

   c) There are 80 students in total.
      How many more students study German than French?
      French $\frac{3}{3+7} = \frac{3}{10}$
      German $\frac{7}{3+7} = \frac{7}{10}$
      $80 \div 10 = 8$
      $4 \times 8 = 32$
      32

8 Describe a situation for each bar model.
   a) green [diagram] blue [diagram] 28
      The ratio of green to blue sweats is 4:3. There are 28 green sweats.
   b) green [diagram] blue [diagram] 28
      The ratio of green to blue sweats is 4:3. There are 28 green sweats.
   c) green [diagram] blue [diagram] 28
      The ratio of green to blue sweats is 4:3. There are 28 more green sweats than blue sweats.

   Compare answers with a partner.
   What is the same and what is different?
Lesson 5 - Guidance Sheet

Here is a rectangle.

Draw another rectangle where each side is three times as big.

1 × 3 = 3
3 × 3 = 9

This shape has been enlarged by a scale factor of 3

Here is an irregular hexagon.

Enlarge the hexagon by a scale factor of 2

This shape has been enlarged by a scale factor of 2

Rectangle A has been enlarged by a scale factor of 3 to make rectangle B.

Find the perimeter of each rectangle.

Perimeter of A
4 + 4 + 6 + 6 = 20 cm

Perimeter of B
12 + 12 + 18 + 18 = 60 cm

Perimeter of A = 20 cm  Perimeter of B = 60 cm
Using scale factors

1. a) Here is a rectangle.

Draw another rectangle where each side is twice as big.

b) Here is a square.

Draw another square where each side is 4 times as big.

2. a) Explain what it means for a shape to be enlarged by a scale factor of 2

b) Enlarge the shapes by a scale factor of 2

3. Complete the sentence.

A shape in which each side has tripled in size has been enlarged by a scale factor of 3.
4. Here is a rectangle.

a) Measure the side lengths of the rectangle and label them on the diagram.

b) Enlarge the rectangle by a scale factor of 3 and label the side lengths.

5. The sides of the rectangle are increased by a scale factor of 2.
   What is the perimeter of the new shape?

6. The shape has been enlarged by a scale factor of $1\frac{1}{2}$.
   Fill in the dimensions of the new shape.

7. Triangle A has been enlarged by a scale factor of 5 to make triangle B.
   Find the perimeter of each triangle.

   perimeter of A = cm
   perimeter of B = cm
Using scale factors

1. a) Here is a rectangle.

Draw another rectangle where each side is twice as big.

b) Here is a square.

Draw another square where each side is 4 times as big.

2. a) Explain what it means for a shape to be enlarged by a scale factor of 2.

All of the side lengths are multiplied by 2.

b) Enlarge the shapes by a scale factor of 2.

3. Complete the sentence.

A shape in which each side has tripled in size has been enlarged by a scale factor of 3.
Here is a rectangle.

a) Measure the side lengths of the rectangle and label them on the diagram.

b) Enlarge the rectangle by a scale factor of 3 and label the side lengths.

The shape has been enlarged by a scale factor of \(1\frac{1}{2}\).

Fill in the dimensions of the new shape.

Triangle A has been enlarged by a scale factor of 5 to make triangle B.

Find the perimeter of each triangle.

perimeter of A = \(44\) km

perimeter of B = \(220\) km

15 km

14 km

70 km

15 km

15 km

75 km

14 + 15 + 15 = 44

75 + 75 + 70 = 220

22 cm

225 cm