# Week 10, Day 4 <br> Exploring ratios (1) 

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the Learning Reminders.

2. Think you've got it? Have a go at the Investigative Practical Activity.

3. Have I mastered the topic? A few questions to Check your understanding.
Fold the page to hide the answers!
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Identify the value of the '4' in the following numbers:
(a) }3.4
(b) 4.821
(c) 0.043
(d) 5.104
(e) 48,739
```

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## Learning Reminders

## Exploring ratios.



For each rectangle, divide the longer side by the shorter side using a calculator.

## What do you notice about the answers?

When large groups of people are asked to do this, a pattern emerges where many answers are between 1.4 and 1.8. How many of you drew rectangles in this range?

Measure the length and width of a debit/credit card. Divide the length by the width. What is the answer
to one decimal place?

## Learning Reminders

## Exploring ratios.

The Golden Section (or Golden Mean) is a special ratio approximately equal to 1 to 1.618 . Rectangles with this ratio are thought to be pleasing to the eye and so this ratio has been used in architecture for centuries. Egyptian pyramids have this ratio between their face heights and half the base.


There seem to be examples of this ratio in nature too.

Renaissance artists called this special ratio the Divine Proportion and used it in their artwork.


## Check your understanding

## Questions

Orange paint is mixed using this ratio of red and yellow paints:
red : yellow

$$
2: 7
$$

Sam uses 4 litres of red.
Assuming he uses the correct amount of yellow, how many litres of orange paint will he make?

Draw a rectangle where the ratio of the longer side to the shorter side is 3 to 2 .
Draw a different size rectangle with the same ratio.

A square of side length $\boldsymbol{a}$ has an area $=16 \mathrm{~cm}^{2}$.
Another square, of side length $\boldsymbol{b}$, has an area $=100 \mathrm{~cm}^{2}$.
What is the ratio of their side lengths, $\boldsymbol{a}: \boldsymbol{b}$ ?

## Check your understanding

## Answers

Orange paint is mixed using this ratio of red and yellow paints:
red : yellow
2: 7
Sam uses 4 litres of red.
Assuming he uses the correct amount of yellow, how many litres of orange paint will he make? 18 litres. If he uses 4 litres of red, then he must use 14 litres of yellow to maintain the red : yellow ratio.

Draw a rectangle where the ratio of the longer side to the shorter side is 3 to 2 .
Draw a different size rectangle with the same ratio.
Accept a pair of rectangles where the longer side is 1.5 times longer than the other side, e.g. 6 cm by 4 cm or 9 cm by 6 cm .

A square of side length $\boldsymbol{a}$ has an area $=16 \mathrm{~cm}^{2}$.
Another square, of side length $\boldsymbol{b}$, has an area $=100 \mathrm{~cm}^{2}$.
What is the ratio of their side lengths, $\boldsymbol{a}: \boldsymbol{b}$ ? $4: 10$ (or 2:5) since the length of the squares are 4 cm and 10 cm respectively.

