

$$a_0 = 1 [a_0]$$

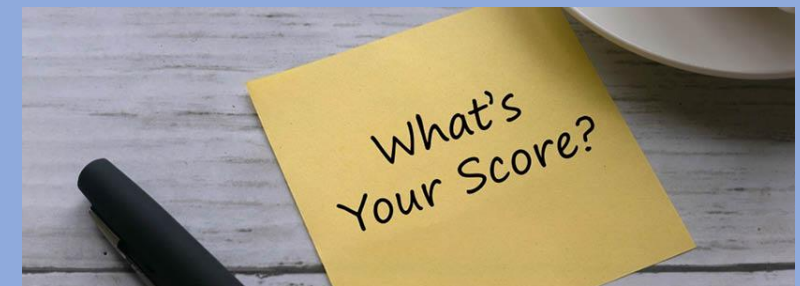
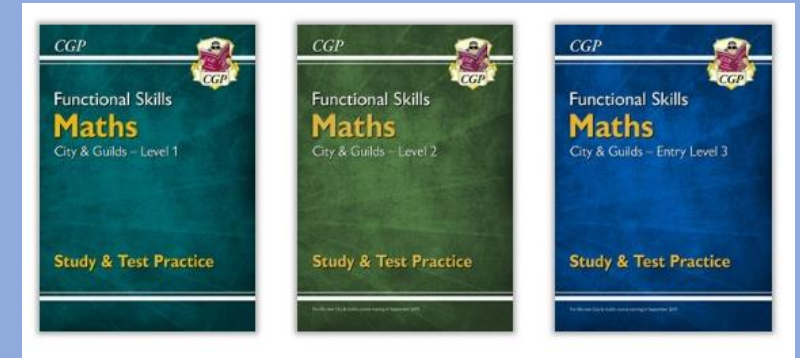
8

$$\arcsin(z)$$

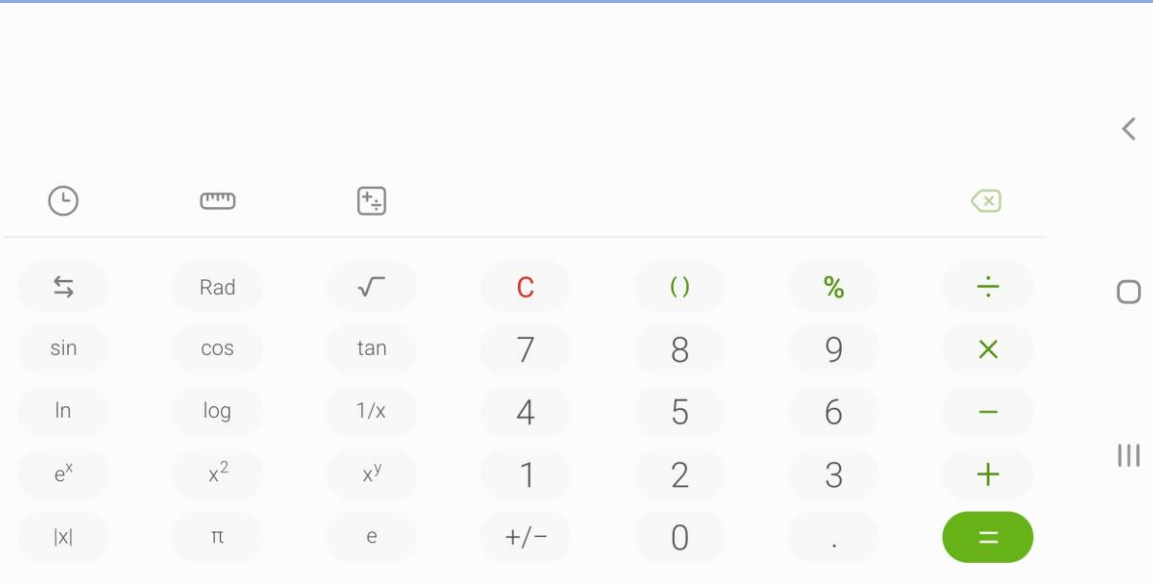
$$x_{n+1} =$$

# Introductions

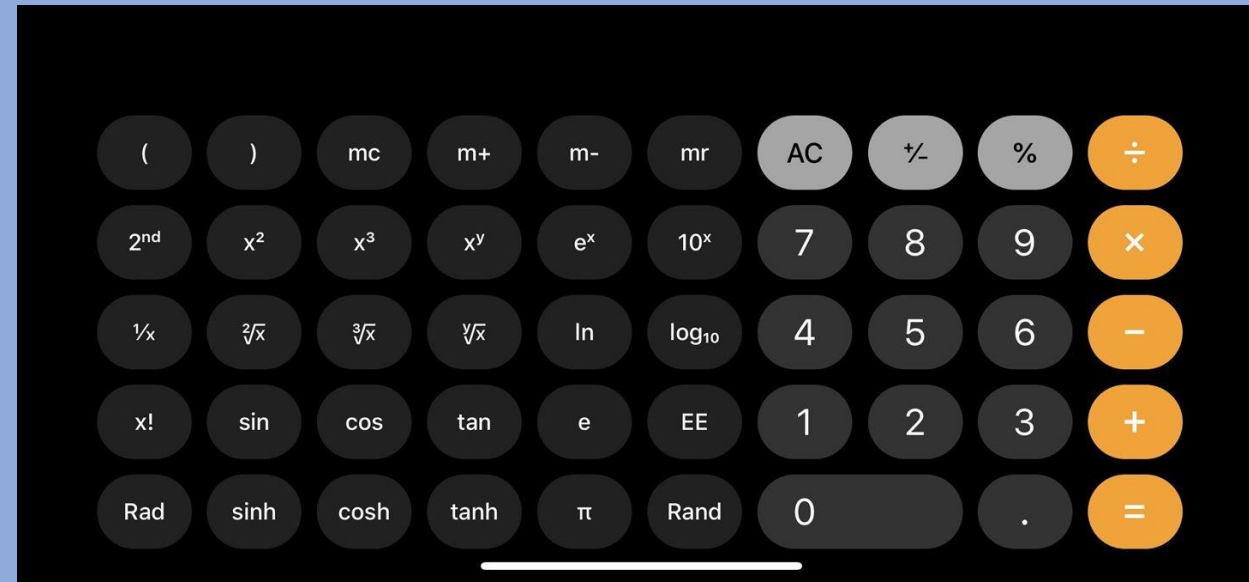
- The CGP textbooks are a fantastic resource for your revision.
- You can use your phone when prompted, and as a calculator, but please keep it on silent during the lesson.
- Please make a note of your scores for interactive games as they let me know how well you are progressing.



# Android



# Apple



Rotate your phone in the calculator app to reveal additional functions.



# Accessibility – For home study

- You can use your phone to read text for you.
- Download the app Google Lens.
- Select the Text option from the bottom of the screen.
- Take a picture of the text.
- Click the Listen button.
- The text will be read to you.
- Note: Apps can sometimes make mistakes so be careful to watch the moving highlights on the screen.

[Download](#)

[https://play.google.com/store/apps/details?id=com.google.ar.lens&hl=en\\_GB&gl=US](https://play.google.com/store/apps/details?id=com.google.ar.lens&hl=en_GB&gl=US)

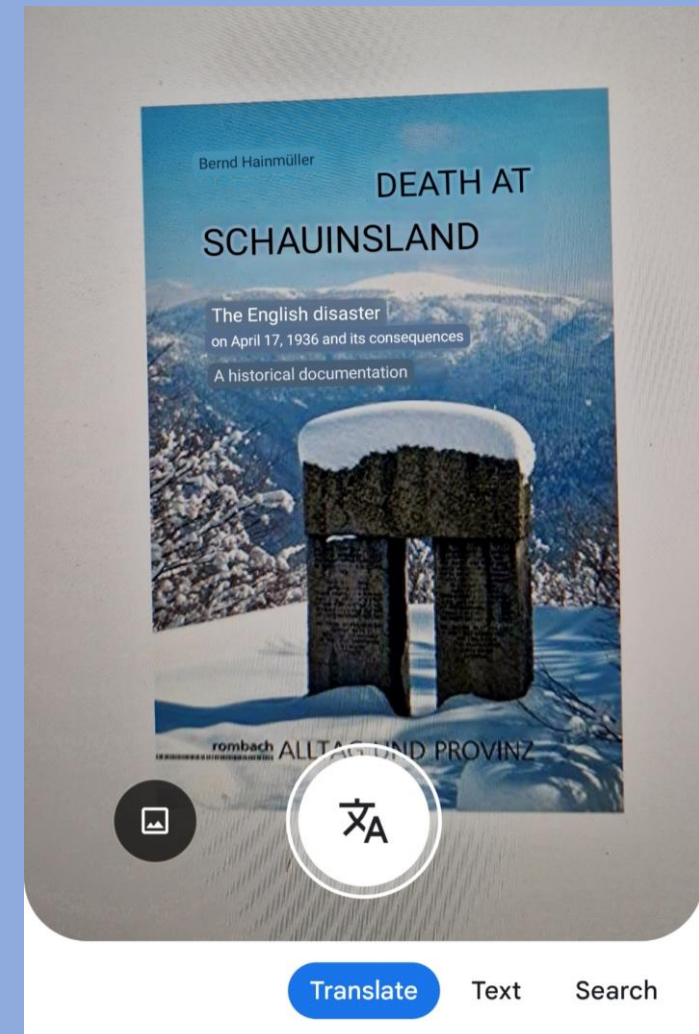
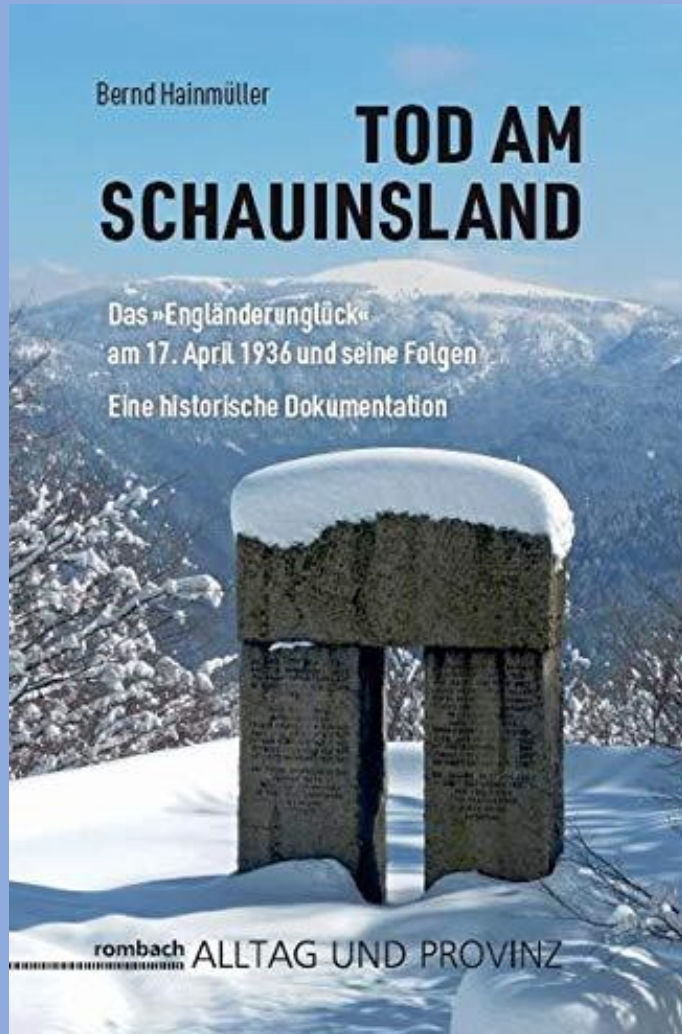
[Using Google Lens](#)

[https://www.youtube.com/watch?v=dkvo50\\_UAqU](https://www.youtube.com/watch?v=dkvo50_UAqU)

The Google Lens app logo is a black square with the words "Google" and "Lens" written in white, stacked vertically in the center.

# Google Lens can do more!

The Black Forest Hiking Disaster – We will cover this story in Health and Wellbeing  
<https://www.youtube.com/watch?v=ZjjgpiDmVCw>

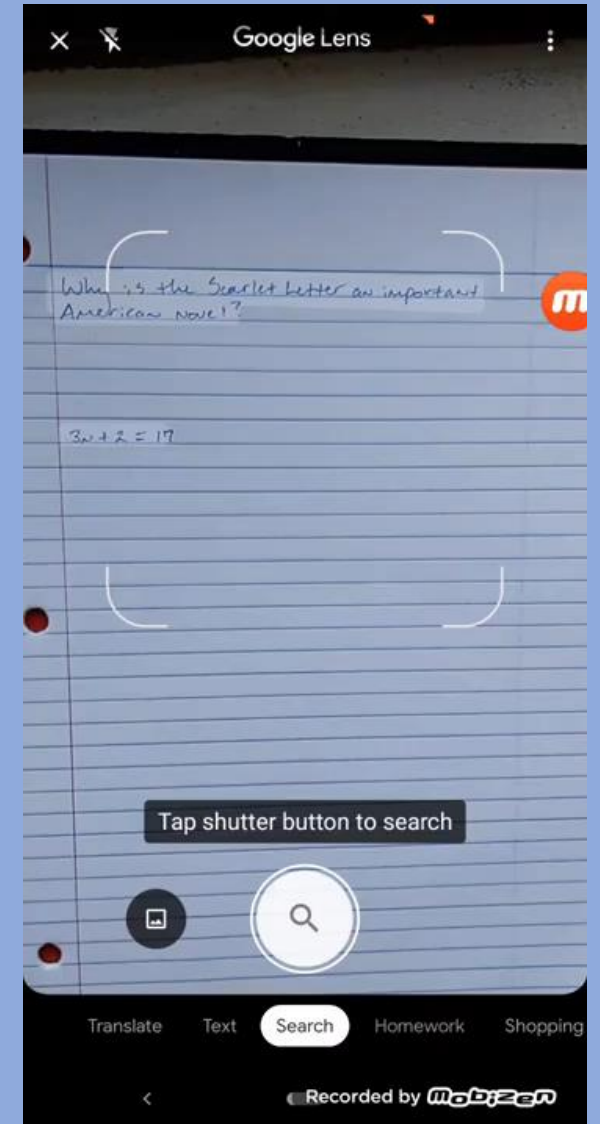


# Google Lens can help with your homework!



The Google Lens Homework Help – TracSoft Inc  
<https://www.youtube.com/watch?v=SOC-d4VDKOY>

- Always attempt questions first before using the application.
- If you do use Google Lens to solve a Maths problem, make sure you follow through the solution carefully, making sure you understand the steps it is showing you.
- You won't be able to use Google Lens in an exam, so once again, make sure you understand the process it is showing you.
- And don't forget...**ALWAYS READ THE QUESTION**...the question may ask for a written answer e.g. Bob does the following calculation...was he right? (Answer Yes or No with a sentence).

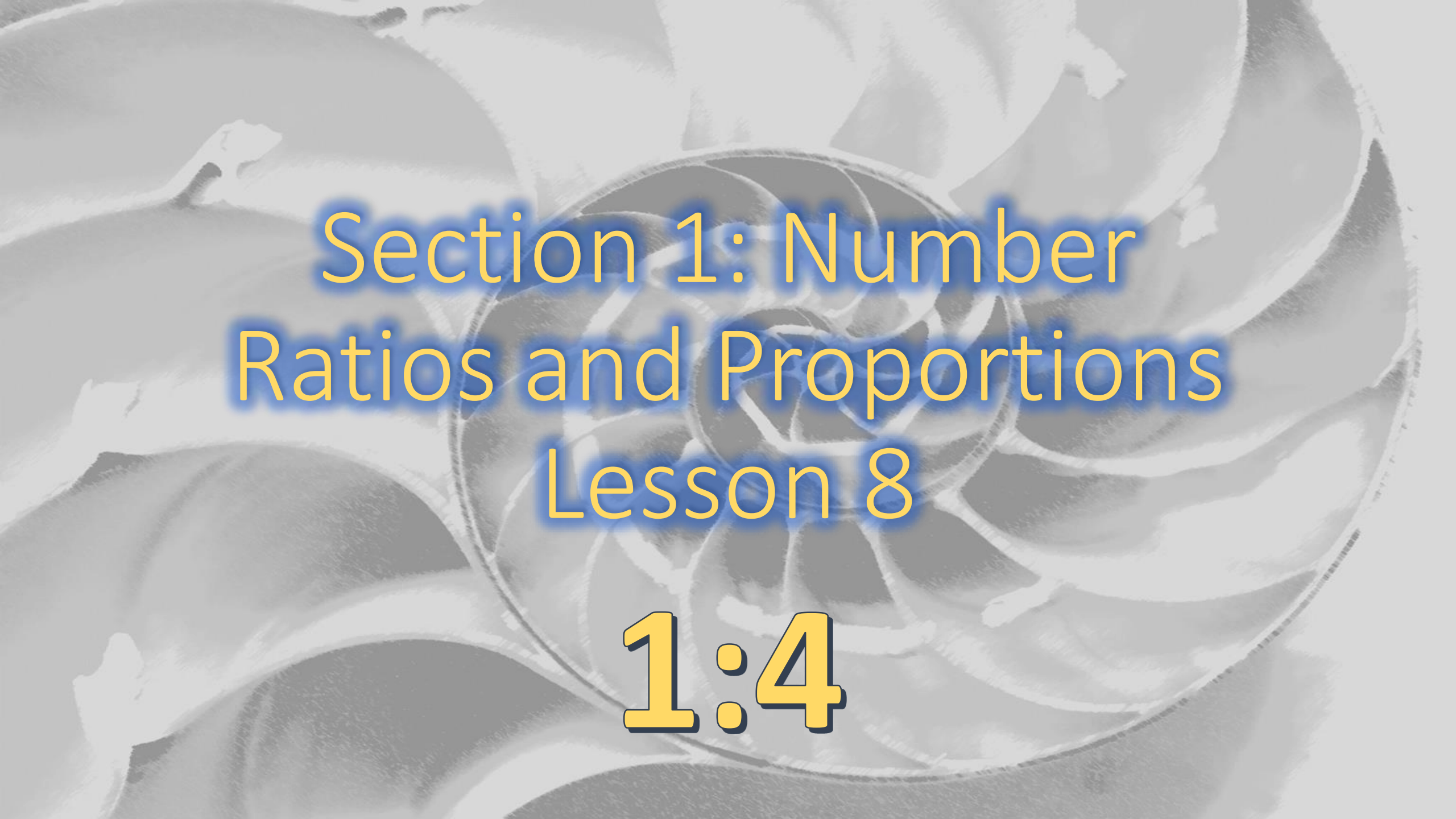


$$a_0 = 1 [a_0]$$

8

$$\arcsin(z)$$

$$x_{n+1} =$$



Section 1: Number  
Ratios and Proportions  
Lesson 8

**1:4**

**Section 1: Number**  
Ratios and Proportions  
Lesson 8

**Part 1: Fractions, Decimals & Percentages**  
Recap

Resources Online  
PowerPoint Slides  
Worksheets  
Videos  
Games

[www.reachoutcf.com/resources](http://www.reachoutcf.com/resources)

[www.reachoutcf.com/maths-resources](http://www.reachoutcf.com/maths-resources)

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revision.



**PASS**  
**FUNCTIONAL**  
**SKILLS**

<https://passfunctionalskills.co.uk>

- Study Guides
- Practice Questions
- Video Demos
- Past Papers

# Lesson Intentions: Monday 4<sup>th</sup> December 2023

## Recap:

- Read, write and understand thirds, quarters, fifths and tenths including equivalent forms. (E3.N7)
- Read, write, order and compare common fractions and mixed numbers (L1.N8)
- Find fractions of whole number quantities or measurements. (L1.N9)
- Read, write and use decimals up to 2 decimal places. (E3.N8)
- Read, write, order and compare decimals up to 3 decimal places. (L1.N10)
- Add, subtract, multiply and divide decimals up to 2 decimal places. (L1.N11)
- Read write order and compare percentages in whole numbers. (L1.N13)
- Calculate percentages of quantities, including simple percentage increases and decreases by 5% and multiples thereof. (L1.N14)

## This lesson:

- Recognise and calculate equivalences between common fractions, decimals and percentages. (L1.N16)
- Work with simple ratio and direct proportions. (L1.N17)

Can you help me find Ziggy?

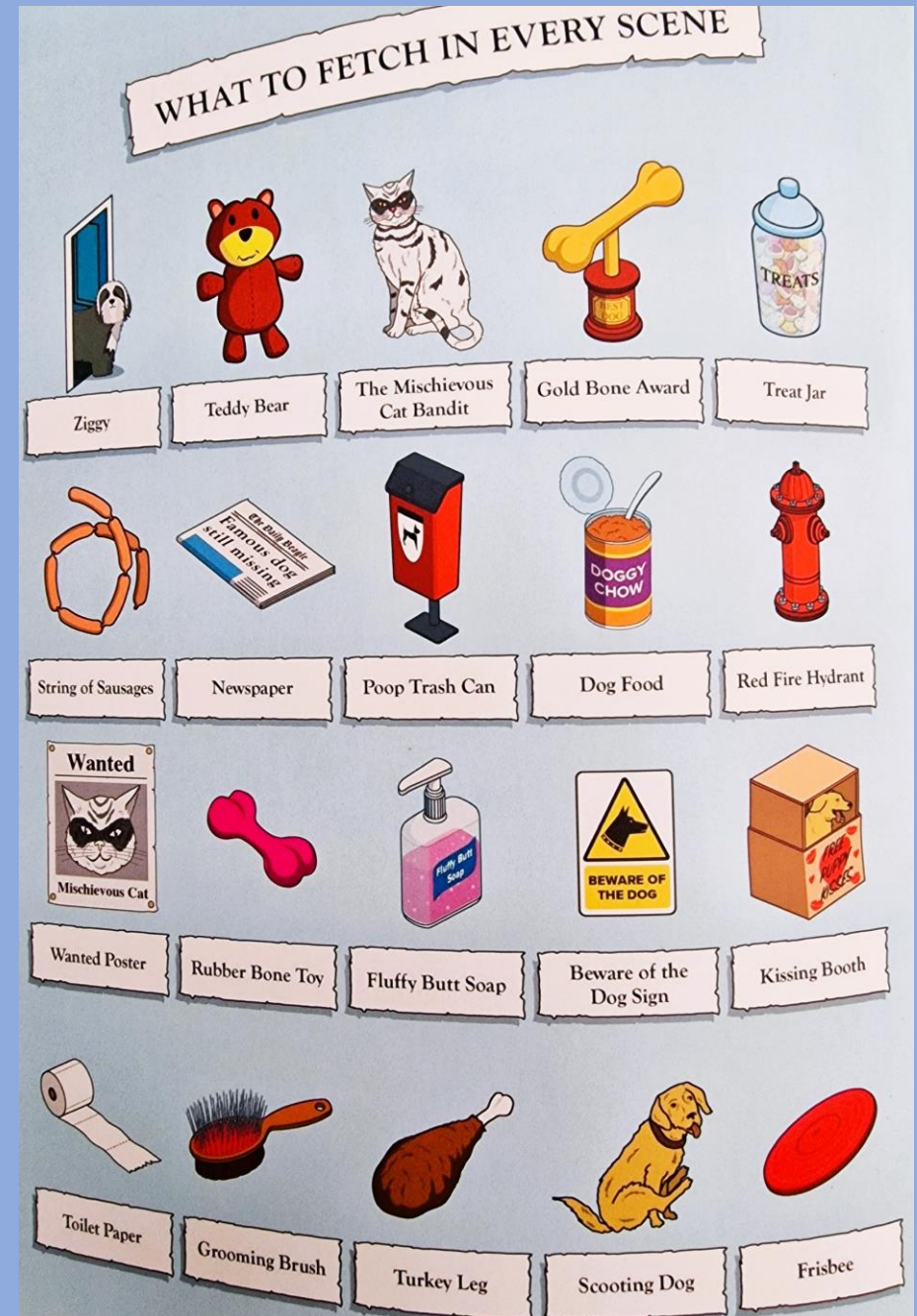
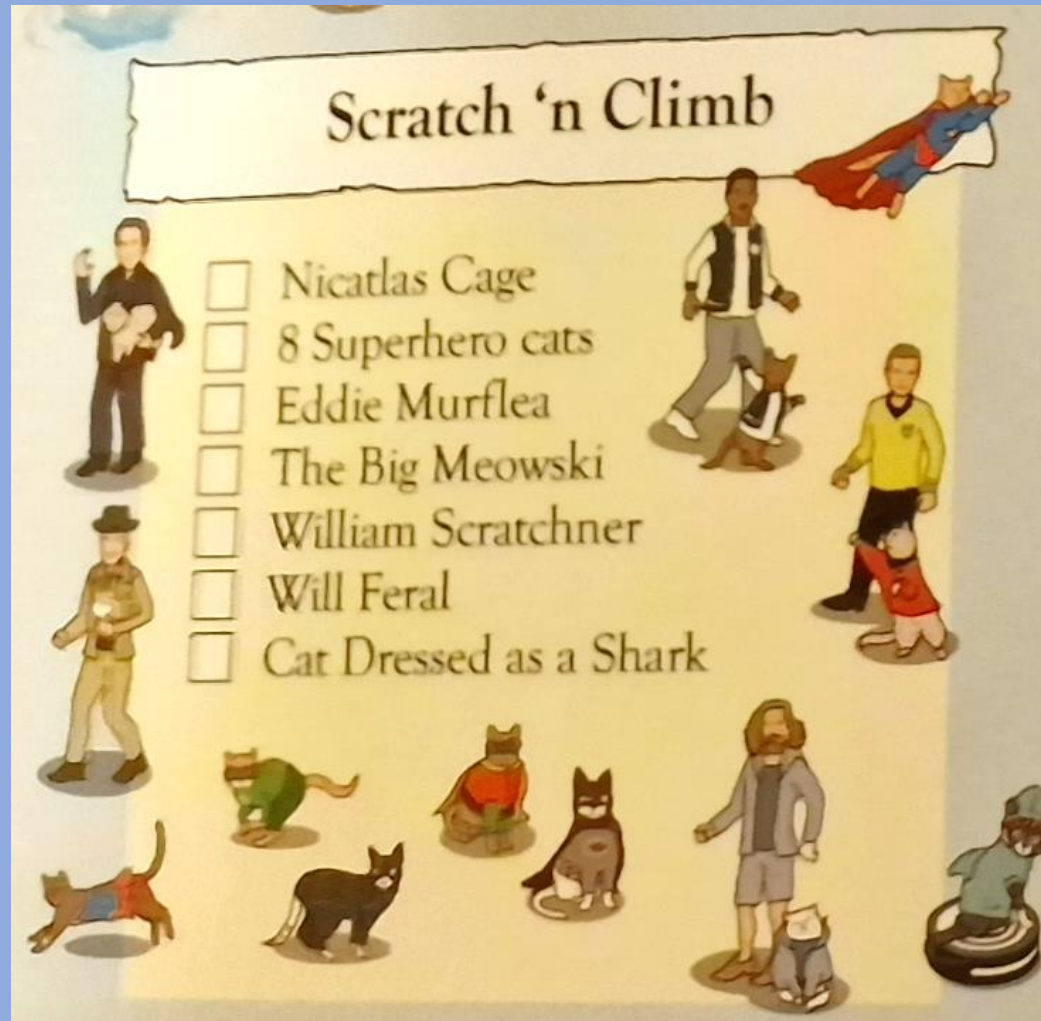


# Scratch 'n Climb

Ready to play ball? Join in with the fun at the world's one and only indoor adventure land, fully dedicated to our feline friends.



# Extra things to spot!



# Scratch 'n Climb

Ready to play ball? Join in with the fun at the world's one and only indoor adventure land, fully dedicated to our feline friends.



00:00

# Recap – Last lesson we looked at:

- Fractions, Decimals and Percentages.
- Education for Sustainable Development – UNSDG 17 – Partnership for the Goals (Working Together).

Today, we will have a recap of Fractions, Decimals and Percentages before moving on to Ratios and Proportions.

In this lesson we will look at UNSDG  
1 – No Poverty

# United Nations Sustainable Development Goals





Recap

# Fraction

**NOUN** a numerical quantity that is not a whole number e.g.  $\frac{1}{2}$

From the Latin: frangere (later fractio) – ‘to break’.

Similar sounding word: fracture – ‘break or cause to break’

**In Maths: Fractions show equal parts of whole things.**

# Decimal

**ADJECTIVE** relating to or denoting a system of numbers based on the number ten, tenth parts, and powers of ten.

From the Latin: decimus – ‘tenth’.

Similar words: decade – ‘ten years’; decagon – ‘a ten sided shape’, decathlon – ‘a ten event athletics challenge’

# Percentage

**NOUN** a rate, number or amount in each hundred.

From the Latin: per centum – ‘by a hundred’.

Denoted by the symbol: %

e.g. 25% is  $25/100$  (or  $\frac{1}{4}$  in the simplest form – divide top and bottom by 25)

# Pass Functional Skills

A really useful website  
for your studies and  
revision.



**PASS**  
**FUNCTIONAL**  
**SKILLS**

<https://passfunctionalskills.co.uk>

- Study Guides
- Practice Questions
- Video Demos
- Past Papers

# Fractions Decimals and Percentages - Recap

[Fractions Decimals and Percentages Revision | Practice Questions \(passfunctionalskills.co.uk\)](#)



# Level 2 Practice Exam Question

**Solution:**

**First find the fraction** – in this case the number of shots that went in the basket, over the total number of shots.

$$\frac{33}{75}$$

Remember that a fraction is like an incomplete division operation.

**Second find the decimal:** We can work out the decimal value by performing

$$33 \div 75 = 0.44$$

**Thirdly convert to a percentage:** To convert the decimal to a percentage we simply multiply by 100.

$$0.44 \times 100 = 44\%$$

Therefore: 44% of her shots went in the basket.

Don't forget the '%' symbol in your answer.

## Activity 2: Basketball

2 (a) Lottie plays basketball.

She does some shooting practice.

She takes 75 shots.

33 of these shots go in the basket.

What percentage of her shots go in the basket?



[2 marks]

$$\frac{33}{75} = 0.44$$

$$0.44 \times 100 = 44$$

Your answer:

44 %

# Equivalent Values and Fractions in their Simplest Form

- In the game you are about to play we will be looking for **equivalent values**, expressed as either a fraction, decimal or percentage.

$$\text{E.g. } \frac{1}{4} = 0.25 = 25\%$$

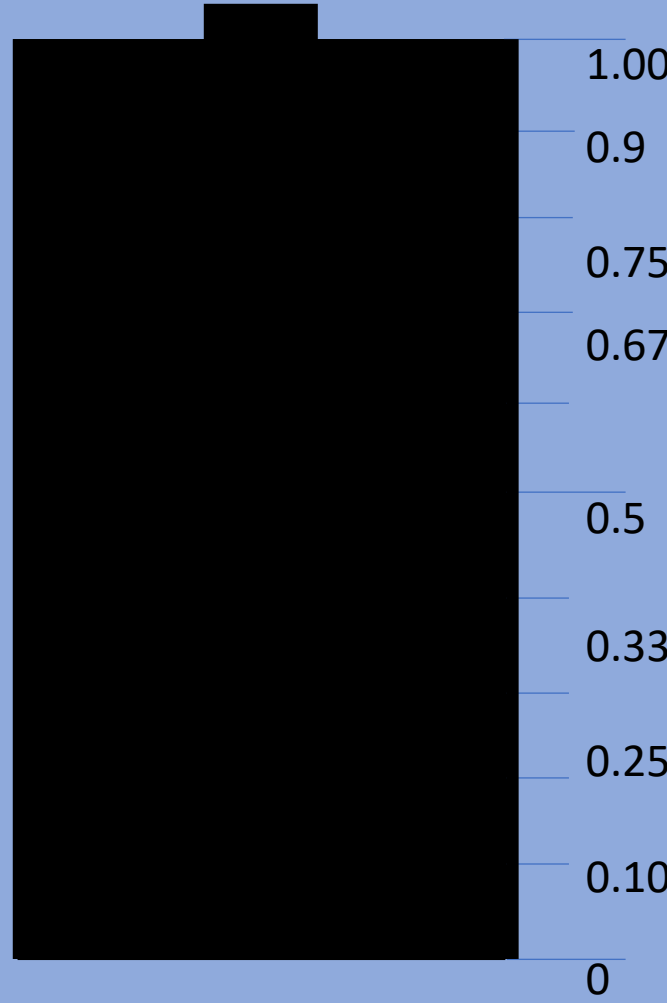
- These all have the same value.
- One of the rules to the game is that fractions are given in their **simplest form**.
- For example, the question might ask: 0.7 as a fraction is...?
- While 70/100 is an equivalent value, the game will want this expressed in its simplest form. So look for 7/10 instead.

# Equivalent Fractions, Decimals and Percentages

Fraction	In words	Operation	Decimal Value	Percentage
$\frac{1}{1}$	One [whole]	$1 \div 1$	1.0	100%
1				
$\frac{1}{2}$	One half	$1 \div 2$	0.5	50%
$\frac{1}{2}$		$\frac{1}{2}$		
$\frac{1}{3}$	One third	$1 \div 3$	0.3333...	33.333...%
$\frac{1}{3}$		$\frac{1}{3}$		$\frac{1}{3}$
$\frac{1}{4}$	One quarter	$1 \div 4$	0.25	25%
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$
$\frac{1}{5}$	One fifth	$1 \div 5$	0.2	20%
$\frac{1}{5}$		$\frac{1}{5}$		
$\frac{1}{10}$	One tenth	$1 \div 10$	0.1	10%
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{100}$	One hundredth One percent	$1 \div 100$	0.01	1%

# Phone Battery Percentage with Fractions & Decimals

- When the battery is full the percentage of charge left is..... 100%
- When the battery loses  $\frac{1}{10}$  (one tenth) of its charge the percentage remaining is..... 90%
- When the battery loses  $\frac{1}{4}$  (a quarter) of its charge the percentage left is..... 75%
- When the battery loses  $\frac{1}{3}$  (one third) of its charge the percentage left is..... 67%
- When the battery loses  $\frac{1}{2}$  (half) of its charge the percentage left is..... 50%
- When the battery loses  $\frac{2}{3}$  (two thirds) of its charge the percentage remaining is..... 33%
- When the battery loses  $\frac{3}{4}$  (three quarters) of its charge the percentage remaining..... 25%
- When the battery loses  $\frac{9}{10}$  (nine tenths) of its charge the percentage remaining..... 10%
- When the battery is flat the charge remaining is..... 0%



# Game – Fractions, Decimals & Percentages Pacman





04:59

# Game – Fractions, Decimals & Percentages Pacman



*What  
was your  
score?*

# Method: Fractions, Decimals and Percentages

- First we find the fraction.
- Second we calculate the decimal (we solve the fraction).
- Third we calculate the percentage (we multiply by 100).



# Example: Fractions, Decimals and Percentages

$$\frac{3}{4} \text{ of a pizza} = 0.75 \text{ of a pizza} = 75\% \text{ of a pizza}$$



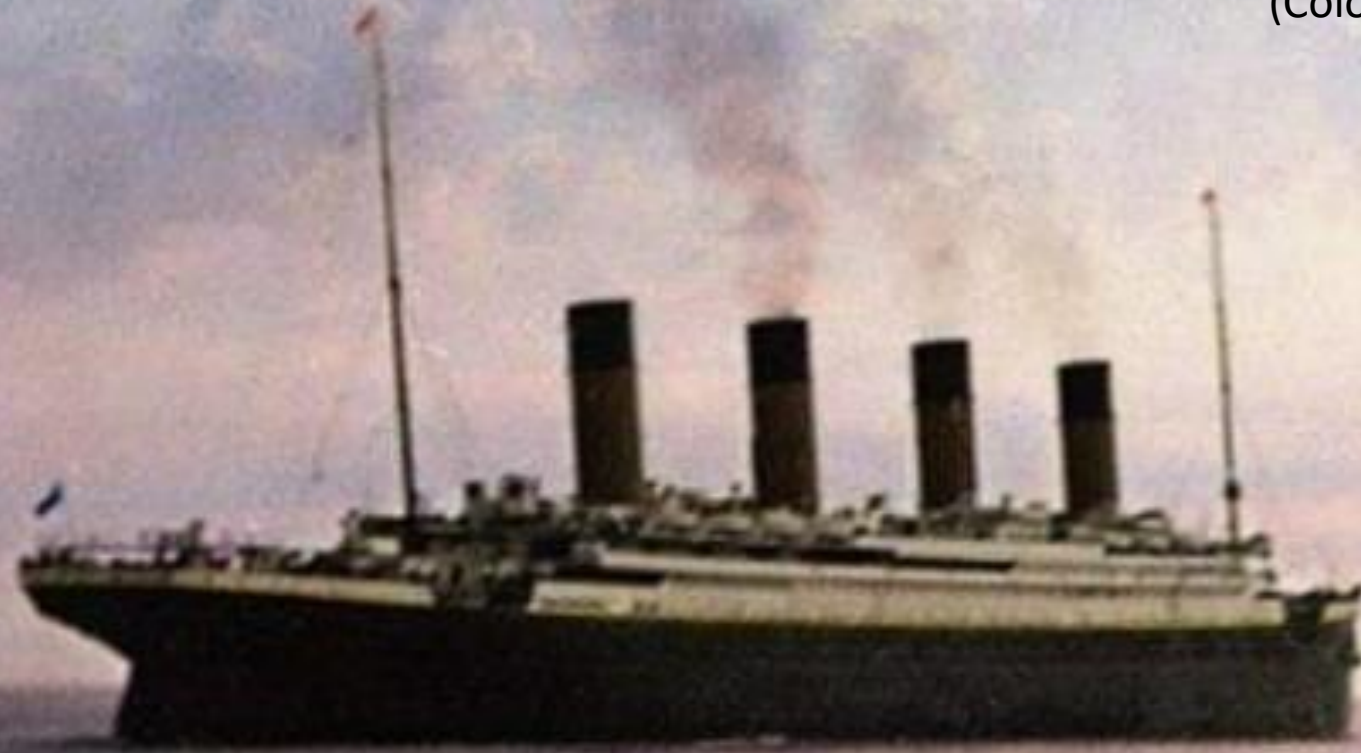
These are equivalent values shown as a fraction, decimal and Percentage.

- Follow along with a calculator.
- This is because  $3 \div 4 = 0.75$  as a decimal.
- $\frac{3}{4} = \frac{75}{100}$  are equivalent fractions. We imagine the pizza is split into 100 equal slices.
- When the denominator is 100, we have split what we are measuring into 100 equal parts.
- To get the percentage, we simply multiply the decimal value by 100. ( $0.75 \times 100$ )
- A percentage is effectively a measurement based on one hundred equal parts. Like a score out of 100.

# Equivalent Fractions, Decimals and Percentages

Fraction	In words	Operation	Decimal Value	Percentage
$\frac{1}{1}$	One [whole]	$1 \div 1$	1.0	100%
1				
$\frac{1}{2}$	One half	$1 \div 2$	0.5	50%
1/2		1/2		
$\frac{1}{3}$	One third	$1 \div 3$	0.3333...	33.333...%
1/3		1/3		1/3
$\frac{1}{4}$	One quarter	$1 \div 4$	0.25	25%
1/4		1/4		1/4
$\frac{1}{5}$	One fifth	$1 \div 5$	0.2	20%
1/5		1/5		
$\frac{1}{10}$	One tenth	$1 \div 10$	0.1	10%
1/10	1/10	1/10	1/10	1/10
$\frac{1}{100}$	One hundredth One percent	$1 \div 100$	0.01	1%

Titanic departs Southampton on  
Wednesday 10<sup>th</sup> April 1912.  
(Colourised photo)







## Iceberg Fractions & Percentages

---

- According to Edith Russel, what fraction of an iceberg is above water?
- $\frac{1}{8}$  (with  $\frac{7}{8}$  below)
- Typically, only  $\frac{1}{10}$  of an iceberg is above water.
- How much is below expressed as a fraction and a percentage?
- Did you know that the top of an iceberg (the piece above water) is called a hummock?
- And the piece below water is called a bummock!
- Small icebergs, about the size of a car or less are called growlers!



# END POVERTY IN ALL ITS FORMS EVERYWHERE

IF CURRENT TRENDS CONTINUE, BY 2030



**575 MILLION** PEOPLE WILL STILL BE LIVING IN EXTREME POVERTY

ONLY **ONE THIRD** OF COUNTRIES WILL HAVE HALVED THEIR NATIONAL POVERTY LEVELS

IN RESPONSE TO THE COST-OF-LIVING CRISIS,



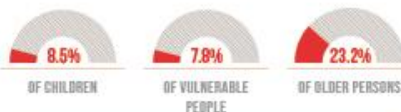
**105 COUNTRIES** ANNOUNCED ALMOST 350 SOCIAL PROTECTION MEASURES IN THE PAST

**12 MONTHS**

(FEB. 2022 – FEB. 2023)

MANY OF THE **WORLD'S VULNERABLE POPULATION** REMAIN UNCOVERED BY SOCIAL PROTECTION

IN LOW-INCOME COUNTRIES, ONLY

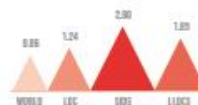


RECEIVED SOCIAL PROTECTION CASH BENEFITS

(2020)

LDCs, SIDS AND LLDCs FACE **HIGHER VULNERABILITY** TO DISASTERS

AVERAGE ANNUAL NUMBER OF DEATHS OR MISSING PERSONS PER 100,000 POPULATION (2012-2021)



WORLDWIDE, COUNTRIES HAVE **INCREASED GOVERNMENT SPENDING** ON **ESSENTIAL SERVICES** (EDUCATION, HEALTH AND SOCIAL PROTECTION) SINCE 2015



# Example: Calculating a Percentage

The Number of Parts we are measuring

The Total Number of Parts in the whole

$\times 100$

The dividing line (vinculum) between numerator and denominator is an alternative way of showing division.

Example:

When the Titanic sank, only **706** people survived out of a total of **2224** passengers and crew. What percentage survived?

$$\frac{706}{2224} \times 100 = 32\%$$

# Practice Question: Passengers by Class

- There were 325 first class passengers onboard the Titanic. 202 of them survived. What percentage of first-class passengers survived?
- There were 285 second class passengers onboard and 118 of them survived. What percentage of second-class passengers survived?
- There were 709 third class passenger onboard and 174 of them survived. What percentage of third-class passengers survived?
- Which class of passengers was most likely to survive?

# Last Week's Exam Questions – Part A

1 (g) The weather forecast says that, at the top of Ben Nevis at 2pm there is

- a 20% chance of snow
- a  $\frac{3}{10}$  chance of rain.

Is it more likely to snow or rain?

Show your working.

[2 marks]

Your answer:

# Equivalent Fractions, Decimals and Percentages

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1				
$\frac{1}{2}$	One half	$1 \div 2$	0.5	50%
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1/5		1/5		1/5
$\frac{1}{10}$	One tenth	$1 \div 10$	0.1	10%
1/10	1/10	1/10	1/10	1/10
$\frac{1}{100}$	One hundredth One percent	$1 \div 100$	0.01	1%

# The word “of”

- When we see the word “**of**” in Maths, we need to think Multiplication.
- For example when you learn your times table, you may have heard the expression: 3 lots **of** 3 =  $3 \times 3 = 9$
- The same is true when it comes to percentages.
- In the next example question we need to find percentages **of** something.
- Remember that a percentage is a fraction of 100 equal parts.
- 20% as a fraction is  $20/100$  (or  $2/10$ , or  $1/5$  in its simplest form)
- To find 20% of something we can divide 20 by a 100 and then ,multiply it by the vale we are working with.
- E.g.  $20\% \text{ of } 1500 = 20 \div 100 \times 1500 = 300$

# Last Week's Exam Questions – Part B

4 (e) An aid charity finds that:

20% of the people in village A are malnourished.

15% of the people in village B are malnourished.

Village A has a population of 300

Village B has a population of 440

Which village has the higher number of people who are malnourished?

Show how you decide.

[2 marks]



Your answer:



# Private Study

**Entry Level 3 Students:** Read through pages 19-25 of your CGP textbook, answering all questions on page 22 and page 25.

**Level 1 Students:** Read through pages 19-40 of your CGP textbook, answering all questions as you work through.

**Level 2 Students:** Read pages 12-40 of your CGP textbook, answering all questions as you work through.

Don't worry if you don't finish, just do as much as you can.

If you need help, ask one of the staff.

# My Skills Forward

- If you have completed all questions in your textbook, let's now look at NCFE My Skills Forward.
- Grab a laptop and visit the following link:  
<https://www.myskillsforward.co.uk>
- Your login details are:
  - Username: Your full name with no spaces
  - Password: Letmein1
- Starts at the beginning of Section 1: Number and work through the exercises.
- Please ask for help where needed and let me know if there are areas in this section that you would like to revise.

End of Part One

# Part Two: Ratios and Proportions

# Section 1: Number

## Lesson 8

### Part 2: Ratios and Proportions



**LIFE IS BUSY**

Take 5 minutes for yourself...



Can you help me find Ziggy?





**The Panther of the Opera**  
Tabby, or not Tabby, that is the question. The stage is set but it's what goes on behind the curtain that matters... Just try not to break a leg!

**ZIGGY**  
PRODUCTIONS

**SOUVENIRS**

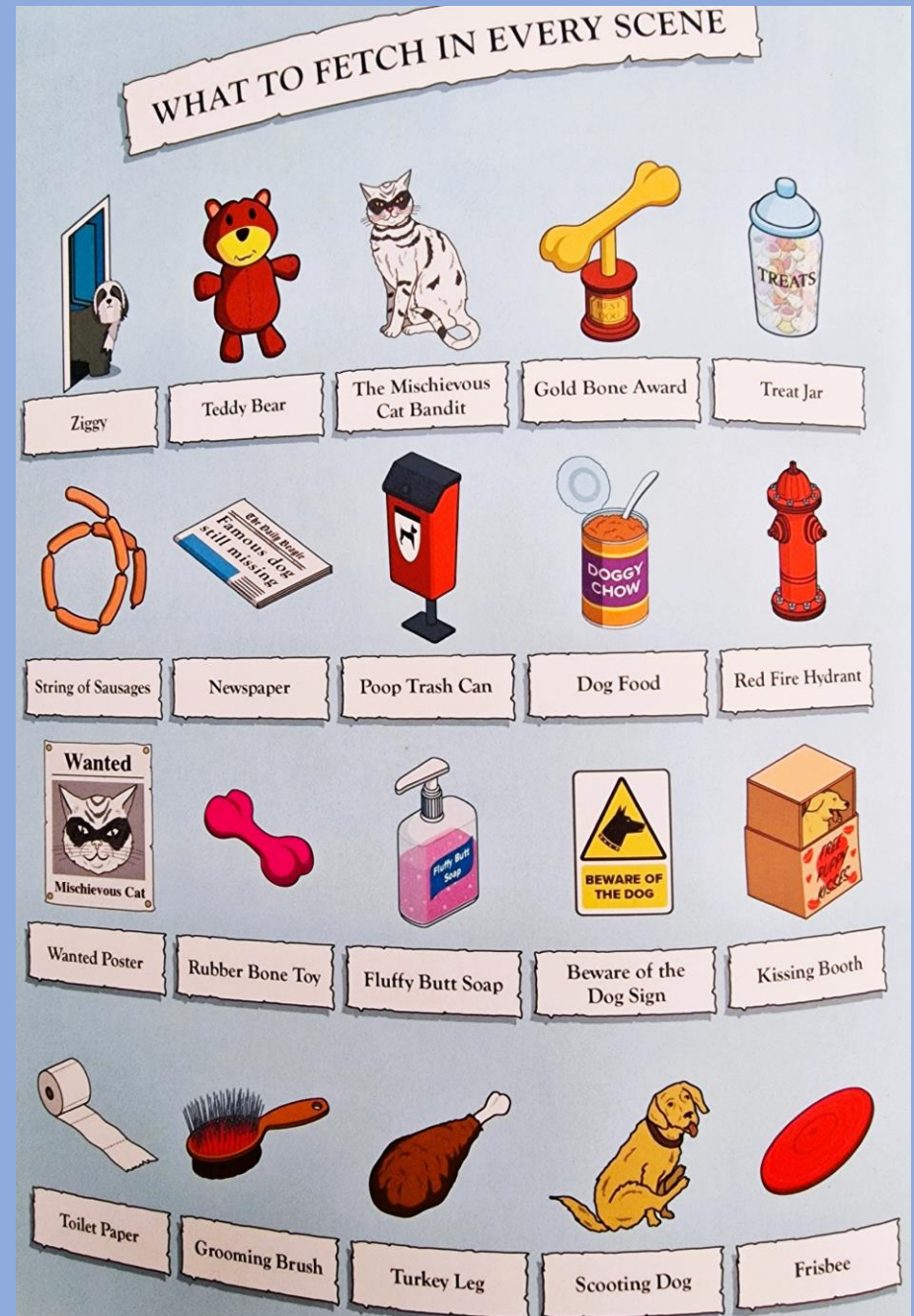
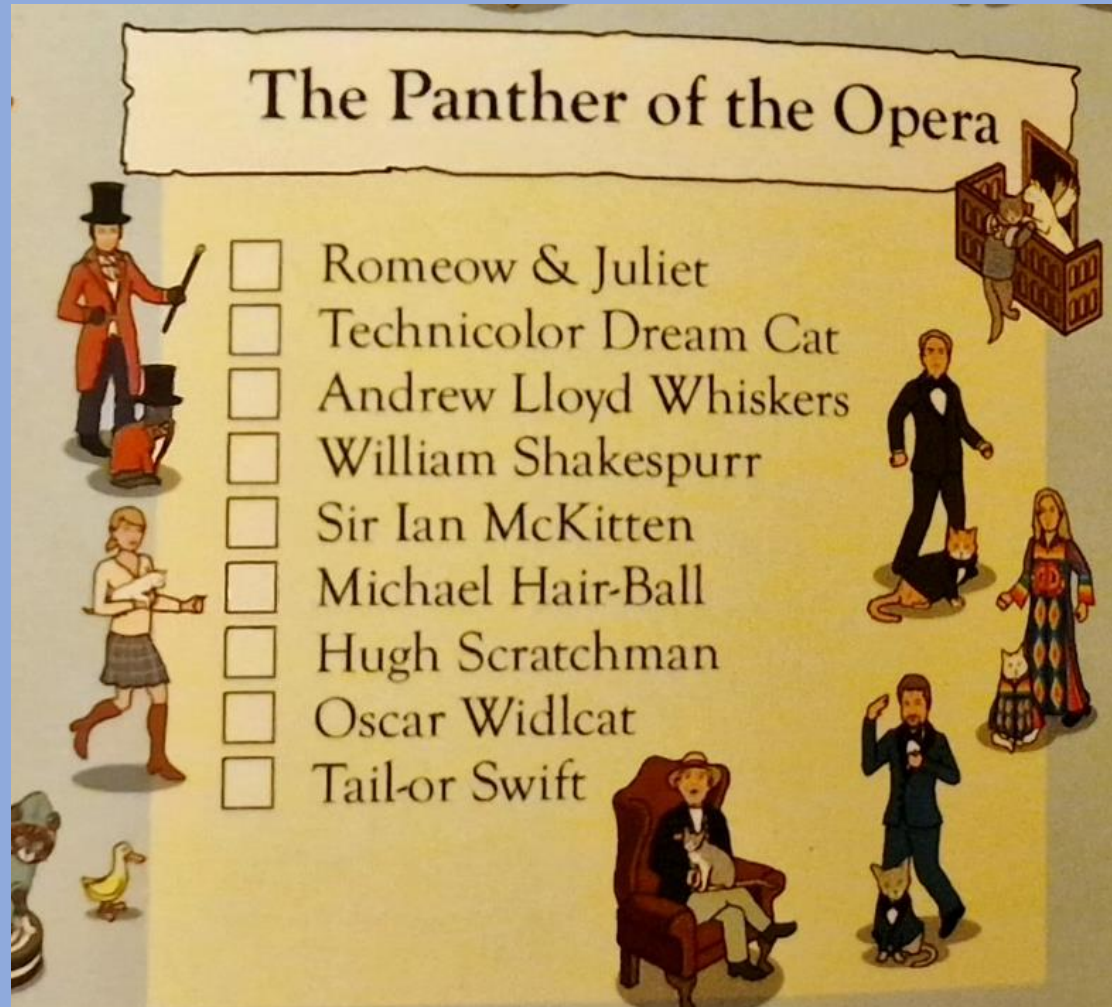
**THE PANTHER OF THE OPERA**

TICKETS

**DOGS**

**THE PANTHER OF THE OPERA**

# Extra things to spot!





The Panther of the Opera  
Tabby, or not Tabby, that is the question. The stage is set but it's what goes on behind the curtain that matters... Just try not to break a leg!

ZIGGY PRODUCTIONS

SOUVENIRS

TICKETS

TICKETS

TICKETS

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TICKETS

TICKETS

TICKETS

TICKETS

DOGS

00:00

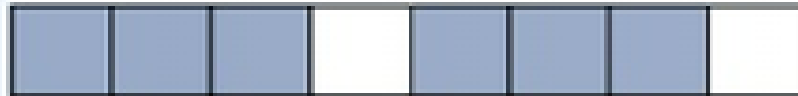
# Ratios – CGP L1 p.40

## Ratios Compare One Part to Another Part

Ratios are a way of showing how many things of one type there are compared to another.

### EXAMPLE:

Look at this pattern:



There are two white tiles and six blue tiles.

In other words, for every one white tile there are three blue tiles.

So the ratio of white tiles to blue tiles is 1:3.

The order the numbers are written in the ratio depends on the order of the words — the ratio of white tiles to blue tiles is 1:3. The ratio of blue tiles to white tiles is 3:1.

# Ratios – CGP L1 p.40

## Questions Involving Ratios

To answer a question involving ratios, you usually need to start by working out the value of one part. For example, the cost of one thing or the mass of one part.

You can then use this to answer the question.

### EXAMPLE 1:

5 pints of milk cost £3.00. How much will 3 pints cost?

- 1) First, you need to find out how much 1 pint of milk costs.  
You know that 5 pints cost £3, so you need to divide £3 by 5.

$$\text{cost of 1 pint} = 3 \div 5 = \text{£}0.60$$

- 2) To work out the cost of 3 pints, times your answer by 3.

$$\text{£}0.60 \times 3 = \text{£}1.80$$

# Ratios – CGP L1 p.40

## EXAMPLE 2:

A drink is made from 1 part cordial and 3 parts water. The ratio of cordial to water is 1:3.  
800 ml of the drink is made. How much cordial is used?

- 1) First, you need to work out how many parts there are in total.  
There's 1 part cordial and 3 parts water, so in total there are:

$$1 + 3 = 4 \text{ parts}$$

- 2) The drink contains 1 part cordial. To work out how many ml are in 1 part, divide the total amount by the total number of parts:

$$800 \div 4 = 200 \text{ ml}$$

# Ratios – CGP L1 p.41

## EXAMPLE 3:

£5000 will be split between two people in the ratio 1:4.  
How much money does each person get?

- 1) First, work out how many parts the £5000 will be split into in total.  
To do this, add up the numbers in the ratio.

$$1 + 4 = 5 \text{ parts}$$

- 2) To find out how much one part is worth, divide 5000 by 5:  $5000 \div 5 = 1000$
- 3) The first person in the ratio gets one part, so they get **£1000**.
- 4) The second person in the ratio gets four parts.  
To work out how much money they get, times the value of one part by 4:

$$1000 \times 4 = \text{£4000}$$

# Ratios – Practice Questions, CGP L1 p.41

1) Helen is making orange drink. She mixes 4 parts water to 1 part squash.

a) What is the ratio of squash to water in Helen's drink?

.....

b) Helen wants to make 500 ml of orange drink. How much squash does she need?

.....

.....

2) Jake is tiling his bathroom floor. He uses three green tiles for every white tile.  
Jake uses twenty-four tiles in total. How many of them are green?

.....

.....

3) £3000 will be split between two people in the ratio 2:1. How much does each person get?

.....

.....

.....

# Ratios – Total Amounts, CGP L1 p.42

- 1) You can use ratios to work out total amounts.
- 2) The first step is to work out the total number of parts.
- 3) The second step is multiplying the total number of parts by the value of one part.

## EXAMPLE:

A drink is made from cordial and water in the ratio 1:3.  
70 ml of cordial is used. How much drink is made?

- 1) Find the total number of parts for the drink.

To do this, add up the numbers in the ratio:  $1 + 3 = 4$

- 2) Multiply the total number of parts by the amount

given for one part:  $4 \times 70 = 280 \text{ ml}$

One part of the drink = 70 ml



# Ratios – Proportions, CGP L1 p.42

Things are in proportion when they increase or decrease together in the same ratio. You can use proportions to scale things up and down — for example, in recipes.

## EXAMPLE 1:

Jia is making brownies. The recipe says to use 6 pieces of chocolate for every 2 eggs. Jia is using 10 eggs.

How many pieces of chocolate does she need?

Answer: 10 eggs is five times as many eggs as in the recipe.

So Jia will need five times as many pieces of chocolate to match.

$6 \times 5 = 30$  pieces of chocolate

# Ratios – Proportions, CGP L1 p.42

## EXAMPLE 2:

Nick is making lasagne. His recipe says to use 1 tin of tomatoes for every 500 g of mince. The recipe serves 4 people.

Nick wants to make lasagne for 12 people.  
How much mince will he need to use?

Answer: 12 people is three times as many as the recipe serves.  
So Nick needs to make three times as much lasagne.

$$500 \times 3 = 1500 \text{ g of mince}$$

# Ratios – Practice Questions, CGP L1 p.43

- 1) Hannah is mixing concrete. She mixes 1 part cement to 3 parts sand. She uses 12 kg of cement. How much concrete will she have in total?

.....  
.....

- 2) Danny is thinning some paint. He mixes 1 part paint thinner to 4 parts paint. He uses 150 ml of paint thinner. How much thinned paint will he end up with?

.....  
.....

- 3) Neil is making fairy cakes. The recipe says to use 120 g of flour for every 2 eggs. The recipe makes 12 cakes.

- a) Neil uses 240 g of flour. How many eggs does he need to use?

.....  
.....

- b) How much flour would Neil need to make 36 cakes?

.....  
.....

# Ratios – Practice Questions, CGP L1 p.43

- 4) Gina and Clive inherit some money. The money is split in a 1 : 2 ratio, with Clive getting the most money. Gina inherits £500. How much money did the pair inherit in total?

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- 5) Marie is making some lemonade. She needs 2 lemons for every 300 ml of water. Marie has 900 ml of water. She wants to make as much lemonade as possible. How many lemons will she need?

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# Game: Ratio Rumble Potion Master



*Start at  
Level 5*



04:59

# Game: Ratio Rumble Potion Master



*What  
was your  
score?*

Always Read the Question

And always re-read the questions at the end.

# Practice Exam Question – L1

3 (g) Tomas needs to mix grit and compost in the ratio 1 : 4

He mixes  $4\frac{1}{5}$  litres of grit with  $16\frac{4}{5}$  litres of compost.

Are these numbers in the correct ratio?

Show how you decide.

[2 marks]

Your answer:

# Private Study

**Entry Level 3 Students:** Read through all pages of your CGP textbook up to page 30, answering all questions not yet completed in Section 1 - Number.

**Level 1 Students:** Read through all pages up to 44 of your CGP textbook, answering all questions.

**Level 2 Students:** Read through all pages up to 43 of your CGP textbook, answering all questions as you work through.

Don't worry if you don't finish, just do as much as you can.

If you need help, ask one of the staff.

# My Skills Forward

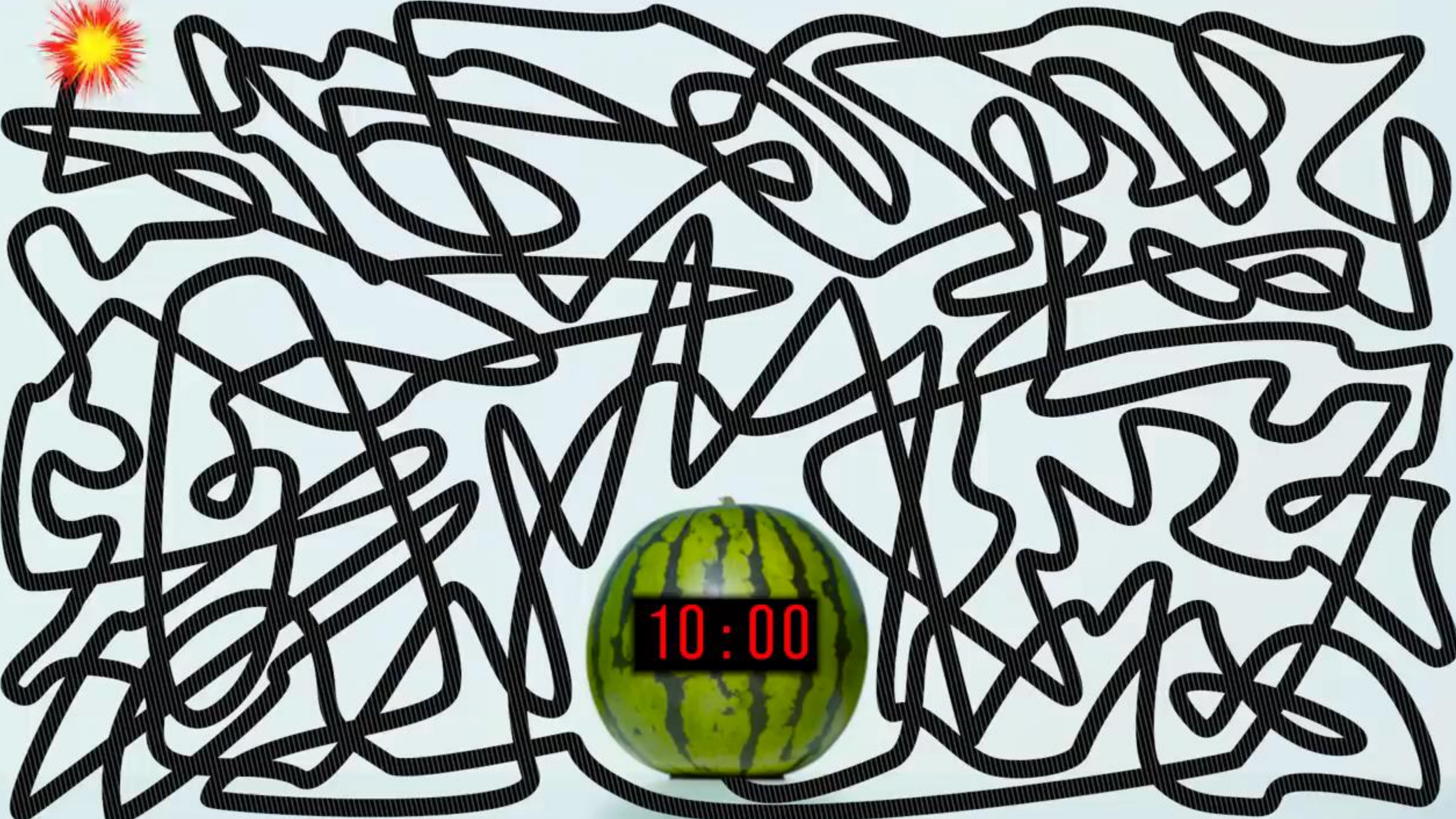
- If you have completed all questions in your textbook, let's now look at NCFE My Skills Forward.
- Grab a laptop and visit the following link:  
<https://www.myskillsforward.co.uk>
- Your login details are:
  - Username: Your full name with no spaces
  - Password: Letmein1
- Starts at the beginning of Section 1: Number and work through the exercises.
- Please ask for help where needed and let me know if there are areas in this section that you would like to revise.



02:00



04:59



10:00

# Your partner is Evil!

We all know that our partners are the product of time and money (particularly when dating!). Mathematically, a product is another way of saying multiplication.

$$\mathbf{Partner = Time \times Money}$$

We all know that Time is Money.  $Time = Money$

$$\mathbf{Partner = Money \times Money = Money^2}$$

You may have heard that Money is the root of all Evil.  $Money = \sqrt{Evil}$

$$\mathbf{Therefore: Partner = (\sqrt{Evil})^2 = Evil}$$