

$$\alpha^0 = 1 [a^0]$$

9

$\tan h$

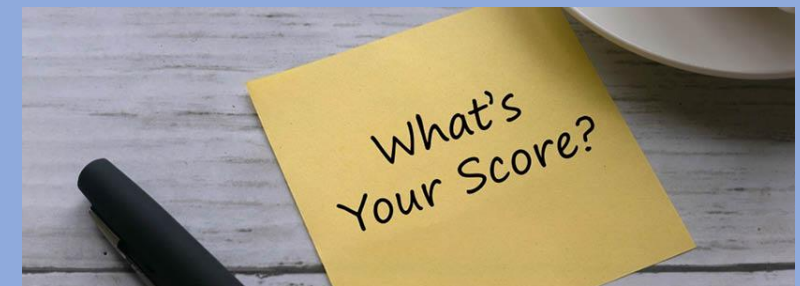
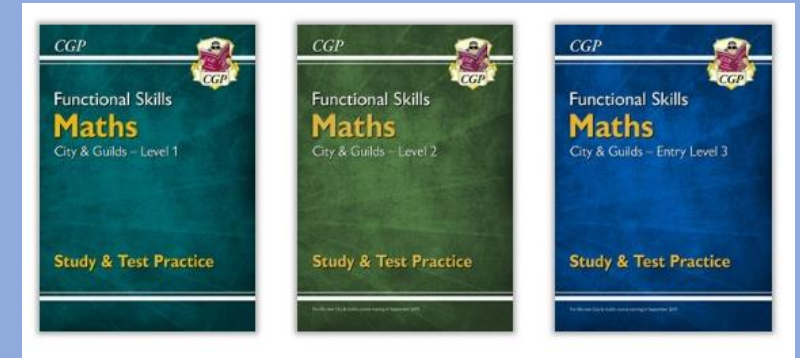
$\arcsin(z)$

$x_{n+1} =$

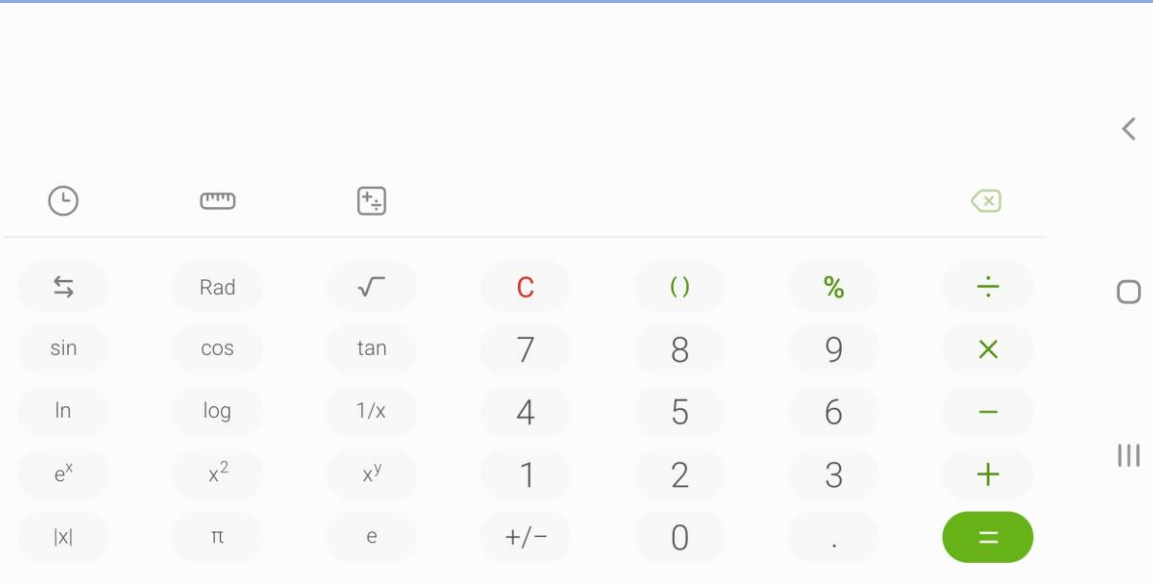
24

Introductions

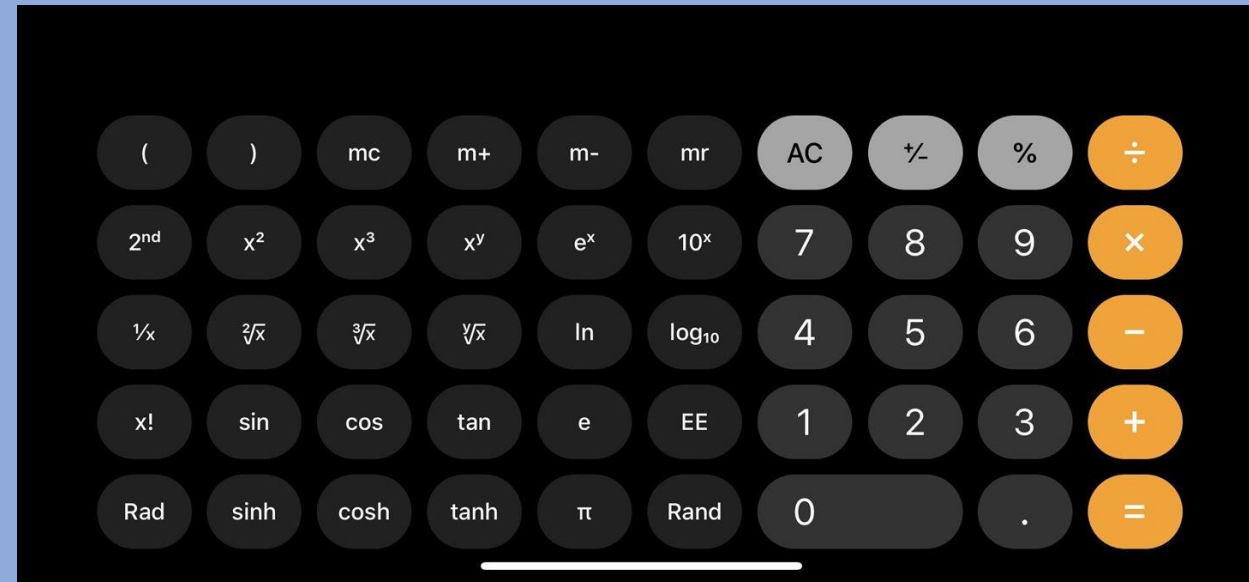
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- Please make a note of your scores for interactive games as they let me know how well you are progressing.



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

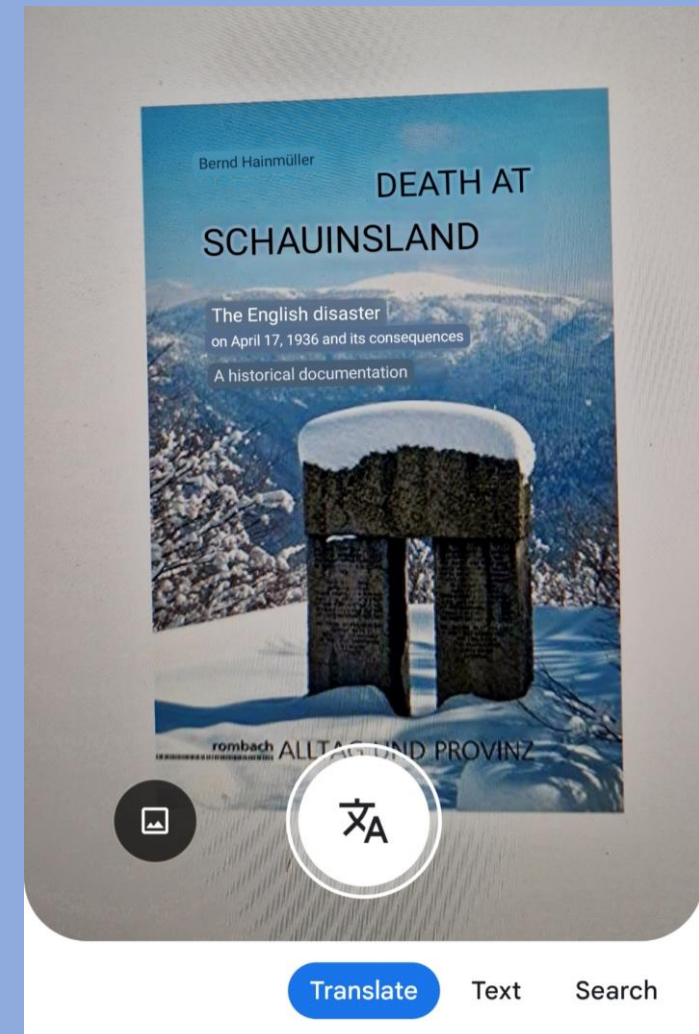
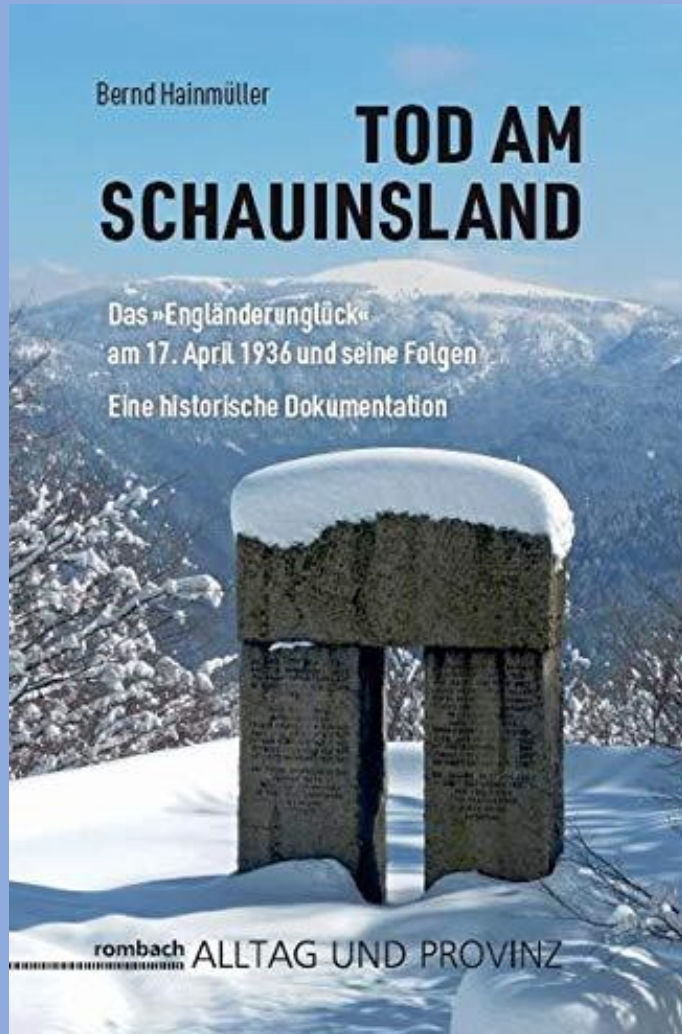
[Using Google Lens](#)

https://www.youtube.com/watch?v=dkvo50_UAqU

Google
Lens

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>

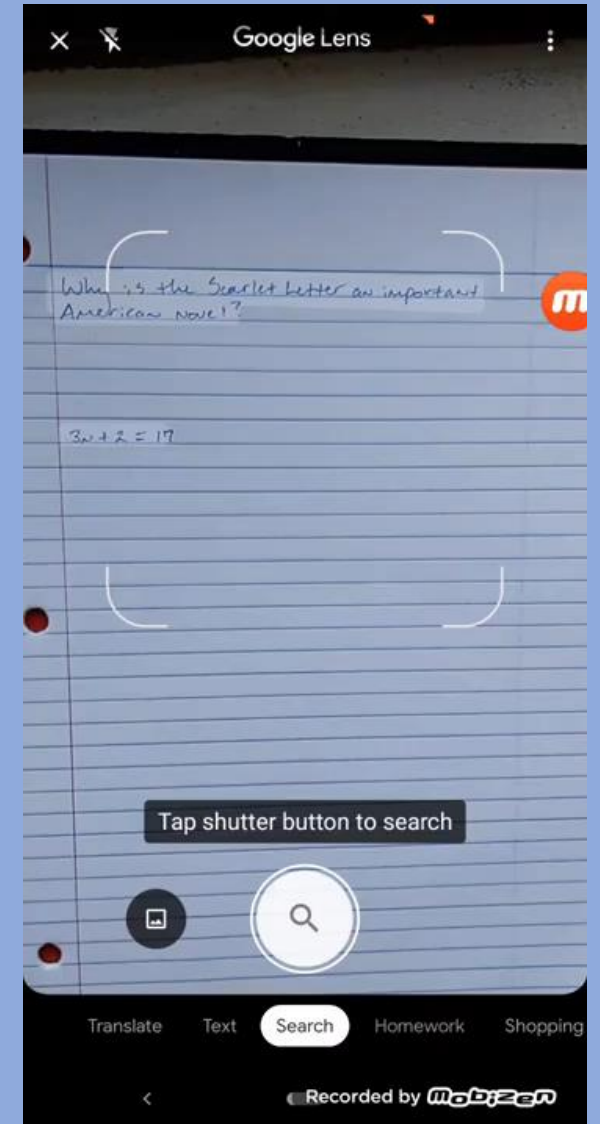


Google Lens can help with your homework!



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

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$$\alpha^0 = 1 [a^0]$$

9

$\tan h$

$\arcsin(z)$

$x_{n+1} =$

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$$F = G \frac{m_1 m_2}{d^2}$$

$$\phi(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$i\hbar \frac{\partial}{\partial t} \psi = \hat{H} \psi$$

$$F = E + V$$

Formulas in Words and Letters

Lesson 9

$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$

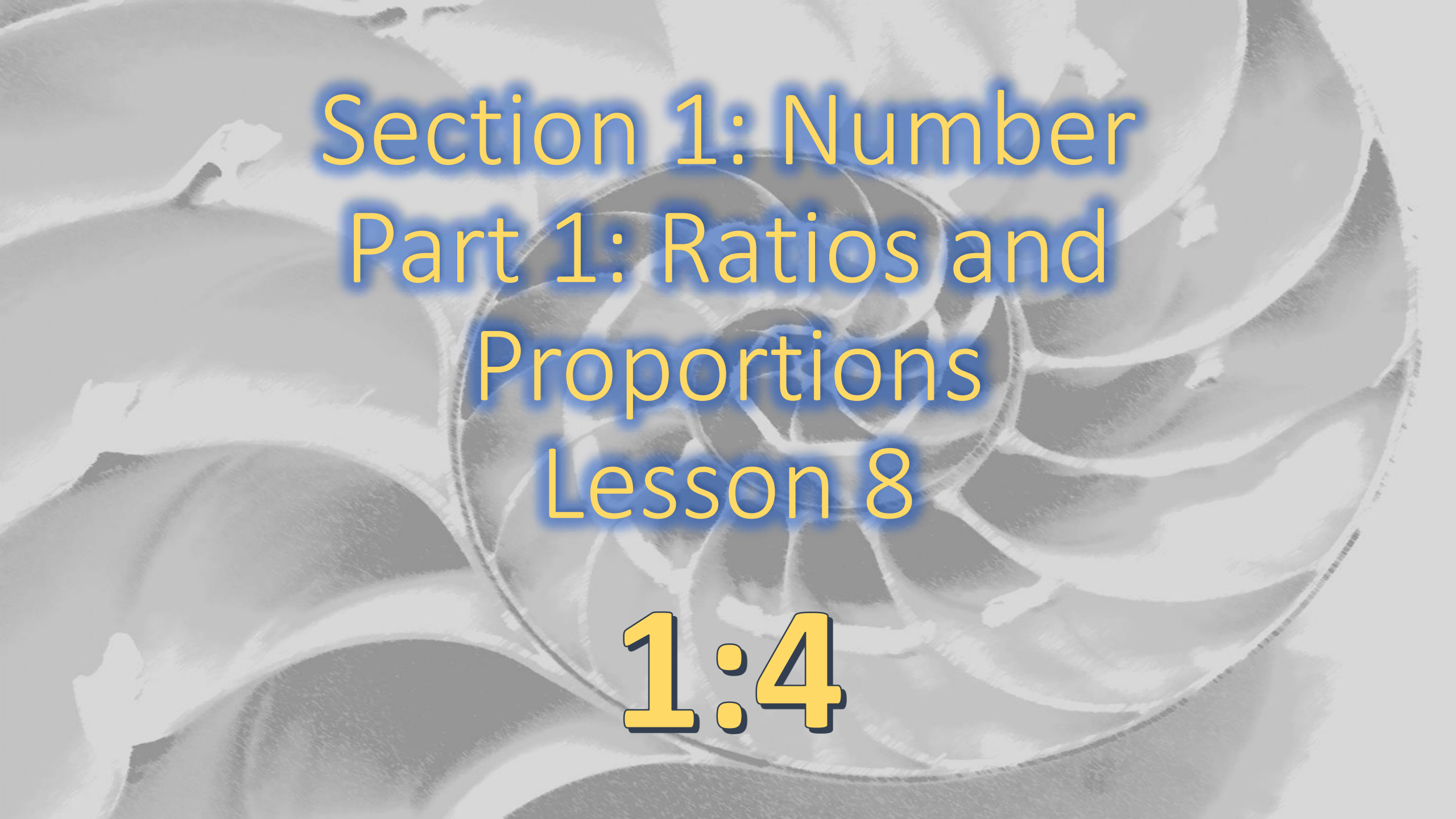
$$\frac{df}{dt} = \lim_{h \rightarrow 0} \frac{f(t+h) - f(t)}{h}$$

Section 1: Number

Part 1: Ratios and Proportions

Notice

This lesson content has been carried across from last week due to decorating the building.



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

1:4

Resources Online
PowerPoint Slides
Worksheets
Videos
Games

www.reachoutcf.com/resources

www.reachoutcf.com/maths-resources

Lesson Intentions: Monday 11th December 2023

Part 1:

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

Part 2:

- Use simple formulae expressed in words for one or 2-step operations. (L1.N5)

Can you help me find Ziggy?

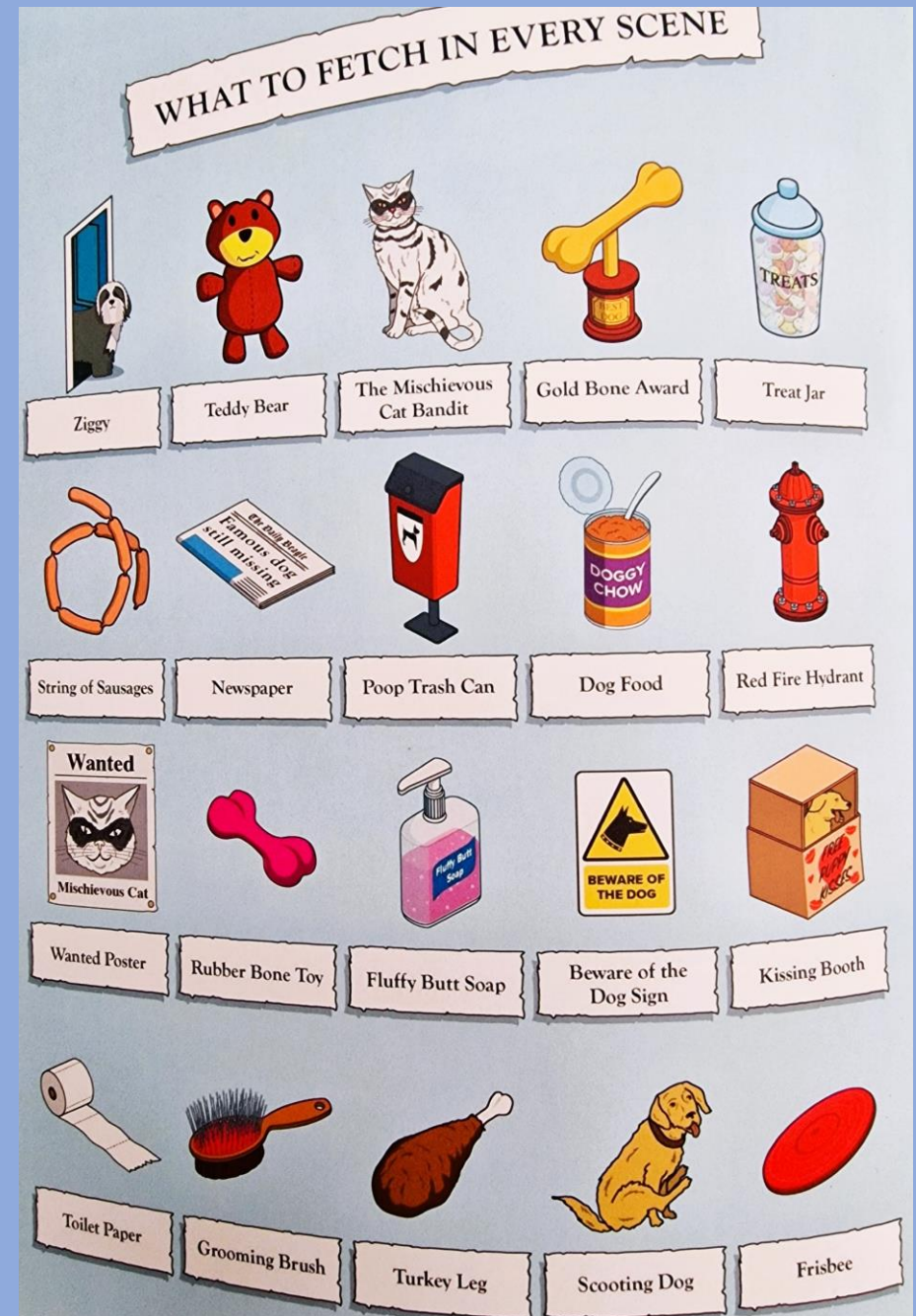
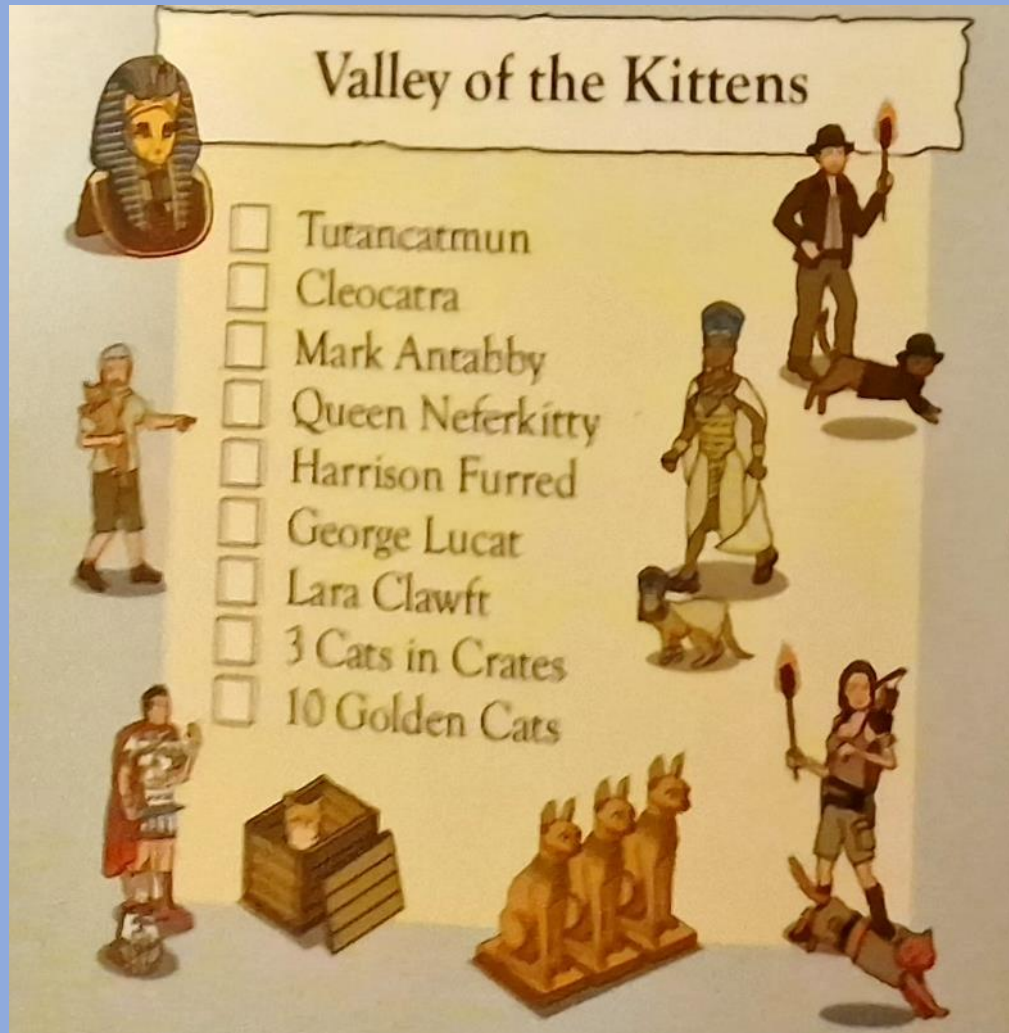


Valley of the Kittens

Unearth ancient treasures in the Valley of the Kittens. It's believed that Cleocatra still prowls the passageways of her palace...



Extra things to spot!



Valley of the Kittens

Unearth ancient treasures in the Valley of the Kittens. It's believed that Cleocatra still prowls the passageways of her palace...



00:00

Recap – Last lesson we looked at:

- Fractions, Decimals and Percentages.
- Education for Sustainable Development – UNSDG 1 – No Poverty

Today, in session 1, we will have a quick recap of Fractions, Decimals and Percentages before moving on to Ratios and Proportions.

In session 2, we will look at Formulas in Words and Letters.

In this lesson we will look at UNSDG
16 – Peace, Justice and Strong
Institutions

United Nations Sustainable Development Goals





Recap

B I D M A S

Brackets

$(2 + 3)$

Indices

4^2

Division or Multiplication

\div or \times

Addition or Subtraction

$+$ or $-$

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

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 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%

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. (0.75×100)
- A percentage is effectively a measurement based on one hundred equal parts. Like a score out of 100.

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?

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

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:

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:

--

Fractions - Recap

Fractions show parts of things that have been divided into **equal** parts.

The top number of a fraction is called the **Numerator**.

This represents the number of parts of something.

The bottom number is called the **Denominator**.

If fractions have different numerators and denominators but the same value we call these **equivalent** fractions.

If fractions have different denominators we need to find the lowest **common denominator**.

If a fraction is top heavy, (numerator $>$ denominator) it is called an **improper fraction**.

Ratios and Proportions

Ratio

NOUN the quantitative relation between two amounts showing the number of times one value contains or is contained within the other:

The ratio of computers to students is now 2 to 1

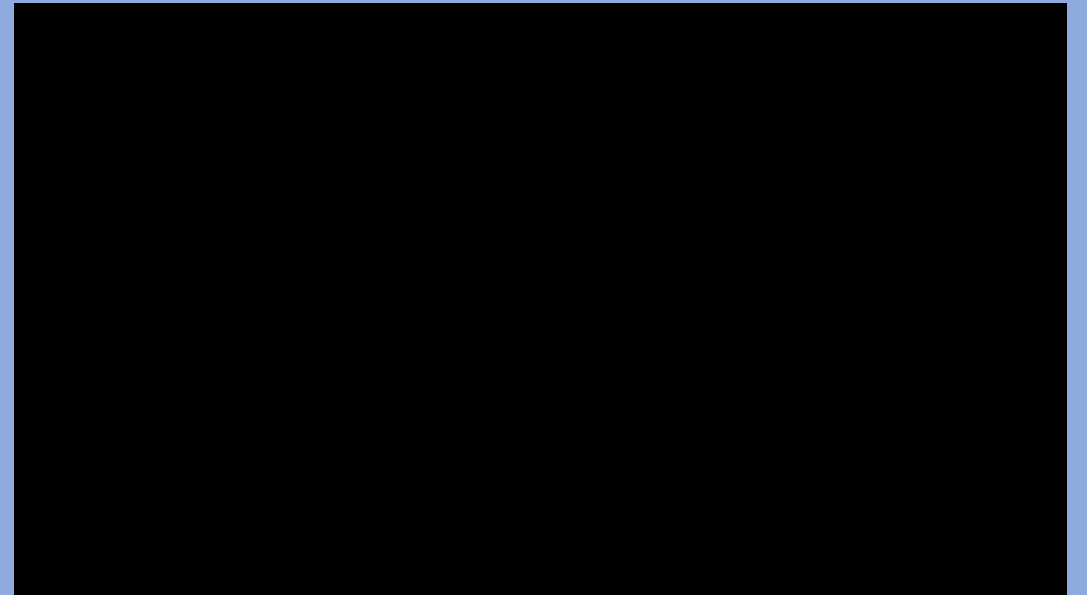
Proportion

NOUN a part, share, or number considered in comparative relation to a whole:

The proportion of greenhouse gases in the atmosphere is rising.

Ratios and Proportions

- When we did paint pouring in the Arts Award, what ratio did we mix the water and paint to make it runny?
- 1 part water to 4 parts paint.
- How would this be written as a ratio?
- 1:4
- If I used 100ml of water, how much paint would I need?
- 400ml
- How much runny paint would I have in total?
- 500ml



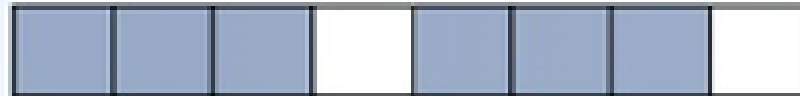
Ratios – CGP L1 p.40

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?

- 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?

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.
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End of Part One

$$\alpha^0 = 1 [a^0]$$

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$\tan h$

$\arcsin(z)$

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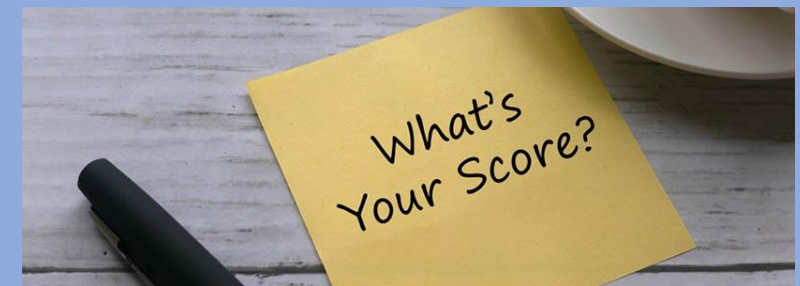
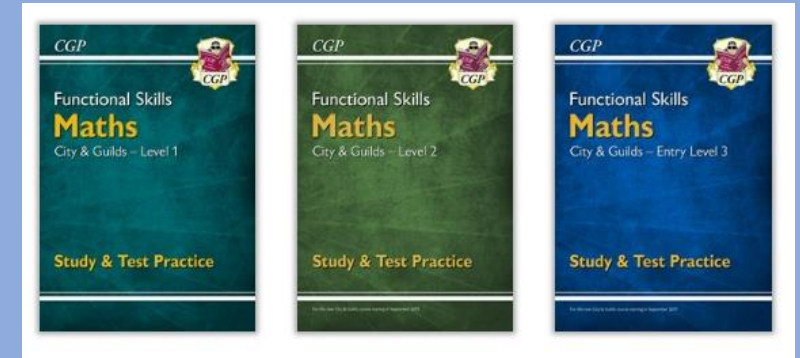
Lesson 9 – Part 2

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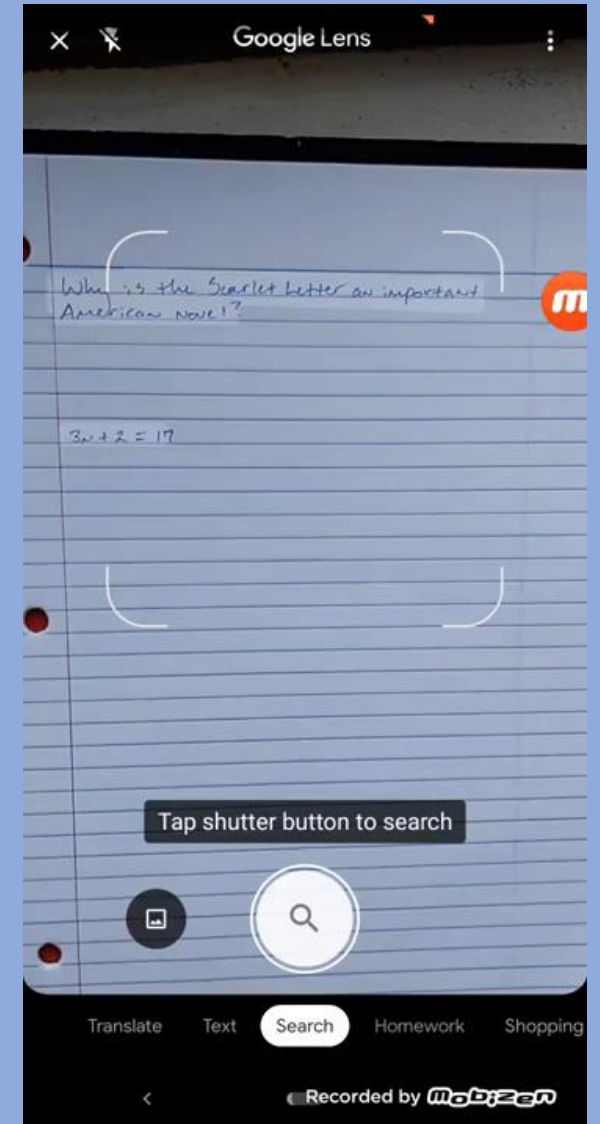


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16 – Peace, Justice and Strong
Institutions

United Nations Sustainable Development Goals



Section 1: Number

Lesson 9

Part 2: Formulas in Words and Letters



LIFE IS BUSY

Take 5 minutes for yourself...

Can you help me find Ziggy?



Santa Paws is Coming to Town






Snow is falling all around us, dogs are playing, having fun. Puppy-love and festive jumpers, Merry Woofmas everyone!


















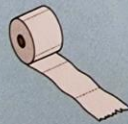




Extra things to spot!

Santa Paws is Coming to Town

- Santa Paws
- Macorgi Culkin
- Ebefleazer Scrooge
- Bob Scratchit
- Bruce Whippet
- Edward Scissorhounds
- Dog in a Christmas Stocking
- Edward Pupper Painting
- Who Ate Elf on the Shelf?
- Dog Wearing Antlers
- Angel Dog



WHAT TO FETCH IN EVERY SCENE

 Ziggy	 Teddy Bear	 The Mischievous Cat Bandit	 Gold Bone Award	 Treat Jar
 String of Sausages	 Newspaper	 Poop Trash Can	 Dog Food	 Red Fire Hydrant
 Wanted Poster	 Rubber Bone Toy	 Fluffy Butt Soap	 Beware of the Dog Sign	 Kissing Booth
 Toilet Paper	 Grooming Brush	 Turkey Leg	 Scouting Dog	 Frisbee

Santa Paws is Coming to Town

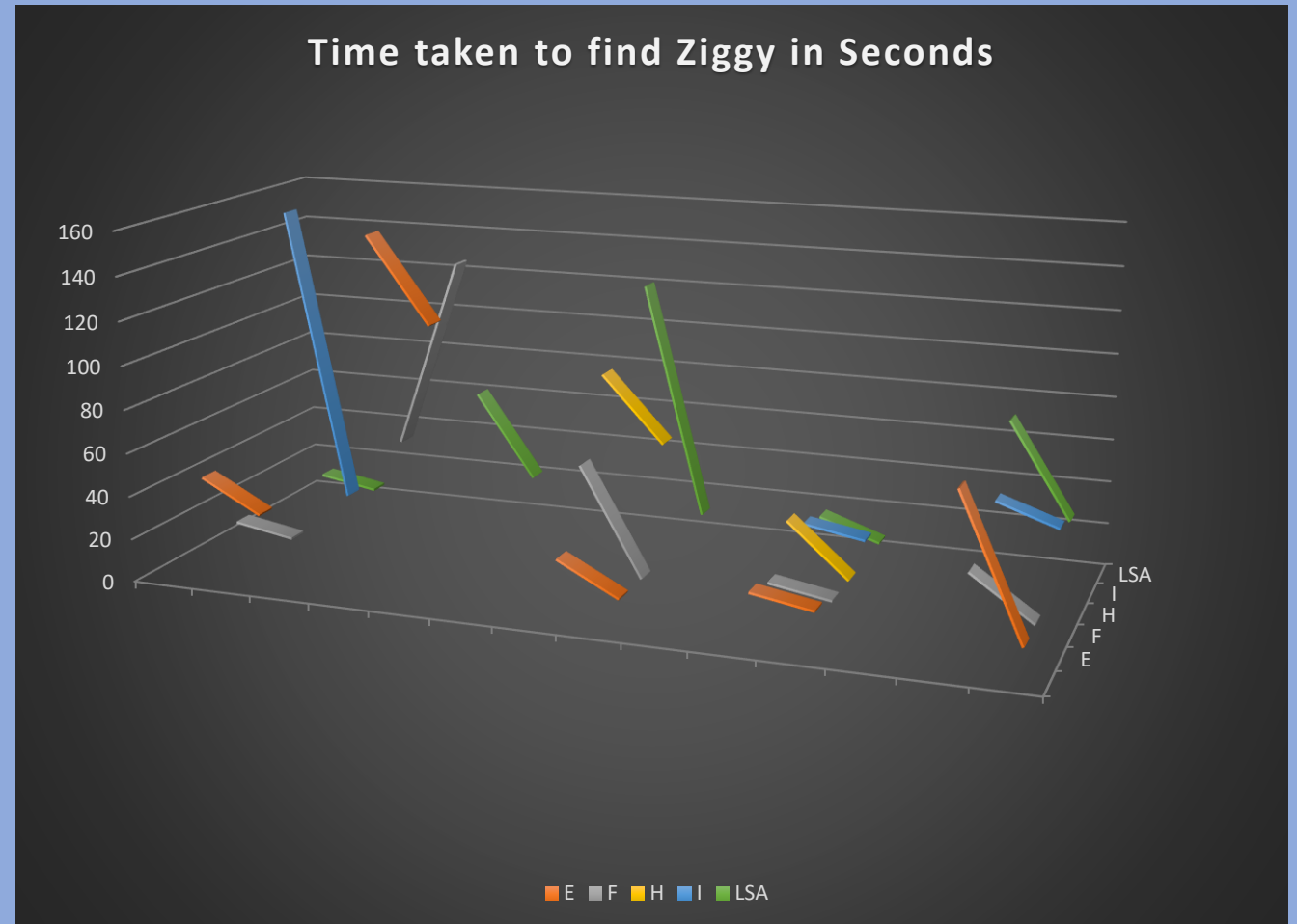
Snow is falling all around us, dogs are playing, having fun. Puppy-love and festive jumpers, Merry Woofmas everyone!



00:00

Classroom Meditation Results

- In 96% of occasions finding Ziggy, your speed improved.
- On one occasion, an exam grade improved by 11% following meditation.
- At the end of the lesson today I will be asking for your feedback as to whether we continue classroom meditations.



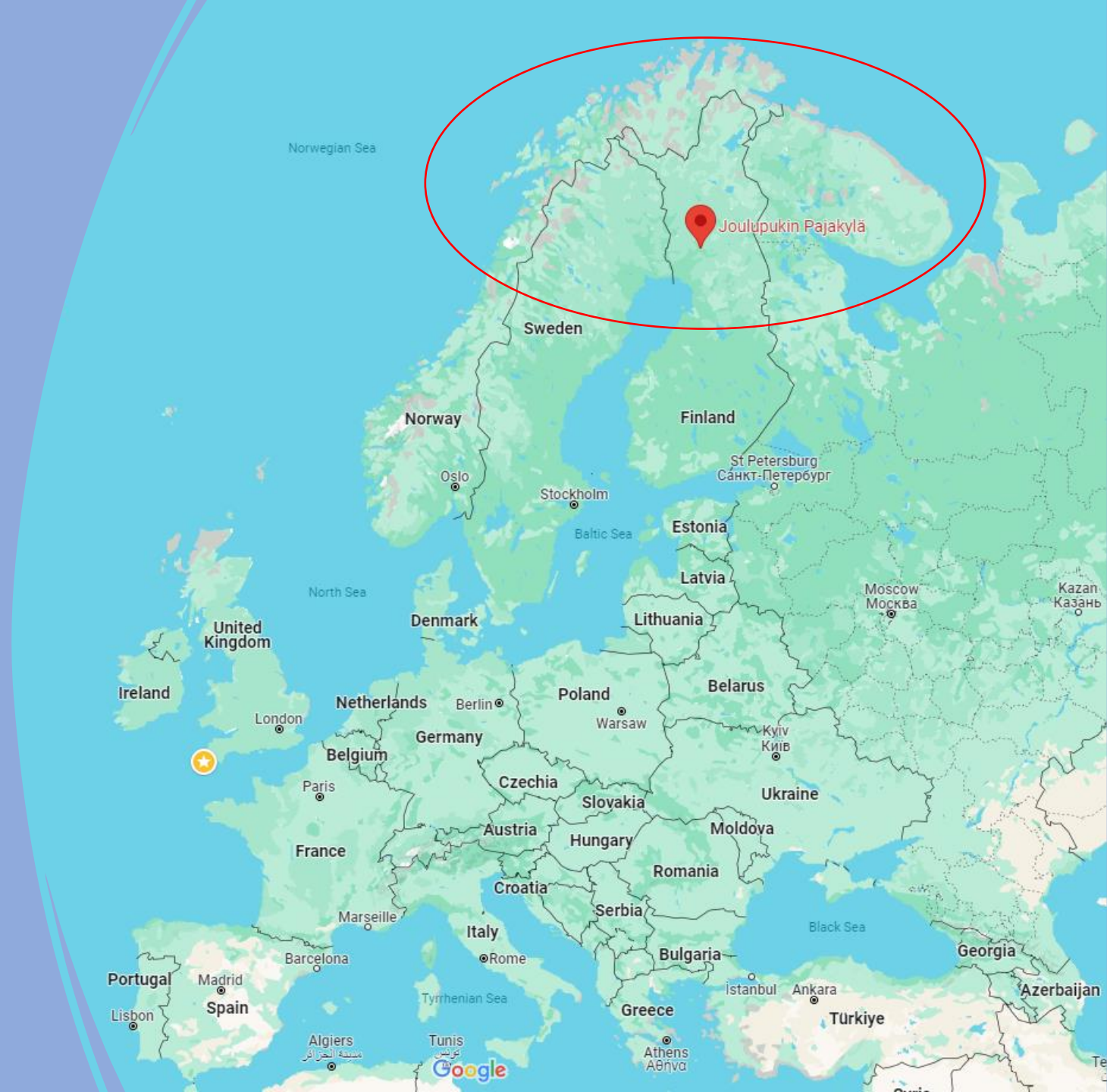
Did you know? Employability Skills

<https://cioslep.com/>

- The Cornwall and Isles of Scilly Local Enterprise Partnership, who is responsible for driving economic growth in the region, have identified the following key employability skills required in the region.
- Communication
- Team Working
- Customer Service
- By utilising techniques such as meditation, you will be in a calmer frame of mind to communicate effectively, work as part of a team and manage the stresses of customer service.

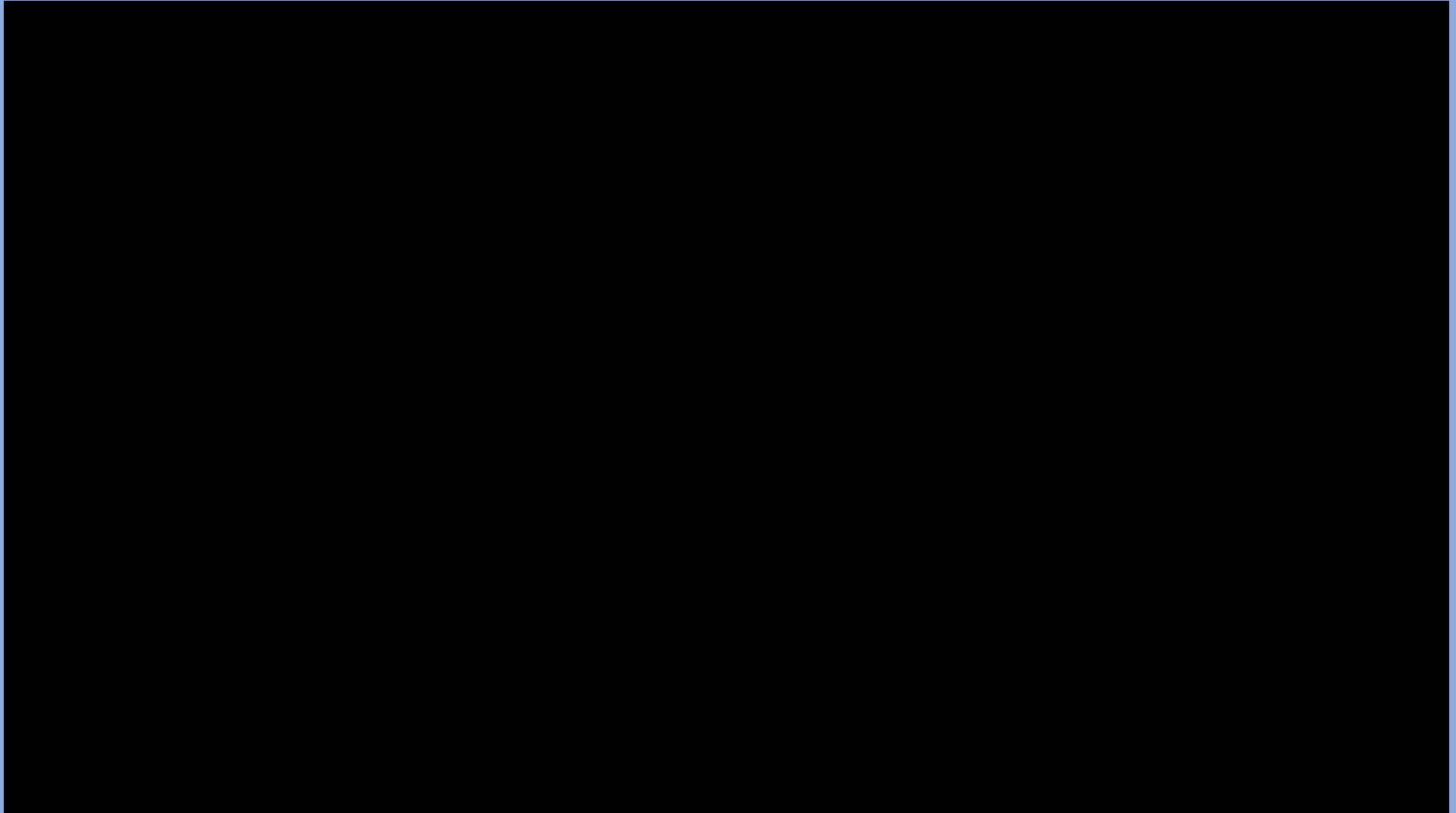
Today's meditation included a walk around Santa Claus Village, Rovaniemi, Finland

- Christmas is a Christian festival celebrated across the world that celebrates the Christ's birth on 25th December.
- It is thought that Santa Claus (also Saint Nicholas) lives either in Lapland or possibly at the North Pole.
- Can you think of any other festivals celebrated in winter?



12 Winter Holidays from Around the World. Not narrated by Morgan Freeman.

<https://www.youtube.com/watch?v=loct760wrsY&t=199s>



This is what I have to put up with!



Starter Activity Game: Multiplication Zombies

<https://mrnussbaum.com/the-multiplication-zombies-of-the-Brittany-graveyard-online-game>



Choose a zone
and note
your score
out of 25?



04:59

Starter Activity Game: Multiplication Zombies

<https://mrnussbaum.com/the-multiplication-zombies-of-the-Brittany-graveyard-online-game>



*What was
your score?*



Recap

B I D M A S

Brackets

$(2 + 3)$

Indices

4^2

Division or Multiplication

\div or \times

Addition or Subtraction

$+$ or $-$

Fractions - Recap

Fractions show parts of things that have been divided into **equal** parts.

The top number of a fraction is called the **Numerator**.

This represents the number of parts of something.

The bottom number is called the **Denominator**.

If fractions have different numerators and denominators but the same value we call these **equivalent** fractions.

If fractions have different denominators we need to find the lowest **common denominator**.

If a fraction is top heavy, (numerator $>$ denominator) it is called an **improper fraction**.

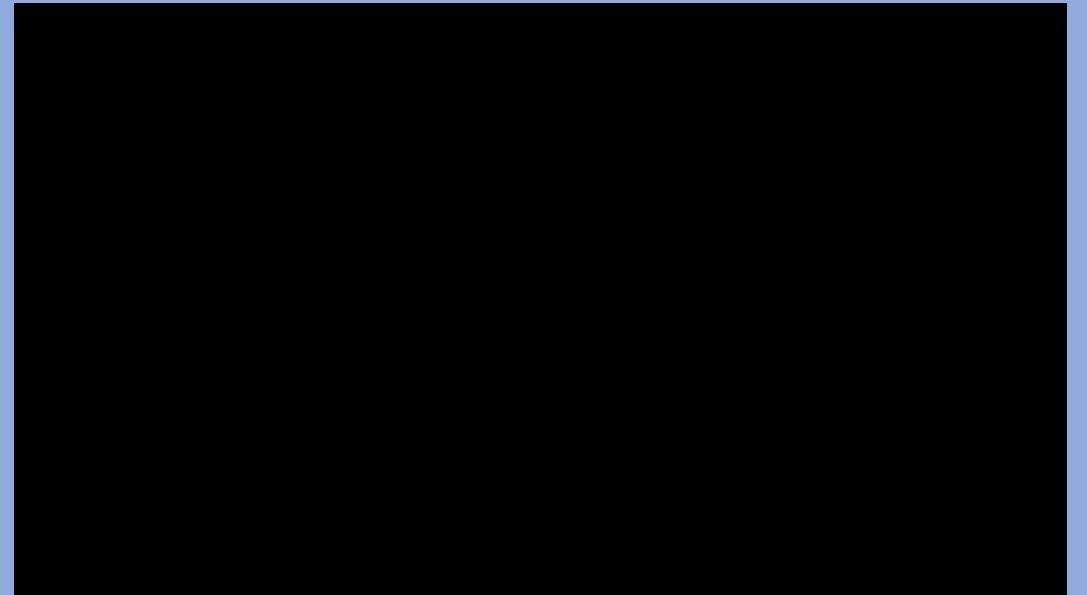
Fractions, Decimals and Percentages - Recap

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



Ratios and Proportions - Recap

- When we did paint pouring in the Arts Award, what ratio did we mix the water and paint to make it runny?
- 1 part water to 4 parts paint.
- How would this be written as a ratio?
- 1:4
- If I used 100ml of water, how much paint would I need?
- 400ml
- How much runny paint would I have in total?
- 500ml



Section 1: Number

Lesson 9

Part 2: Formulas in Words and Letters

Formula

NOUN a mathematical relationship or rule expressed in symbols.

At Level 1 the 'symbols' will be words. At Level 2 the 'symbols' will be letters.

Formulas in Words – CGP L1 p.44

A Formula is a Type of Rule

- 1) A formula is a rule for working out an amount.
- 2) Formulas can be written in words. Sometimes, it can be tricky to spot the formula.

EXAMPLE:

Sam is paid £7.25 per hour. How much does he earn in 8 hours?

You're told that: "Sam is paid £7.25 per hour." This is a formula.
You can use it to work out how much Sam earns in a given number of hours.

- 1) The calculation you need to do here is:

$$\text{Sam's pay} = 7.25 \times \text{number of hours}$$

- 2) You've been asked how much Sam earns in 8 hours, so put '8' into the calculation in place of 'number of hours':

$$7.25 \times 8 = \text{£58}$$

You can use the same formula to work out how much Sam earns for any number of hours.

Formulas in Words – CGP L1 p.44

Formulas Can Have More Than One Step

Some formulas have two steps in them. You need to be able to use two-step formulas.

EXAMPLE:

A ham takes 30 minutes per kilogram to cook, plus an extra 25 minutes.
How long does a 1.5 kg ham take to cook?

The formula here is "30 minutes per kilogram, plus 25 minutes".

1) Work out the calculation you need to do:

Step 1: $30 \times$ number of kilograms

Step 2: $+ 25$

Cooking time = $(30 \times \text{number of kilograms}) + 25$

There's more on
brackets on page
17. (BIDMAS)

2) Then just substitute the right numbers in.

In this case it's '1.5' in place of 'number of kilograms':

$$(30 \times 1.5) + 25 = 70 \text{ minutes}$$

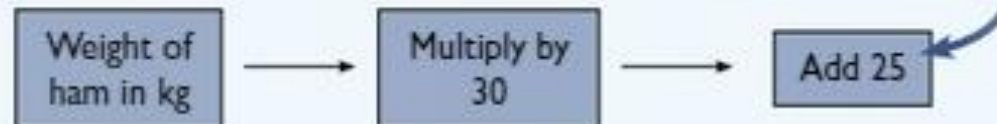
Function Machines – CGP L1 p.45

Function Machines

Function machines can help you to use formulas with one or more than one step.

EXAMPLE 1:

This function machine helps you to work out the cooking time for a ham. It gives you the cooking time of the ham in minutes.



To work out how long a 1.5 kg ham takes to cook:

- 1) Put 1.5 into the function machine in place of 'Weight of ham in kg'.
- 2) Follow the rest of the steps.



So the ham takes **70 minutes** to cook.

Function Machines – CGP L1 p.45

EXAMPLE 2:

Carrie is checking her electricity bill.

To work out how much her electricity costs, she uses this rule:

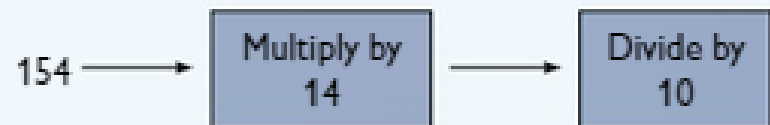


This gives her the cost of the electricity she has used in pounds (£).

Carrie has used 154 units of electricity so far this year.

How much will she be charged?

- 1) Put 154 into the function machine, in place of 'Number of units used'.
- 2) Follow the rest of the steps.



$$154 \quad \times 14 \quad \div 10 \quad = 215.6$$

So Carrie will be charged **£215.60**.

Remember to write your answer in the correct money format (see page 47).

Practice Questions – CGP L1 p.46

1) Sanjay earns £7.60 per hour. How much will Sanjay earn in 7.5 hours?

.....
.....

2) A chicken takes 50 minutes per kilogram to cook, plus 20 minutes extra.

a) How long will a 2 kg chicken take to cook?

.....
.....

b) How long will a 1.4 kg chicken take to cook?

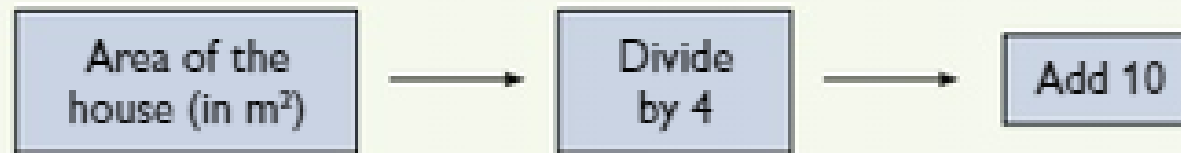
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3) A company offers broadband for a one-off charge of £60 for the first 3 months, then £28 per month after that. How much will 12 months' broadband cost?

.....
.....
.....

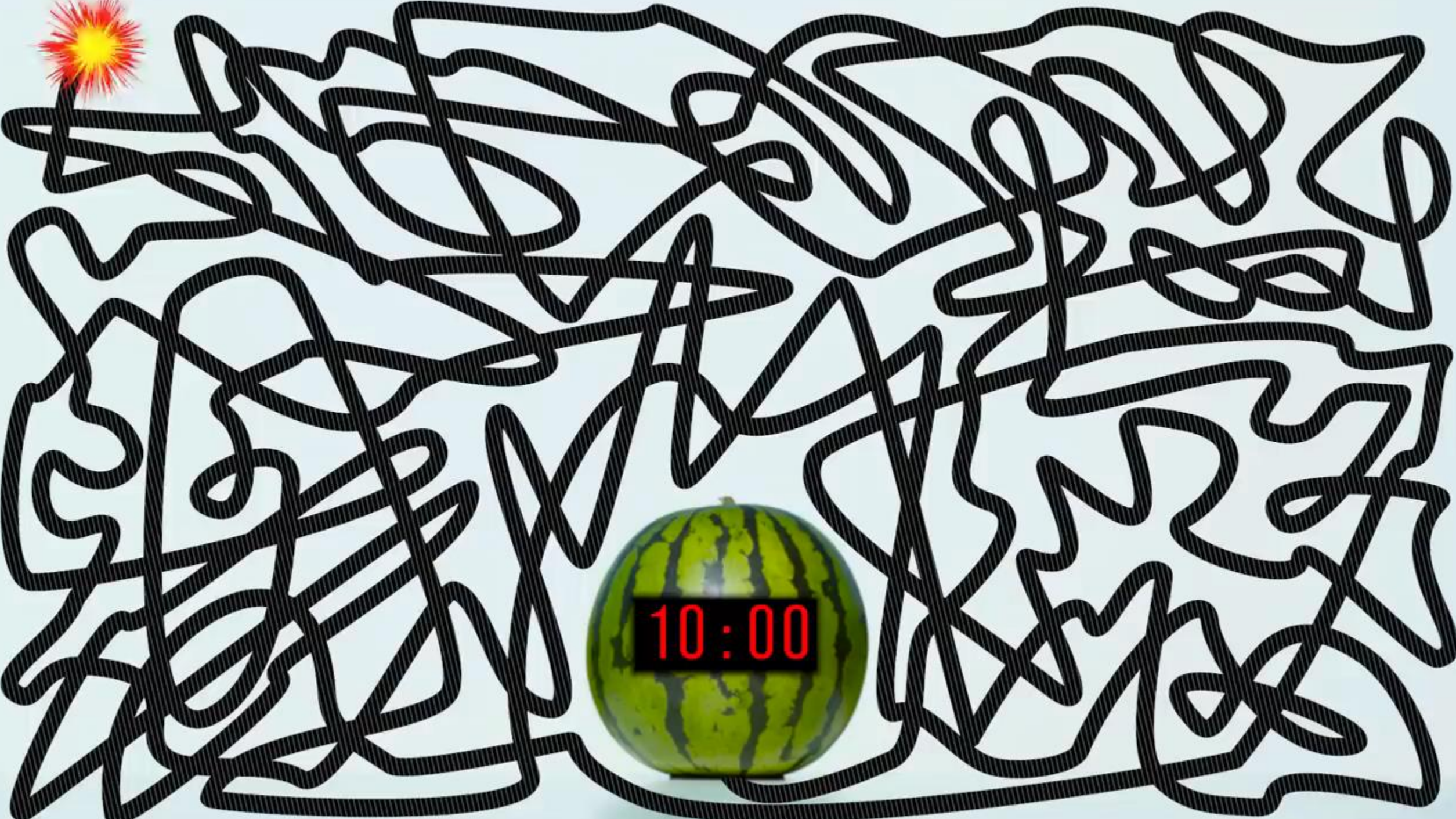
Practice Questions – CGP L1 p.46

- 4) Charlie is adding an extension to her house.
She wants to know the maximum area that the extension is allowed to cover.
When she asks the council, they tell her to work it out using this rule:



This will give Charlie the maximum area allowed for the extension in m^2 .
The area of Charlie's house is 90 m^2 .

Charlie wants to build an extension with an area of 32 m^2 .
Is this more or less than the maximum allowable area? Explain your answer.



10:00

Practice Questions – CGP L1 Answers p.119

Page 46

Q1 £57

Q2 a) 120 minutes (or 2 hours)

b) 90 minutes

(or 1 hour 30 minutes)

Q3 £312

Q4 Less, 32 m^2 is smaller than the maximum area of 32.5 m^2 .

Speed = Distance ÷ Time

- Santa Claus travels from the North Pole to the Equator to begin his trip around the globe delivering presents.
- He returns to the North Pole at the end of his shift to put his feet up.
- Santa has 24 hours to complete his entire journey, including going to and from home.
- The circumference of the Earth is 24,901 miles.
- What speed does Santa's sleigh have to travel at to do his deliveries, and get to and from his home.





02:00

Santa's sleigh speed

- First we need to calculate the total distance.
- Total distance = 1 circumference + (2 x $\frac{1}{4}$ circumferences)
- Total distance = 1.5 circumferences = 37,351.5 miles
- We then divide this by 24 hours
 $37,351.5 \div 24 = 1556$ mph
- Therefore, Santa's sleigh has to travel 56 mph faster than an F22 Raptor!



Formulas in Letters – CGP L2 p.50

EXAMPLE 2:

Temperature can be measured in degrees Celsius ($^{\circ}\text{C}$) or degrees Fahrenheit ($^{\circ}\text{F}$).

The formula $F = \frac{9}{5}C + 32$ can be used to swap between the two.

C represents Celsius and F represents Fahrenheit.

If the temperature is 15°C , what is the temperature in Fahrenheit?

1) Write out the formula in full: $F = \frac{9}{5} \times C + 32$

2) Put numbers in place of any letters you know.

Here you're told that $C = 15$: $F = \frac{9}{5} \times 15 + 32$

3) Work it out in stages.

Write down values for each bit as you go along: $F = 27 + 32$
 $F = 59$

So the temperature is **59°F** .

The hottest place in the world

- Furnace Creek is a village in Death Valley, California. It gets very hot in the summer and once recorded a temperature of 57C.
- Using $F = \frac{9}{5} \times C + 32$, calculate the temperature in degrees Fahrenheit of Furnace Creek.
- Round this number to the nearest whole degree.



Equation

NOUN **Mathematics** a statement that the values of two mathematical expressions are equal (indicated by the sign =).

What is the most famous
equation you know?

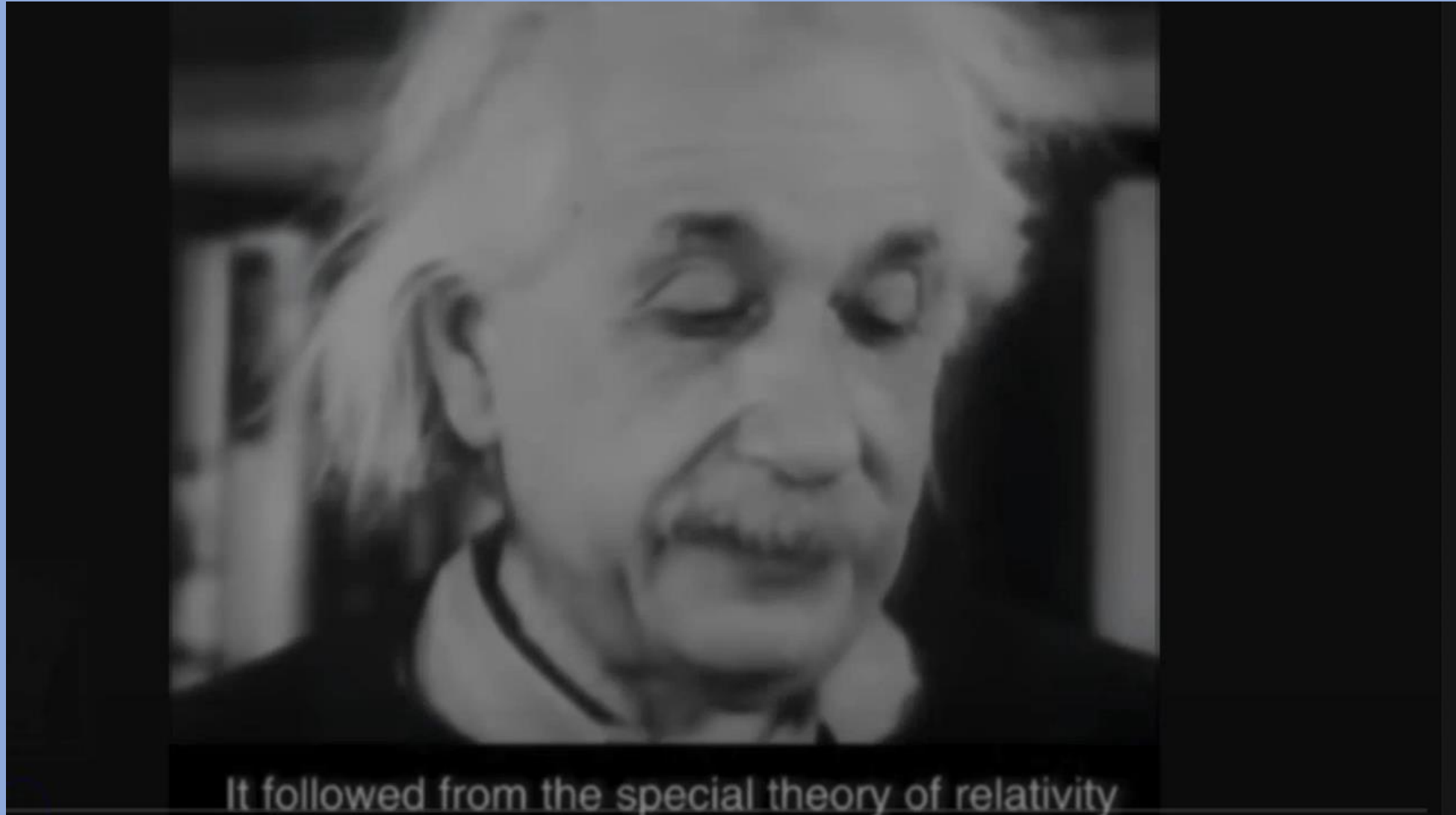
$$E = mc^2$$

$$E = mc^2$$

Is part of Albert Einstein's theory of special relativity that expresses the fact that mass and energy are the same physical entity and can be changed into each other.

Albert Einstein discusses $E = mc^2$

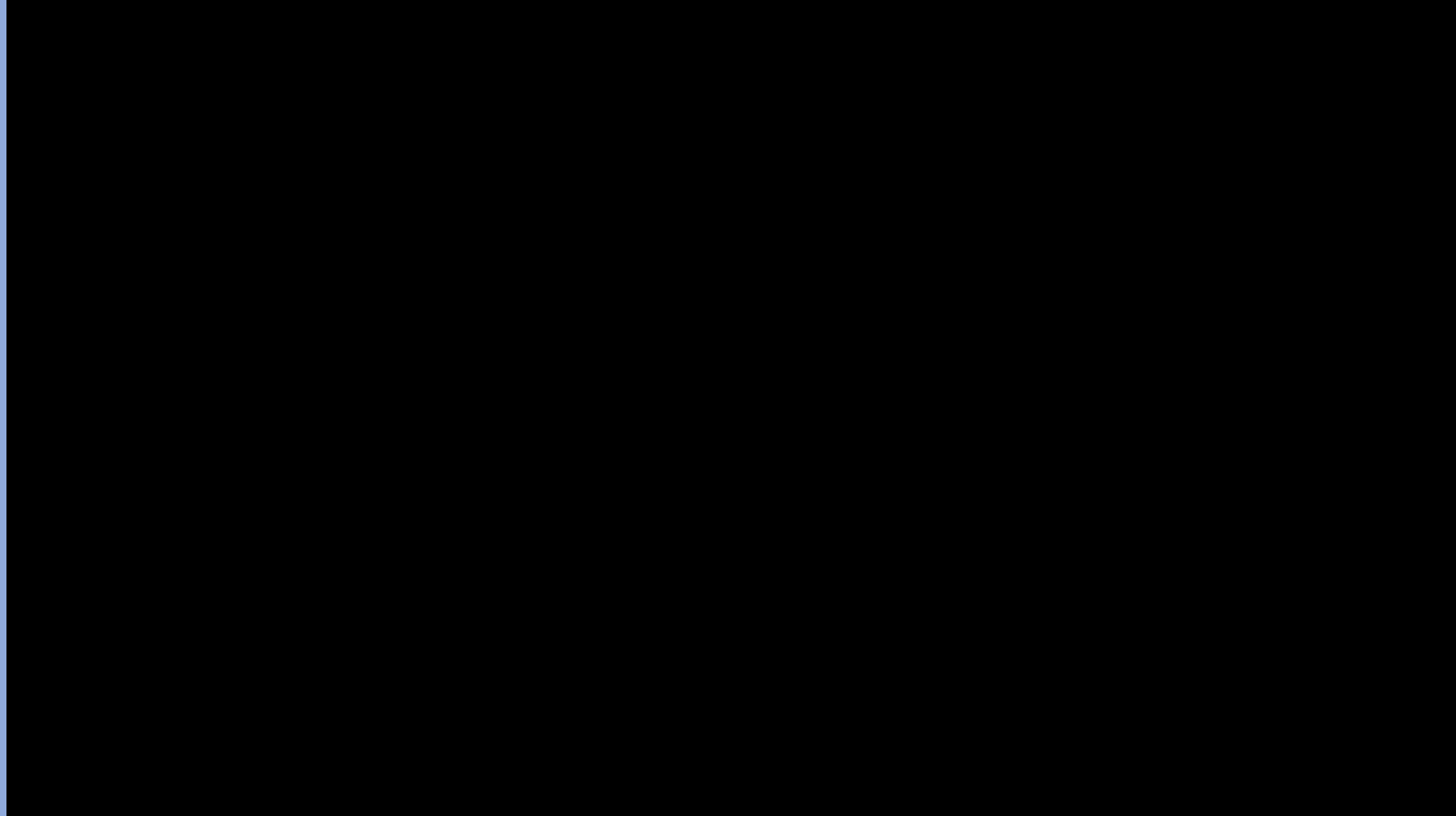
<https://www.youtube.com/watch?v=IMvNkl8uts0>



The consequences of knowledge

Trinity, Ivy Mike and Tsar Bomba Nuclear Tests

<https://www.youtube.com/watch?v=SgspnpDDfJU>



PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS

STEEP RISE IN
**CONFLICT-RELATED
CIVILIAN DEATHS**



WITH AN OVER **50% SURGE** IN 2022,
FUELED BY THE **WAR IN UKRAINE**

2021 SAW

THE HIGHEST NUMBER OF
INTENTIONAL HOMICIDES
IN 20 YEARS

458,000 LIVES LOST



9 IN 10 VICTIMS WERE MALE



MORE THAN

108.4 MILLION PEOPLE

HAD BEEN FORCIBLY DISPLACED
WORLDWIDE AS OF **END-2022**

2.5X THE NUMBER A DECADE AGO

NEARLY
200,000



TRAFFICKING VICTIMS

WERE DETECTED WORLDWIDE
BETWEEN 2017 AND 2020

BUT MANY MORE LIKELY
REMAINED **UNDETECTED**

YOUTH FACE UNDERREPRESENTATION IN POLITICS,
HINDERING THEIR PARTICIPATION IN DECISION-MAKING PROCESSES



30
GLOBAL MEDIAN AGE

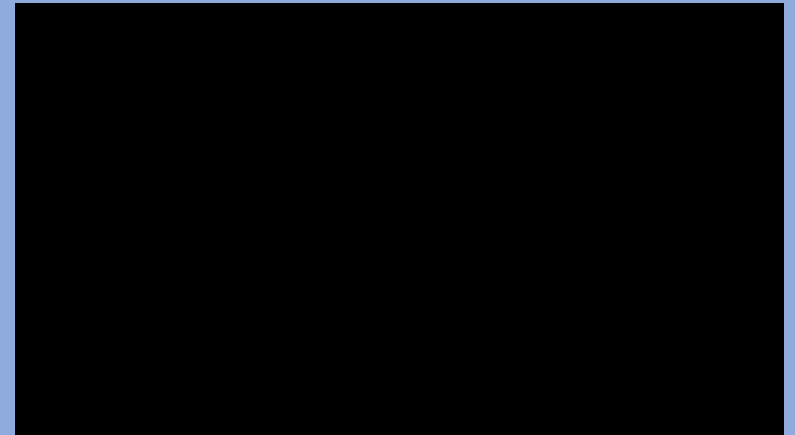


51
AVERAGE AGE OF MEMBERS OF PARLIAMENT

The energy within you...

<https://www.universalmedicine.com.au/articles/emc2-everything-energy-why-we-do-we-continue-ignore-energetic-truth>

- $E = mc^2$ is an equation where:
- E = energy measured in Joules,
- m = mass of an object in kg
- c = the speed of light (300,000,000 m/s)
- In a 2016 article, Australian medics calculated that a typical Australian man weighing 86kg had the potential energy of 7.8 septillion joules of energy.
- That is the equivalent of 1.86 billion tonnes of TNT.
- This is 88,000 times the energy in the bomb that was dropped on Hiroshima in WW2.
- This 56 times more energy than the Tsar Bomba.
- That is enough energy to power the world for 13,448 days or 37 years (based on current global daily energy use)
- YOU are full of energy...make the most of it!



Revision

It is time to revise everything you have covered this term...but wait!

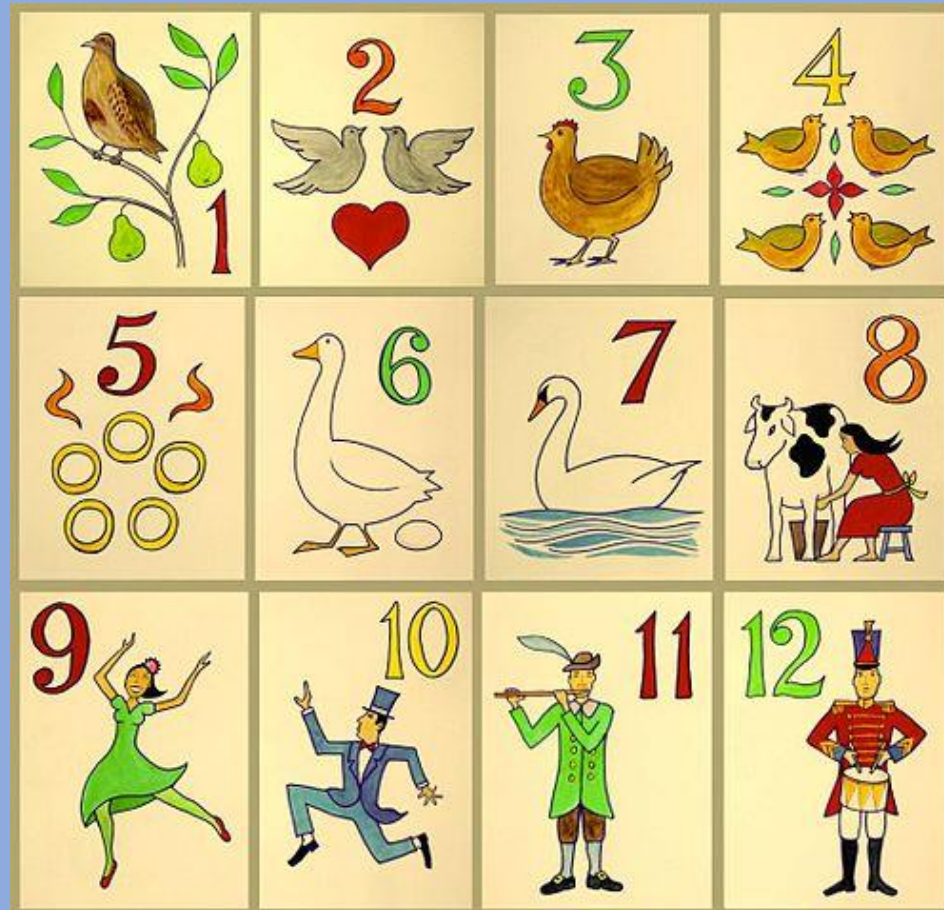
Sire's BIG FAT Maths Quiz of the Year

My name is Si!



Yes Sire!

Q1: **Addition:** On the twelfth day of Christmas, how many gifts would you receive, for that day, according to the song “The Twelve days of Christmas”?



Answer = 78 gifts

$12+11+10+9+8+7+6+5+4+3+2+1$

Q2: **Division:** If you sent half of the gifts back from question 1, how many would you have left?



Answer = 39 gifts

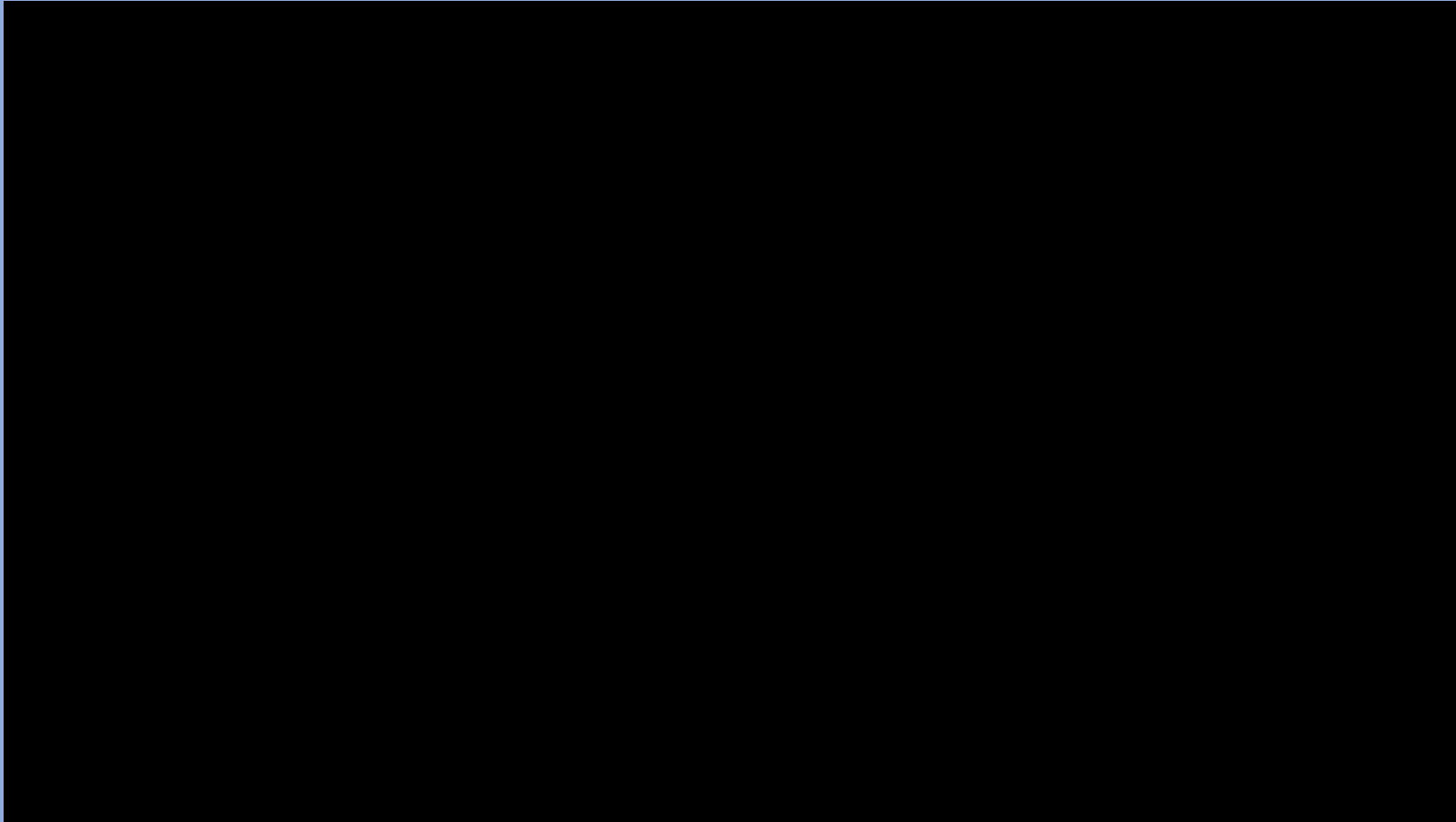
$$78 \div 2 = 39$$

Q3: Food and Drink: According to the song, how does Good King Wencelas like his pizza?



Answer = Deep and Crisp and Even

Q4: Order of Operations: In the abbreviation BIDMAS, what does the 'I' stand for?



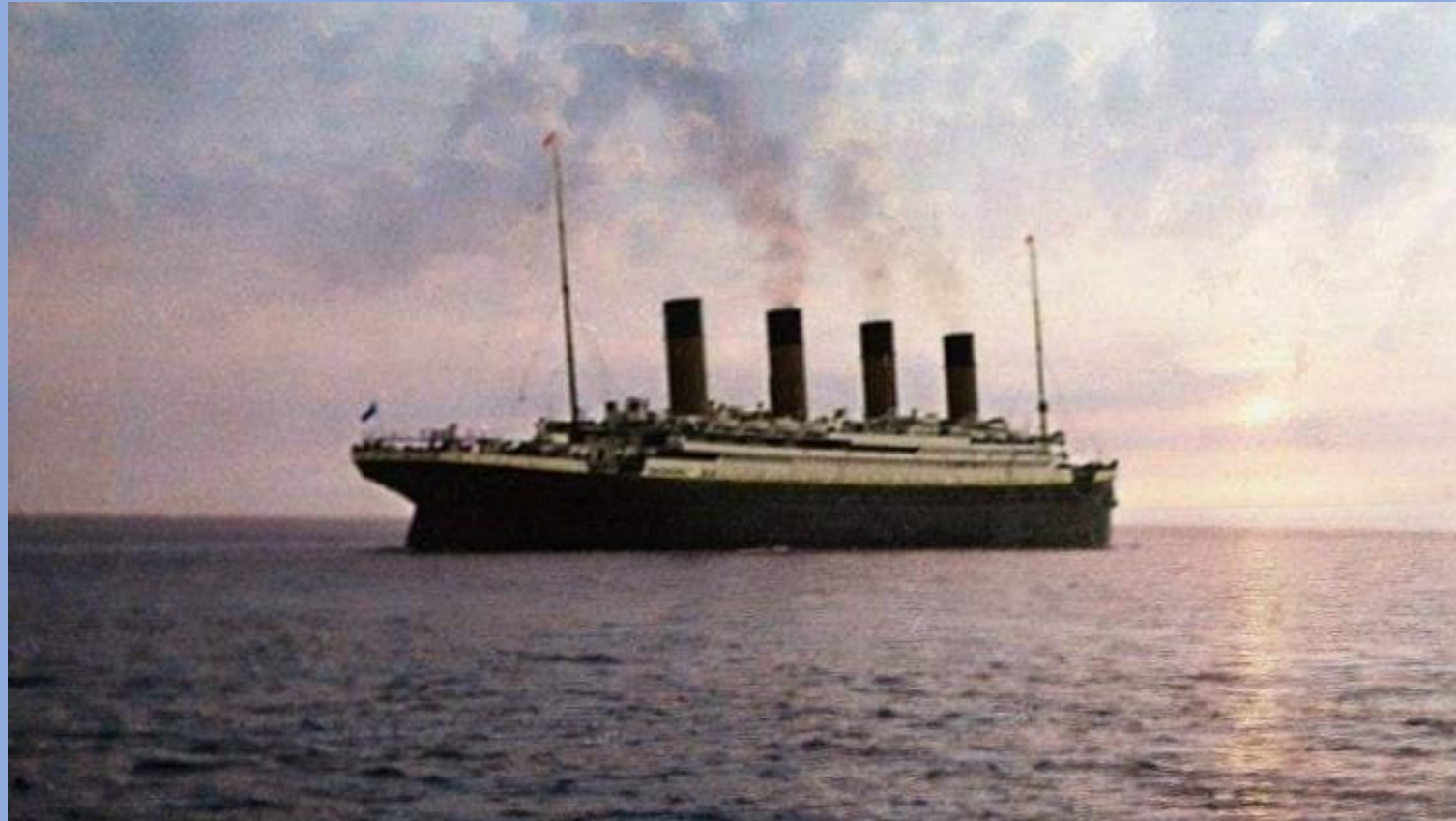
Answer = Indices

Q5: Multiplication: In dice games, what would my score be if I rolled two 5s?



Answer = 10
 $5 \times 2 = 10$

Q6: Percentages: What percentage of people survived the sinking of the Titanic? (706 survived of 2224)



Answer = 32%

$$706 \div 2224 \times 100 = 32$$

Bonus Question

What is a small iceberg, about the size of a car or less called?

Answer

A growler.

Q7: **General Knowledge:** Theoretically, could you put your trunks on and go for a swim in Titanic's pool?



Answer = No

The pressure at this depth (approx. 2 miles) is 6500 psi or 400 atmospheres. You would be crushed to the size of a ping-pong ball!

Q8: Food and Drink: What are your favourite crisps?



Answer = Any crisp that is derived from a potato.

Note: Monster Much is a Maize based snack and would be incorrect!

A discussion about crisps!



Q9: Totals: What is the total weight of these 3 bags?



Answer = 165g

$$85 + 40 + 40 = 165$$

Q10: **Stupidity:** How much wood would a woodchuck chuck, if a woodchuck could chuck wood?



Answer

If a woodchuck could chuck wood, then a woodchuck would chuck a lot of wood!

Bonus Question

By what other name is the woodchuck known?

Bonus Answer

A groundhog.

Please fill out the feedback form.

Let me know how you are progressing and also whether you find the meditation beneficial.

Private Study

Entry Level 3 Students: Read through all pages of your CGP textbook in Section 1 - Number. Fill in any gaps.

Level 1 Students: Read through all pages of your CGP textbook in Section 1 - Number. Fill in any gaps.

Level 2 Students: Read through all pages of your CGP textbook in Section 1 - Number. Fill in any gaps.

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

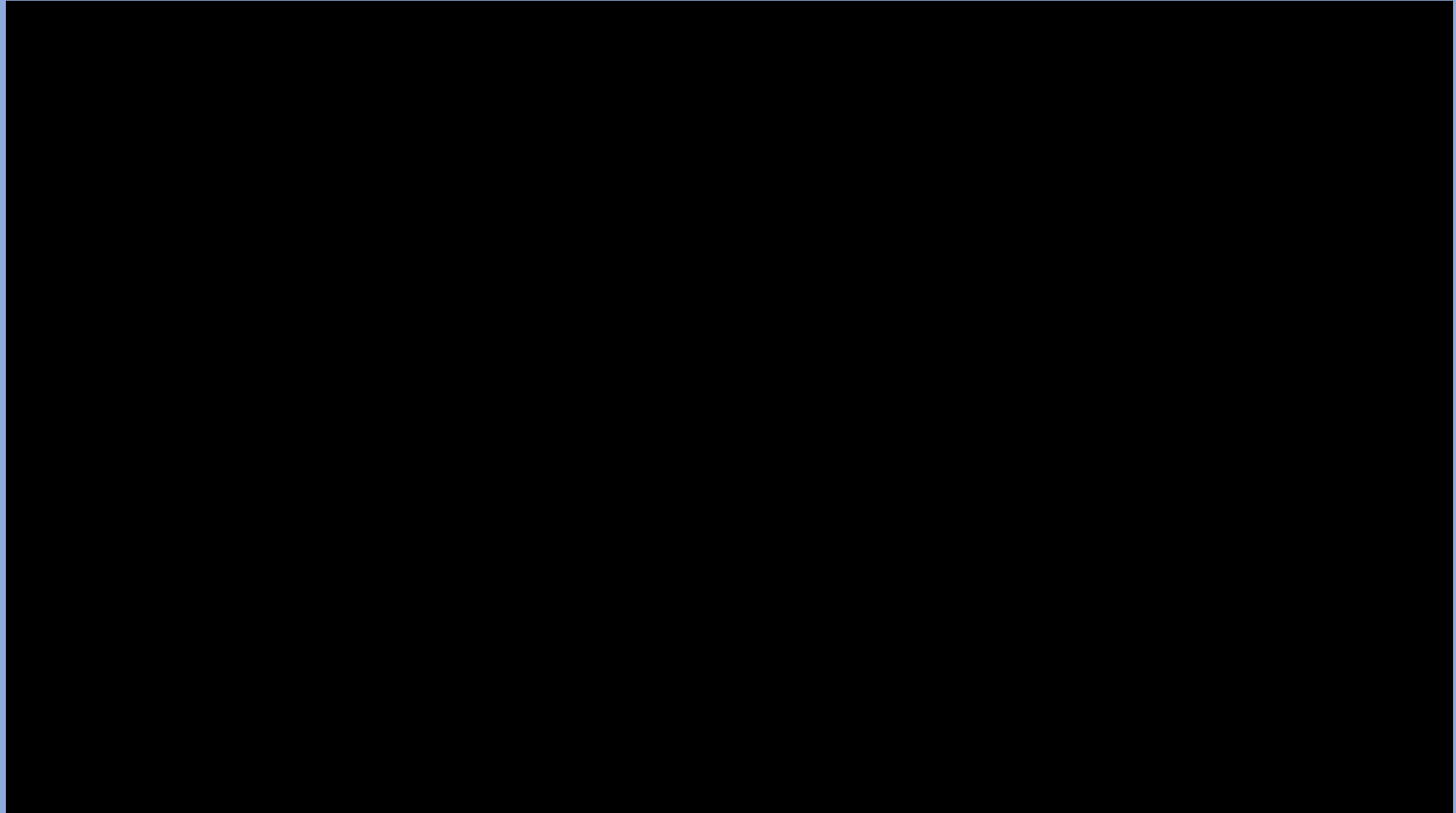
If you need help, ask one of the staff.

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.

I wish you a Merry BIDMAS!

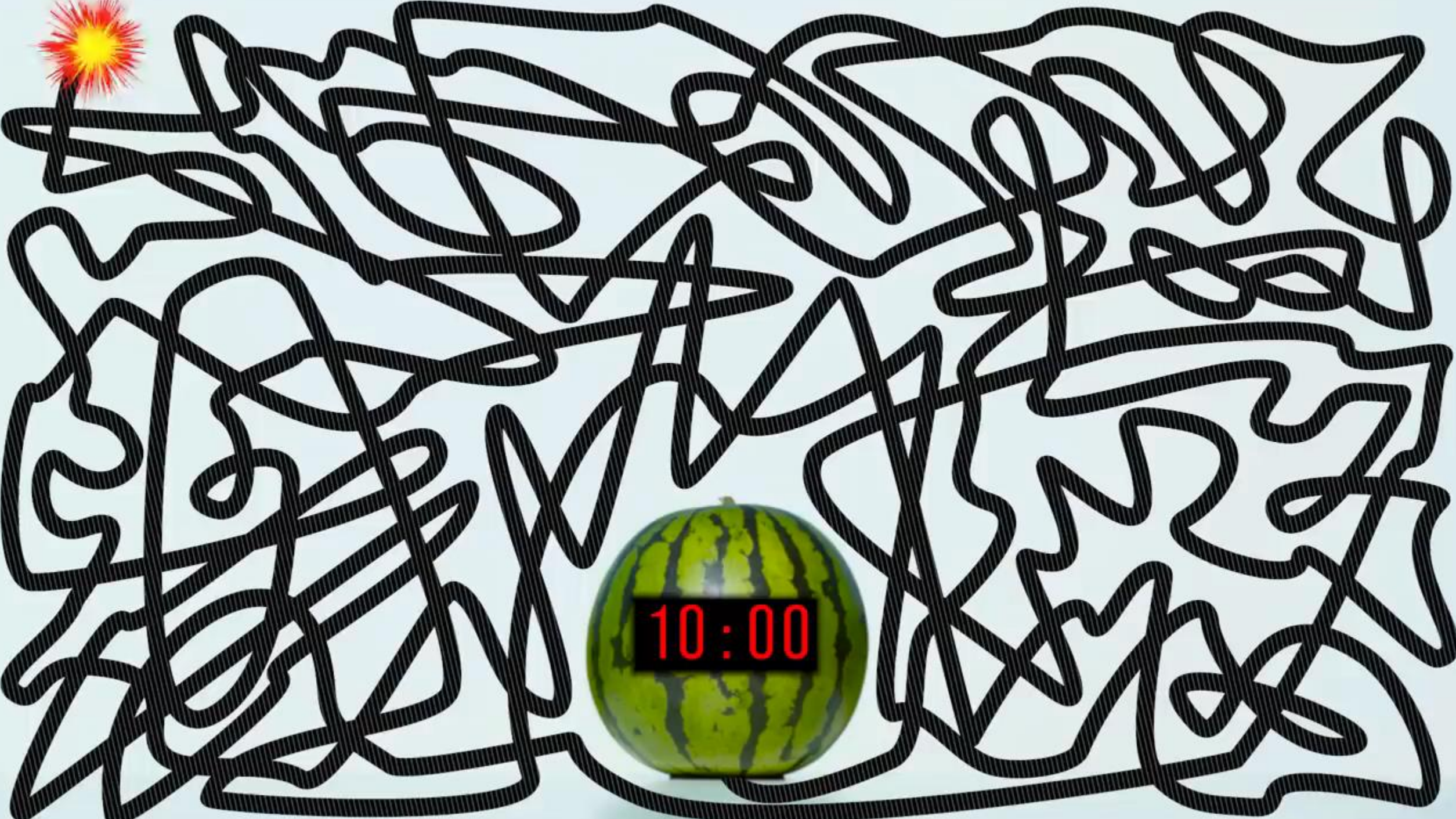
https://www.youtube.com/watch?v=fXdZSya_FPI







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. $Money = \sqrt{Evil}$

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