

$$a_0 = 1 [a_0]$$

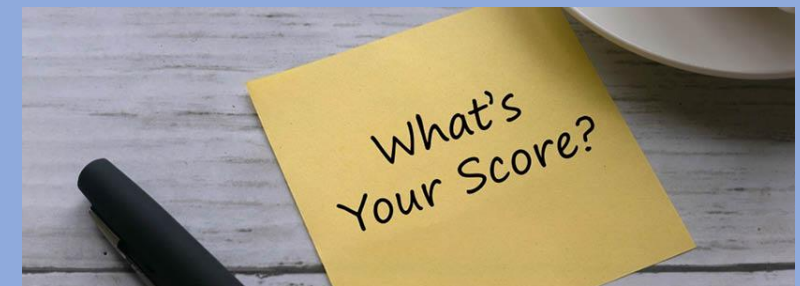
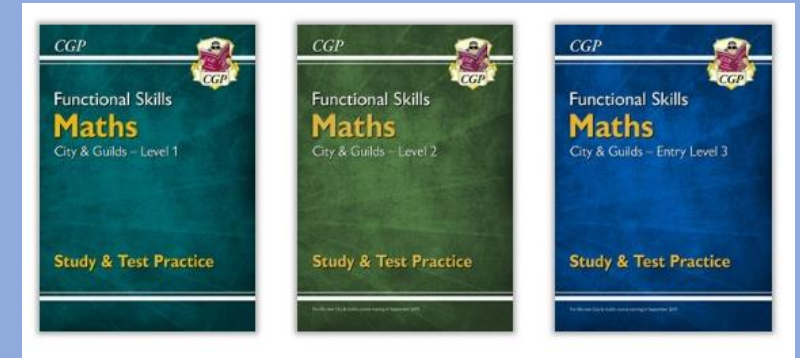
7

$$\arcsin(z)$$

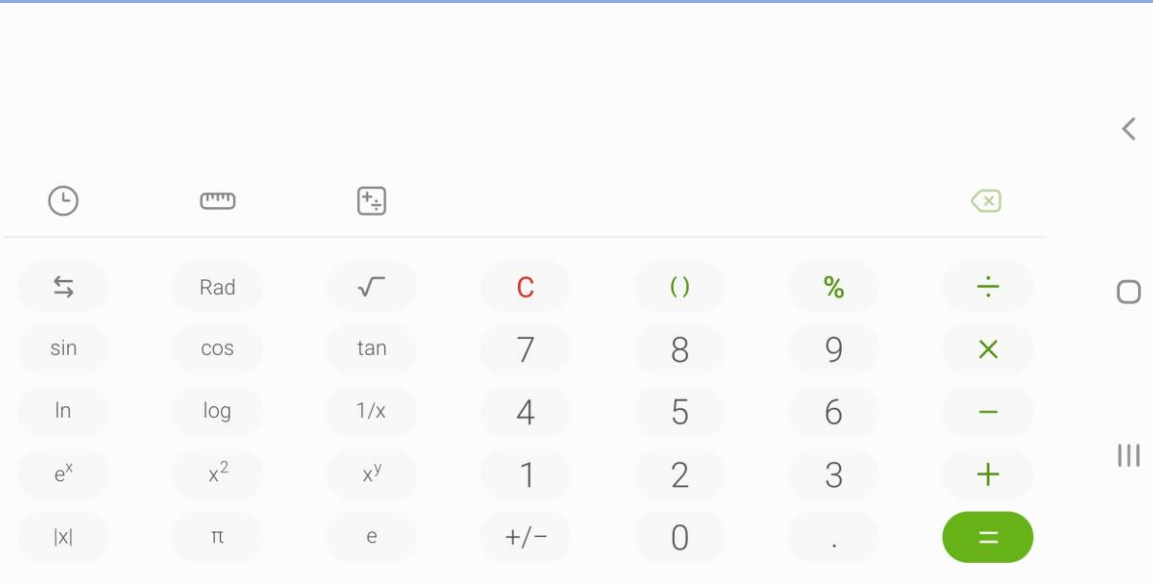
$$x_{n+1} =$$

Introductions

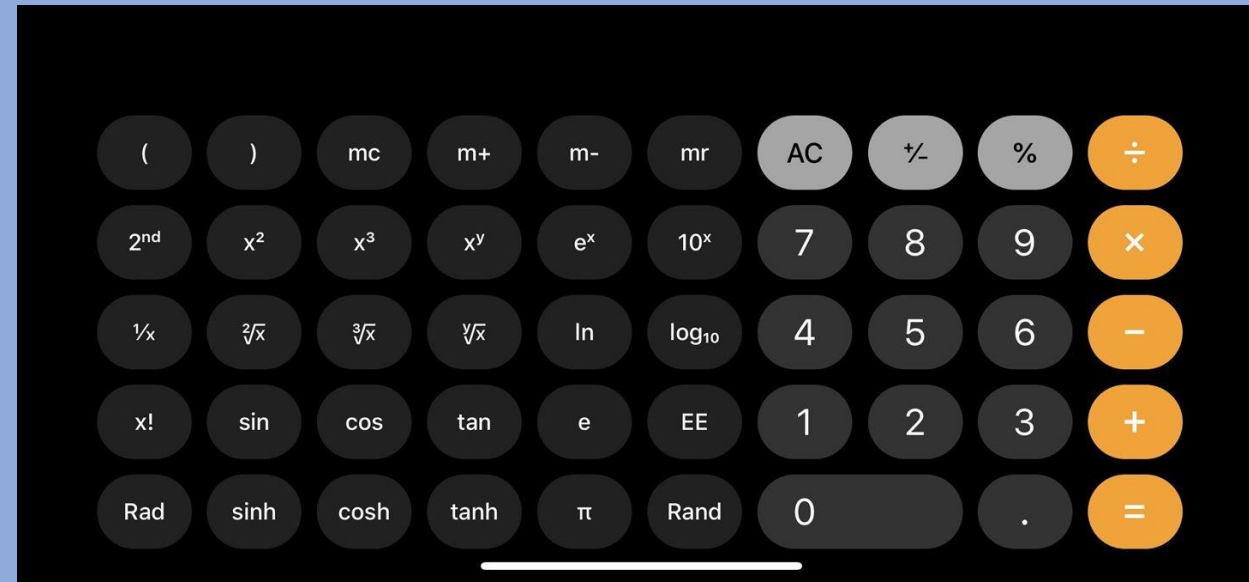
- The CGP textbooks are a fantastic resource for your revision.
- You can use your phone when prompted, and as a calculator, but please keep it on silent during the lesson.
- Please make a note of your scores for interactive games as they let me know how well you are progressing.



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

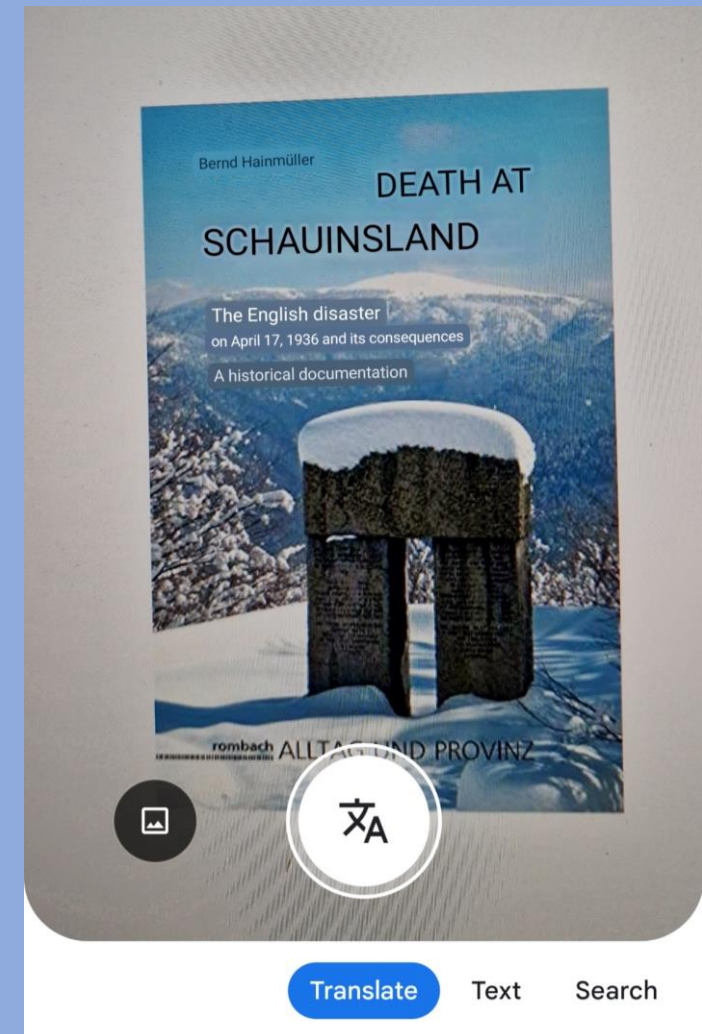
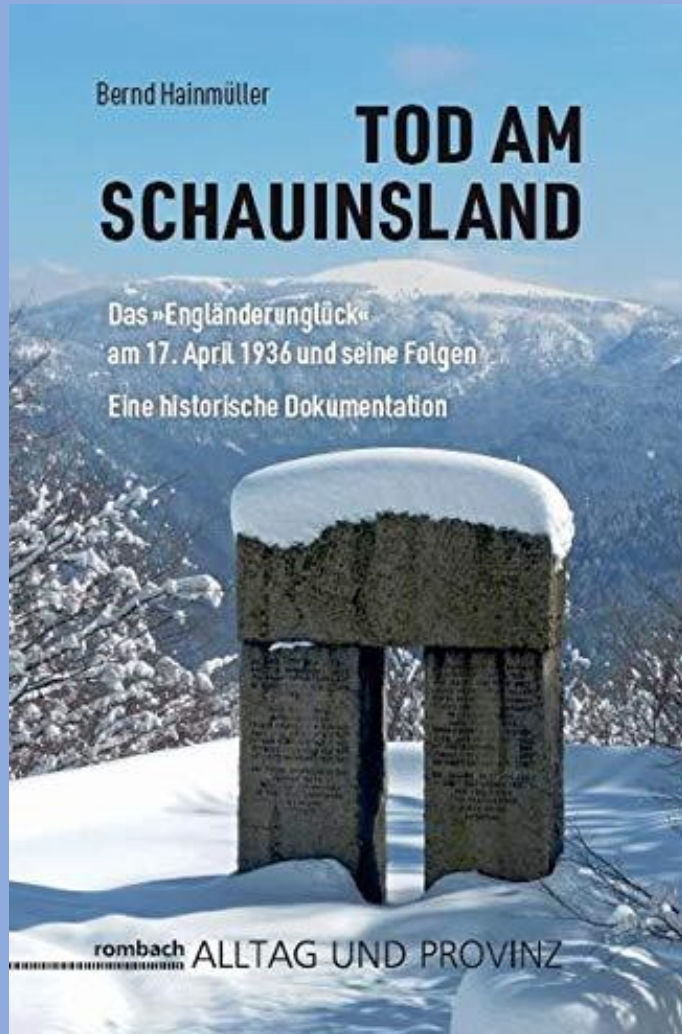
[Using Google Lens](#)

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>

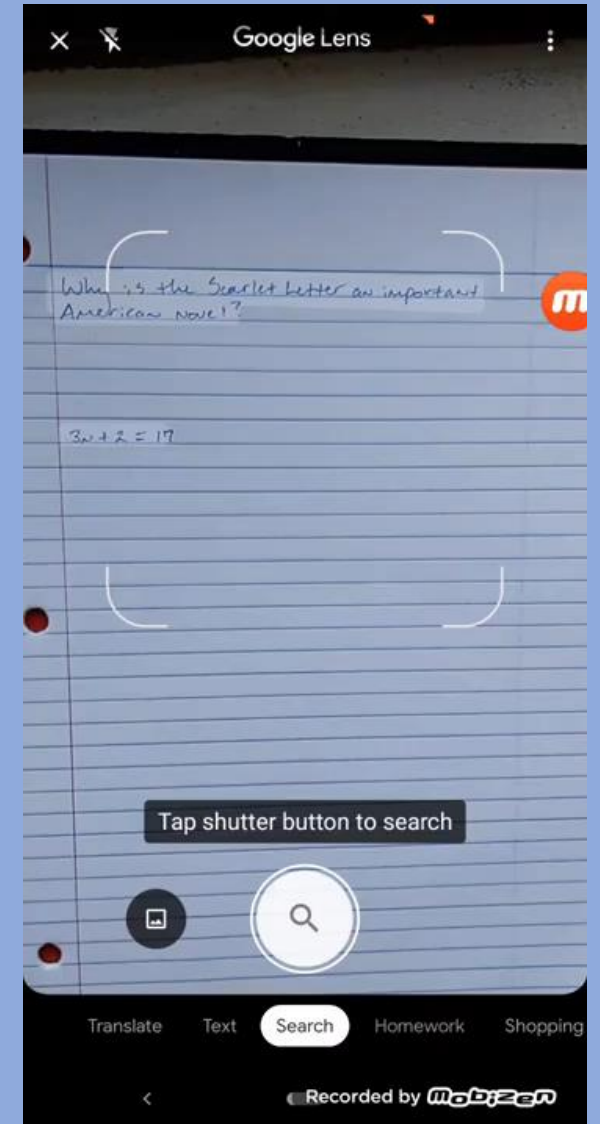


Google Lens can help with your homework!



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

- 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).



$$a_0 = 1 [a_0]$$

7

$$\arcsin(z)$$

$$x_{n+1} =$$

Resources Online
PowerPoint Slides
Worksheets
Videos
Games

www.reachoutcf.com/resources

www.reachoutcf.com/maths-resources

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

Number Patterns (Linear Sequences) - Recap

<https://passfunctionalskills.co.uk/entry-level-3-maths/functional-skills-number-patterns/>



Section 1: Number
Fractions, Decimals & Percentages
Lesson 7

$\frac{1}{2}$

0.5

50%

Section 1: Number

Fractions, Decimals & Percentages

Lesson 7

Note: Session 2 will be a practice exam paper at your level

Lesson Intentions: Monday 27th November 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)

This lesson:

- 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)

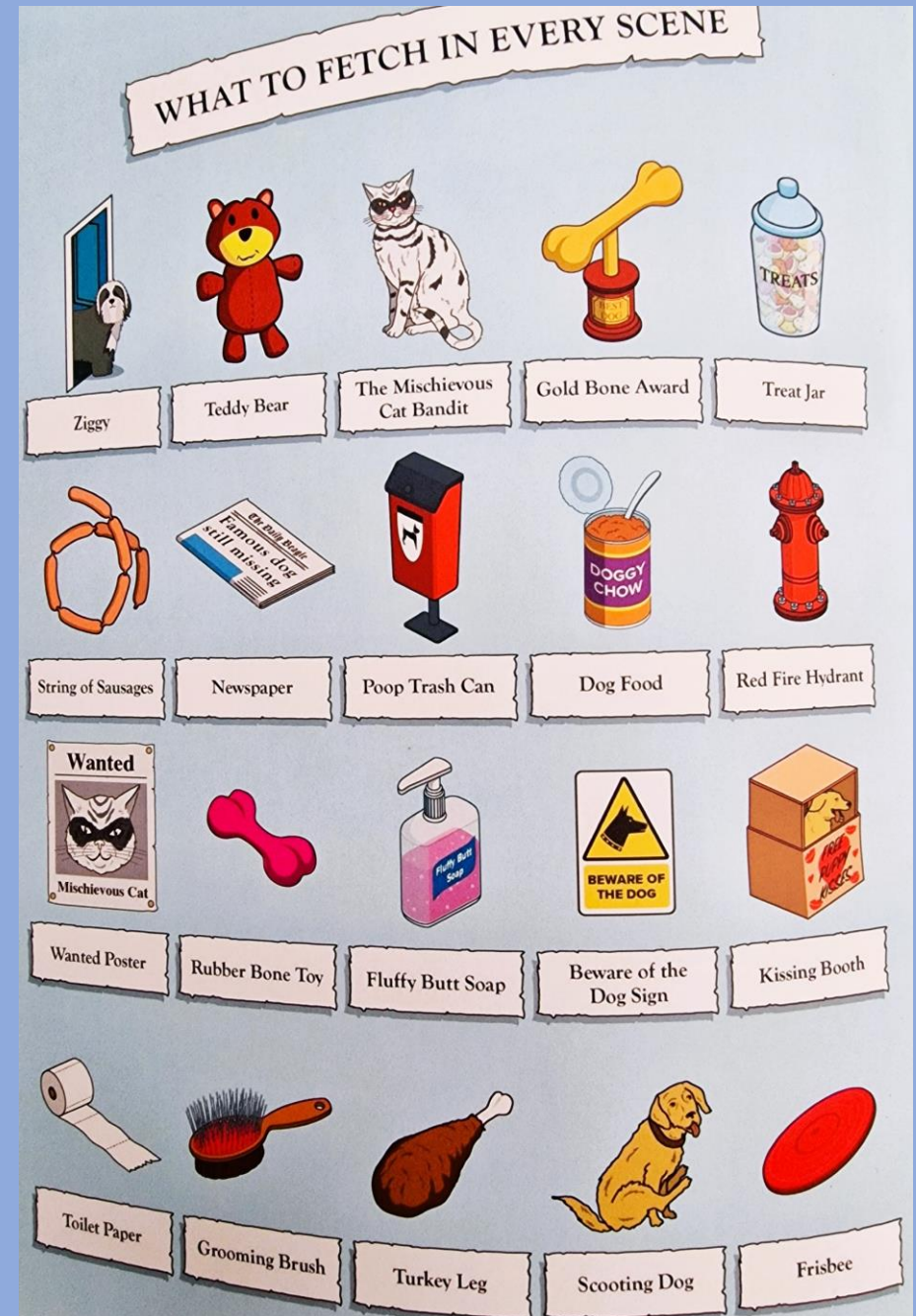
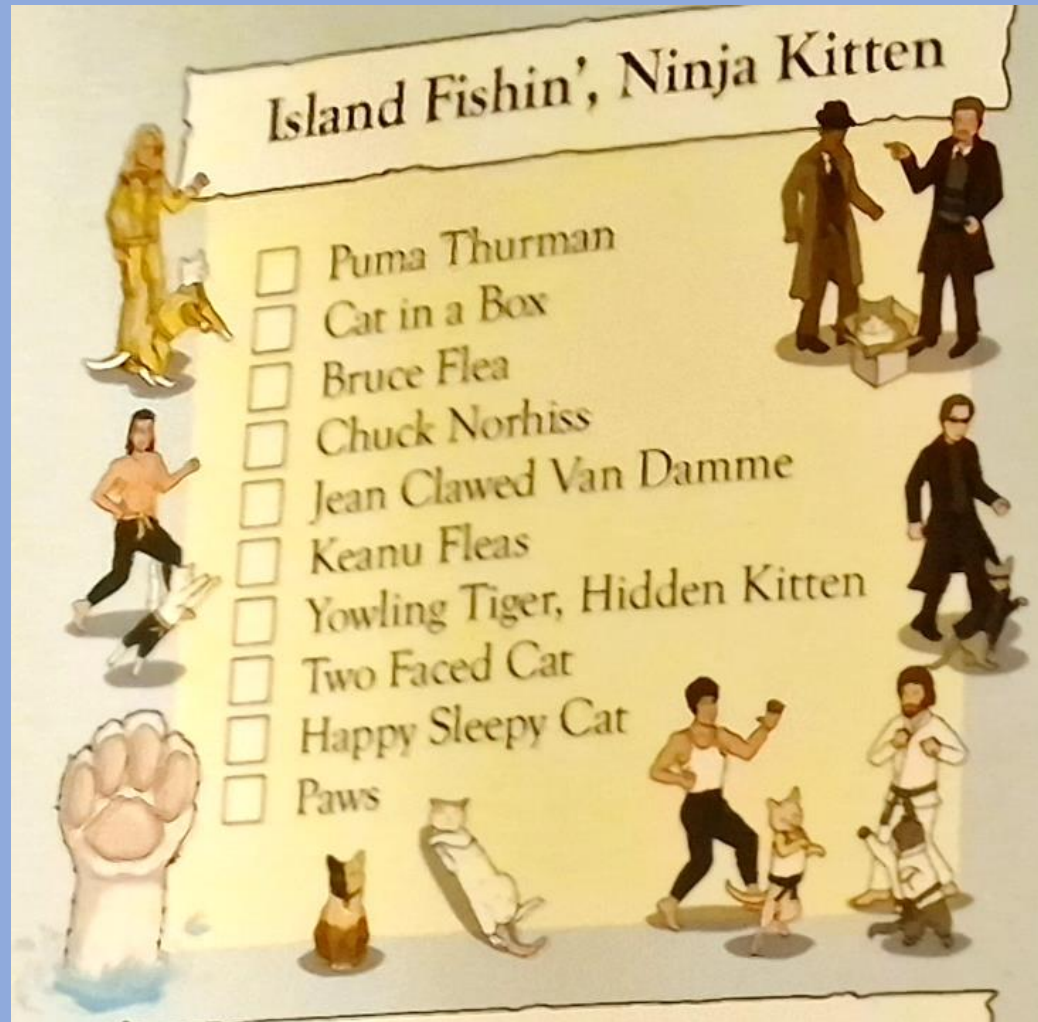
Can you help me find Ziggy?



Island Fishin', Ninja Kitten
It's the way of the kitten on Cat
Island in Katsuro. The blossoms are
in full bloom and even the kitties
have a spring in their step.



Extra things to spot!





Island Fishin', Ninja Kitten
It's the way of the kitten on Cat
Island in Katsuyama. The blossoms are
in full bloom and even the kitties
have a spring in their step.

00:00

Recap – Last lesson we looked at:

- Number Patterns, which are sometimes called Linear Sequences.
- Fractions.
- Education for Sustainable Development – UNSDG 4 – Quality Education.

Today, we will have a recap of Fractions before moving on to Decimal and Percentage values.

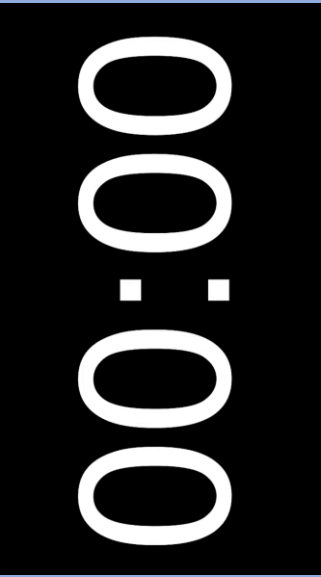
In this lesson we will look at UNSDG
17 – Partnerships for the Goals

United Nations Sustainable Development Goals



Time for a test. Do the best you can.

- You have $\frac{1}{2}$ of 5 minutes to complete the test.
- $\frac{1}{2}$ of 5 minutes is $= 1 \div 2 \times 5 \text{ minutes} = 2.5 \text{ minutes}$
- Or $2 \frac{1}{2}$ minutes = 2 minutes and 30 seconds.
- Starting NOW.



00:00

Half of a
Minute
Left...



How to read - Fractions

Do not talk to anyone during this test. Please read the following text carefully. It is always a really good idea to read things carefully, particularly when it comes to questions in exams and tests. It is also really important to make sure you answer exactly what the question is asking for. This is also really important in life when it comes to reading the small print in contracts. Read through the following problems relating to fractions. You do not need to answer any of the questions that follow. Once you have read them, write your name at the top of the page, then turn your page over so the blank side is facing up. You will have completed the test. Please sit quietly until time is up.

1.0

$$\frac{1}{2} \text{ of } 14$$

2.0

$$\frac{1}{4} \text{ of } 32$$

3.0

$$\frac{1}{4} \text{ of } 24$$

4.0

$$\frac{1}{2} \text{ of } 8$$

5.0

$$\frac{1}{3} \text{ of } 48$$

6.0

$$\frac{1}{3} \text{ of } 6$$

7.0

$$\frac{2}{7} \text{ of } 63$$

8.0

$$\frac{12}{13} \text{ of } 195$$

9.0

$$\frac{9}{11} \text{ of } 44$$

10.0

$$\frac{13}{19} \text{ of } 114$$

11.0

$$2\frac{1}{2} \text{ of } 6$$

12.0

$$1\frac{1}{2} \text{ of } 30$$

13.0

$$3\frac{1}{2} \text{ of } 48$$

14.0

$$1\frac{3}{4} \text{ of } 72$$

15.0

$$7\frac{1}{2} \text{ of } 8$$

16.0

$$8\frac{1}{3} \text{ of } 24$$

How did the test go?

- Who managed to complete what was asked for in the test?
- Always read and re-read the question before answering.
- You can **highlight** or underline important features.
- Be aware of the placement of question marks ‘?’ and **BOLD** text in exam questions. They usually denote what is being asked for and/or a very important point.
- The test I gave you before was particularly misleading, as what was being asked of you was hidden in the small print.

One of last week's questions

1 (a) Boarding kennels look after cats and dogs.

Linda is setting up a boarding kennel business.

She researches other kennels and finds that:

- $\frac{3}{8}$ of kennels take dogs only
- $\frac{2}{5}$ of kennels take cats only.

Linda thinks that more kennels take dogs only than take cats only.

Is she correct?

Show how you decide.

Always read the small print!

The Guardian logo, featuring the words "The Guardian" in white serif font on a dark blue square background.

Thousands sign up to clean sewage because they didn't read the small print. [Alex Hern](#) [@alexhern](#)

Fri 14 Jul 2017 11.07 BST. Last modified on Fri 29 Dec 2017 08.18 GMT

Do you read the terms and conditions? Probably not. No one does. And so, inevitably, 22,000 people have now found themselves legally bound to 1000 hours of community service, including, but not limited to, cleaning toilets at festivals, scraping chewing gum off the streets and “manually relieving sewer blockages”.

The (hopefully) joke clause was inserted in the terms and conditions of Manchester-based wifi company Purple for a period of two weeks, “to illustrate the lack of consumer awareness of what they are signing up to when they access free wifi”. The company operates wifi hotspots for a number of brands, including Legoland, Outback Steakhouse and Pizza Express.

Purple also offered a prize for anyone who actually read the terms and conditions, and flagged up the “community service clause”. Just one person claimed it.

It's no surprise that people will agree to anything to get free wifi. In 2014, cybersecurity firm F-Secure ran a similar experiment in London, operating a wifi hotspot that anyone could use – in exchange for their firstborn child. The so-called “Herod clause” was clearly stated in the terms and conditions, and six people still signed up. Though it's not clear how many of them simply dislike their eldest children.

F-Secure also pointed out that “while terms and conditions are legally binding – it is contrary to public policy to sell children in return for free services, so the clause would not be enforceable in a court of law”.

It remains unclear whether terms and conditions in general are actually applicable to the typical customer. While they are contracts, and usually considered legally binding as such, some have argued that the inability to negotiate them violates common law principles of fairness, leaving them void.

Always Read the Question
And always re-read the questions at the end.

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.

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**.

Game – Fruit Splat Fractions (Start at Level 1a)





04:59

Game – Fruit Splat Fractions (Start at Level 1a)



What level
did you reach?

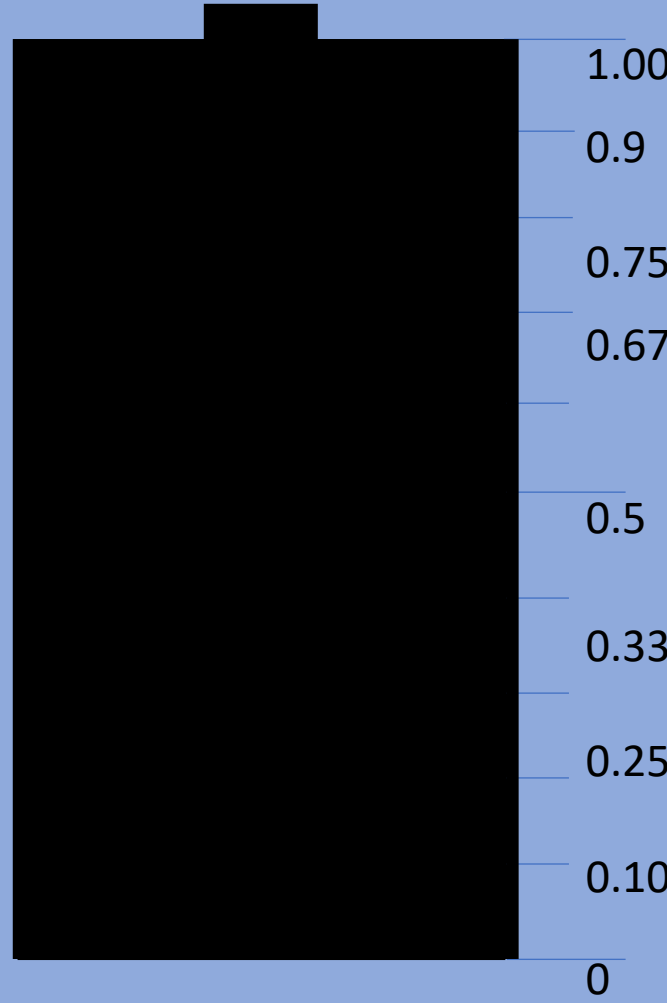
What
percentage
score?

Fractions, Decimals and Percentages

- Where have you seen numbers expressed as fractions?
- Where have you seen numbers expressed as decimals?
- Where have you seen numbers expressed as percentages?

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%



Fractions, Decimals and Percentages


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



- 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.

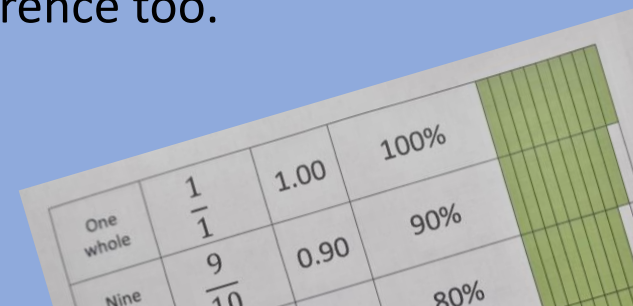
Important Fractions, Decimals and Percentages

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%
$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$
$\frac{1}{10}$	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%



Important Fractions, Decimals and Percentages - Activity

- You have been given a sheet with fractions, decimals and percentages. There are some gaps in the answers.
- Using the cut-outs, fill in the gaps.
- You may find it helpful to start with the fractions.
- You may use a calculator to work out the decimal value.
- Remember that a fraction is a bit like an incomplete sum.
- Levels 1 and 2 will fill in some percentage values.
- Level 2 students will write their answers on the sheet.
- You can use your fraction wall for reference too.
- You have 5 minutes to fill in the gaps.



One whole	$\frac{1}{1}$	1.00	100%
Nine	$\frac{9}{10}$	0.90	90%
			80%



04:59

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’

Decimals – Example Numbers

- Decimal values occur when we need to **split whole numbers (integers) into smaller amounts**.
- For most mathematical processes we use the numbering system called **base 10**. This is best summarised using a place value chart.

PLACE VALUE	Thousands	Hundreds	Tens	Units	Decimal Point	Tenths	Hundredths	Thousandths
	0	0	0	9	.	5	0	0
	0	3	6	5	.	2	5	0
	1	0	1	6	.	0	4	7

- The first row above shows the number 9.5
- If we were working with units of £s, 9.5 would equal £9.50 (or 9 and a half pounds). This is the current minimum wage hourly rate for people aged 23 and over.
- In the next example we have 365.25, which is the number of days in a year.
- The extra 0.25 of a day, or quarter of a day (or 6 hours), is absorbed by a leap year (every four years).
- In the third example above we have the number of kilograms in an old (imperial) ton.
- The amount represents 1016kg and 47g.
- Note: The prefix kilo denotes 1000's of grams. 1kg = 1000g
- Note: A metric tonne (notice different spelling) has 1000kg.

Decimals – Addition and Subtraction

- If you have been shopping and bought several items together, then you will already have worked with decimal values.

Sandwich	£2.50
Crisps	£0.50
Drink	£1.00
<hr/>	
Total	£4.00

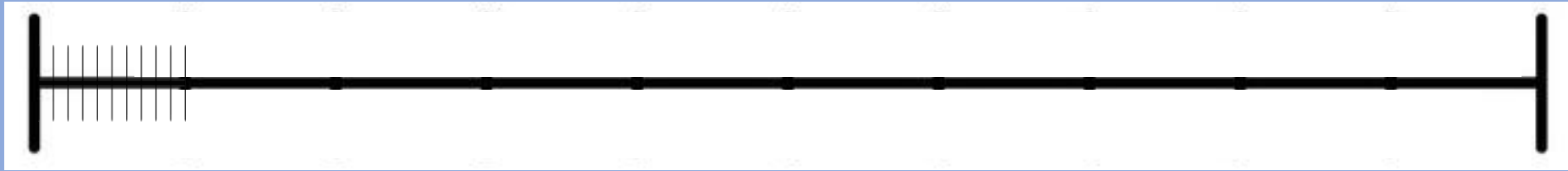
+



- In this example 0.5 or 0.50 represents 50 pence.
- Remember to keep your digits and decimal point in line when adding and subtracting.

Decimals – Measuring Length

- Imagine 1 metre in length.



- If we split the metre into ten equal pieces, or tenths, it would look like this.
- Each section is called a decimetre and represents 0.1 metres.
- A decimetre is not a very common unit of measurement.
- If we split each decimetre into ten equal sections, then we now have a tenth of a tenth, or one hundredth of a metre.
- One hundredth of a metre is called a centimetre and represents 0.01 metres.
- We can further split the centimetre into tenths and these are millimetres.
- A millimetre is one thousandth of a metre and represents 0.001 metres.

Decimals – Measuring Height

- I am 1.73 metres tall.
- What is this value in centimetres?
- We know there are 100cm in 1m.
- So $1.73 \times 100 = 173\text{cm}$.
- You may view this as the decimal place moving two places to the right (for the two zeros in 100).



Percentage

NOUN a rate, number or amount in each hundred.

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

Denoted by the symbol: %

Percentages

- Percentages are very easy to work out once we know:
 - The number of parts of a whole thing we are measuring.
 - The total number of parts that make up that whole.
- First we find the fraction.
- Second we calculate the decimal (we solve the fraction).
- Third we calculate the percentage (we multiply by 100).

Calculating a Percentage

The Number of Parts we are measuring

The Total Number of Parts in the whole

$\times 100$

Example:

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

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

Percentage Increase

- Last year Inflation had risen to 11%.
- This means that (on average) products you buy cost 11% more than they did last year.
- If something cost £1.00 last year, how much would it cost now?

- We can find 11% of £1.00 very easily.
- There are 100 pence in a pound, so 1% of a pound is 1p.
- 11% of a pound is therefore 11p.
- Therefore if you bought something for £1.00 last year it would now cost £1.11

Percentage Increase

- The previous example was very simple, so what if the cost of something was different – your weekly shop cost £40.00 last year, how much will it cost now?
- 11% expressed as a fraction is $\frac{11}{100}$
- $11 \div 100 = 0.11$
- $0.11 \times £40.00 = £4.40$
- This value represents the percentage increase, so we add it on to our original value.
- Therefore our shopping will now cost $£40.00 + £4.40 = £44.40$

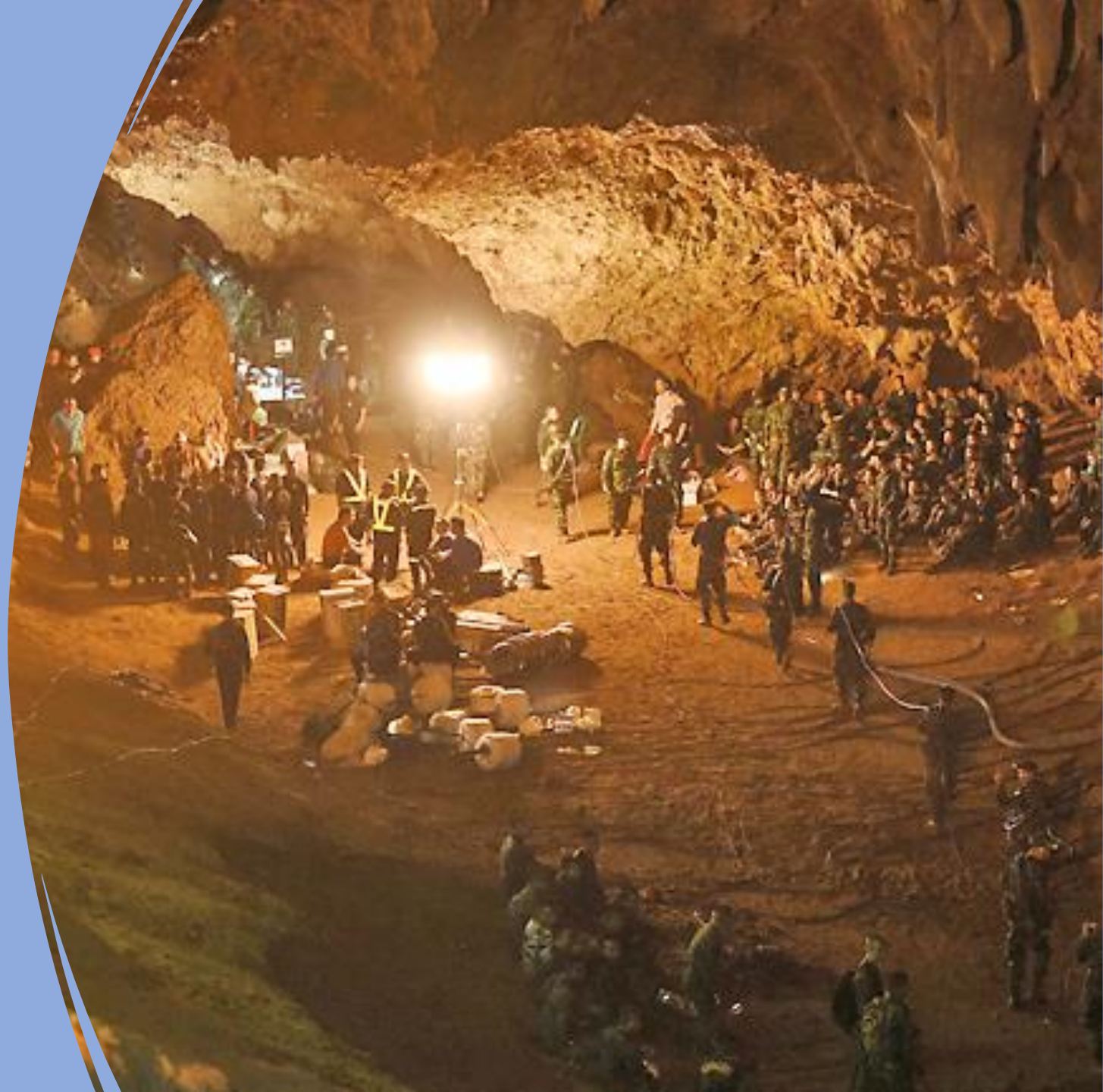
Putting this all into practice

In 2018, a football team comprising 12 boys and their coach, went to visit a local cave after football practice. While they were exploring the cave, it began to rain heavily outside. When they went to leave the cave they found their exit blocked by floodwater. The cave flooded rapidly leaving them to retreat to the highest ground they could find inside the cave.

It was thought that the monsoon had come early due to climate change. There was a 50% increase in rainfall that spring.

That night, when they did not return, the alarm was raised and the parents and locals went looking for them. It was clear the football team was trapped.

It was ten days before they were found.



Who would you rather have rescue you?

- 37 Thai Navy Seals



- Elon Musk

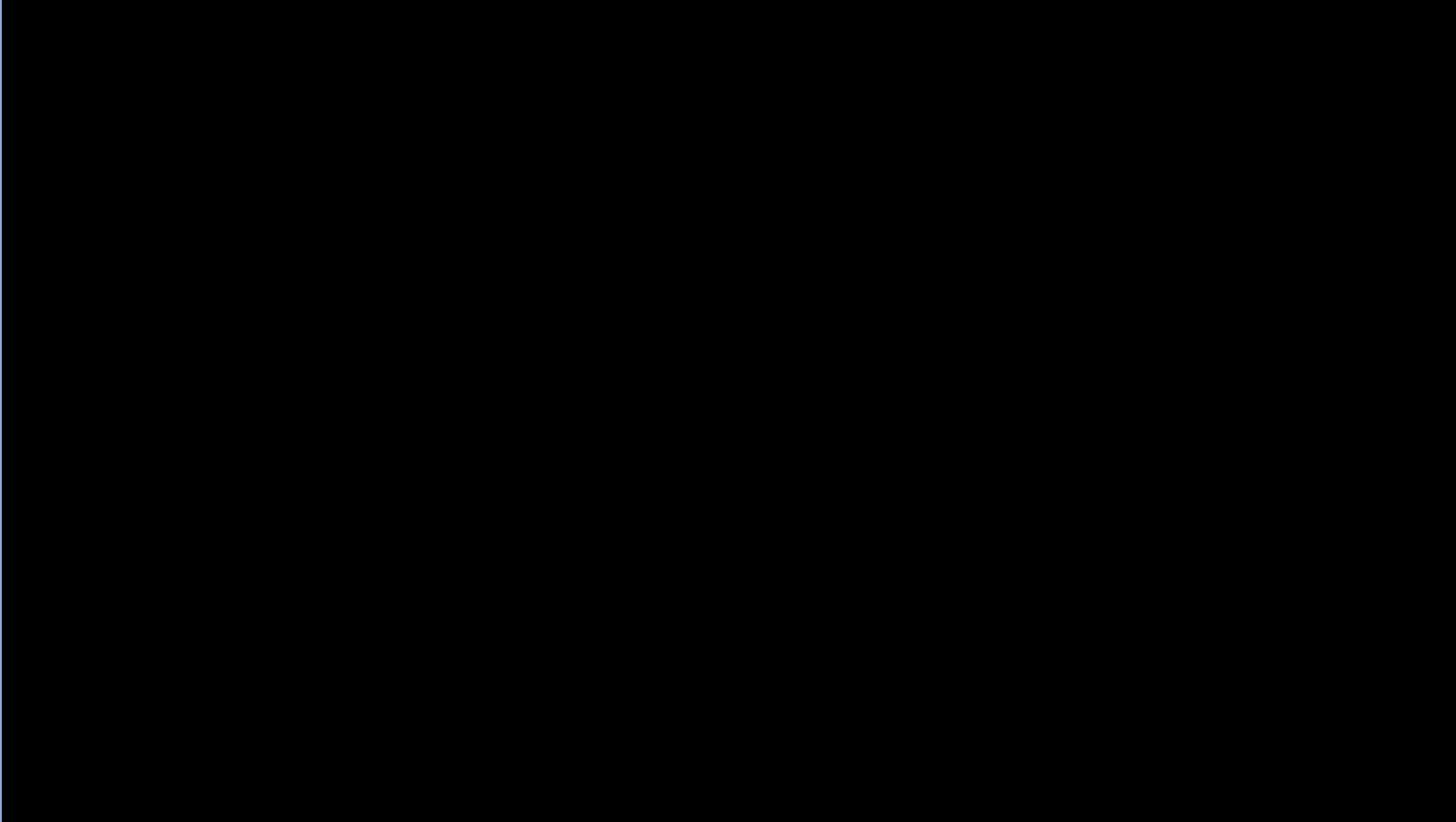


- A retired Fireman and an IT Consultant
- (Who both have to use Maths actively!)



Meet Rick, John, Chris, Josh & Jim

<https://www.youtube.com/watch?v=v08sSDTuFYw> (The Rescue - Trailer Only)



Sue Charles
@Sue_Charles



Not all heroes wear capes... some wear Shaun the Sheep t-shirts!

Top job, John Volanthen. 🙌🙌🙌

[#ThaiCaveRescue](#)



The Mirror @DailyMirror · 12 Jul 2018

Official

Hero Brit diver who helped save boys trapped in Thai cave returns home to UK
[mirror.co.uk/news/uk-news/b...](https://www.mirror.co.uk/news/uk-news/b...)



10:43 am · 12 Jul 2018

62 Retweets 177 Likes

Entry Level 3 - Question

The football team was found **4km** inside the cave.

Rescue workers had managed to remove water from the first **1km** of the cave. The rest of the cave remained flooded.

What **fraction** of the cave was **flooded**?

What is the **decimal** value?

What **percentage** of the cave was **flooded**?

Level 1 - Question

129 divers of different nationalities were involved in the rescue mission.

37 of the divers were Thai Navy Seals.

9 of the divers were from the UK.

What **percentage** of the divers were Navy Seals and what percentage were British?

STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

MANY DEVELOPING COUNTRIES ARE FACING A DEBT CRISIS



37 OUT OF 69
OF THE WORLD'S POOREST COUNTRIES
WERE IN DEBT DISTRESS OR AT HIGH RISK OF IT

THE SHARE OF EXPORTS FROM LDCs IN GLOBAL MERCHANDISE TRADE



HAS STAGNATED AT AROUND 1%

— SINCE 2011 —



NET ODA REACHED \$206 BILLION IN 2022, UP 15.3% FROM 2021



MAINLY OWING TO SPENDING ON REFUGEES IN DONOR COUNTRIES AND AID TO UKRAINE

NET ODA REACHED 0.37% OF GNI, STILL BELOW THE TARGET OF 0.7%

2 IN 3 PEOPLE USED THE INTERNET
IN 2022
259 MILLION MORE MALE THAN FEMALE USERS



ODA FUNDING FOR DATA



Level 2 - Question

Each diver needed **6 cylinders** of compressed air for their journey into the cave and back. They used 2 cylinders for the journey in and 2 cylinders for the journey out. 2 of the cylinders were for emergencies and were not needed. (They call this the rule of 3 in diving)

Each of the boys needed **1 cylinder** of compressed air for their journey out of the cave.

For each rescue, what percentage of cylinders were not used and kept for emergencies?



Practice Exam Questions

- You have each been given a practice exam question on the topic of fractions, decimals and percentages.
- Have a go at completing the question on your own.
- If you get stuck or are unsure, please ask one of the staff for help.
- You have 5 minutes.


Entry Level 3 Practice Exam Question

3(e) Jadon uses 0.25 litres of cleaning product in each bucket of water.

He checks the amount of product after each bucket is used.

Complete the table to show how much cleaning product he uses.

[2 marks]



Buckets used	Cleaning product used (litres)
1	0.25
2	0.5
3	0.75
4	
5	

Level 1 Practice Exam Question

3 (f)

Chester needs 240 tiles.

He buys 10% more tiles in case some of the tiles break.

He cuts $\frac{3}{8}$ of the tiles he buys.

How many tiles does he cut?

[3 marks]



Your answer:

tiles

Level 2 Practice Exam Question

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]

Blank area for writing the answer.

Your answer:

%

End of Part One

In the next session you will attempt a past exam paper.

Do not worry...this is purely to see how you are getting on and any pre-existing knowledge you may have.

The exam is in two parts:

Part A: Non-calculator for 20 minutes (you would usually be allowed 30 minutes).

Part B: Calculator for 1 hour (you would usually have 1hr 15 minutes E3 or 1hr 30 minutes L1).

A close-up photograph of a hand holding a blue pencil, poised to write on a document. The document features a grid pattern of small squares, typical of a practice exam or a data recording sheet. The background is softly blurred, showing a white surface with some faint, yellowish markings. The overall lighting is warm and focused on the hand and pencil.

Part Two: Practice Exam

Section 1: Number

Lesson 7

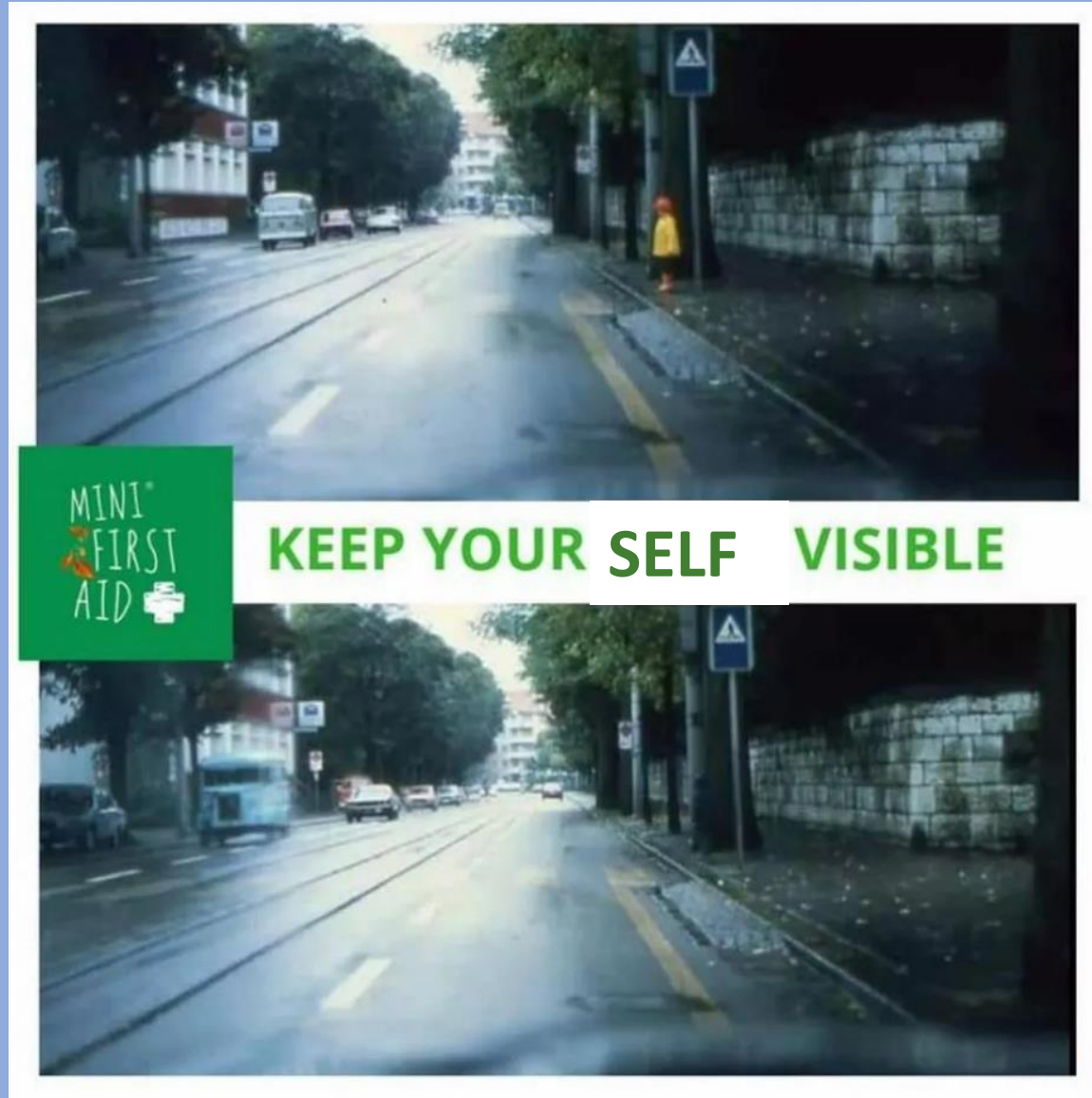
Part 2: Practice Exam



LIFE IS BUSY

Take 5 minutes for yourself...

Road Safety Week (Last Week)



Can you help me find Ziggy?

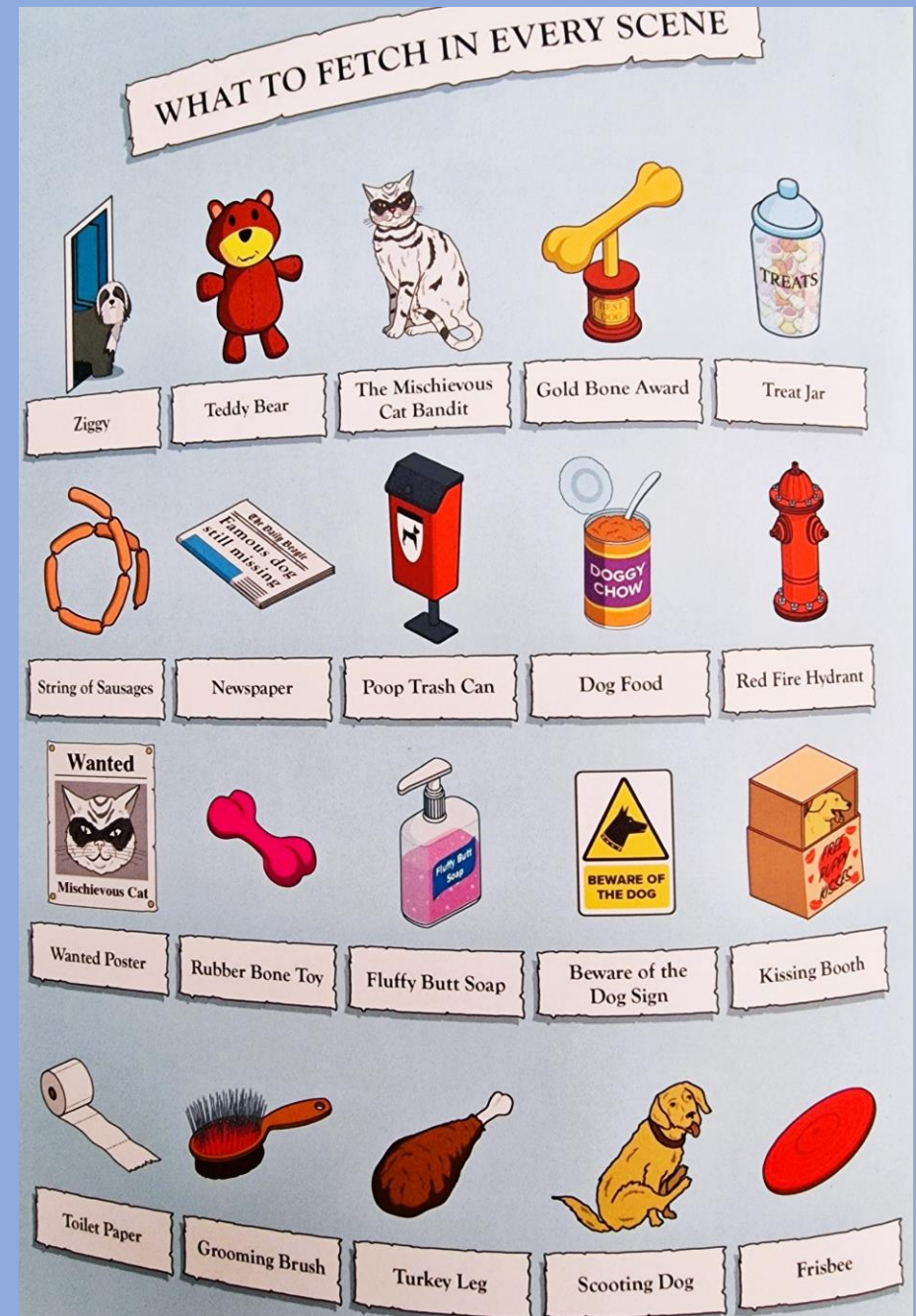
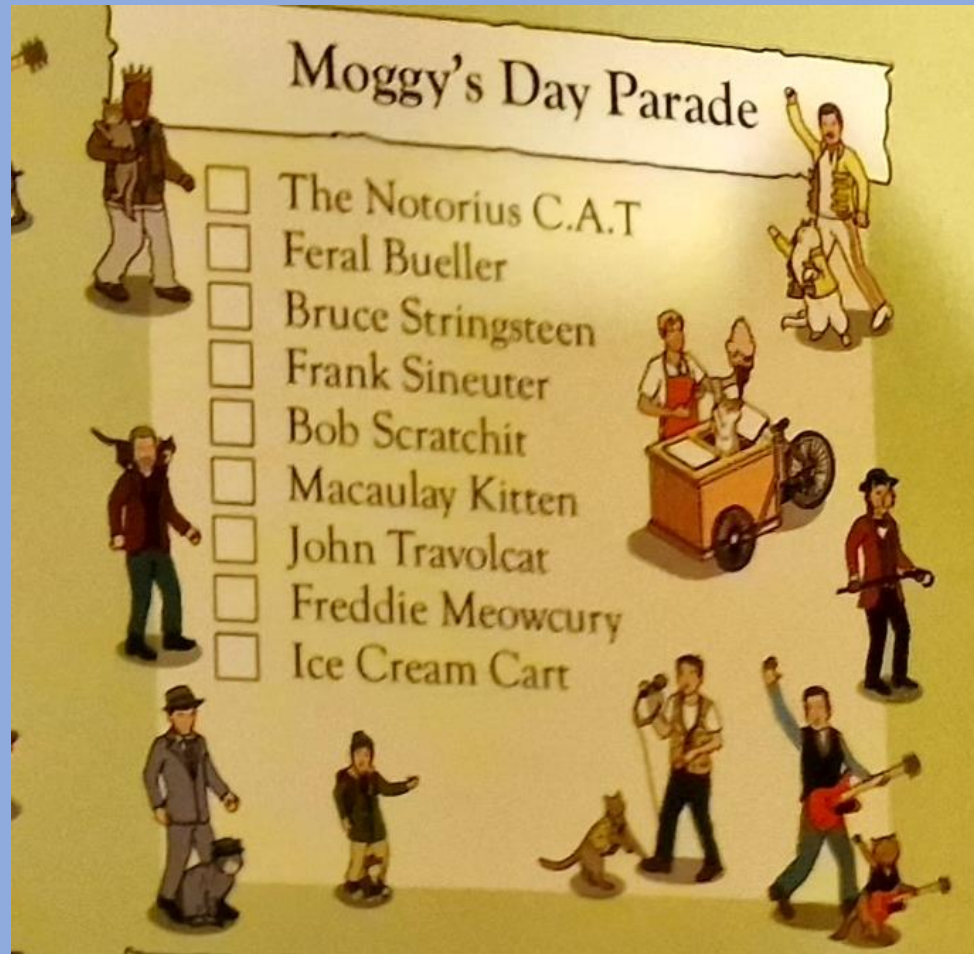


Moggy's Day Parade

It's time to get the pawty started!
The meowisic is pumping and the
crowds are out in full swing to
enjoy the Moggy's Day parade.



Extra things to spot!



Moggy's Day Parade

It's time to get the pawty started!
The meowsic is pumping and the
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00:00

Practice Exam:

- **Part A – 20 minutes. Non calculator.**
- **Part B – 1 hour. Calculator permitted.**

If you finish early, please get on with your private study:

EL3 – Pages 19-25 of your Textbook

L1 – Pages 19-40 of your Textbook

L2 – Pages 12-40 of your Textbook



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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.

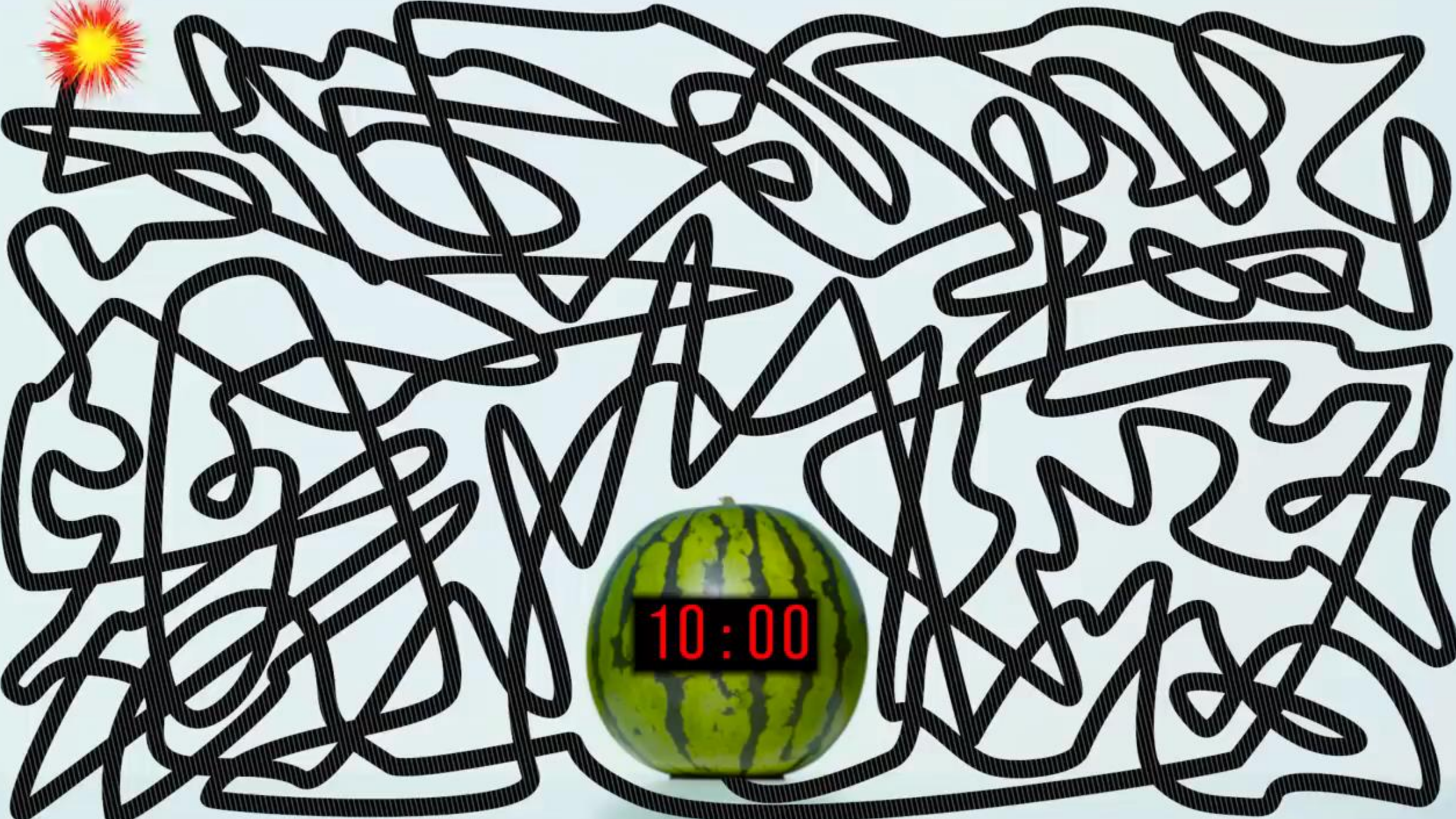
If you need help, ask one of the staff.



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. $Money = \sqrt{Evil}$

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