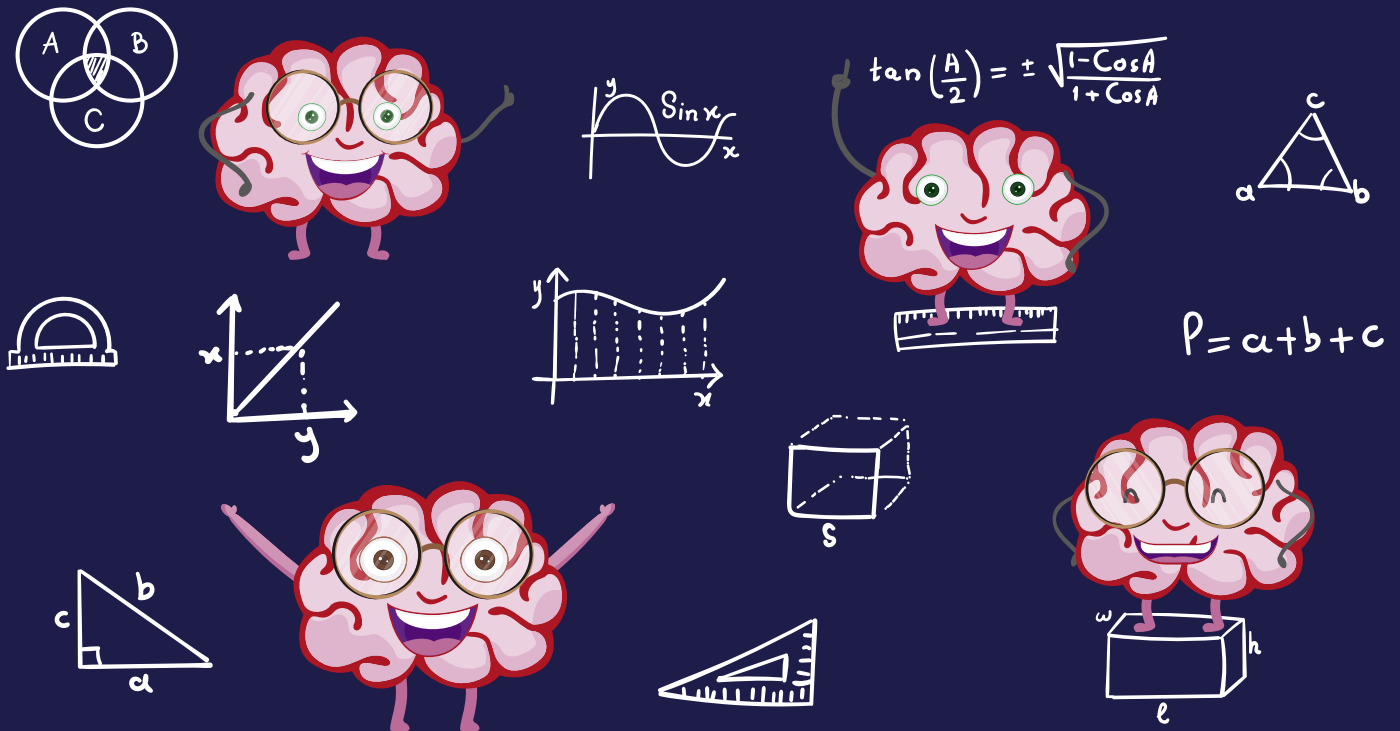# 2026 HFL EDUCATION
YEAR 5 MATHEMATICS CHALLENGE.

EVENT GUIDANCE AND PRACTICE QUESTIONS

Event Guidance

Format

- There will be a choice of four 1-hour heats for teams to join online from their school.
- The 20 highest scoring teams from across the heats will be invited to join us online again for the Grand Final.
- Schools can enter multiple teams on the same date or across different heat dates.
- Each team should be made up of four Year 5 pupils who will work together to solve questions and problems across three live rounds.

Live rounds

- There are three rounds in each live heat.
- Two rounds consist of four questions or problems to solve.
- One round consists of visual estimation questions and problems.
- There is a time limit for each question which will be explained by the presenter in each round.
- A 'final few seconds' prompt will be provided by the presenter so teams can agree their answer and get ready for the next question.

Pre-heat challenges

- There is one round for pupils to complete before the heat. This is the 'Perplexing Puzzles!' round.
- The materials and rules for this round will be made available prior to the heat.
- This round is not strictly timed. We anticipate that it will take around 15 minutes to complete.
- Team answers will be submitted on the Google Form along with answers from the live event.

Submitting answers

- A 'Team answer sheet' will be available to download prior to the live event. These can be printed and provided to the team to write on.
- Submission of answers will be explained during the live event.

Scores

- Following the completion of the live heats, team marks will be emailed to the school contact.
- A certificate for each member of the team will also be sent to the school contact.

Invitation to the final

Once all four heats have been completed, the 20 highest scoring teams will be notified by email and invited to take part in the final on **Tuesday 24th March from 1:30 – 3:10pm.**

Getting ready

- The team will need to have clear access to a screen and sound. A class whiteboard or screen is advisable for size but not essential.
- Pupils cannot be seen or heard by other schools or the presenters.
- The supervising adult can use the 'chat' facility to communicate with the presenters.
- We recommend that pupils have paper, pencils, pens, and erasers.
- Supervising adults are asked to ensure that pupils do not have calculators or rulers.

If you have entered multiple teams

- If you have entered more than one team, schools can choose whether the teams will take part from the same room (separated) or in different rooms.
- Decide who team A and Team B etc are and include this when submitting the answers.
- If teams are in the same room, please ensure the screen they can all see is large enough.

Correspondence

All correspondence, including queries, should be sent to **primarymathschallenge@hfleducation.org**

Challenge, teamwork, making sense of problems and sharing ideas

To support your team, we have compiled some practice questions and top tips for each round.

Challenge

The competition is designed to be fun and will challenge teams in many ways. Not least in the mathematical focuses, but also in working 'well' as a team and agreeing answers within the time limit set.

• •

Teamwork

Collaborative working in mathematics (and in life) is a crucial skill. The competition challenges how well teams can work together. Alongside practising strategies to solve mathematical questions and problems, it is also helpful to consider how to be a great team.

Tips for developing great teamwork:

Working together is crucial. Think about how you can best do this.

- Decide upon who the 'scribe' (answer recorder) is. This isn't the person who makes the final decision, but they will ensure that your team commits to an answer before time runs out.
- Use paper to record your jottings and ideas. These will be helpful when showing other team members your thoughts.
- You may decide to quickly divide up parts of a question to work out a smaller part each before coming back together to agree an overall answer.
- Think through how you can quickly reach an agreement, listen to each other, and consider each team member's response. Agreeing how you will calmly negotiate will really help in the midst of the competition.

• •

Making sense of problems and sharing ideas

When thinking about and articulating their thoughts around a problem or question, children might find the following sentence frames useful:

- I can see …
- I have noticed …
- I know that …
- If … then …
- I see what you mean. What I've noticed is that … What do you think?

Practice Questions

The following practice questions and answers will be available as a PowerPoint upon booking for use in school.

Round 1 and 4 – General mathematics

These two rounds each consist of questions that need to be solved within a given time limit. Teams must work quickly and efficiently. Each question will have a different mathematical focus and will require different types of problem-solving skills.

Each question is 'marked' out of 10. Marks can be awarded for partial answers.

Some questions ask pupils to complete a calculation. In these, pupils can solve separately and then compare their answers to agree the team's response.

Questions with 'parts'

Some questions contain 'parts' to solve. Team members could solve one 'part' each and then use these to agree an overall answer. A team member may have a strength in one aspect but teams will need to decide quickly if they are going to distribute roles as the clock will be ticking.

Some example 'parts' style questions:

Solutions can be found on page 11.

Put these in order, starting with the smallest answer.

(answer in the form of D, B, A, C)

A) $87 \div 3$

B) $\frac{3}{10}$ of 90

C) 2.8×9

D) 26% of 120

These are the volumes of paint left in 3 containers. How much paint is there in total?

1.2 litres

$2\frac{4}{5}$ litres

375 ml

Order these calculations from smallest to largest answer.

(answer in the form of D, B, A, C)

A) $49.2 \div 6 =$

B) $15.3 - 2.75 - 4.25 =$

C) $3 \times 0.45 \times 6 =$

D) $4.62 + 2.9 + 0.83 =$

Which 'chain' ends in the lowest value?

	Start					End
A)	Start 50	÷ 5	− 3	Treble it	$\frac{1}{2}$ of it	➡	End ?
B)	Start 1.25	× 4	+ 183	$\frac{1}{4}$ of it	÷ 5	➡	End ?
C)	Start 31.8	+ 5.2	÷ 4	− 0.75	× 1.1	➡	End ?

Problem-style questions

Some questions require pupils to problem solve in context. Teams will have to work quickly to establish what the problem is asking them to do and identify the relevant information that they need to work on.
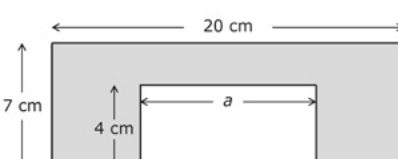
Teams can work separately or in pairs to work on the problem and then confer to agree the solution.

Being able to make quick sketches and representations to aid thinking will support this, as will pausing to consider what is 'known' and what is 'unknown' in a problem.

Some examples of 'problem-style' questions:

Solutions can be found on page 12.

The area of this shape is 90 cm².

20 cm

7 cm

4 cm

a

(not drawn to scale)

Work out the length marked a.

6 © HFL EDUCATION

The hidden digits are all the same.
What are they?

1 ⬤ 5 ⬤ ÷ 1 1 = 1 2 ⬤

7 © HFL EDUCATION

What time did **train D arrive** in London?

Station	Train A	Train B	Train C	Train D
Manchester	09:37	10:17	11:35	12:41
Birmingham	10:51	🚩	12:49	🚩
Milton Keynes	🚩	12:19	🚩	14:43
London	12:26	🚩	14:24	🚩

8 © HFL EDUCATION

What is the value of ⬠ ?

◆	◆	⬤	13.25
⬤	◆	⬠	12.75
⬤	◆	⬤	13
13	13.5	12.5	

9 © HFL EDUCATION

Round 2 – Visual estimation

This round consists of a series of questions and problems that focus on pupils' visual estimation skills.

Each answer in the estimation round is worth up to 10 points. Teams do not need to have the 'exact' answer. Instead, they use their estimation skills to agree answers that are approximately accurate.

Marks are awarded in 'zones of closeness'. So, for example, if the exact answer was 100, pupils would be awarded the full 10 marks for an answer between 95 – 105. Points then decrease incrementally as the distance from the 'exact' answer increases.

As this challenges estimation, we suggest pupils practise by thinking about what good estimates might be. Teams might also think about how they can work together to look at the visual stimulus, think separately or in pairs and then reach an agreed team response.

The most important tip is to look carefully at the image and the clues and prompts already provided.

The following questions provide opportunities for practice of estimation and of team-working:

Solutions can be found on page 13.

Estimate the total monetary value.
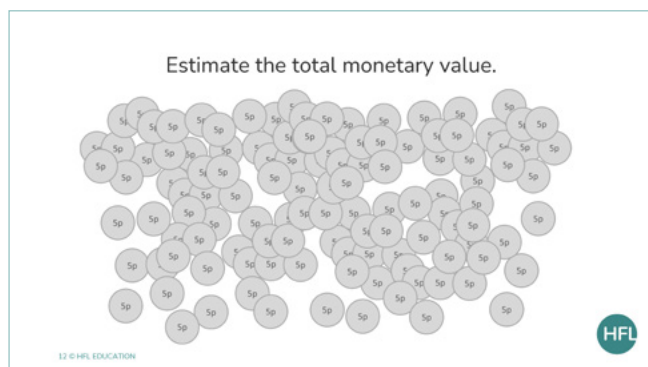
Tips:
- Remember this is a visual estimation question and not an exact counting one.
- Would splitting the image into sections for each team member to scan and approximate help?
- Would taking an estimate from a quarter and then scaling up help?

How many triangles would be needed to cover the rectangle?
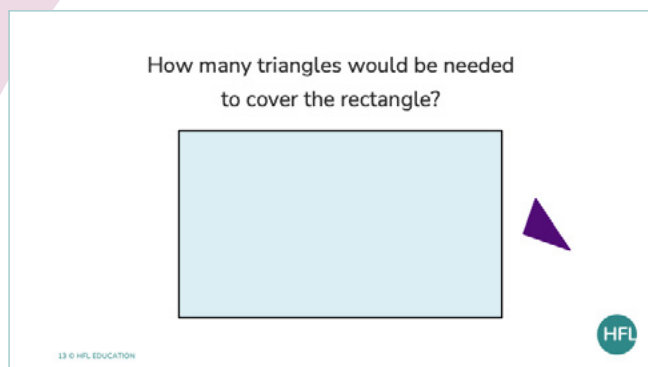
Tips:
- Estimate how many triangles would be needed to cover part of the rectangle. You could consider one corner.
- Think about how you might scale up your estimate of one part for the whole shape.

Round 3 – Perplexing Puzzles

Teams will be provided with three perplexing puzzles to complete before the live heat. Team answers to this round will be submitted along with the responses during the live event. We no longer require you to submit any solutions or workings in advance. Points will be awarded for correct answers and part answers so please do encourage children to submit an answer even if they do not quite complete the puzzle.

There will be a maximum of 45 points available for this round. Puzzle A is worth a maximum of 10 points, puzzle B is worth a maximum of 15 points and puzzle C is worth a maximum of 20 points.

Rules:
- There is a time limit of 30 minutes for this round.
- Teams should be provided with all three puzzles at the same time.
- Teams can choose to solve the puzzles in any order.
- Teams can decide how long they spend tackling each puzzle but must agree their final answers within the 30 minute time limit.

An example set of 'Perplexing Puzzles' questions:

Perplexing Puzzle A (practice)

10 points

Niko is thinking of a whole number.

He multiples it by 7.

Then he subtracts 64.

$\frac{1}{5}$ of this number is 11.

What number did Niko first think of?

16 © HFL EDUCATION

HFL

Each column and row of shapes has a value of 14.4.
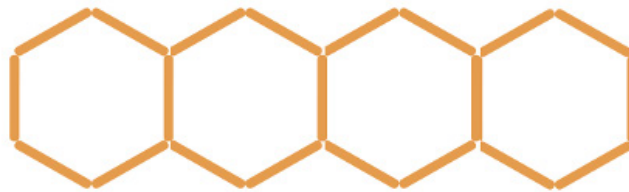
What is the value of each shape?
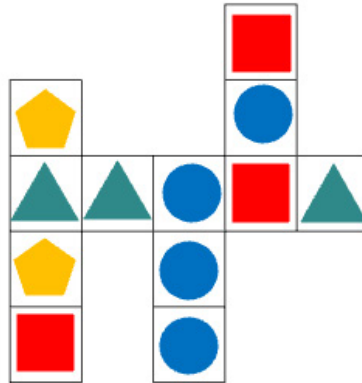
17 © HFL EDUCATION

Sami is building a pattern with lollipop sticks.

Each lollipop stick is 7cm long.

If Sami builds a pattern with 50 hexagons, what will the perimeter of the shape be?

Give your answer in cm.

18 © HFL EDUCATION

Tips:

- Have a quick look at the three puzzles and decide in which order you will tackle them.
- Consider the complexity of each puzzle and think about how much time you will spend on each.
- Will you all work on the same puzzle or will you split up and then come back together to discuss your final answers?

Solutions

Put these in order, starting with the smallest answer.
(answer in the form of D, B, A, C)

A) $87 \div 3$
B) $\frac{3}{10}$ of 90
C) 2.8×9
D) 26% of 120

A) 29

B) 27

C) 25.2

D) 31.2

C, B, A, D

These are the volumes of paint left in 3 containers.
How much paint is there in total?

1.2 litres $2\frac{4}{5}$ litres   375 ml

1200 ml

2800 ml

375 ml

Total volume: 4375ml or 4.375ml

Order these calculations from smallest to largest answer.
(answer in the form of D, B, A, C)

A) $49.2 \div 6 =$
B) $15.3 - 2.75 - 4.25 =$
C) $3 \times 0.45 \times 6 =$
D) $4.62 + 2.9 + 0.83 =$

$49.2 \div 6 = 8.2$

$15.3 - 2.75 - 4.25 = 8.3$

$3 \times 0.45 \times 6 = 8.1$

$4.62 + 2.9 + 0.83 = 8.35$

C, A, B, D

Which 'chain' ends in the lowest value?

A) Start 50 | $\div 5$ | $- 3$ | Treble it | $\frac{1}{2}$ of it | End ?
B) Start 1.25 | $\times 4$ | $+ 183$ | $\frac{1}{4}$ of it | $\div 5$ | End ?
C) Start 31.8 | $+ 5.2$ | $\div 4$ | $- 0.75$ | $\times 1.1$ | End ?

$50 \div 5, - 3$, treble it, half of it $= 10.5$
10,   7,   21,   10.5

B. Start at 1.25, $\times 4$, $+ 183$,   ¼ of it, $\div 5 = 9.4$
5,   188,   47,   9.4

C. Start 31.8, $+ 5.2$, $\div 4$, $- 0.75$, $\times 1.1 = 9.35$
37,   9.25   8.5

Answer is C is lowest

Solutions (continued)

The area of this shape is 90 cm².

20 cm

7 cm

4 cm   a

(not drawn to scale)

Work out the length marked a.

12.5 cm

The hidden digits are all the same.
What are they?

$1 \bullet 5 \bullet \div 1 1 = 1 2 \bullet$

$1\ 3\ 5\ 3 \div 1\ 1 = 1\ 2\ 3$

Missing digits are 3

What time did **train D arrive** in London?

Station	Train A	Train B	Train C	Train D
Manchester	09:37	10:17	11:35	12:41
Birmingham	10:51		12:49	
Milton Keynes		12:19		14:43
London	12:26		14:24	

Train D arrives at 15:30

What is the value of 🔷 ?

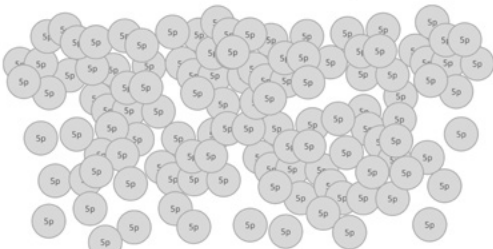|			
◆	◆	●	13.25
●	◆	⬠	12.75
●	◆	●	13
13	13.5	12.5	

Square = 4.5

Circle = 4.25

Pentagon = 4

Solutions (continued)

Estimate the total monetary value.
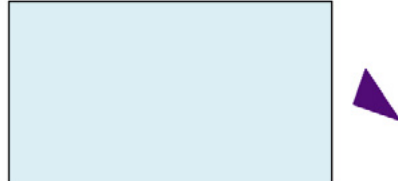
10 points   £6.00 - £6.30

How many triangles would be needed to cover the rectangle?

10 points for 63 - 67 triangles

Perplexing Puzzle A (practice)
10 points

Niko is thinking of a whole number.

He multiples it by 7.
Then he subtracts 64.
$\frac{1}{5}$ of this number is 11.

What number did Niko first think of?

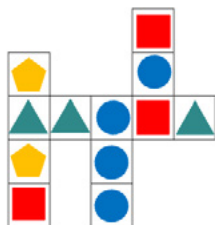**10 points   17**

Perplexing Puzzle B (practice)
15 points

Each column and row of shapes has a value of 14.4.
What is the value of each shape?

15 Points Circle = 4.8
Square = 4.8
Triangle = 1.6
Hexagon = 4

Perplexing Puzzle C (practice)
20 points

Sami is building a pattern with lollipop sticks.
Each lollipop stick is 7cm long.
If Sami builds a pattern with 50 hexagons, what will the perimeter of the shape be?
Give your answer in cm.

20 points   1414cm