

Monday 7th March 2022

Which One Doesn't Belong?

The aim of the *Which One Doesn't Belong?* challenges is to promote children's interest and enthusiasm for English. Focusing on these tasks should allow children to develop their ability to articulate and justify answers, arguments and opinions.

Using language to speculate has also been shown to broaden children's logical thinking and reasoning skills. Allowing them to make connections and comparisons to their own experiences, their understanding of texts, as well as drawing on their knowledge of the wider world, will undoubtedly support the development of comprehension and their engagement with English.



Cambridgeshire
County Council



Cambs
English
Team

Monday - Which One Doesn't Belong?

under

Which One Doesn't Belong?

over

below

beneath

Which One Doesn't Belong?

This week's WODB challenge contains words which we might use to describe position or movement. Which is most different from the others?

Tuesday 8th March 2022

Maths Eyes

Tuesday - Maths Eyes



Maths Eyes



Maths Eyes activities are designed to help make connections and 'see' where maths is in the world around us.



Images and real-life experiences seen through 'Maths Eyes' promote engagement, enthusiasm and creativity, as well as building confidence, in maths.



Using mathematical language to describe what can be seen, and speculate about what cannot, broadens reasoning skills and logical thinking.



Cross curricular links can be made and progression in learning can be evident by comparing the responses of learners at different ages and stages.



Prompts and suggestions can be provided or adapted, if required, depending on the intended topic focus or experience that the learner has.



Sharing ideas and collaborative discussions can generate an even greater range of responses after individual reflections.

Tuesday - Maths Eyes



Maths Eyes

Who do you know that enjoys a cup of tea? How many cups of tea are there in this array? What's the same and what's different about them? How many ways could you describe the positions of the different cups of tea? Can you use the language of ratio and proportion to compare different cups of tea? Is there any symmetry in this image? If so, where? If you were to continue this pattern, what would you put and where?



Wednesday 9th March 2022

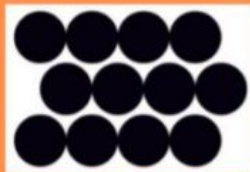
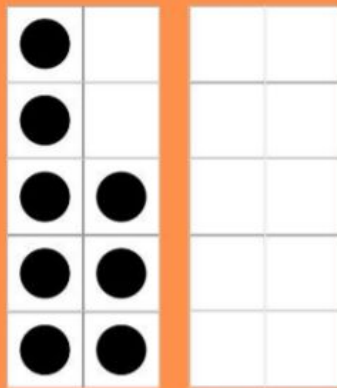
Maths Challenge!
(pick your level)

Weekly Maths Challenges Years 1 & 2



Fill It

Weekly Maths Challenge



You're playing a game with two ten frames, 20 counters and a dice.

Each time you throw the dice, you put that number of counters on the frames.

The aim is to fill them both.

This is a snapshot taken in the middle of your game. You then throw the dice **three** more times and fill both frames.

What numbers could you have got on those three throws?

Are there any other possible answers?

How will you make sure you find them all?



Prompts

Challenge Prompts

If children are unfamiliar with tens frames or playing games like the one in this challenge, it might be helpful to model playing the game as a demonstration before moving onto the problem. Some pupils might benefit from working within 10 rather than 20 and finding pairs of possibilities rather than trios. Some pupils may need support in being systematic.



Solution Prompts

How did your pupils get on with this challenge? Were they able to find more than one solution? How did they record and explain their results? Here are some extension questions you could use:

- Tyrone has 13 spaces on his tens frames. He says he can fill them in two dice throws. Is he correct? How do you know?
- You have 17 counters on your tens frames. When you throw the dice again, which numbers do you not want to throw because they'll take you over 20?
- Can you make up a similar problem based on this game?

Have you tried playing games like this with your pupils? They are a great way to encourage pattern recognition and knowledge of number bonds. They can also lead to rich mathematical discussions.

Solution

Weekly Maths Challenge

Solution

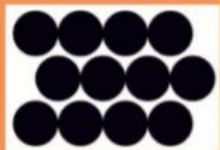
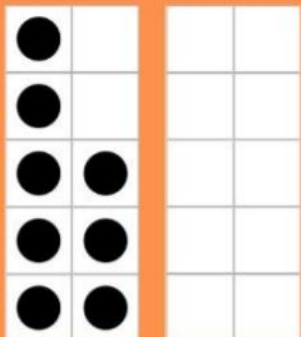
I've recorded the numbers which could have been thrown using a table. Because there are 12 spaces on the tens frames, I had to find different ways of making 12 with three numbers from the dice.

There are 25 possible combinations of throws altogether.

How many did you find?

How did you record your ideas?

Throw 1	Throw 2	Throw 3
6	5	1
6	4	2
6	3	3
6	2	4
6	1	5
5	6	1
5	5	2
5	4	3
5	3	4
5	2	5
5	1	6
4	6	2
4	5	3
4	4	4
4	3	5
4	2	6
3	6	3
3	5	4
3	4	5
3	3	6
2	6	4
2	5	5
2	4	6
1	6	5
1	5	6





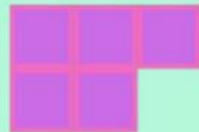
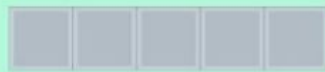
Weekly Maths Challenges Years 3 & 4



Pentominoes

Weekly Maths Challenge

Pentominoes



These are pentominoes. A pentomino is a polygon made with 5 equal-sized squares, connected edge-to-edge. **Try making these three.**

1. Without reflections or rotations it is possible to create 12 unique pentominoes. **Can you create the other 9?**
2. When you have all twelve, try connecting them together without overlapping to make a large rectangle with an area of 60 tiles.



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Prompts

Challenge Prompts

- What is a pentomino? How do you make one?
- Which resources could you use to help you? How will you record your results?
- Can you move one of the tiles in the L-shaped pentomino to create a new pentomino?
- The first challenge is to make three given pentominoes. What will you use to help you?
- The second challenge is to make 9 more so that you have all 12. What strategy or system can you use to find the other 9?
- The third challenge is to use the 12 pentomino shapes to make a large rectangle with an area of 60 tiles. What could you use to help you? Do you think there will be only one solution?

Further Challenge: If you enjoy this challenge, you might also like Tri-Five on the NRICH website:

<https://nrich.maths.org/1022/index>

Solution Prompts

In the first image you can see the 12 possible unique pentominoes. Yours might look slightly different if they are reflections or rotations of these shapes.

Here are some possible discussion points relating to this first challenge:

- How did you find your solutions? Did you have a strategy or did you use a particularly helpful resource?
- What is similar and what is different about the two green pentominoes in this solution? Can you find any other pairs of pentominoes in this solution that have lots in common?

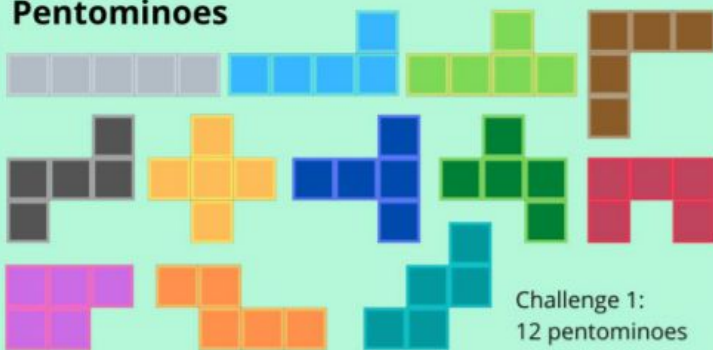
In the second image you can see one solution to the rectangle challenge. This is just one solution and it is possible to create other rectangles with different length sides. Here are some possible discussion prompts:

- In this solution the pink shape is a reflection of the original shape created for challenge 1. Are any of the other shapes reflections, or are they all rotations?
- This rectangle has an area of 60 tiles, what is its perimeter? Would other solutions all have the same perimeter?

Solution

Weekly Maths Challenge

Pentominoes



Weekly Maths Challenge

Pentominoes

Challenge 2: This is one way that you can join 12 pentominoes together to make a rectangle with an area of 60 tiles. Did you find any other ways?





Weekly Maths Challenges Years 5 & 6



How Many Cubes?

Weekly Maths Challenge



This solid cube is made from smaller blue and white cubes.
Each small cube measures $10\text{cm} \times 10\text{cm} \times 10\text{cm}$.

How many smaller cubes are there of each colour?
How do you know?

A different cuboid is made using all of the cubes, in any position.
What could the dimensions be?

What is the largest and smallest possible surface area that you can make using all of the cubes?



Prompts

Challenge Prompts

Whilst visualisation is an important skill, you might find it helpful to use practical resources to support manipulation too, such as multi-link cubes or building blocks. Another consideration will be how responses and ideas are recorded - photographs, abbreviations, calculations, sketches or three dimensional drawings are all possibilities.

Variations to consider when supporting or extending this challenge could be varying the size of the initial cube using less or more smaller cubes, excluding or changing the colour pattern, changing the dimensions of the smaller cubes or converting between different units of measurement.

You might also widen the challenge by not using all of the original cubes to make new cuboids (finding all) or exploring volume instead of surface area.



Solution Prompts

How did you get on exploring with cubes?

Here are some of the ways you could have recorded responses to the challenge set last week.

- Did anyone record their ideas differently?
- Were any patterns spotted with varying the size of the initial cube, or the smaller cubes within in?
- What else could you investigate? There are so many interesting and exciting variations to this challenge

Solution

Weekly Maths Challenge



There are 14 blue cubes and 13 white cubes.



*Top
Layer*



*Middle
Layer*



*Bottom
Layer*

The pattern is such that no two cubes of the same colour are next to/above/below each other.

The cube above has dimensions 30cm x 30 cm x 30 cm

The surface area is $6(30\text{cm} \times 30\text{cm}) = 5,400\text{cm}^2$ (smallest surface area)

Another cuboid has dimensions 10cm x 10cm x 270cm

The surface area is $2(10\text{cm} \times 10\text{cm}) + 4(10\text{cm} \times 270\text{cm}) = 11,000\text{cm}^2$ (largest surface area)

Another cuboid has dimensions 10cm x 30cm x 90cm

The surface area is $2(10\text{cm} \times 30\text{cm}) + 2(10\text{cm} \times 90\text{cm}) + 2(30\text{cm} \times 90\text{cm}) = 7,800\text{cm}^2$



Thursday 10th March 2022

Estimation and Benchmarking

Thursday - Estimation and benchmarking



Estimation and Benchmarking



Estimating is roughly calculating or judging a value or number – it doesn't need to be exact, but it should be reasonable or 'sensible' in the real world.



A benchmark is a known standard or reference point against which something else can be measured or compared. We can use a benchmark that we do know to estimate a measurement or quantity that we don't.



Using mathematical language to describe the benchmark in relation to the estimate broadens reasoning skills and logical thinking.



Cross curricular links can be made and progression in learning can be evident by comparing the responses of learners at different ages and stages.



Prompts and suggestions can be provided or adapted, if required, depending on the intended topic focus or experience that the learner has.



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Thursday - reasoning prompts

Encouraging mathematical thinking and reasoning:

Describing

What do you notice?

How many can you see?

How do these pine cones compare with yesterday's beads?

Reasoning

How many do you think there are? Why do you think that?

Will it be more or less than 20? A lot more/less? Or a little more/less?

Will it be between 15 and 20? A little or a lot more than this? Or less than this?

How many can you see? How many do you think are hidden?

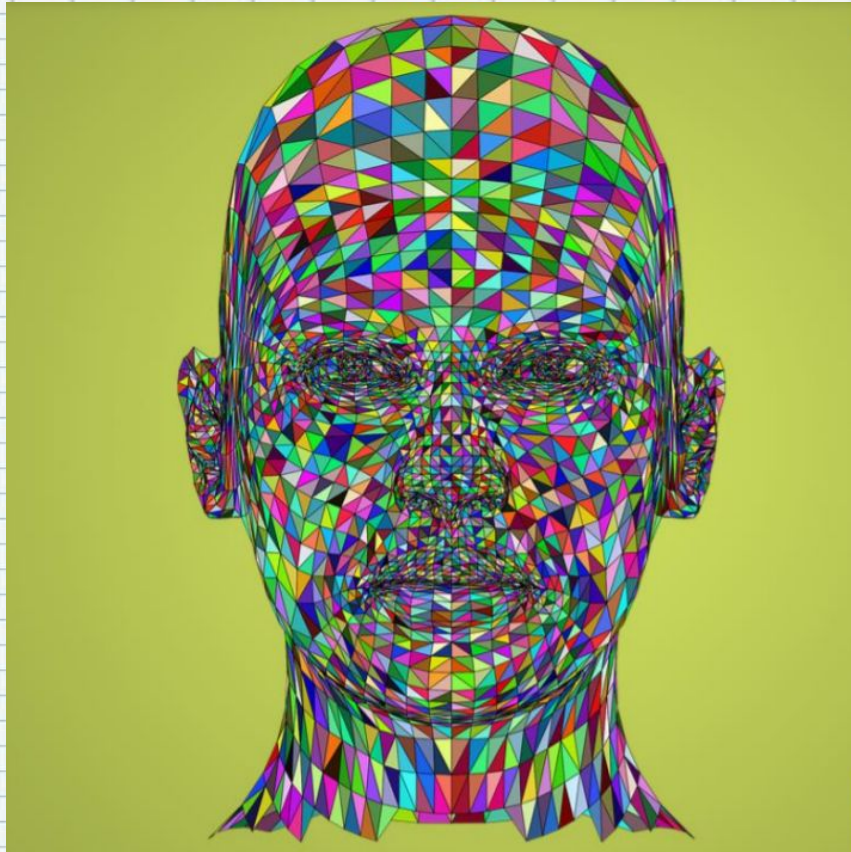
Was your guess more or less than the actual count?

Was your guess very close/way out? Why do you think that was?

Can you put the estimates in order on the board/washing line?

Were most people close or far out?

Thursday - Estimation and benchmarking



Looking What shapes can you see? Estimate how many of these shapes there are - in the whole image or in certain parts, for example, an ear or the nose. Estimate the most and least common colours used. What fraction of the whole surface do you think is a shade of green? Why do you think this? How many times as many shapes do you think you would need to cover a representation of a whole human body? How else can you use your estimation and benchmarking skills?

Friday 11th March 2022

Times Tables focus

- Which times tables award are you working towards?

Practise your skills on TTRockstars:

<https://trockstars.com/>
















Some more games here:

<http://www.maths-games.org/times-tables-game.s.html>

Times table support here:

<https://home.oxfordowl.co.uk/maths/primary-multiplication-division/help-with-times-tables/>

Sutton School's Gem Certificates of Times Table Excellence

1		Sky Blue Topaz	doubling with equipment
2		Swiss Blue Topaz	doubling and halving with equipment
3		Pink Imperial Topaz	doubling without equipment
4		Reddish-pink Imperial Topaz	halving and 10 x
5		Mystic Topaz	doubling, halving and 10 x
6		Azotic Topaz	divide by 10
7		Onyx	2 x, 5 x, 10 x multiplication facts
8		Black Opal	2 x, 5 x, 10 x multiplication and division facts
9		Garnet	2 x, 3 x, 4 x, 5 x, 10 x multiplication
10		Emerald	2 x, 3 x, 4 x, 5 x, 10 x multiplication and division facts
11		Tanzanite	2 x, 5 x, 10 x, 3 x, 4 x, 6 x, multiplication and division facts.
12		Ruby	2 x, 5 x, 10 x, 3 x, 4 x, 6 x, 7 x, 8 x 9x multiplication and division facts.
13		Sapphire	all multiplication and division facts to 12 x 12
14		Diamond	<ol style="list-style-type: none"> 1. all multiplication and division facts to 12 x 12 and complete the grid in under five minutes (100 questions) 2. all multiplication and division facts to 12 x 12 and complete the grid in under five minutes (144 questions) 3. Ultimate Times Tables Missing Numbers Challenge
15		Blue Diamond	elite level in all areas of multiplication and division Levels 1, 2 and 3 available

STRIVE