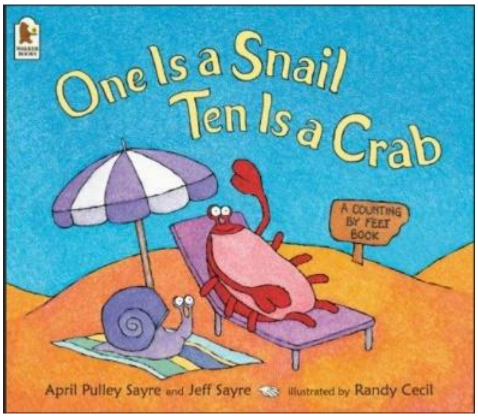
Years 3 -6

Open ended investigations/problems

**One is a snail**

Read one is a Snail 10 is a crab or watch via the link below.




https://www.youtube.com/watch?v=VyDTpj8uxs8

Discuss the different numbers represented by the characters in the story. How might we be able to see 15 feet on the same page? Is there a way that we could find all combinations? What about 18? Encourage children into a systematic approach like the one below.

| | | | | | | | Now write the calculation |
|---|---|---|---|---|---|---|---|
| How many legs? | 1 | 2 | 4 | 6 | 8 | 10 | |
| How many ways can you make 5? | ✓ | | ✓ | | | | 1 + 4 |
| | ✓ | ✓✓ | | | | | 1 + 2 + 2 |
| | ✓✓✓ | ✓ | | | | | 1 + 1 + 1 + 2 |
| | ✓✓✓✓ ✓ | | | | | | 1 + 1 + 1 + 1 + 1 |
| How many ways can you make 10? | | | | | | ✓ | 10 |
| | | ✓ | | | ✓ | | 2 + 8 |
| | ✓✓ | | | | ✓ | | 1 + 1 + 8 |
| | | | ✓ | ✓ | | | 4 + 6 |
| | | ✓✓ | | ✓ | | | 2 + 2 + 6 |
| | ✓✓ | ✓ | | ✓ | | | 1 + 1 + 2 + 6 |
| | ✓✓✓✓ | ✓✓✓ | | | | | 1 + 1 + 1 + 1 + 2 + 2 + 2 |
| Can you think of any more ways to make 10? | | | | | | | |

Children work systematically to establish what animals could be represented by a given number (Y3/y4 36 legs y5/y6 100 legs)

Children who need pictorial representations could draw the animals or have cut outs to move around.


Year 6 children could be encouraged to come up with algebraic statements, e.g. if dog is represented by d which = 4, crab is represented by c which = 10 how would you represent the other numbers from 1 – 10? You may want to change 8 to an octopus so that you don't have 2 lots of s. How many other ways could you represent the numbers between 1 and 10? E.g. 10 could be 2d + p.

How could you show 3 crabs? 3c. Give children other numbers to investigate.

Children could then create their own book using a different setting (e.g. Jungle – 1 is a snake, 2 is a parrot, 3 is a snake and a parrot…)

**Create your own business**

Ask your children to create a product that they would like to sell. Get them to design their product, think about what it will look like, how it will be packaged and how they will advertise it.

You can ask the Year 5 and 6 children to work in groups to investigate the real costs of this and then write a letter to you to apply for the amount of money that they will need to start their business. You may want to give the Year 3 and 4 children the example below to ensure that the numbers that they are working with are manageable.

Give the children a start-up budget of £200 to pay for the manufacturing and packaging of their product and creating marketing materials. How much could they realistically sell their product for? How many units would they need to sell in order to be in profit? Is there company a viable company or will they need to change some of their original design to fit their budget?

**Product Costs**

Manufacturing a football – £1 and 20p

Manufacturing a t-shirt – 80p

Manufacturing a chocolate bar – 12p

Manufacturing a smoothie – 55p

(add items of interest to this list accordingly)

**Packaging Costs**

Plastic packaging – 13p

Colour plastic packaging – 15p

Cardboard packaging – 26p

Colour cardboard packaging – 37p

(add items to this list accordingly)

**Marketing Costs**

Poster – 30p

Colour poster – 40p

TV advert - £100

Radio advert - £50

(add other marketing to this list accordingly)

Children can reflect on their business plans. Can they afford a TV advert straight away or would they need to sell some of their products first?

**Building bridges**

Give your children £20 (play money of course!) Tell them that they can buy materials to create the most efficient bridge/tallest tower that they can. Give them time to plan and a price list.

**Price list**

Sellotape – 50p for 30cm

Cardboard - £1 a sheet

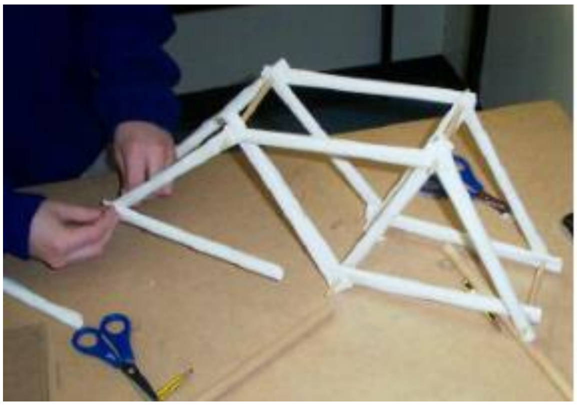
Art Straws – 30p each

(add to the list with resources available)

Ask the children to consider how many compare bears their bridge would be able to hold or how tall they think that they can make their tower.

Children earn money back for the amount of compare bears that can stand on the bridge (£1 per bear) or how many cm tall the independently standing tower is (£1 per 10cm).

Are any of the teams in profit?



What is the most efficient shape that they can use to give them structure? Was spending lots of money on materials cost effective? Did they earn back more than they spent?

Years 3 -6

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**Top Trumps**
Create a set of top trump cards for their favourite sports. Encourage children to research mathematical facts. But include one element of calculation in each card template suitable to different age groups of children.

**Examples**
**Football top trumps**

https://www.transfermarkt.co.uk/harry-kane/profil/spieler/132098

Player – Harry Kane


Value- £135,000,000

Home stadium capacity (rounded to the nearest 1000)- 62,000

Goals scored in premier league career- 136

Games played in premier league career – 201

Number of goals per game (rounded to 1 d.p) 0.6

**Swimming top trumps**

https://www.sports-reference.com/olympics/athletes/ad/becky-adlington-1.html

Swimmer – Rebecca Adlington

Number of medals – 4

Distance usually swam- 400m

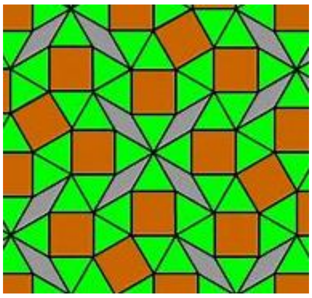
Personal record swim – 4:02.24

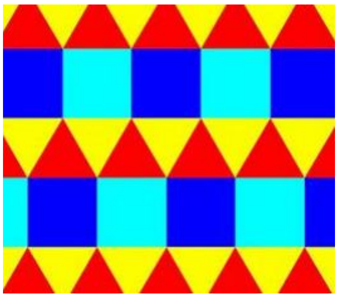
Number of seconds it takes to swim a metre- 0.6 seconds

How close to the world record are they?- 5.74 seconds

**Tessellating Shapes**

Escher tessellating patterns tiles activity. Begin with tessellating shapes, what patterns can children make with 2D shapes where they can repeat a shape, rotate a shape, reflect a shape or translate a shape but leave no gaps.





Introduce the artist Escher. Explore some of his work with tessellating designs. Can the children describe what has happened to one tile to make the pattern (translation, rotation, reflection, etc)

Show the children how to make Escher tiles. Begin with a rectangle or a square. Cut a shape out of one side then move that piece across to the directly opposite side and stick it down. Repeat this as many times as necessary but always attach the cut-out piece to the directly opposite side.