Y8 Learning at home activity sheet #2

Problem 1:

You have a pair of red socks, a pair of green socks and a pair of blue socks in your drawer. If you take two socks out at random, what is the chance that they are a pair? How many socks would you need to take out to be sure of getting a pair?

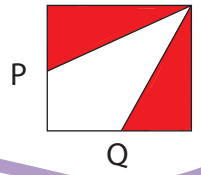
Problem 2:

A number less than 100 has 5 factors. 4 of these factors are divisible by 3. The factors add up to 121. What is the number?

Problem 3:

Flip made a flag for her boat. She took a red square. She then put a white triangular piece of material over the red square. Her working sketch is shown here.

If P and Q are the midpoints of the original square, what fraction of the square is white?



Project:

Draw a map of your local area. Make it as accurate as you can. You may choose to just show a small area around your house, or you may show a larger area in less detail. Which of these will you include?

- A scale
- A key
- Something to show which direction is north
- Street names
- Individual houses

Quick questions:

1. What number multiplied by itself gives 121?
2. What fraction is halfway between $\frac{3}{4}$ and $\frac{5}{6}$?
3. What is the area of a rectangle 3.1cm by 4cm?
4. What is 50% of 50?
5. Which is more, 1.25 or $\frac{8}{6}$?
6. How many faces does a tetrahedron (triangle-based pyramid) have?
7. If you roll a dice, what is the probability that the result is an even number greater than 3?
8. Is 98 divisible by 3?
9. What is $21 \div 6$?
10. How many square numbers are there between 0 and 20?

Number facts:

Complete the number facts on the attached sheet.
You can complete one box each day. On the fifth day, make up some examples of your own.

Population challenge:

The population of New Zealand was 1 million in 1908, 2 million in 1952, 3 million in 1973, 4 million in 2003, and 5 million in 2019.

Work out the increase in population per year between each of those dates.

When do you think the population will reach 6 million?

Learning at home: Notes for whānau

When your child finishes each activity, ask them to add a mouth to the face to show how they felt about that activity.

Problem 1:

After selecting the first sock, there are five remaining socks in the drawer and only one of these completes the pair. So the chance of taking out a second sock at random and making a pair is 1/5.

Your first three selections could be one of each colour (no pair) but your next pick must be the pair of one of the first three, so taking 4 socks would guarantee a pair.

Problem 2:

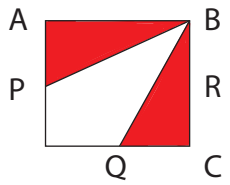
This problem could be solved by trial and error, but it would take a long time, so it is best to narrow down the possibilities. The number has five factors. Every number has 1 and itself as factors. 1 is not a multiple of 3 so all the other factors of the number must be multiples of 3.

Factors of numbers come in pairs, that multiply together. There are two clues here:

1. If two factors that multiply to give the number are both multiples of 3, then the number must be a multiple of 9.
2. There are an odd number of factors. The only reason for an odd number of factors is if the number is a square number (because then the factor multiplies by itself instead of with a pair).

There are only two square numbers that are multiples of 9, so the answer is either 36 or 81.
36 has more than 5 factors (1, 2, 3, 4, 6, 12, 18, and 36) , so the answer must be 81.
The factors of 81 are 1, 3, 9, 27, and 81. These add to 121 as required.

Problem 3:



If you look at the top half of the flag it is a rectangle with corners ABRP. PB is a diagonal of this rectangle. That means that the red triangle at the top (ABP) is half of that half of the whole flag, so it is a quarter of the whole flag.

If you look at the right hand side of the flag, you can see that the triangle (BCQ) on the right is also a quarter of the whole flag.

If the two red triangles each cover quarter of the flag, they cover a total of half the flag, meaning that the other half of the flag is white.

Project:

Your child may prefer to attempt this task from memory, or they may like to go for a walk so they can sketch a draft and make notes to help them.

They may choose to draw a map of a relatively small area, such as just your block, or they may prefer to include a larger area so that they can include interesting features such as shops, the school, friends' houses etc. Encourage them to include any interesting objects, such as large trees.

If you don't know which way is north from your house, it should be halfway between where the sun rises and where it sets.

Population challenge:

This is an activity that is best completed with the help of a calculator. A key idea when using a calculator is to look at the answer and ask yourself "is that answer seem reasonable?". It is important that they realise that when the number of years taken to increase by a million is smaller, the increase per year is larger.

Between 1908 and 1952 is 44 years. 1 million ÷ 44 = 22,727 people per year

Between 1952 and 1973 is 21 years. 1 million ÷ 21 = 47,619 people per year

Between 1973 and 2003 is 30 years. 1 million ÷ 44 = 33,333 people per year

Between 2003 and 2019 is 16 years. 1 million ÷ 44 = 62,500 people per year

It is hard to predict from these numbers when New Zealand's population will reach 6 million. Statistics NZ predicts that it will happen in around 2050.

Quick questions:

1. 11
2. $\frac{19}{24}$
3. 12.4cm²
4. 25
5. $\frac{8}{6}$
6. 4
7. $\frac{2}{6}$ or $\frac{1}{3}$.
8. No
9. 3.5 or $3\frac{1}{2}$
10. Four (1, 4, 9, and 16)

Number facts to check:

40 x 9 = ☐ 240 ÷ 4 = ☐ ☐ x 0.7 = 5.6 2100 ÷ ☐ = 700 80 x 70 = ☐ ☐ ÷ 7 = 70 90 x ☐ = 72	70 x 5 = ☐ 320 ÷ 8 = ☐ ☐ x 0.7 = 5.6 2800 ÷ ☐ = 400 40 x 50 = ☐ ☐ ÷ 4 = 50 60 x ☐ = 48
60 x 5 = ☐ 250 ÷ 5 = ☐ ☐ x 0.7 = 5.6 2800 ÷ ☐ = 700 60 x 50 = ☐ ☐ ÷ 4 = 70 90 x ☐ = 54	90 x 7 = ☐ 810 ÷ 9 = ☐ ☐ x 0.6 = 4.2 6400 ÷ ☐ = 800 30 x 70 = ☐ ☐ ÷ 8 = 70 90 x ☐ = 36