

Y8 Learning at home activity sheet #3

Problem 1:

Which has a greater area, a square with sides 2 metres long, or a circle with a diameter of 2 metres?



Problem 2:

Jordie and Mere want to know how tall the two plants that they have at home are. Jordie measured them with a paper clip and Mere with a small pencil. The first plant Jordie said was 12 paper clips high and Mere said was 8 pencils high. Jordie measured the second plant at 18 paper clips. How high did Mere say it was?

Problem 3:

If you toss four coins at the same time, what is the most likely number of heads to show? What is the most likely number of tails? Are you more likely to have two heads and two tails, or different numbers of each?

Number line challenge:

Draw a number line. Put these numbers on it. Think carefully about which numbers to put on first and how long your number line needs to be.

0, -4, $\frac{120}{3}$, 8.57, $-20\frac{1}{3}$, 20

Add your age and the ages of any pets you have to the number line.



Quick questions:

1. What number multiplied by itself gives 1?
2. What is the perimeter of a rectangle 3.1cm by 4cm?
3. Which is bigger, $\frac{3}{4}$ or $\frac{5}{6}$?
4. Is 96 divisible by 4?
5. What is 21×6 ?
6. Is 0 a square number?
7. What is $\frac{1}{2}$ divided by 2?
8. What is 0.3 as a fraction?
9. What is the smallest prime number?
10. What is $1.5 \times \frac{1}{2}$?



Running the tap:

Calculate approximately how long it would take for your kitchen tap to fill up your kitchen with water if it was left on and none of the water could escape.

You will need to estimate the volume of your kitchen, and measure how long it takes the tap to fill a smaller volume.



Number facts:

Cut out the cards on the attached sheet and use them to practice your multiplication facts with place value.

1. Shuffle the cards.
2. Pick two randomly and multiply them together.
3. If you need to, check your answers with a calculator.



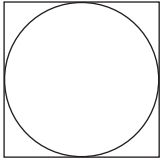
Learning at home: Notes for whānau

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:

The answer to this problem is actually quite obvious if you picture the two shapes on top of each other:



The area of a square with sides 2 metres long is $2\text{m} \times 2\text{m} = 4\text{m}^2$.

The formula for the area of a circle is πr^2 .

So, the area of a circle with a diameter of 2 meters is $\pi \times 1\text{m}^2$, which equals πm^2 , or about 3.14m^2 .

So the square is bigger.

Problem 2:

There is a temptation to say that since the second plant is 6 paper clips taller then you can just add 6 onto 8 and it must be 14 pencils tall. This is not correct.

The correct answer is that the second plant is one and a half times as tall as the first one, since 18 is one and a half times 12. The height in pencils is one and a half times 8, which is 12 pencils.

Problem 3:

There are 16 possibilities for the results of tossing four coins. They are listed below (with the number of heads in brackets).

HHHH (4)

HHHT (3)

HHTH (3)

HHTT (2)

HTHH (3)

HTHT (2)

HTTH (2)

HTTT (1)

THHH (3)

THHT (2)

THTH (2)

THTT (1)

TTHH (2)

TTHT (1)

TTTH (1)

TTTT (0)

By counting up the possibilities with each number of heads we can see that there is 1 way to get 4 heads, 3 ways to get 3 heads, 6 ways to get 2 heads, 4 ways to get 1 head, and 1 way to get 0 heads.

So, the most likely number of heads is 2. The most likely number of tails is also 2.

Since 6 of the 16 possibilities give 2 heads, that means that 10 out of 16 give different numbers of heads and tails, so it is more likely that the numbers will be different.

Number line challenge:

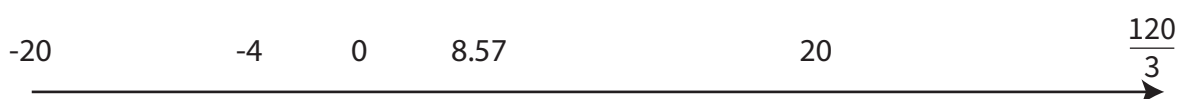
The first thing to do in creating this number line is to work out what numbers should go closest to each end. Here are the numbers to place on the line in order from lowest to highest.

$-20\frac{1}{3}$, -4 , 0 , 8.57 , 20 , $\frac{120}{3}$

The lowest number is $-20\frac{1}{3}$, and the largest number is $\frac{120}{3}$, so put those in first.

Then work out about where each other number belongs. If you divide the space between the first two numbers into thirds, then you can place 0 and 20 on those marks.

The numbers do not need to be placed exactly, but make sure they are in the right order and the spacing is reasonable. Here is a possible answer:



Running the tap:

To complete this challenge you need to do three things:

1. Work out the approximate volume of your kitchen in litres.
A litre is 1000cm^3 . There are 1000 litres in a cubic metre. If your kitchen is 4 metres by 4 metres and 3 metres high, then its volume is $4\text{m} \times 4\text{m} \times 3\text{m} = 48\text{m}^3$, or 48000 litres.
2. Work out how fast water comes out of your tap (also in litres).
You can do this by timing how long it takes to fill a large container of known volume (for example a 2 litre milk bottle). Your tap is likely to flow at between 5 and 15 litres per minute.
3. Use those answers to work out how long the tap would take to fill the room.
For the kitchen above and a 10 litre per minute tap, it would take 4800 minutes to fill the room. This is equivalent to 3 days and 8 hours.

Quick questions:

1. 1
2. 14.2
3. $\frac{5}{6}$
4. Yes
5. 126
6. Yes
7. $\frac{1}{4}$
8. $\frac{3}{10}$
9. 2
10. 0.75 or $\frac{3}{4}$

0.1	0.2	0.3	0.4	0.5
0.6	0.7	0.8	0.9	
1	2	3	4	5
6	7	8	9	
10	20	30	40	50
60	70	80	90	
100	200	300	400	500
600	700	800	900	1000