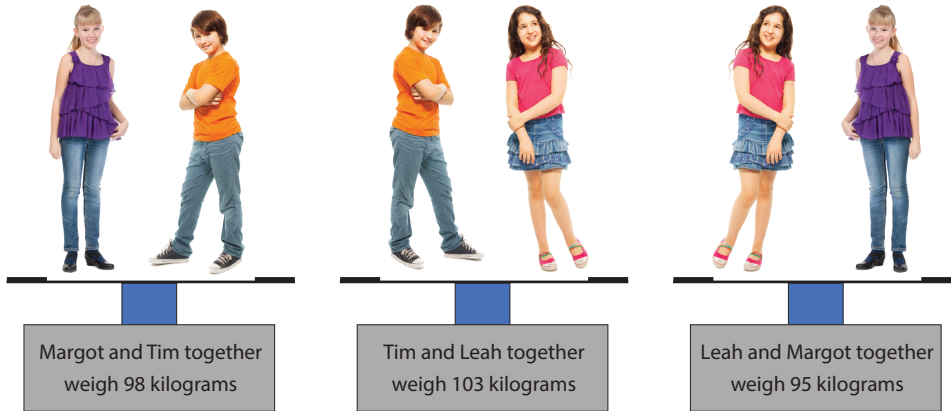# Y7 Learning at home activity sheet #6

Problem 1:

You have ten cards, 1 (Ace), 2, 3, 4, 5, 6, 7, 8, 9, and 10.

Arrange the cards in order so you can:

- Put 1 down first
- Put the next card to the bottom
- Put 2 down
- Put the next card to the bottom… and so on until all the cards are used.

Problem 2:

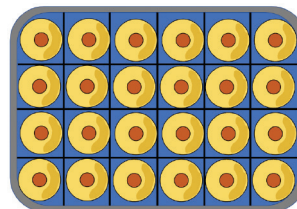| Margot and Tim together weigh 98 kilograms | Tim and Leah together weigh 103 kilograms | Leah and Margot together weigh 95 kilograms |

How much does each person weigh by themselves?

Problem 3:

Remove six bottles from this crate so that each row and column has an even number of bottles.

Start with a full crate and remove eight bottles so each row and column is odd.

Finding factors:

1. There are 36 students in your class. All students go into equal groups for the Maths Quiz.
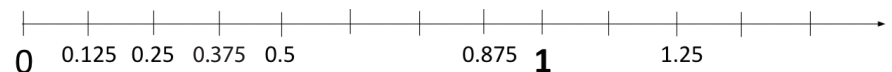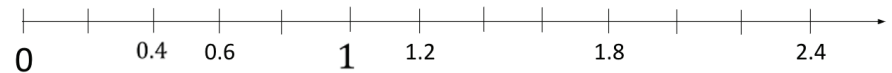   What equal groups are possible?

2. In another room there are 37 students. What equal sized groups can be made with 37 students?
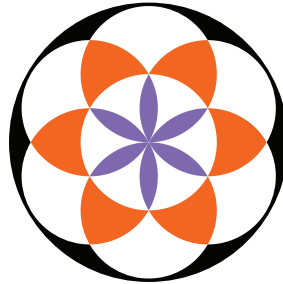
Placing numbers:

Write the missing decimals on these number lines.

0   0.4   0.6   1   1.2   1.8   2.4

0   0.125   0.25   0.375   0.5   0.875   1   1.25
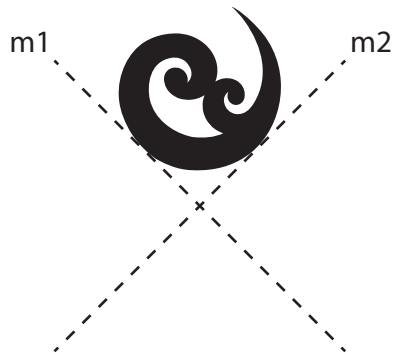
nzmaths.

Y7 Learning at home activity sheet #6

Reflection symmetry:

This figure has reflection symmetry.
Draw all the lines of symmetry.

Complete this figure so it has only two lines of relfection symmetry.

m1   m2

Scissors:
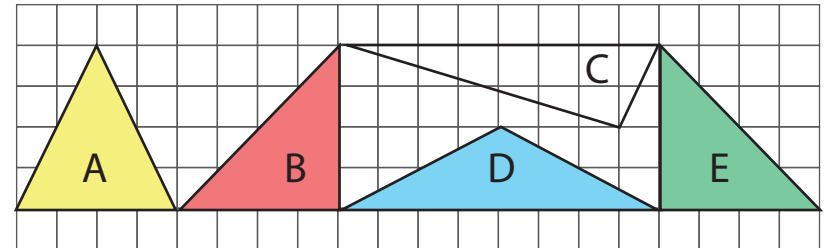
Which pair of scissors is most open?

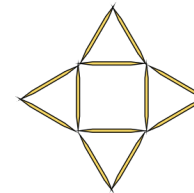Find a pair of scissors in your home and open them to different angles.

Triangle areas:

Which triangle below has the greatest area?

Remember that area is the amount of flat space inside the triangle.

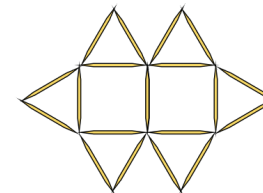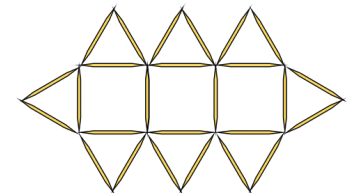A   B   C   D   E

Pattern finding:

Here is a growing pattern made with toothpicks.

Pattern 1   Pattern 2   Pattern 3

Draw Pattern 4.

- Predict how many toothpicks will be in pattern 10.
- Explain your prediction.
- Find a rule for the number of toothpicks in any pattern number you are given.
- Test your rule on patterns 2, 3, and 4 to see it works.

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.
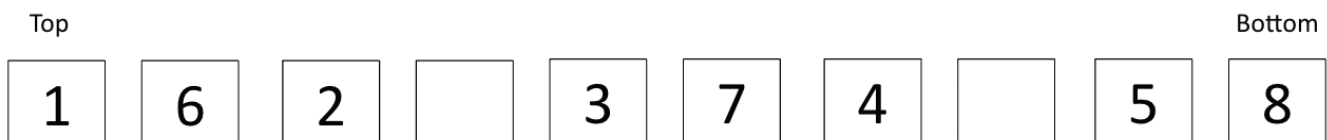
Problem 1:

Your child can use a pack of playing cards if you have some, or just use small pieces of paper with the numbers 1-10 written on them. If you child gets stuck suggest these recording steps:

Draw ten squares and label every second one with the numbers 1-5 that come out first. Why do you need to leave gaps?

Top   Bottom

| 1 | | 2 | | 3 | | 4 | | 5 | |
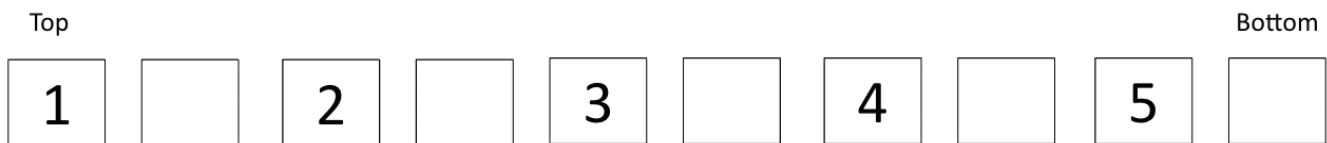
The last card went to the bottom and only the blank squares are left. Label every second remaining card with 6–8.

Top   Bottom

| 1 | 6 | 2 | | 3 | 7 | 4 | | 5 | 8 |

The first blank card left must go to the bottom. That means the remaining blank card has 9 on it. 10 must go after 2.

Problem 2:

Your child might use trial and error but that is likely to be very slow. Ask questions like:

Which person is lightest? How do you know? (Margot since she features in both smallest weights)

Which person is heaviest? How do you know? (Tim since he features in both highest weights)

What do the weights of all three people add to? (Half of 88 + 103 + 95 = ½ x 296 = 148 since each person features twice in the weigh-ins)

What is the average weight of the three people? (148 ÷ 3 = 49.333...)
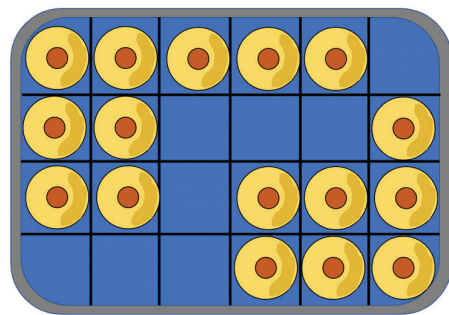
The answer weights are Margot (45kg), Tim (53kg), Leah (50kg).

Problem 3:

Your child might need to use physical objects like stones or acorns to represent the bottles. They will need to draw a 4 x 6 grid. Discuss that rows run horizontally, and columns run vertically. There are several answers, but they are variations on these two solutions.
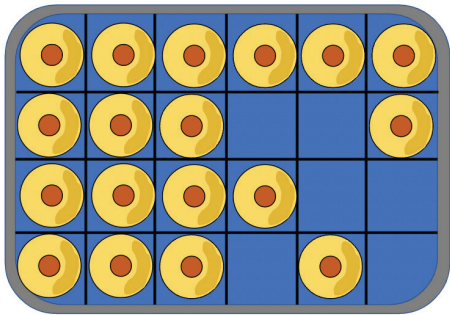
Rows and columns are all even   Rows and columns are all odd
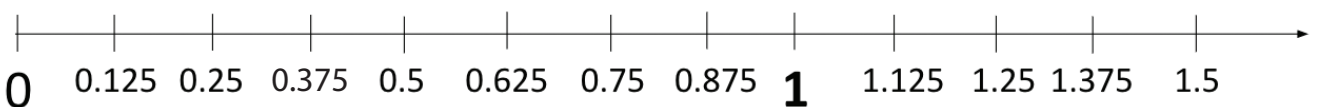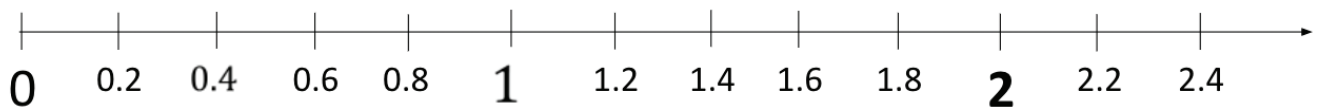
Finding factors:

Using multiplication facts and properties of multiplication to find factors is important to your child's future success in further mathematics. Factors underpin important concepts like fractions, rates, and slope (rate of change).

Your child might need support from physical objects representing students. However, encourage them to use the power of equations to find answers and not rely on physical actions.

With 36 students, teams of 1, 2, 3, 4, 6, 9, 12, 18, and 36 are possible since these are the factors of 36.

With 37 students, only teams of 1 and 37 are possible since 37 is prime. Prime numbers have only two factors, 1 and themselves.

Placing numbers:

0   0.2   0.4   0.6   0.8   1   1.2   1.4   1.6   1.8   2   2.2   2.4

0   0.125   0.25   0.375   0.5   0.625   0.75   0.875   1   1.125   1.25   1.375   1.5

Your child should notice the pattern in the way the decimals grow. Identifying the size of each interval is important. In the top number line each interval is two tenths or 0.2. In the bottom number line the interval is one eighth or 0.125. Can your child explain why numbers like 0.25, 0.5, 0.75, 1.25 and 1.5 appear?

Reflection symmetry:

A small mirror might help your child to find the lines of symmetry and complete the figure. The first figure has 12 lines of symmetry.
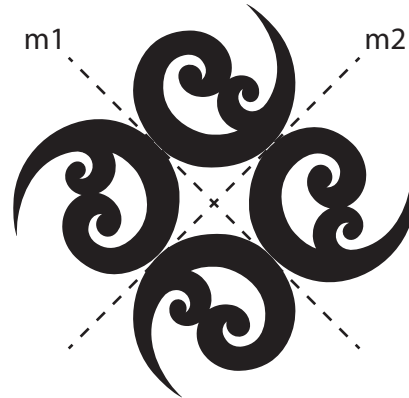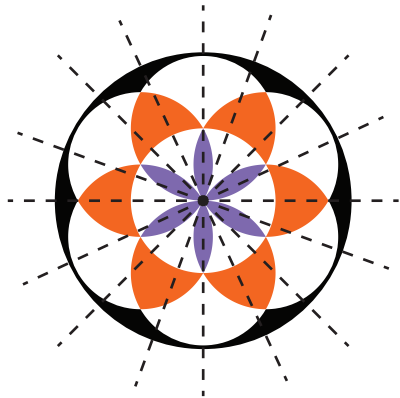
Scissors:

The blades of the scissors create an angle which is a turn. The right-hand scissors are open at a right angle of 90 degrees. The other two pairs of scissors are open at angles less than 90 degree.

Triangle areas:

Your child might find the areas of the triangles by counting square units or parts of units. They should notice that all five triangles have an area of 8 squares?

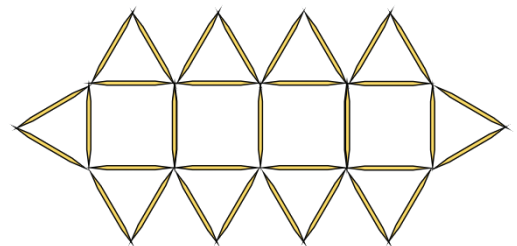Why are the areas the same when the triangles look to be of different sizes?

Pattern finding:

Does your child notice what changes and what remains the same as the pattern grows?

They should see that a square with top and bottom triangles is added each time.

The left and right triangles are constant.

The fourth pattern is to the right.

Creating a table of values might be useful to support your child find a rule.

Pattern 4

Pattern number	1	2	3	4	5	6	7	8	9	10
Number of toothpicks	12	19	26	33						

The number of toothpicks goes up by seven for each increase of one in the pattern number.

That is because this element adds to the figure each time.

Applying the same thinking to different pattern numbers gives a general rule. If it represents the number of toothpicks and n represents the pattern number, the number of toothpicks is always the pattern number multiplied by seven then add five. Algebraically this is $c = 7t + 5$.

nzmaths.