5th and 6th Class Resource Pack for Maths Week

This pack contains five activities that are suitable for either 5th or 6th class pupils. The numbers in the questions may have to be adapted to suit the class and the time of year that they are completed. These five activities are suitable for use in the classroom but can be adapted for use outdoors.

Prior to completing the activities teachers should pre-plan their questions ensuring that the questions they ask will promote mathematical thinking. Examples of questions are given with each activity but the list below also shows some question stems:

- ⇒ Explain how you….
- ⇒ What would happen if I changed this number….
- ⇒ Is there another way you could do it? Show me.
- ⇒ If you did it again what would you do differently/keep the same?
- ⇒ Draw it.

One of the main emphasis of these activities should be on **language** and allowing pupils to talk about what they are doing using the correct mathematical vocabulary. The teacher needs to lead by example by always modelling the correct language and reason their own mathematical thoughts out loud.

Remember to register your school at www.mathsweek.ie and check for any events that may be happening in your area!

What's the question? (5th and 6th Class)

Activity 1

Resources: A variety of concrete resources to support pupils

Strands: Addition, subtraction, multiplication, division, fractions, decimals

Activity: Give pupils any number between one and ten, for example, 6. Explain that '6' is the answer but you do not know what the question is. Ask pupils what the question might have been if it was an addition question? What if it was a subtraction question? How about a multiplication or division question? Give pupils the opportunity to come up with lots of different possibilities for what the question might have been using different operations.

Questions: What other multiplication question might it be?

Can you think of another one?

Challenge Questions:

- Have you found all possibilities? How do you know?
- Can you find all possibilities if all the numbers used in the question were less than 20?

Variations:

1. What might the sum be if one of the numbers was odd? Is it possible? Why not?

2. What might the subtraction question be if the two numbers were even?

Teacher's note:

This is an open activity where there an infinite number of answer that pupils can give. Explore how all pupils can achieve at this task by using any of the four operation: addition, subtraction, multiplication and division. Encourage pupils to use fractions, decimals and negative numbers with the operations.

Activity 2:

Really—only one minute?!

Resources: Stop watches

Strands: Measures—time

Activity: This activity draws on pupils understanding of time. To start the activity ask all pupils to stand up and explain that you would like to them to sit back down when they think one minute has passed. Ensure a clock is not visible. There more than likely will be differences in when pupils sat down. Explain that this task is going to focus on how long one minute really is. Divide the class into groups of 4 or 5 pupils. One pupil will act as the time keeper and the other pupils must decide on an activity that they will each do for one minute, for example, jumping jacks, clapping hands, singing, etc. The time keeper in each group should record the time of another group as they complete their activities in succession (i.e. if there are four people the activities should last for four minutes). Pupils take it in turns to complete their activity and must judge for themselves when their minute is up and allow the next person to complete their activity. Allow pupils some practise runs first. The group that complete the activities closest to the four or five minutes is the winner.

Questions: How many seconds are in one minute?

How did you judge when the minute was up?

Challenge Questions:

* If you were to do it again would you do anything differently?
* Was the minute longer/shorter than you expected? Explain?

Variations:

1. Change the amount of time they are judging, for example, 30 seconds, two minutes.

Activity 3

Squares and triangles (5th and 6th Class)

Resources: The shapes on the activity template cut out. Scissors.
Strands: Shape and space

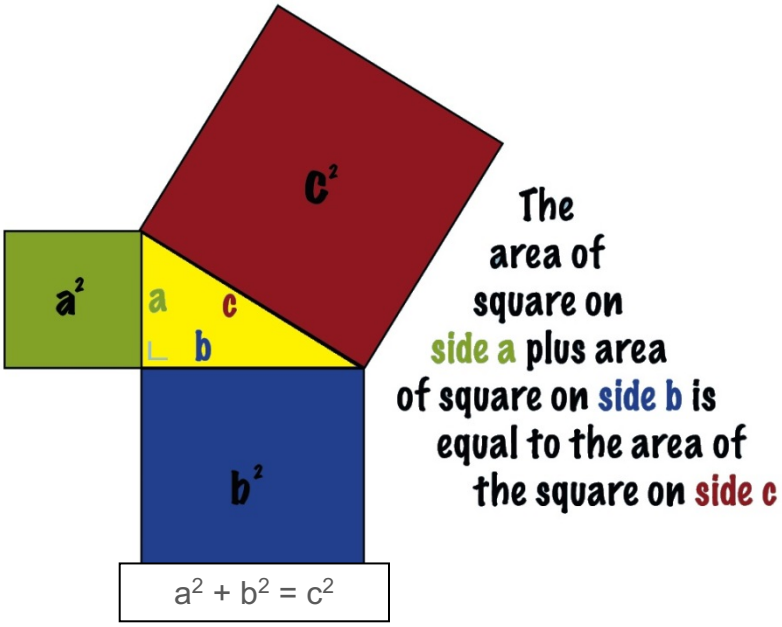
Activity:
Each pupil or pair of pupils has a set of coloured/shaded shapes which were cut out from the template below. The cut-out shapes were from two squares which were based on two of the sides of the right-angled triangle shown.
Pupils must assemble the shapes into the larger square, which is based on the third side of the right-angled triangle. The third side of the right-angled triangle is labelled c below. It is the longest side of the triangle and is known as the hypotenuse.
Students may have to twist, turn, flip and rotate the shapes to get all them to fit into the square of the hypotenuse.

Teacher's note:
This is a demonstration of Pythagoras's Theorem. Students will learn how to prove this theorem when they study Geometry in secondary school.
Pythagoras's Theorem applies to all right-angled triangles. It tells us that if we build a square on each side of the triangle, the area of square on the longest side of the triangle (hypotenuse) is equal to the areas of the other two squares added together.

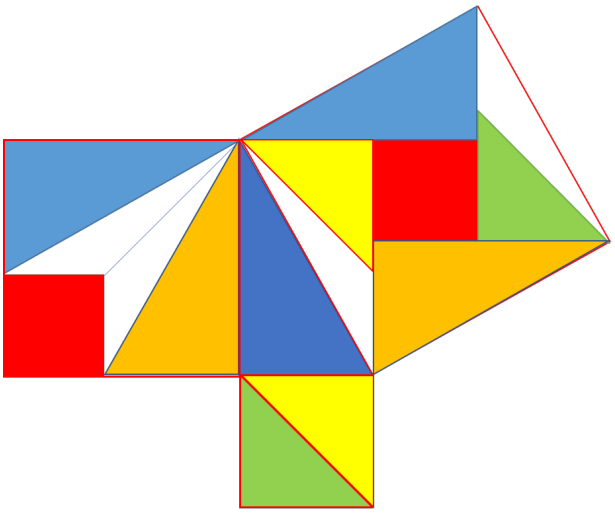
Questions:
What is the same/what is different about the shapes you are using to create the third square?
Is there another way to put the shapes together to make a square? How do you know?
What other shape could you make using all of the shapes?
Can you make a square/triangle/rectangle using only three of the shapes?

Challenge Questions:
The two squares shown are equal to the square made on the third side of the triangle. Without using the shapes what could you tell me about the third square?
Could you calculate the area?
How about the length of each side

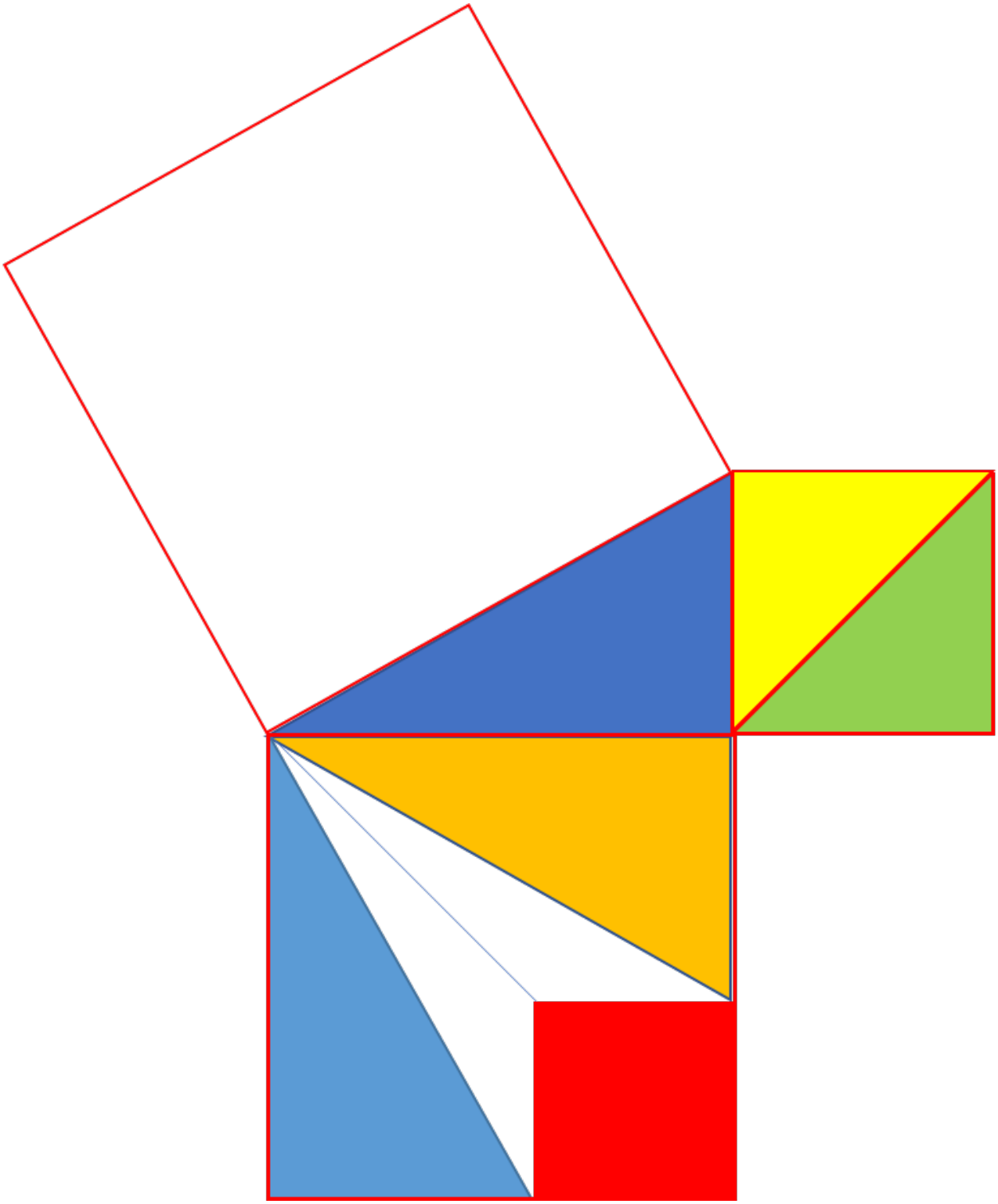
Pythagoras's Theorem



Solution:



Solution



Activity 4:

Same area, different perimeter

Resources: Squared paper, rulers, pencils

Strands: Measures: area and perimeter

Activity: Show pupils the rectangle on the activity template and calculate the area and perimeter if each square is 1 cm^2. Ask pupils to create another shape, not a rectangle, with the same area. What is the perimeter? Ask the suggested questions below once pupils have made a shape.

Questions: How do you know this is not a rectangle?

What shape is it? How do you know?

What is the simplest way of making sure you keep the same area?

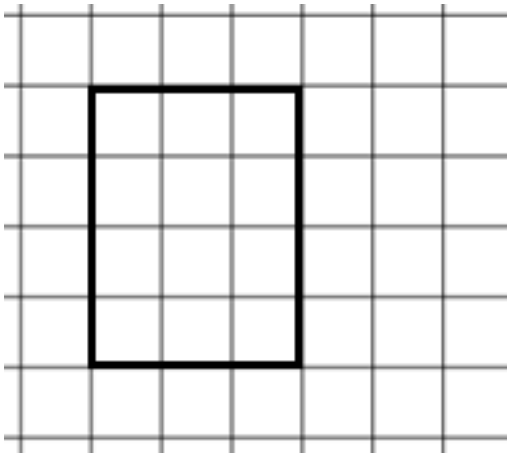
What is the difference between perimeter and area?

Challenge Questions:

* How many hexagons/octagons/pentagons can you make with the same area but different perimeters?
* Can you make another hexagon with the same perimeter but different area?

Variations:

1. *Use the challenge questions above to change the focus of the activity, for example, pupils can only use hexagons. Have they found all possible hexagons for that area? How do you know?*
2. *Pupils could make the shapes outside using a grid drawn on the ground and some rope to outline the shape.*

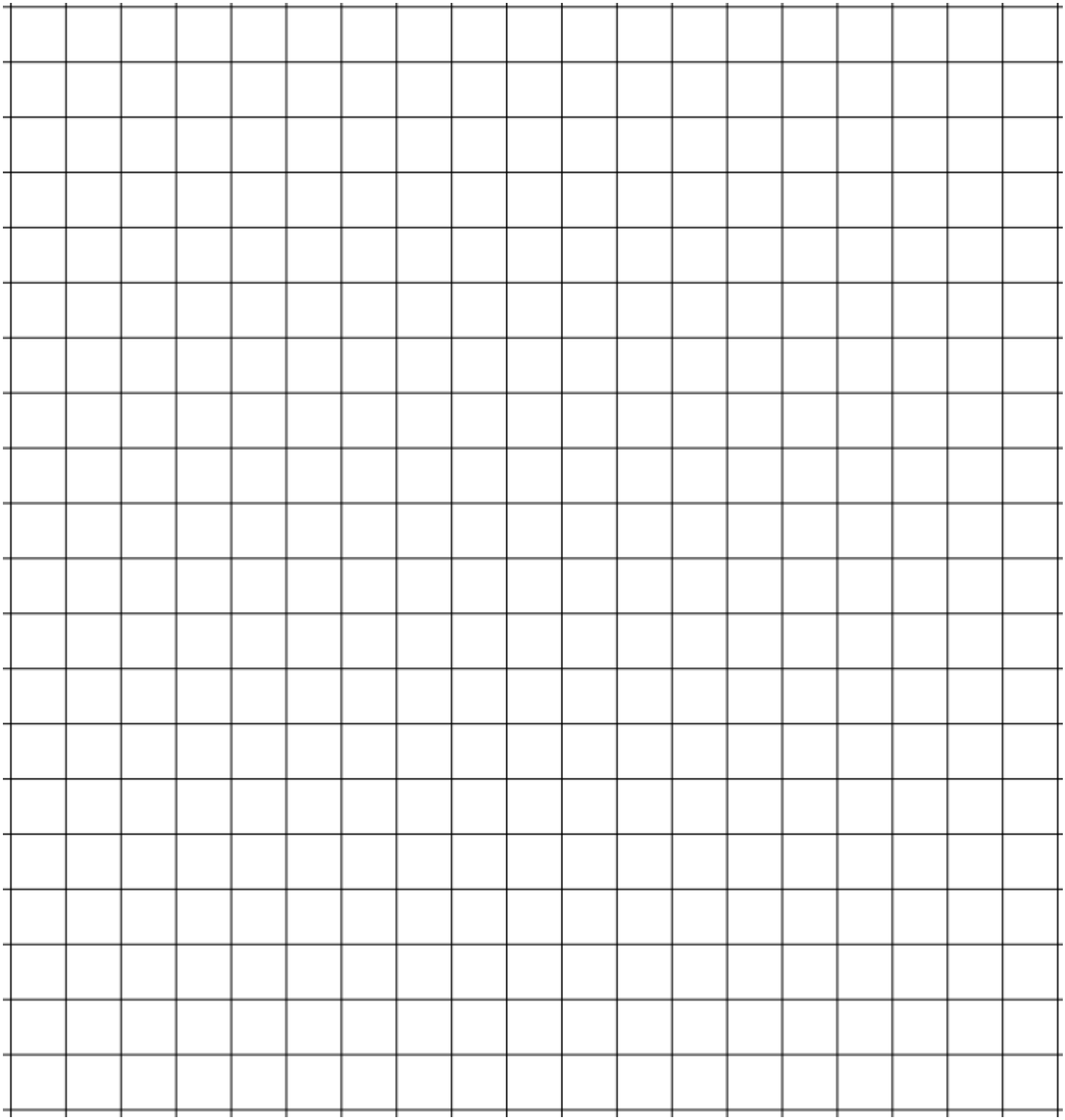


Assume that each square has a side length of 1 cm.

What is the area of this shape?

What is the perimeter?

Create another shape, not a rectangle, with the same area.



Activity 4—Same area, different perimeter

Activity 5:

The Mayan Number system

Resources: Mayan number chart on activity template

Strands: Place value

Activity: This activity explores the Mayan number system which used a combination of base 5 and base 20. We use a base 10 system. Show pupils the Mayan number chart on the activity template and explore how the numbers are represented. Use the questions below to explore in greater depth.

Questions: How would you represent the number 51?

How would you represent the number 76?

What are the possible ways of representing 100?

Challenge Questions:

* How could you write the sum 21 + 14 using the Mayan number system? What would the answer look like in the Mayan system?
* Select two numbers and subtract the smaller number from the larger number using the Mayan number system.

Variations:

1. Think about place value in another base system—what would the number ten be if using a base four system? (4, 4, 2 = 22)
2. How about the number ten in a base eight system? (8, 2 = 12)

Maths Week Ireland

5th and 6th class

The Mayan Number system

A dot represents the number 1	A stick represents the number 5	A shell represents the number 0

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50