TRANSITION BOOKLET
YEAR 7

SUMMER 2020

Getting ready for Year 7

Summer 2020

A booklet of activities for Year 6 pupils

Name:

Primary School:

High School:

New form tutor:

(if known)

Getting ready for Year 7

Dear Year 6 pupil,

This booklet contains some activities for you to complete either at home or at school before you move to your new high school in September.

The activities cover some of the subjects that you will be studying in Year 7. The work may build on what you already know and or it may be completely new. It would be great if you could challenge yourself to complete the activities but don't worry if you can't finish them all!

Please take this booklet with you when you go to your new school and show it to your form tutor.

Very best wishes for Year 7!

Getting ready for Year 7

Year 6 to 7 Transition Activities 2020

Subjects

English

Maths

Science

Art

Computer science

Geography

History

Music

Religious Education (RE)

Year 6 to 7 Transition Activities 2020: English

1. Detective work: Create a Fact File of your new school

Find out **10 facts about your new school** and **design a fact file** to give information to other students new to the school.

Some hints to get you going:

- When was it built?
- What is the name of the Headteacher?
- How many students currently attend the school?

You may want to use headings or pictures to make your information interesting to read.

2. Write a letter to your new Form Tutor

In a letter, tell your new Form Tutor at high school about yourself with details of your family, hobbies/interests, favourite food, subjects you enjoy etc.

3. Create an 'ALL ABOUT ME' POSTER

Draw a picture of yourself surrounded by your **important places and people** and your **favourite food, books, hobbies, objects etc.** Label your images with extra information about yourself.
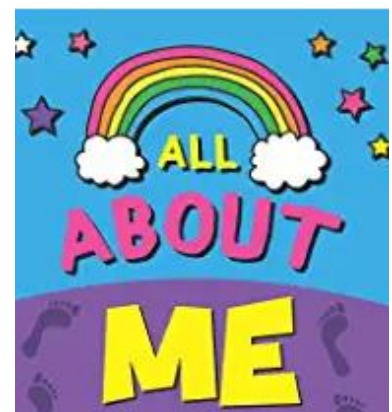
CHALLENGE: draw yourself in your new uniform!

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Year 6 to 7 Transition Activities 2020: Maths

In year 7, you will build on the skills and knowledge you have learnt throughout your time at primary school. You will engage with a range of topics from number, algebra, shape and data, and within each of these areas; you will learn both fluency skills and problem-solving techniques. The core skills you have learnt at primary school will be important, as a significant amount of the maths you will learn at secondary school, will build on these core foundations. We look forward to welcoming you to secondary school in September.

KS2-3 Transition

1. Developing calculator CALCULATOR CRUNCH skills

MEI's Calculator Crunch... it's fun and it's free!

https://mei.org.uk/Primary-KS2-3-Transition

Scroll down to the **Resources** section and work your way through each of the 9 questions – use the "learn from home resources" to support you if working remotely.

2. Mathematical investigations / Developing problem solving

https://www.tes.com/teaching-resource/maths-investigations-3005645

Complete the **Consecutive numbers** task below. There are five more investigations for you to try at the back of the booklet. You will need extra paper for these.

Ma2 Task Sheet - These are levels for your self assessment
Consecutive Numbers

Focus: Positive & Negative Numbers

You probably use consecutive numbers all the time. In fact, you've probably been using them since you first learnt to count 1, 2, 3…

In this investigation you will be investigating the patterns you get when you add and subtract consecutive numbers. To do this, you need to choose a set of numbers first of all, and set them out with space in between, like this:

$$3 \quad 4 \quad 5 \quad 6$$

The first step of the investigation is to find as many ways as possible of making addition & subtraction sums using the four consecutive digits, like these:

$$3 + 4 - 5 - 6$$
$$3 + 4 - 5 + 6$$

Once you've found all the possible combinations, you can explore the answers to the sums you've created. It is probably a good idea to write down everything you notice.

Now use the Level Ladder to achieve your target.

To get level	You should:
2	Set out your sums clearly. Explain anything you notice about the numbers which result. Calculate problems using both addition and subtraction
3	List as many possible combinations of problems as possible. Check your data for errors, such as repeated problems. Record any patterns you notice
4	Use a strategy to list the possible combinations of problems. Present results in a clear way, checking for errors. Make at least one general statement
5	Systematically represent all the possible combinations of problems. Devise a method to represent any sequence of consecutive numbers. Make at least one general statement, and support it with examples
6	Devise a method to represent the results of all possible problems. Use a generalisation to explain or justify your findings. Devise a further investigation

Now use the Level Ladder to assess your work and decide on improvement targets.

Your Task:
- Select your 4 consecutive numbers.
- Try to find all the possible ways of arranging sums using the + and – signs.
- Write down your observations of your answers.
- Investigate other combinations of consecutive numbers.

Things to think about:
- Do you notice any patterns in the answers you get to your sums?
- Do you notice any patterns when you change the consecutive numbers?
- What other variations of the investigation could you try?
- How can you collect and show your findings?

Remember to use the level ladder to help you to achieve your target level.

Key words

combination, pattern, positive, negative

Numerise

- https://www.numerise.com/secondary-ready/
  Download the app and create a free account – work through each of the skills in the "secondary ready" section
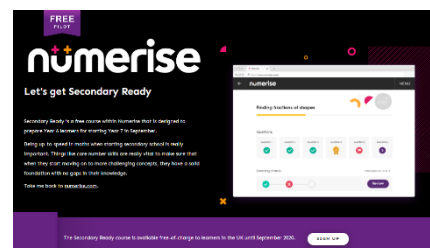
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1.1 Asking scientific questions

Learning objectives

After this topic you will be able to:

- describe how scientists develop an idea into a question that can be investigated
- identify independent, dependent, and control variables.

Why does the battery last longer in some mobile phones than others? What might mobile phones be like in the future? We can ask lots of different questions about the world. Some are questions that science can answer.

What's the question?

Scientists make **observations** of the world, and ask questions such as, 'How do fossil fuels form?' or 'Why are there are so many different animals on Earth?' These are scientific questions.

Scientists do **investigations**. They collect **data** to try to answer their questions.

Suggesting ideas

Tom and Katie are talking about balls used in sport.

> The football doesn't bounce as high as the tennis ball. Maybe size affects the bounce.

Katie makes an observation about footballs and tennis balls. An observation can give you an idea that you can test in an investigation.

Developing ideas into questions

Tom watches a tennis match. New tennis balls are brought out from a refrigerator during the match.

Here are some questions that Katie and Tom might investigate:

- How does the size of a ball affect how high it bounces?
- How does the temperature of a ball affect how high it bounces?

What's a variable?

The size and temperature of the ball are not the only things that might affect the height of the bounce.

> Let's investigate how the temperature of the ball affects how high it bounces.

▲ What affects the battery life of your mobile phone?

▲ The balls are changed every seven or nine games during a tennis match.

Year 6 to 7 Transition Activities 2020: Science

In science, anything that might affect the outcome of an investigation is called a **variable**. The thing that is affected as a result of the change is also a variable.

The temperature is the **independent variable**. It is independent because you change it. How high the ball bounces is the **dependent variable**. It is dependent because it changes when you change the temperature.

A State the two types of variable that you can change in an investigation.

Other variables

Katie and Tom think about all the other variables that might affect the bounce height. Here is their list:

- the height you drop the ball from
- the type of ball
- the surface that you drop it onto
- the size of the ball

Katie and Tom need to keep these variables the same during their investigation so that they do not affect the bounce. These are called **control variables**.

B Name the type of variables that you keep the same in an investigation.

Making a prediction

Katie makes a **prediction** about what might happen. This is only part of the prediction. Katie should use her scientific knowledge to explain *why* she thinks that the ball will bounce higher.

> I think that if the temperature of the ball is higher it will bounce higher.

Name those variables!

Imagine that you are going to investigate whether the size of a ball affects how high it bounces.

a State your dependent and indepedent variables.
b List all the variables that you would need to control.

Key Words

observation, investigation, data, variable, independent variable, dependent variable, control variable, prediction

Fantastic Fact!

Over 50 000 tennis balls are used during the Wimbledon tennis championship each year.

Summary Questions

1 Copy the sentences below, choosing the correct bold word.

You can turn an **idea/question** into an **idea/question** that you can investigate. You can answer some scientific **ideas/questions** by doing an investigation. You collect **data/observations** or make **data/observations**. Things that can change in an investigation are called **predictions/variables**. Science can answer **all/some** questions.

(7 marks)

2 A student is looking at an ice cube melting in a glass of water.

a Suggest a question that she could answer by doing an investigation. *(1 mark)*

b Explain why this is a question that science can answer.
(2 marks)

3 Suggest three questions that scientists could investigate about food, and three that they could not. Explain your choices.
(6 marks)

3

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Year 6 to 7 Transition Activities 2020: Art

Task 1:
Cut out lots of examples of shoes in art, designer shoes or the ultimate trainer.
Make a collage that fills an A4 page

Task 2: Draw your shoe

Choose your favourite shoe to draw in pencil – use a full range of tone

Make it harder by drawing a pair of shoes.

Task time : 2 hours (but you don't need to do it all at once)

Extension task:

Using scrap cardboard and packaging design and make your own shoe

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Year 6 to 7 Transition Activities 2020: Computer science

Computer Science is all about understanding what a computer is, and then using it as a tool to solve problems in the real world. At high school, you will also learn how to control a computer by programming it.

Task 1: Software is the name **for programs that are used on a computer system**. Windows, Word and Chrome are all examples of software. Can you think of five more examples of software that you have used, and what specific task they perform?

1. Windows (control the computer)	2. Word (type documents)	3. Chrome (web browser)	4.
5.	6.	7.	8.

Task 2: Hardware is the name for the **physical components that make up a computer**. (These are the parts we can touch.) A mouse, motherboard and monitor are all examples of hardware. Can you think of five more examples of hardware, and their purpose?

1. Mouse (control the pointer)	2. Motherboard (connect all the components together)	3. Monitor (allow the user to see what they are doing)	4.
5.	6.	7.	8.

Task 3: We are surrounded by computers, although we may not recognise them because they are built into other devices and known as embedded systems. An example is your washing machine or mobile phone. Can you think of four more embedded systems?

1. Washing machine	2. Mobile phone	3.
4.	5.	6.

Task 4: Go to **www.smallbasic.com** and click **start coding online**. Try my code out (copy it out and click **run**, try it with different answers to see what happens).

Can you create 4 more computer science riddles? Use similes and metaphors to trick the user! You can copy and paste your code into a document so you can print it and show your new teacher in September.

```
1  TextWindow.WriteLine("You might think I am alive BUT")
2  TextWindow.WriteLine("I am not, even though I am hung by my tail")
3  TextWindow.WriteLine("My two beady eyes are gone...")
4  TextWindow.WriteLine("Replaced by a single red eye in my belly")
5  TextWindow.WriteLine("What am I?")
6  answer = TextWindow.Read()
7  If answer = "Mouse" Then
8    TextWindow.WriteLine("Correct!")
9  Else
10   TextWindow.WriteLine("Wrong answer!")
11 EndIf
```

Extension 1: find out how to change the text colour.

Extension 2: work out how to use a while loop so the program keeps asking the riddle until the user gets the answer right?

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Year 6 to 7 Transition Activities 2020: Geography

What is geography and what will I learn?

Geography is the study of the earth, the landscape and how humans interact with the landscape.

You will study the UK and lots of other countries in the world as you learn about:

- place and location (where places are)
- the population (people) in different places
- the landscape and how it was formed
- the weather and climate
- how humans are can harm or protect the natural environment
- natural hazards and how to reduce the threat
- how different people, places and environments are linked and affect each other.
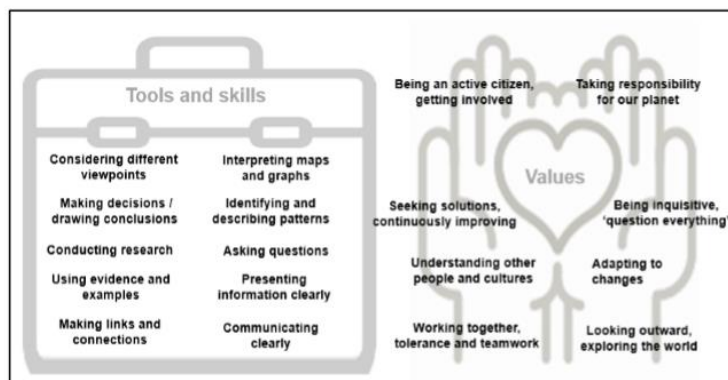
Geographical skill: Finding out about the world (research)

Good geographers know where important places are.

Use an atlas and/or the internet to find out the answers to the questions below.

1. Which continent is missing from the list? Europe, Asia, North America, South America, Antarctica, Africa _____.
2. Nigeria, Ghana, Kenya and Egypt are all on the continent of Africa. Name 5 other African countries.
3. What is the tallest mountain in the world?
4. What country is it in?
5. Which is the world's longest river?
6. What country is it in?
7. Which country has the biggest population?
8. What is the capital of the USA?
9. Which are the top 5 biggest countries (by land area) in order?
10. Which country is closest to the Great Barrier Reef?
11. Name a country that has rainforest, but isn't Brazil.
12. Which ocean is to the west of the UK?

Stretch yourself:

a. Name all the countries that border Kyrgyzstan
b. Where are Vladivostok, Volgograd and Kamchatka?
c. What country is the Atacama Desert in?
d. Which is the newest country in the world?
e. Name a country that speaks Spanish as an official language (that isn't Spain)
f. Why do the people here speak Spanish?

Geographical Skill: Using maps and directions

Use the map on the right to decide if that statements are true or false.

1. Glasgow is in Scotland.
2. The Atlantic Ocean is to the east of the UK.
3. Plymouth is on the south coast of the UK
4. France is in the south east of the UK
5. The prime meridian runs through London

Stretch yourself:

a. What is the Prime Meridian and what is it for?
b. What are the Pennines?
c. What do the stars represent?
d. How far is it from Glasgow to London? (Use the scale bar)

Answers:
1. True
2. False (Its to the west)
3. True
4. False (It is to the south east)
5. True

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Year 6 to 7 Transition Activities 2020: History

At secondary School, you will study a large variety of topics, some of which you may have learnt about at primary School. In order for us to learn about these topics we have to examine what has been left for us from the past. These objects are called 'sources' and are the heart of History. You will be encouraged during your History lessons at secondary school to ask lots of questions about the past and the objects that have survived from the past.

The 'Hand of History'
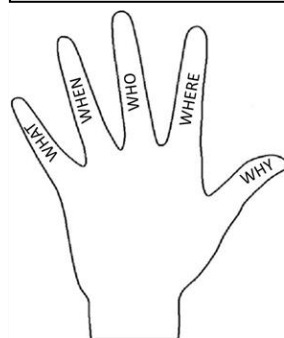
Task 1: One way of asking questions could be by using the 'hand of History' (see right).

For example, if I wanted to use the Greek pot below to ask questions about the past I could ask:

1) What is the drawing on the pot?
2) When was this pot made?
3) Who owned this pot?
4) Where was this pot found?
5) Why was the pot made?

All these questions would help me understand more about the Ancient Greek's from one item from the past.

What questions could you ask of these sources that would help you know more about the people and the time from when they were made? Use the 'Hand of History' to help you.

	Source A: 'The Bayeux Tapestry.'	Questions you would like to ask: 1. 2. 3.
	Source B: The Diary of Anne Frank, 1942	Questions you would like to ask about the source: 1. 2. 3.
	Source C: A penny stamp, 1902	Questions you would like to ask about the source: 1. 2. 3.

Extension: Can you find any of the answers to your questions?

Extended Task: Draw a timeline of your family's History, try to find out 8 events that have taken place in your family's history and put them into chronological order on your time. You may find out some really interesting stories by speaking to those around you!
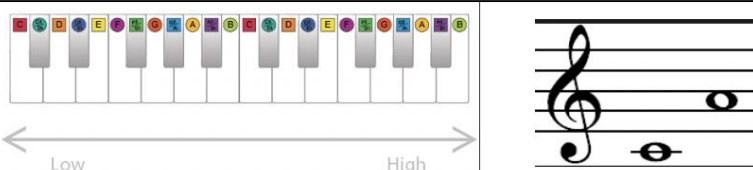
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Year 6 to 7 Transition Activities 2020: Music

1. Using the keywords below, fill in the left-hand column that matches the meaning and graphic.

Silence / Dynamics / Tempo / Pitch / Melody / Pulse / Rhythm / Duration / Texture / Structure / Sonority

	Keyword	Meaning	Graphic
1		The beat of the music.	
2		The way notes are played over time. Patterns of sound.	
3		How high or low sounds are	
4		Length of the sound or note. Long or short?	
5		The most important part of the song.	
6		Speed of music. Fast or slow?	
7		How many sounds or parts are played together and the relationship between those parts.	
8		Volume. How loud or soft the sound is.	
9		The story of the music. Different sections in the music.	
10		No sounds heard.	
11		**Sound quality.** Every instrument has its own unique timbre.	

Stretch Activities: Choose 1 or more of the following activities to complete:

WARM	HOT	SCORCHING
If you can, talk to and interview an older person in your family over the phone or someone in your home. Ask them about all of the live music events they have experienced in their life. How did that music influence them? Create a presentation in the format of your choice about the information you have found out.	Design a musical instrument using every day household objects. Name your instrument and then record a video demonstrating its design and playability. You may even perform a piece of music. Example resources: rubber band, cereal box, utensils, etc. Use your imagination!	Compose a piece of music or song with lyrics inspired by the Covid-19 virus pandemic. The mood or tone of your composition is up to you. It could be humorous, happy, sad, hopeful etc. Make a recording of your piece and share it with your teacher.
Watch one of the following films below. Discuss the film with someone. What was the main message of the film? Write a film review, focusing on why that film is in the top <u>music</u> films of all time. • Sister Act (1992) • Sister Act 2: Back in the Habit (1993) • The Sound of Music (1965) • August Rush (2007) • The Wrecking Crew (2008)	If you were to take GCSE music in year 10 and 11 and continued music into further education what career paths would be available to you. Research all the different job titles (e.g. foley artist) that would benefit from someone who has studied music. Present your findings in a creative format.	Choose a song that you would like to learn and practice by singing or playing along on an instrument with the original recording. Then find a backing track to practice with and record yourself performing with the backing track. Email or share your recording with your teacher.
Research and explain what a 'rider' is in the music industry. Give 5 funny or ridiculous examples that you have discovered through your research. If you were a music performer what would your rider be and why?	Choose a music solo artist or band album and write an album review. You may want to write about the mood of the songs, the meaning behind the lyrics and/or the musical success of the songs. Make sure to include as much music vocabulary as possible. The words from activity 1 will help you.	Create a board game based on the 11 keywords from activity 1. For example, this could be question/answer rounds, snakes and ladders etc. Stretch: Can you include any other music keywords you may know? E.g. harmony

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Year 6 to 7 Transition Activities 2020: Religious Education

When you start secondary school, you will continue to study RE. It is important to study RE because we live in a society that is multicultural, and in life you will meet, be friends with and work with people of a variety of religions and cultures. In RE, we will encourage you to learn about different beliefs, and to reflect on your own.
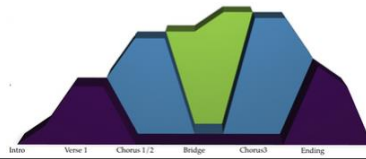
Create a timeline for the six major world religions:

The six major world religions:

Buddhism
BUDDHISM
DHARMACHAKRA

Christianity
CHRISTIANITY
LATIN CROSS

Hinduism
HINDUISM
AUM LETTER

Islam
ISLAM
CRESCENT AND STAR

Judaism
JUDAISM
STAR OF DAVID

Sikhism
SIKHISM
KHANDA

Your timeline will run from around 3000 BC (an estimate of when Hinduism started) **to 1469** (when the founder of Sikhism, Guru Nanak, was born). *It might go later than this, if you attempt the extension task below, so plan your timeline out in pencil first.*

Include the six religions and relevant pictures. Make it colourful and well-presented.

For each religion, **include core facts and beliefs:**

- **Belief about God** – monotheist (one God) or polytheist (more than one God)? Buddhism is quite complicated but the focus should be on the Buddha as a human leader
- **Founders** (who started the religion?), key people or prophets
- **Key festivals** e.g. Christmas, Eid
- **Place of worship** e.g. Church, synagogue
- **Artefacts or objects** e.g. The Bible, prayer mats
- Maybe **celebrities or well-known people** of that faith
- **A key quotation or teaching for each** – such as "Love thy neighbour" for Christianity

Once you have finished your timeline, make a **list of similarities and differences** that you notice between the religion.

Extension task:

- *You could also research lesser known religions and incorporate these into their timeline (Baha'i faith, Zoroastrianism, etc)*

Websites that might help:
There is an excellent set of videos on YouTube by BBC Teach, entitled "My life, my religion". Just click on the religion you want to find information on:

https://www.youtube.com/results?search_query=bbc+teach+my+life+my+religion
https://www.bbc.co.uk/bitesize/subjects/z7hs34j

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Additional Maths Tasks

Sequences

Focus: Sequences, Functions & Graphs

In this investigation you will be looking at patterns in sequences that you will construct yourself. You will be given one to start you off, and then some ideas you may choose to pursue if you like.

Remember, with all investigations you should clearly show all your drawings, explanations, graphs & charts for the reader. Firstly, look at this sequence:
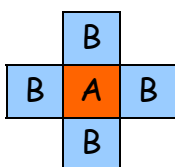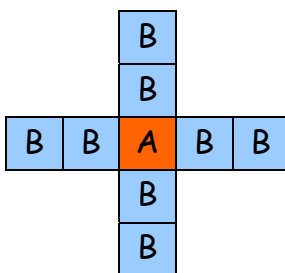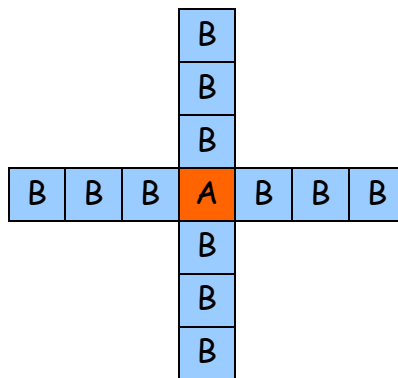
Diagram 1   Diagram 2   Diagram 3

Your Task:
- You may choose to continue the sequence in your book
- You should try to find a way to record any patterns in the sequence
- You should try to describe any patterns you find in words
- You may be able to describe patterns using algebra

Things to think about:
- How can you record all the details of the sequence?
- How could you represent any patterns you spot?
- Can you find any links, or rules?
- How can you collect and show your findings?

Remember to use the level ladder to help you to achieve your target level.

Key words

sequence, pattern, equation, formula, graph

axis, gradient, y-intercept, position, term

Ma2 Task Sheet - These are levels for your self assessment

Sequences

Now use the Level Ladder to achieve your target.

To get level	You should:
2	Continue the sequence by drawing the next 2 or 3 diagrams Make at least on statement about any patterns you notice With help from your teacher, use a table to record some information
3	Use a table to record some information about the sequence Describe any patterns you notice in the sequence Test your statements by extending the pattern
4	Use a table to help you to identify patterns Present your results in another form, such as a graph Try to describe in words any patterns you've found in the table
5	Explore different ways of representing your findings Investigate another sequence Write your own statements based on what you have found
6	Investigate a more complex sequence Relate your graph to the formula found, or sequence used Begin to explain why your formula works
7	Investigate a more complex sequence, including square numbers Explain the link between the sequence, the algebra & its graphical form Explain how you know that your formula will always be true

Now use the Level Ladder to assess your work and decide on improvement targets.

Square Rectangles

Focus: Shape, Space & Measures

In this investigation you will be looking at 2-dimensional shapes. The aim is to explore the relationship between the area and perimeter of shapes – particularly different types of rectangle.

It's useful to remember that a square is just a special type of rectangle which has 4 sides of the same length. You might want to talk with your class to discuss the main features of different shapes – particularly quadrilaterals.
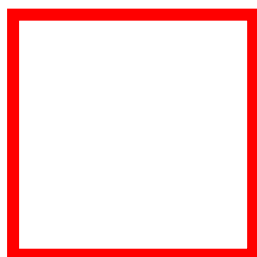
Your Task:
- Try to find a square which has the same measurement around its perimeter as it does for its area (remembering that area is measured in cm^2)
- Draw the shape you've found, and record any other shapes you tried
- Explore other options – can you find a rectangle with one length twice as long as the other which also has perimeter equal to area?

Things to think about:
- Can you show how you calculated these measurements?
- What other investigations could you try? What other shapes?
- How can you record your observations?
- Is there any easy way of finding solutions?

Remember to use the level ladder to help you to achieve your target level.

Key words

rectangle, square, perimeter, area
table, length, width

Ma3 Task Sheet - These are levels for your self assessment
Square Rectangles

Now use the Level Ladder to achieve your target.

| To get level	You should:
3	Accurately draw out some squares to investigate Measure the perimeter of squares With help, count squares to find the area of squares
4	Use your own methods for finding perimeters and areas of squares Record your results in a suitable way, checking for errors Use a method to find an answer to the original problem, noting any patterns
5	Record findings from some initial sketches in a suitable form Use calculations (using ICT as appropriate) to explore relationships Draw some conclusions, using diagrams or graphs
6	Use a calculation method to solve the initial problem, i.e. without drawing all shapes Find a solution to the original problem, explaining whether it is unique – using graphs or diagrams as appropriate Explore further variations of the investigation, based on other shapes or relationships

Now use the Level Ladder to assess your work and decide on improvement targets.

Polyominoes

Focus: Shape, Space & Measures

In this investigation you will begin by looking at combinations of 2-dimensional shapes. Of course, once you've done this, it's up to you to devise your own extensions to the problems to make the mathematics more interesting & challenging for you!

Lets start first of all with something you know: a domino. We can think of a domino as being made up of two squares:
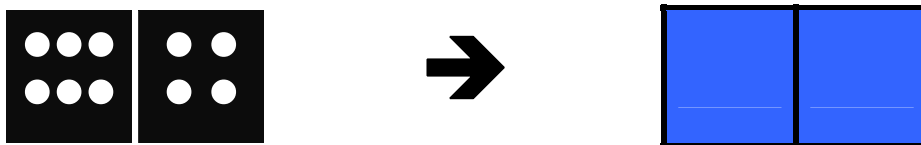
There is only one way in which two squares can be put together to make a shape by joining edges – you will always get a rectangle. You can turn it, or reflect it, but it will still be the same shape: there is only one type of domino.

Now you can explore other combinations of squares to make shapes.

Your Task:
- Start by investigating *tri*ominoes. How many of them can you find?
- What about tetrominoes?
- Are there any methods you can use to find all the possible combinations?
- Extend your investigation yourself in some way.

Things to think about:
- How can you record your findings?
- Is there a limit on the number of shapes?
- Can you transfer your work into three dimensions?
- What else could you investigate about the properties of these shapes?

Remember to use the level ladder to help you to achieve your target level.

Key words

domino, triomino, tetromino, pentomino, hexomino, polyomino

reflection, rotation, symmetry, area, perimeter

Ma3 Task Sheet - These are levels for your self assessment
Polyominoes

Now use the Level Ladder to achieve your target.

| To get level	You should:
3	Draw out all the varieties of triomino
	Find as many different types of triomino
	Explain why there are no more triominoes, or which triominoes didn't count
4	Find all the varieties of tetromino
	Check that you have no duplicated tetrominoes, explaining where you do
	Present your results clearly
	Explore one other aspect of tetrominoes, for example, reflection
5	Use a strategic approach to finding all tetrominoes and pentominoes, explaining why some have to be discounted
	Identify other features of tetrominoes, or pentominoes, including reflectional and rotational symmetry
	Explore the relationships between perimeter and area in different tetrominoes or pentominoes
6	Use a strategic approach to find all pentominoes, explaining where some have been discounted using mathematical language
	Systematically record all varieties of pentomino, and may extend this to hexominoes
	Explore other features of pentominoes or hexominoes, such as those which can be used to create nets of 3D shapes
7	Extend your investigation beyond the framework set for pentominoes & hexominoes, perhaps by considering 3D arrangements, or using other starting shapes
	Investigate other aspects of shapes produced, for example surface area, or volume
	Seek to explore general statements about some aspects of your work

Now use the Level Ladder to assess your work and decide on improvement targets.

Pocket Money

Focus: Handling Data

In this investigation you will design your own investigation which will require you to collect some data, and find out some information about it to answer a question. The questions you ask are up to you, but you need to make sure that it is a question you can answer by collecting some data.

Your focus for the investigation should be on pocket money.

You need to decide on your question, carry out some research, and then record and present your data and your findings in the form of a report.

Your Task:
- Decide on a question that you could ask in relation to the main topic
- Select a way of collecting and recording information
- Investigate the data you collect to find some answers to questions
- Present your findings neatly and *clearly*

Things to think about:
- What questions could you ask?
- What data would you need to collect? What might be useful?
- How can you present your data clearly?
- What can you do with the data you have collected?

Remember to use the level ladder to help you to achieve your target level.

Key words

table, graph, average, range, median

mean, mode, maximum, minimum

Pocket Money

Now use the Level Ladder to achieve your target.

| To get level	You should:
2	With help, decide what you are going to find out Collect some information from your class Explain what you have found out
3	Devise an appropriate question to ask Collect some data using an appropriate chart or table Present your findings in writing, perhaps using graphs
4	Identify the necessary data to collect to answer your question Collect and present your data in a clear and organised way Calculate the mode and/or range of your collected data
5	Devise a question which requires comparing two sets of data Calculate averages and/or the range of collected data to draw comparisons Present your findings using grouped data and frequency charts
6	Collect data using grouped frequency sets to draw comparisons Present findings using grouped frequency charts, or scattergraphs Explain and justify your findings in response to your original question
7	Devise a question, and make a hypothesis about your study Collect appropriate data in a suitable format Calculate averages of grouped data, for example finding the modal class Identify limitations of your investigation

Now use the Level Ladder to assess your work and decide on improvement targets.

Easy winnings

Focus: Probability

James and Sasha play a board game online which uses two dice to move around the board. Sasha doesn't have two dice, but uses a 12-sided spinner. The rules say that each player moves along the board the number of spaces shown on the two dice together. For example, throwing a 3 and a 6 means the player can move 9 spaces. An extra go is awarded each time the player rolls a double-six – James and Sasha agree that Sasha earns her extra 'roll' if she spins a '12'.
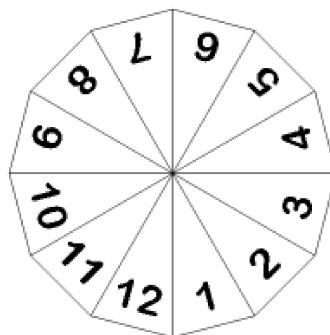
After playing several games, James claims that Sasha must be cheating because she gets many more extra 'rolls' than him on every game.

Your Task:

- Try to decide whether James is right. Must Sasha be cheating, or is there some other explanation for her luck?

- Use probability to explain why this problem has arisen

- Try to devise a fairer way to play the game.

Things to think about:

- What is the chance that each player will score a bonus point?

- What difference does using the spinner make?

- Are there any other problems which might occur?

- How can you collect and show your findings?

Remember to use the level ladder to help you to achieve your target level.

Key words

bias, equal, event, fair, unfair,

chance, outcome, possible, probability

Ma4 Task Sheet - These are levels for your self assessment

Easy winnings

Now use the Level Ladder to achieve your target.

To get level	You should:
3	List as many possible outcomes of the dice throws as possible Check your data for errors Describe the number of chances each player has of earning an extra 'roll'
4	List all the possible outcomes of the dice throws Include all variants of the dice throw outcomes Give a reason for Sasha's apparent success
5	Systematically list all the possible outcomes of dice throws Represent probabilities as either a fraction, decimal or percentage Explain a reason for Sasha's apparent success Devise a fairer way of allocating extra 'rolls'
6	Use a two-way table to record all the possible outcomes of dice throws Check probabilities by totalling for all outcomes, and compare the resulting probabilities for the two methods Devise a fairer way of running the game with the existing tools Consider how the spinner could be made more fair
7	Compare the probabilities of getting an extra 'roll' with both methods Examine another aspect of the game, for example, whether both players can expect to achieve the same number of moves over the course of a game Consider how the spinner could be made to 'mimic' the behaviour of the die Conduct an experiment with a mock-up spinner to see if you have created an improved product

Now use the Level Ladder to assess your work and decide on improvement targets.

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