Key Vocabulary

Levers	A rigid bar which moves around a pivot.
Catapult	A machine worked by a lever and ropes for hurling large stones or other missiles.
Structure	A building or other object constructed from several parts.
Stability	The state of being firmly fixed or not likely to move or change.
Vehicle	A thing used for transporting people or goods, especially on land, such as a car, lorry, or cart.
Materials	The matter from which a thing is or can be made.
Prototype	A test, or original, model of a product or a technology from which improvements, upgrades or fundamental changes can be made.
Design	A test, or original, model of a product or a technology from which improvements, upgrades or fundamental changes can be made.
Evaluate	Is the process of deciding if you have done something the best way, and looking at what could be improved.
Tools	A device or implement, especially one held in the hand, used to carry out a particular function.
Projectile	Is a missile propelled by the exertion of a force , which is allowed to move free under the influence of gravity and air resistance.

Theme Name: Balloon Blaster

Summary:

I will begin by exploring the history of toys across the world. Then, I will compare and analyse old and new toys. Throughout the half-term, I will be learning about strength, stability and structure. I will put this into practice by building structures and building a range of mechanisms, such as: leavers, cams, pulleys, gears, wedges and screws. I will use this knowledge to begin planning, designing, making and evaluating my own device that can pop a balloon.

Equipment:



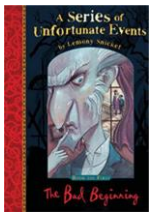






Texts we will be reading:

We will be reading A Series of Unfortunate Events: The Bad Beginning by Lemony Snicket.



Activities:

- In Maths, I will be using measure to make my vehicle and to measure the distance of the projectile. Also, I will use data collection to inform my design.
- In English, I will be writing a chronological report, an instructional text and persuasive letters to our DT lead in the school.

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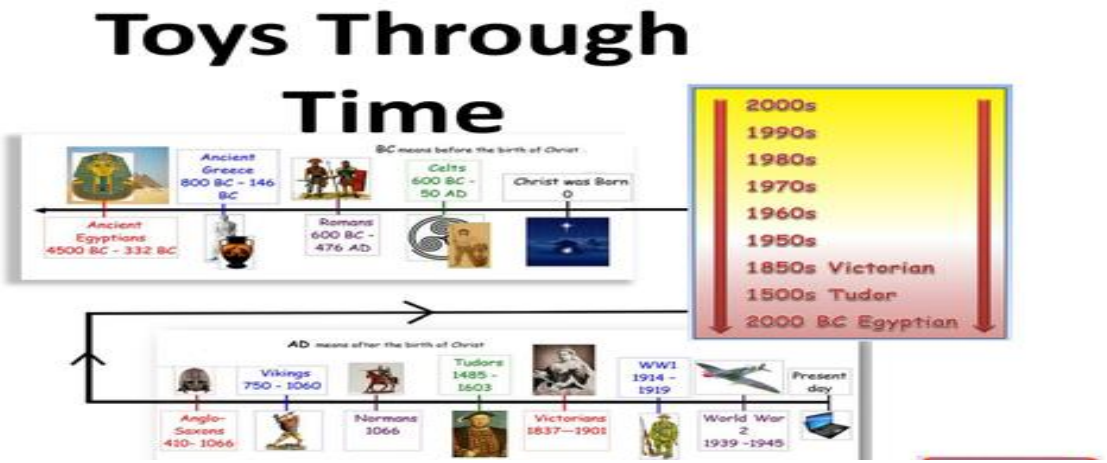
History

In our topic, I will be learning how to use sources of evidence to deduce information about the history of toys. Before the 20th century children had few toys and those they did have were precious. Furthermore, children did not have much time to play. Only a minority went to school but most children were expected to help their parents doing simple jobs around the house or in the fields. Toys changed little through the centuries. In the 16th century children still played with wooden dolls and cup and ball.

The industrial revolution allowed toys to be mass produced and they gradually became cheaper. John Spilsbury made the first jigsaw puzzle in 1767. He intended to teach geography by cutting maps into pieces but soon people began making jigsaws for entertainment. In a well off Victorian family children played with rocking horses and clockwork toys like moving animals. Clockwork trains, spinning tops, hoops and games like knucklebones and pick up sticks were also popular. So was the jackin-the-box. In the late 19th century, town councils laid out public parks for recreation. The first children's playground was built in a park in Manchester in 1859. Many new toys were invented in the 20th century. Plasticine was invented in 1897 by William Harbutt. It was first made commercially in 1900. Other popular toys in the early 20th century were tin cars. In the 1920s train sets became very popular. Soft toys also became common in the early 20th century including teddy bears. During World War II, most toy factories were turned over to war production. However, in the late 20th century, with the arrival of an affluent society plastic and metal toys became much cheaper and much more common. In the 1950s, Lego became a popular toy. Mr Potato Head was invented in 1952. The skateboard was invented in 1958. Barbie dolls were invented in 1959 and Action Man went on sale in Britain in 1966. In the early 1970s, space hoppers and clackers were popular toys. At the end of the 20th century, computer games became very popular.

Timeline



Design Technology (D&T)

Design

At the end of the half-term I will know:

At the end of this half-term, I will know how to design with a user in mind. I will be designing as a part of my planning process to ensure my product meets the requirements of the brief. The requirements are that my device includes different mechanisms in order to move and burst a balloon. Also, I will revise my knowledge of catapults so that my device can shoot a malteser. Also, I will be planning to make sure my product is of high quality. Then, I will know how to create an innovative design that improves upon existing products. I will be designing my toy based on various recyclable materials from home. I will combine elements of design from a range of toys throughout history, giving reasons for my choices. Lastly, I will ensure my product has a high quality finish, using art skills where appropriate (based on my questionnaire results). A questionnaire is a set of printed or written questions with a choice of answers, devised for the purposes of a survey or statistical study.



Make

At the end of the half-term I will know:

At the end of this half-term, I will know how to make a product through stages of a prototype. A prototype is a test, or original, model of a product or a technology from which improvements, upgrades or fundamental changes can be made. Prototypes are useful to identify errors so then you can make appropriate refinements or possible changes to your design.

Also, I will show an understanding of the qualities of materials to choose appropriate tools to cut and shape accurately. I will be using a saw to cut wooden dowel to support the structure of my device. In addition, I will be using glue guns to attach mechanisms to my device. Before using these tools, I will learn the health and safety of handling these tools appropriately. Furthermore, I will use my prior knowledge of electricity to use different kinds of circuits as well as incorporate a switch in my product.


Evaluate

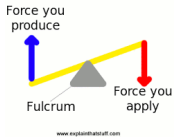
At the end of the half-term I will know:

At the end of this half-term, I will know how that the evaluation stage is a cyclic process in order to refine my product and mechanism as the making process develops. At the end of the making stage, I will know how to evaluate the final design of products to suggest improvements if I were to make a device again. An evaluation is the process of judging or calculating the quality, importance, amount, or value of something. It is part of the iterative design process, a circular design process that models, evaluates and improves designs based on the results of testing.

Technical Knowledge

At the end of the half-term I will know:

At the end of this half-term, I will know how to apply an understanding of how to strengthen, stiffen and reinforce more complex structures. A structure is a building or other object constructed from several parts. It will be important to ensure this is reinforced as the device will also be supporting a catapult. I will also understand and use my knowledge of pulleys and levers. The lever and the pulley are two very simple machines that we can use to help move objects around. A lever is a bar with a balance point called the fulcrum and a pulley looks very similar to a wheel and axle. However, rather than winding or unwinding rope onto an axle, the outer wheel has a groove around the edge that can hold a rope. Also, I will know what a fulcrum is. This is when the point against which a lever is placed to get a purchase, or on which it turns or is supported. Furthermore, I will use my knowledge (that a small gear will have to rotate more times to make a larger gear turn one revolution) to make my device move.



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Maths:

Here are the National Curriculum objectives that we will cover this term:

I can convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)

I can understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.

I can estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water].

I can solve problems involving converting between units of time.

I can use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

I can identify 3-D shapes, including cubes and other cuboids, from 2-D representations.

I know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.

I can draw given angles, and measure them in degrees (°).

I can identify angles at a point and one whole turn (total 360°), angles at a point on a straight line and 1/2 a turn (total 180°), other multiples of 90°.

I can use the properties of rectangles to deduce related facts and find missing lengths and angles.

I can distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

At the end of the half term:

I will know how to convert between different units of metric measure.

I will know to use my knowledge of place value, multiplication and division to convert between standard units.

I will know that 1 kilogram is equivalent to 1000g.

I will know that 1 metre is equivalent to 100 centimetres.

I will know that 1 centimetre is equivalent to 10 millimetres.

I will know that 1 kilometre is equivalent to 1000 metres.

I will know approximate equivalences between metric and imperical units.

I will know that 1 inch is equivalent to 2.5 centimetres.

I will know that 16 ounces is equivalent to 1 pound.

I will know that 8 pints is equivalent to 1 gallon.

I will know that volume means the amount of space occupied by a 3D shape. It is measured in cubed units like cm^3.

I will know that capacity means the amount a container can hold. Capacity is measured in metric units such as litres or imperial units such as pints.

I will know how to estimate the volume and capacity of 3D shapes and containers, using $1cm^3$ cubes to work out the volume of 3D shapes.

I will know how to use multiplication and division to convert between different units of time. For example: 180 minutes into hours. 180÷ 60 = 3 hours.

I will be able to recognise and name 3D shapes.

I will know that an angle is a measurement of how much something turns and that angles are measured in degrees.

I will be able to estimate and compare acute (less than 90°), obtuse (between 90° and 180°), and reflect angles (between 180° and 360°).

I will be able to accurately draw angles and measure them in degrees (°) using a protractor.

I will know that angles around a point add up to 360 and that angles on a straight line add up to 180.

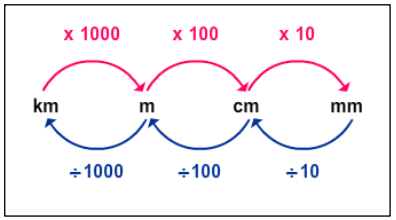
I will know the properties of rectangles. For instance, I will know that all rectangles have straight sides making up two pairs of parallel lines, four corners, and four right angles, and that the angles in all rectangles add up to 360°.

I will know that a regular polygon is a 2D shape that has equal angles and three or more straight sides of equal length.

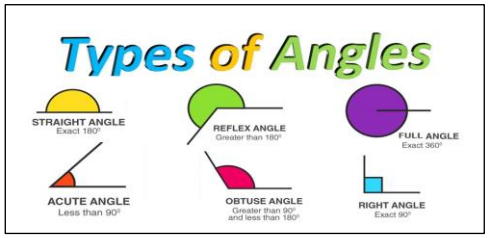
I will be able to tell the difference between regular (where all angles and sides are equal) and irregular polygons (where all angles and sides are not equal).

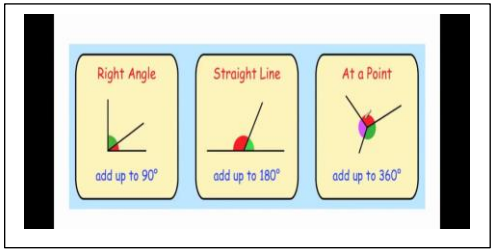
I will be able to show the position of simple shapes on the full coordinate grid using all four quadrants, using positive and negative values for x and y.

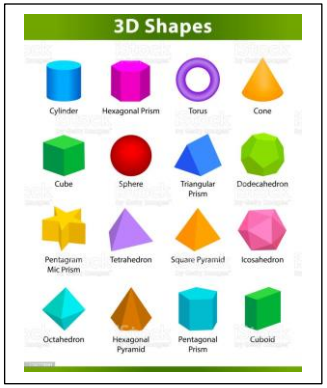
I will be able to record the position of a shape using the full coordinate grid after a shape has been translated or reflected.

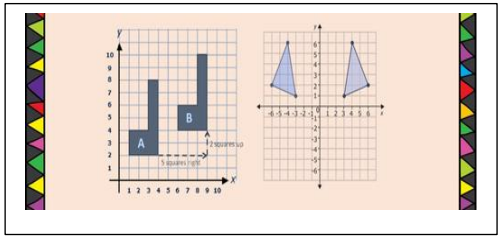


Length	Mass	Capacity
1 inch = 2.5cm 1 foot = 30cm 1 mile = 1.6km 5 miles = 8km	16 ounces = 1 pound 1 ounce = 25g 1 pound = 450g 2.2 pounds = 1kg	8 pints = 1 gallon 1 gallon = 4.5 litres 1 pint = 570ml









PSHE:

In PSHE I will be learning about how to be safe online and using social media.

How to be safe online and using social media

As modern day technology is being used more frequently both at home and at school, it is important to educate children from a young age about the dangers of the Internet in the hope that they will remain safe on the Internet whilst they benefit from its many uses.

At the end of the half-term I will know:

- Strategies for keeping safe online.
- The responsible use of mobile phones.
- How to manage requests for images of themselves or others.
- To understand personal boundaries.

RE:

In RE I will be learning about Sikhism.

At the end of the half-term I will know:

- Special buildings in the local area.
- The main features of Sikh gurdwaras.
- The significance of the gurdwara for Sikhs.
- What happens inside the gurdwara.
- The importance of equality.

Sikhism was founded by Guru Nanak around 500 years ago in a place called the Punjab. This is an area, which spans part of India and Pakistan in South Asia today. Guru Nanak is the **founder** of Sikhism. Sikhism is still based on his teachings and those of the nine Sikh Gurus who followed him. Sikhs believe in one God who guides and protects them. They believe everyone is equal before God. Sikhs believe that your actions are important and you should lead a good life. They believe the way to do this is: keep God in your heart and mind at all times, live honestly and work hard, treat everyone equally, be generous to those less fortunate than you and serve others. Also, the Sikh community of men and women is known as the Khalsa, which means the 'Community of the Pure'. In order to become a Sikh and join the Khalsa, people need to follow the Five Ks.

A Gurdwara is the place where Sikhs come together for congregational worship. The first Gurdwara in the world was built by Guru Nanak in 1521-2 at Kartarpur. There are about 200 Gurdwaras in Britain. The literal meaning of the Punjabi word Gurdwara is 'the residence of the Guru', or 'the door that leads to the Guru'.

Computing:

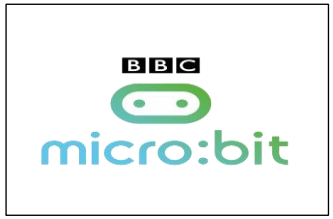
This term, I will be learning how to program a scoreboard using a microbit.

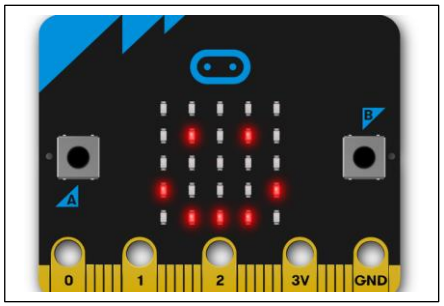
Programming:

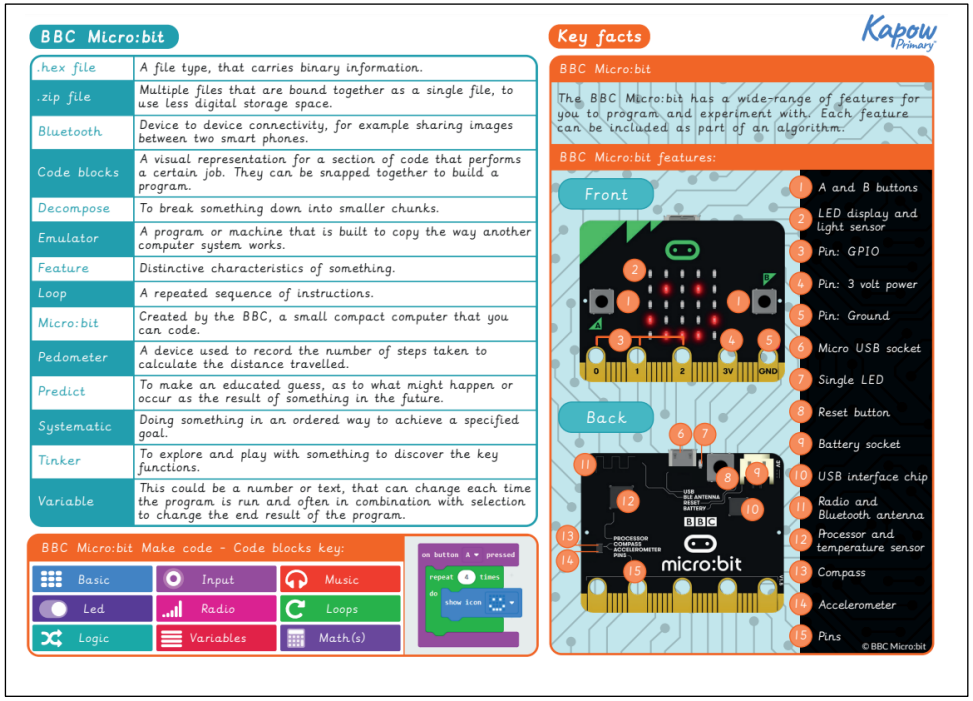
- I can design, write and debug programs that accomplish specific goals use sequence, selection, and repetition in programs.
- I can solve problems by decomposing them into smaller parts.
- I can use sequence and repetition in programs; work with various forms of input and output.
- I can use logical reasoning to explain how some simple algorithms work
- I can work with variables and various forms of input

At the end of the term I will know:

- How to tinker with a new piece of software.
- How to program an animation.
- How to recognise coding structures.
- How to create a program.







Science:

In Science, I will be learning about Forces.

Forces:

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
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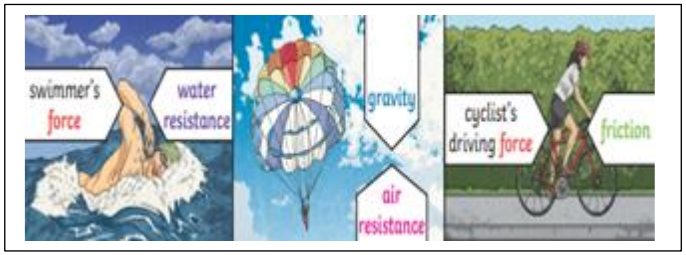

At the end of this topic, I will know:

At the end of this topic, I will know forces can make an object start to move, stop moving, change direction, change its shape, move more slowly or move faster. I will know mass is how much mater is inside an object and that it is measured in kilograms (kg). Whereas weight is how strongly gravity is pulling an object down and it is measured in newtons (N). Interestingly, I will learn that Isaac Newton is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree. Additionally, I will learn about forces in action. For example, water resistance and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, air resistance is helpful as it stops the skydiver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful. Moreover, I will learn that pulleys can be used to make a small force lift a heavier load. The more wheels in a pulley, the less force is needed to lift a weight. Also, I will learn that gears or cogs can be used to change the speed, force or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other. Lastly, I will learn that levers can be used to make a small force lift a heavier load. A lever always rests on a pivot. I will be able to apply this knowledge to my Design Technology unit on moving mechanisms.