Key Vocabulary:

Conductor

Insulator

Electricity

Battery

Cell

Circuit

Parallel circuit

Series circuit

Electronics

Intruder

Products

Appliance

Year 4 - Robot Wars (Spring 1 and 2)

Summary: We will be learning about electronics and exploring how to combine our knowledge of electrical circuits with design to create a variety of fun and useful products. We will be learning how basic electrical circuits work and then using this knowledge to design electronic toys and gadgets. We will be learning about where electricity comes from, how it is made and transported to our homes for the appliances we use in everyday life. We will studying this theme over Spring 1 and Spring 2.

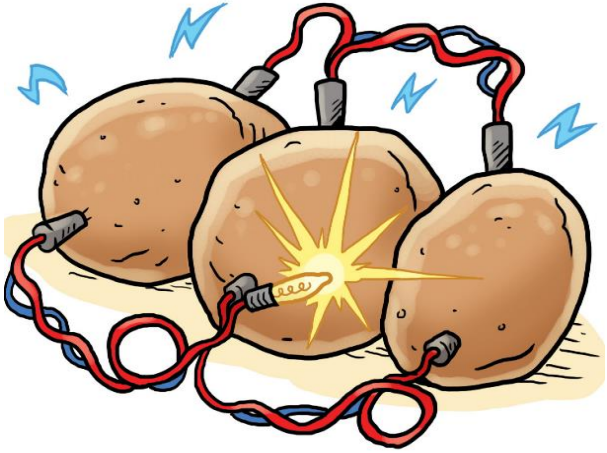
Suggested Activities:

We hope to be able to combine motors with other materials to create an Art Bot.

We will discover how potatoes can be used to create electricity.

We will be making toy electric cars.

We will create series and parallel circuits and use this knowledge to create an intruder alarm and times table checker.



In English we will be looking at and writing poetry based on our main text of The Iron Man. We will be writing diaries from the perspective of the Iron Man and newspaper reports and persuasive letters.

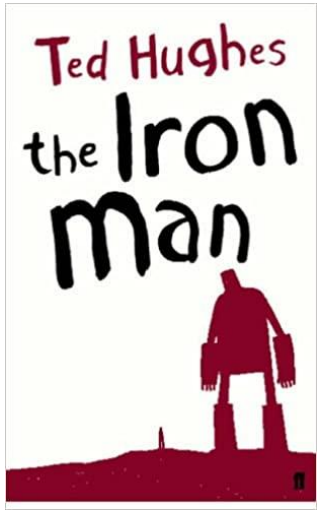
We will be using figurative language linked with our poetry writing. Identifying and improving noun phrases. Understanding about the use of determiners, more practice with prepositional phrases and using expanded noun phrases to give our reader a clear image of our ideas to encourage them to read more.

In PE we will be doing gymnastics and dance on Fridays.

With the PE coaches we will be doing sports hall athletics activities.

To start this theme, we will be reading

The Iron Man by Ted Hughes



In this book mankind must put a stop to the dreadful destruction by the Iron Man and set a trap for him, but he cannot be kept down. Then, when a terrible monster from outer space threatens to lay waste to the planet, it is the Iron Man who finds a way to save the world

In maths we will be measuring out materials to make our DT toys and gadgets. We will use reflective symmetry to draw our robots.

In history we will be looking at how various scientists have been involved in bringing electricity into our everyday lives. How this has changed the way we live today and what life was like before we had electricity.

In art – we will be studying work by the artist Eric Joiner - robots, doughnuts or both have featured prominently in all of Joyner's paintings. The rest is up to his imagination.

In DT we will be learning how to:

Key vocabulary

Prototype

Criteria

Battery

Generate

Bulb

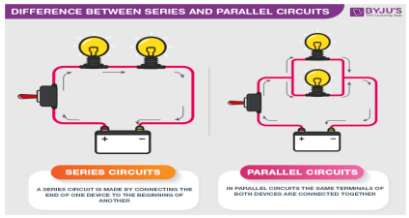
Motor

Intruder alarm

- Create series and parallel circuits.
- Cut materials accurately and safely by selecting appropriate tools.
- Measure and mark out to the nearest millimetre.
- Apply appropriate cutting and shaping techniques
- Select appropriate joining techniques.
- Choose suitable techniques to construct products or to repair items.
- Strengthen materials using suitable techniques.
- Design with purpose by identifying opportunities to design.
- Make products by working efficiently (such as by carefully selecting materials).

- Refine work and techniques as work progresses, continually evaluating the product design.
- Improve upon existing designs, giving reasons for choices.
- Disassemble products to understand how they work.

<u>By the end of this unit I will know:</u>



A series circuit comprises a path along which the whole current flows through each component.

A parallel circuit comprises branches so that the current divides and only part of it flows through any branch.

How to use a glue gun and a saw safely and accurately.

That there are 10mm in a cm and I will be able to measure accurately. How to work collaboratively.

How to follow instructions step by step to make my product work.

I will be able to disassemble products (take it apart) to see how they work and know how to take care of the componentry used to ensure my product works.

- Potatoes and other vegetables generate electricity so can be used to power an electrical circuit without a battery.
- A potato that is boiled for 8 minutes can make a battery that produces ten times more power than a raw one.
- An art bot is an electronically operated toy which we can guide to make pictures.
- Circuits can be used to make objects move, light up and make noises.
- An intruder alarm senses movement and sets off an alarm to raise people's awareness.

In science this term I will be learning to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors

Throughout this term, the children will construct simple series circuits, trying different components, for example, bulbs, buzzers and motors. The children will make and test simple switches and use these to create simple devices. The children will draw the circuit as a pictorial representation. During the term they will be taught about precautions for working safely with electricity and the difference between mains and battery.

The children will work scientifically by:

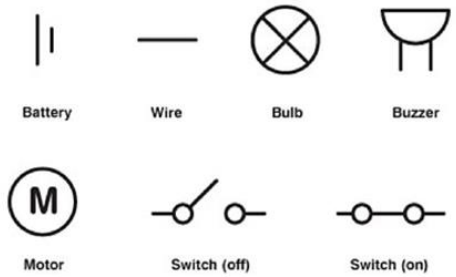
Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.

By the end of this these I will know:

That kettles, fridges, TVs and other household appliances run on mains electricity, generated and transported to the house.

What a series and parallel circuit is. (see DT)

Some of the symbols used in electrical circuit diagrams:



The difference between a battery and a cell – A cell is a single unit device which converts chemical energy into electric energy. A battery usually consists of a group of cells. A cell has a positive and negative end. Cells generate electricity by using chemical energy which they store.

How a switch works – when it is open the components will not work and when it is closed it should work.

Electrical conductors allow electricity to pass through them – electrical conductors include most metals.

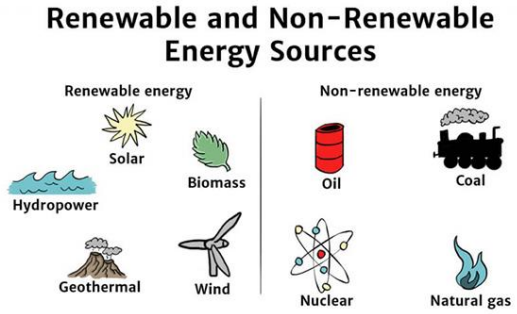
An electrical insulator does not allow electricity to pass through it eg plastic.

How to stay safe by not directly touching a mains electrical source or using a conductive material (fork or knife) to touch an electrical source.

When more cells are used in a circuit the bulb will be brighter. In a parallel circuit, the electrical current is shared equally between the different components, eg the bulbs have the same brightness.

That mains electricity is generated using renewable energy or non-renewable sources.

Sources of renewable energy include solar, wind, water (hydropower), geothermal -energy from heat inside the earth. These sources can be replaced quickly. Sources of non-renewable energy include fossil fuels- coal, gas, oil, and nuclear energy. These are sources of energy that cannot be replaced quickly.



SPRING TERM HISTORY

Throughout the term, we will study inventors and those responsible for the first ideas about electricity, batteries and go on to look at some significant electrical appliances that we use today. This will be taught through comprehension and shared reading.

By the end of this term I will know:

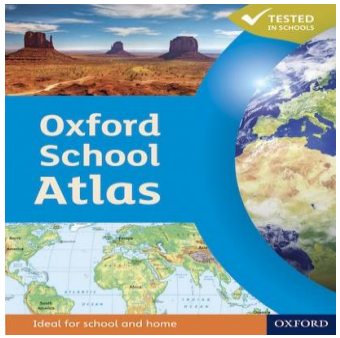
Thomas Edison is usually credited with inventing the light bulb in 1879

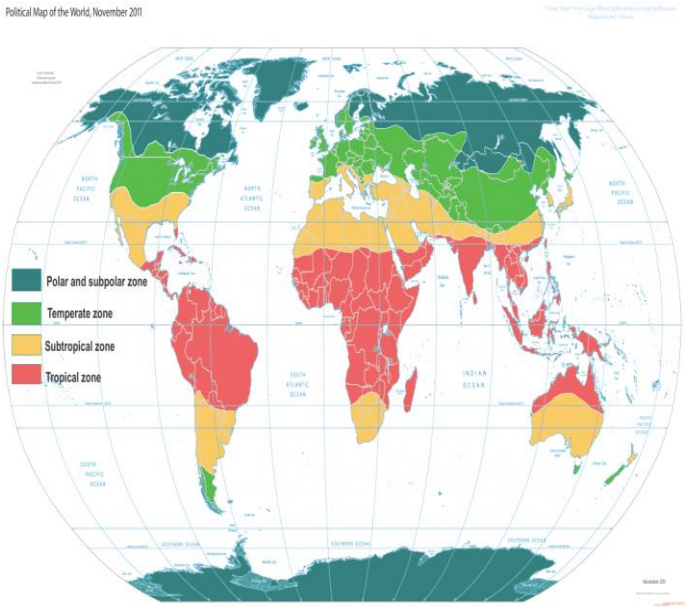
Nikola Tesla and Michael Faraday were also important in inventing electricity.

To explore inventors involved in inventing electricity.

SPRING TERM GEOGRAPHY

- Describe and understand key aspects of: physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle
- Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied.
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature





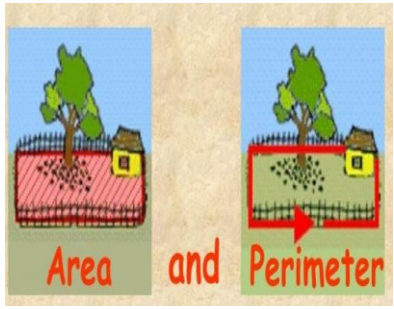
By the end of the term I will know:

Climate zones are areas around the world with specific patterns of weather. In a certain place, if there is a pattern of weather that occurs over a long period of time, this can be described as its climate.

Different climate zones across the world are polar, temperate, subtropical and tropical. We live in a temperate zone.

Biomes are regions of the world with similar climate (weather, temperature) animals and plants. There are terrestrial biomes (land) and aquatic biomes, both freshwater and marine. Whereas a biome is a large area on the earth's surface that is defined by the types of animals and plants living there, a vegetation belt is **just the plant life as a whole within a certain area.**

Spring 1 - in Maths we will be learning:

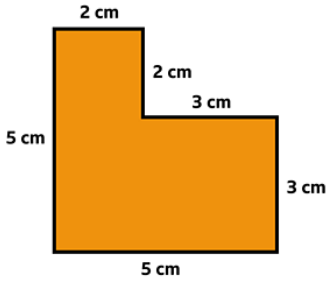


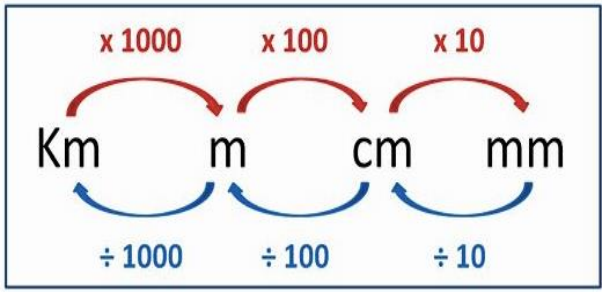
Perimeter and area:

- To investigate what is perimeter? Perimeter is the total distance around the outside of a shape

- To measure accurately

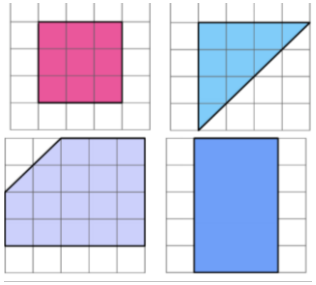
- To measure and find missing lengths of rectilinear and compound shapes





- To convert between units of measure I will know 10mm = 1cm , there are 100cm in a metre and 1000m in a km.

- To add and subtract lengths, converting to a unit of measure where needed



- To investigate area – area is the total space inside a shape.

- To find area by counting squares

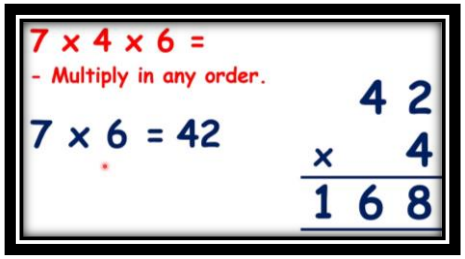
- To make shapes and compare area

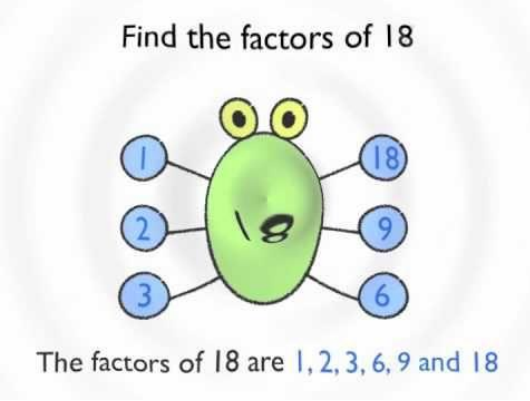
Multiplication:

- To learn our 11 and 12 times-table off by heart

1 × 11 = 11	1 × 12 = 12
2 × 11 = 22	2 × 12 = 24
3 × 11 = 33	3 × 12 = 36
4 × 11 = 44	4 × 12 = 48
5 × 11 = 55	5 × 12 = 60
6 × 11 = 66	6 × 12 = 72
7 × 11 = 77	7 × 12 = 84
8 × 11 = 88	8 × 12 = 96
9 × 11 = 99	9 × 12 = 108
10 × 11 = 110	10 × 12 = 120
11 × 11 = 121	11 × 12 = 132
12 × 11 = 132	12 × 12 = 144

- To multiply 3 numbers together





-To recognise and use factor pairs – factors of 6 are 1 and 6 as well as 2 and 3

Factors of a number are numbers which go into a number equally without leaving a remainder

-How to use multiplication in an efficient manner

- To practice and perfect written methods for:

- Multiply 2-digits by 1-digit

- Multiply 3-digits by 1-digit

123 × 5

1st Step	2nd Step	3rd Step
123	123	123
× 5	× 5	× 5
5	15	615
1	1 1	1 1

- Divide 2-digits by 1-digit

- Divide 3-digits by 1-digit

$$\begin{array}{r} 032 \\ 9\overline{)28^{2}8^{1}} \end{array}$$

1. Circle the correct number of possible combinations that can be made using the table below.

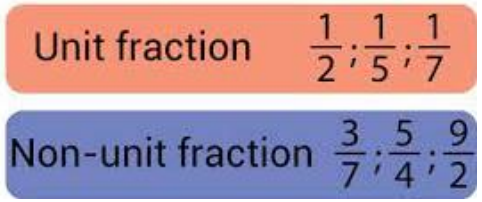
Sandwich	Drink
Ham Cheese Jam Egg Tuna	Water Milk Coke Lemonade

9 19 20

- To solve correspondence problems - Correspondence problems involve finding the number of possible combinations for different groups of items. The combinations are every possible choice that could be made if you were to pick one item out of each group, making sure the children learn how to work systematically

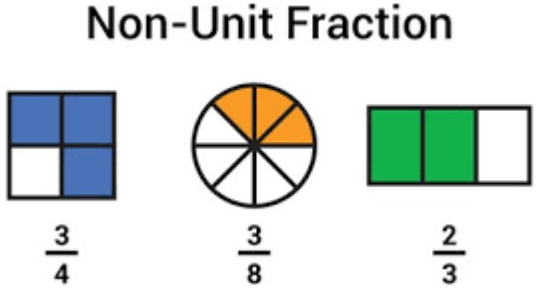
Spring 2 - in Maths we will be learning:

Fractions:



- To investigate and

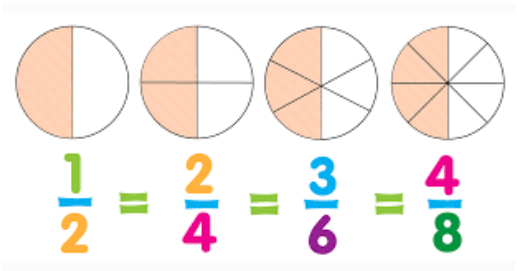
- To identify unit and



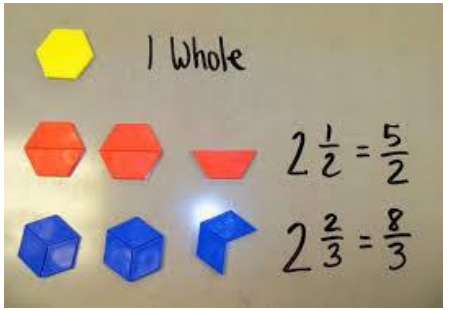
understand what a fraction is

non-unit fractions The number on the top of the fraction is called the numerator, in a unit fraction this is always 1. In a non-unit fraction this can be anything other than 1. The number on the bottom of the fraction is called the denominator. This tells us how many equal parts the whole has been divided into.

- To recognise and find equivalent fractions (fractions that are the same size but have different numbers for the numerator and denominator)



- To find and use fractions greater than 1 – fractions bigger than 1 are called improper fractions and the numerator will be bigger than the denominator.



- To count in fractions

- To add fractions

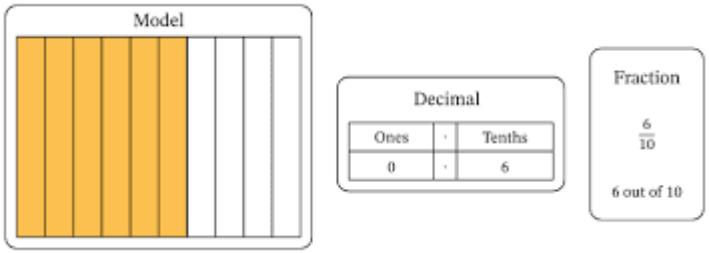
- To add 2 or more fractions

- To recognise tenths and hundredths

- To identify and investigate tenths and hundredths

- To count in tenths and hundredths

- To recognise tenths and hundredths as decimals



DECIMAL PLACE VALUE CHART

THOUSANDS TO THOUSANDTHS

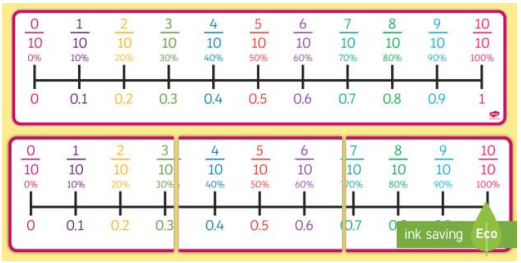
Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

- To place tenths and hundredths on a place value grid

- To place tenths and hundredths on a number line

- To divide 1 or 2 digits by 10

- To divide 1 or 2-digits by 100



<u>When I divide a number by 10, I move all of the digits one place to the right.</u>

<u>When I divide any number by 100, I move all of the digits two places to the right.</u>

Spring 2

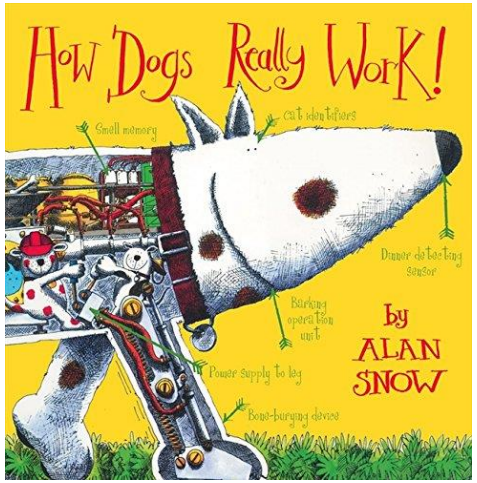
In English we will be learning to:

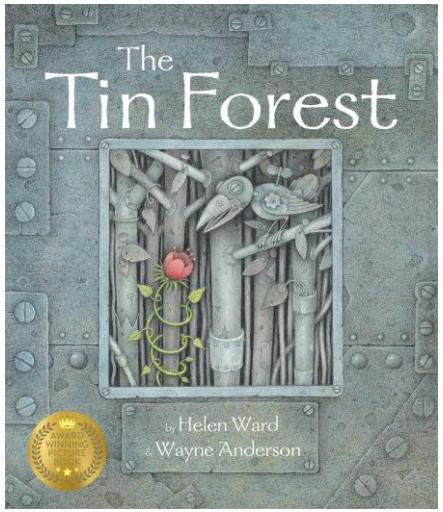
We will participate in discussions, presentations, performances, role play, improvisations and debates.

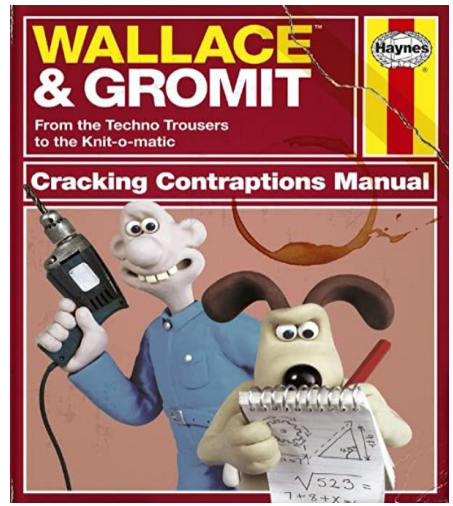
We will write in a variety of styles including instructional and explanation texts, as well as fiction writing. During the lessons children will identify the features of the particular text type by analysing examples, then apply these in their writing. The children will edit and redraft their work for presentation.

In our Grammar lessons, we will be consolidating grammar taught previously, plus:

Expanded noun phrases, Prepositional phrases – (a preposition tells us where something is (beside, under, against, etc) or when something is happening (until, after, before), the use of plural apostrophes and finally, developing our knowledge and use of figurative language – using similes, metaphors, personification, etc, to add to our work. To support our learning will be reading the following books in class for English and shared reading, as well as additional texts supporting our theme this term.







I will know - An expanded noun phrase **gives more detail or information about a noun in a** simple noun phrase. E.g. 'She walked through the forest.' becomes – 'She walked through the dark, mysterious forest.'

Plural possessive apostrophes indicate when something belongs to more than one person or thing, e.g. The dog's bowl – this means there is one dog and it is his bowl. However, if it says 'The dogs' bowl' this means there is more than one dog that the bowl belongs to. The apostrophe here goes after the s.

Similes – the comparison of one thing with another thing of a different kind, used to make a description more vivid (e.g. *as brave as a lion*)

Metaphors - a word or a phrase used to describe **something** as if it were something else: For example, "A wave of terror washed over him." The terror isn't actually a wave, but a wave is a good way of describing the feeling. "Jess is dynamite." She's not made of dynamite, but it's a way to explain how exciting she is.

Personification - figurative language where human characteristics, such as thoughts, feelings or actions, are given to something non-human.
Lightning danced across the sky.
The wind howled in the night.
The car complained as the key was roughly turned in its ignition.
Rita heard the last piece of pie calling her name.

PSHE will be taught over the whole term.

The children will look at and investigate the unit of work 'How to Keep safe in our local area'

During this unit of work, the children will discuss and learn how:

- To understand and manage risk.

- To deal with risk at the places I visit.

– Spot dangers in the road-

- Keep safe outside of school

- Identify people who they can trust to help them to keep safe.

Key vocabulary for this unit:

risk, minimise, manage, low risk, high risk, rules harm, signs, precaution, support/care giver, trustworthy, report

At the end of the unit, the children will be able to:

- remember to: consider how a risk can affect them. The children will be able to consider the amount of risk involved and follow rules to keep safe

- To follow signs and rules, use role-models in our communities to lower risks.
- To only approach sensible strangers, how can you report to these people?

Spring I PE:

We will be using music to 'Step to the Beat' for a unit on Fitness and health. The children will be taught

- To understand the importance of a warm-up.
- To improve fitness, particularly strength and stamina
- To complete a step routine to music to improve fitness. · To develop co-ordination and balance
- To develop co-ordination and balance
- To understand the importance of a warm-up.
- To develop co-ordination and balance

Vocabulary and Information		
Heart Rate: how many times the heart pumps blood around the body over a set amount of time. Usually 1 minute **Recovery:** the ability for the heart rate to return to its resting rate. The quicker the better **Exercise:** an activity requiring physical effort **Muscular Strength:** is the amount of force a muscle can produce in a single effort. A weight lifter or sprinter are examples of sports that require muscular strength **Muscular Endurance:** to repeatably use the same muscle or group of muscles for an extended period of time. Running, cycling and rowing are some sports that require muscular endurance. How many different sports involve running? **Flexibility:** how much a muscle or joint can move through its full range of motion. How far do your muscles stretch? Gymnasts and dancers require a lot of flexibility **Cardiovascular Fitness:** being able to sustain physical activity and the ability to deliver oxygen to the working muscles. Long distance running, boxing and any sport that requires high intensity physical activity need cardiovascular fitness **Diet:** the kinds of food and drink that you intake	**Personal Challenges – Be The Best You Can BE!** Personal challenges are a great way to motivate yourself and provide a bit of competitiveness. The great thing is that it is purely about YOU! No one else. It doesn't matter how anyone else does. Have a go and set a score. Can you improve it to get a personal best? Even if it's only a small improvement.  **Growth Mindset**  Having a growth mindset is associated with having the fundamental belief that your abilities and outcomes are influenced by hard work **Lifestyle** A healthy active lifestyle is essential for physical and mental health and wellbeing. You should be physically active for at least 60 minutes a day. 30m in school, 30m at home #active60  Your diet is also important. A healthy diet involves eating from the 5 food groups: Carbohydrates, Protein, Fruit and Veg, Dairy (if applicable) and Fats	**Short Term Effects** When you exercise you will experience some changes. Your heart rate and breathing will increase and you will breath heavier. You may start to get hot, sweaty and your face might go redder in colour. Some of your muscles will start to ache. You will need to rest after exercise as there is a risk of injury without any rest! **Long Term Effects** During exercise the body systems respond immediately to provide energy for the muscles to work. After regular and repeated exercise, these systems adapt to become more efficient. You may be able to run further and quicker. Heart rate lowers (resting and active). Increase your muscle strength, endurance and flexibility. Some muscles might become more visible and less body fat. **Circuits**  Circuit training is a brilliant way to train in all aspects of your fitness. A circuit can be designed to train all during the same circuit or focus on a specific one such as flexibility. You can use a circuit to see how your heart rate changes after different kinds of exercise!

Spring 2 PE

The children will learn how to play handball, culminating in a year 4 tournament in the final week

The children will be taught to:

- To throw pass and receive the ball
- To develop passing and receiving techniques
- Introduce passing and shooting
- To develop passing and shooting
- Moving with and without the ball (emphasis on dribbling)

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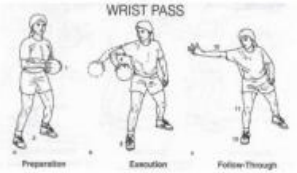
Key Vocabulary	Skills	Famous Player & Competitions
Passing – not set style of passing but must be one handed i.e. shoulder, bounce, side (wrist)  **Dribbling** – used infrequently – only using one hand with a continuous bounce ideally if no defenders in front of you. **Outwit** – use of passes and movement to get the ball past an opponent. **Positions** - set places for each player – all players defend and all players attack. **Centre Pass** – must be passed to one of your own players. **Re-starts** – Goal keeper starts with the ball if attackers through it out or the last touch is off the goal keeper. 	**Attacking and Shooting** Teams attack as a full 6. Normally one ball carrier and the others fan out round the opposition's D. Try to spread them out as much as possible! Try to move the ball around quickly to outwit defenders to get into better positions to shoot from. Shooting - One handed, ideally with a jump at the edge of the D to shoot from closer. Bottom corners ideally!  Shooting  **Defensive Positioning** All players to immediately drop back to goal-side and spread around the outside of the GK area. 	 Danish player Mikkel Hansen – 3 time world player of the year. Olympic, World & European champion For countries the highest competitions are the World Championships and the Olympic Games. Clubs the EHF Champions Cup is the top competition. **Court**  Split into 2 halves with a centre spot and two areas where only the GK can be. (Other players may enter the GK area but their feet must not touch the floor in possession of the ball. **Basic Rules** • 7 players per side (1GK, 6 outfield) • Can't shoot inside the D (GK area) • Take up to 3 steps with the ball then you must dribble (bounce or pass the ball) • You can hold the ball for 3 seconds • You must make an attempt to attack and try and school • Cannot pass back to GK in their area. • No contact

Spring 1

Computing

This half-term we will be completing a unit of work on Data Handling and Investigating the Weather

At the end of the unit I will know how:

- To log data taken from online sources within a spreadsheet
- To design a weather station
- To design an automated machine to respond to sensor data
- To understand how weather forecasts are made

Investigating weather

Algorithm	A sequence of instructions which, when followed, solve a problem.
Automated machine	Works without the need for human interaction, after being programmed to carry out a specific job.
Calculate	To use mathematics to discover, prove or solve something.
Climate	The weather conditions you would normally expect in a location.
Device	Equipment created for a certain purpose or job.
Forecast	To predict what might happen or occur as the result of something in the future (for example, weather forecasts).
Log data	A record of information that has been collected by a person or a computer, while monitoring something.
Predict	To make an educated guess, as to what might happen or occur as the result of something in the future.
Record	To log information in the present (for example data during a science experiment), to look back on it in the future.
Sensor	A tool or device that is designed to monitor, detect and respond to changes for a specific purpose, such as a smoke alarm, which will ring if smoke is detected in the air.
Source	Where something comes from, for example milk is a source of calcium.
Spreadsheet	A file where you can input, sort and analyse data across a series of cells.
Temperature	How hot or cold something is.
Weather	The current condition of the atmosphere around the world, such as the temperature, rain, wind, clouds and sunshine.

Key facts

Kapow Primary

A weather station uses a system of sensors to monitor the atmosphere:

Weather satellites collect and send data back down to Earth, after monitoring the atmosphere from space.

Using a green screen when recording, means that the subject (person, animal, object) can be separated from the backdrop and put in front of another background.

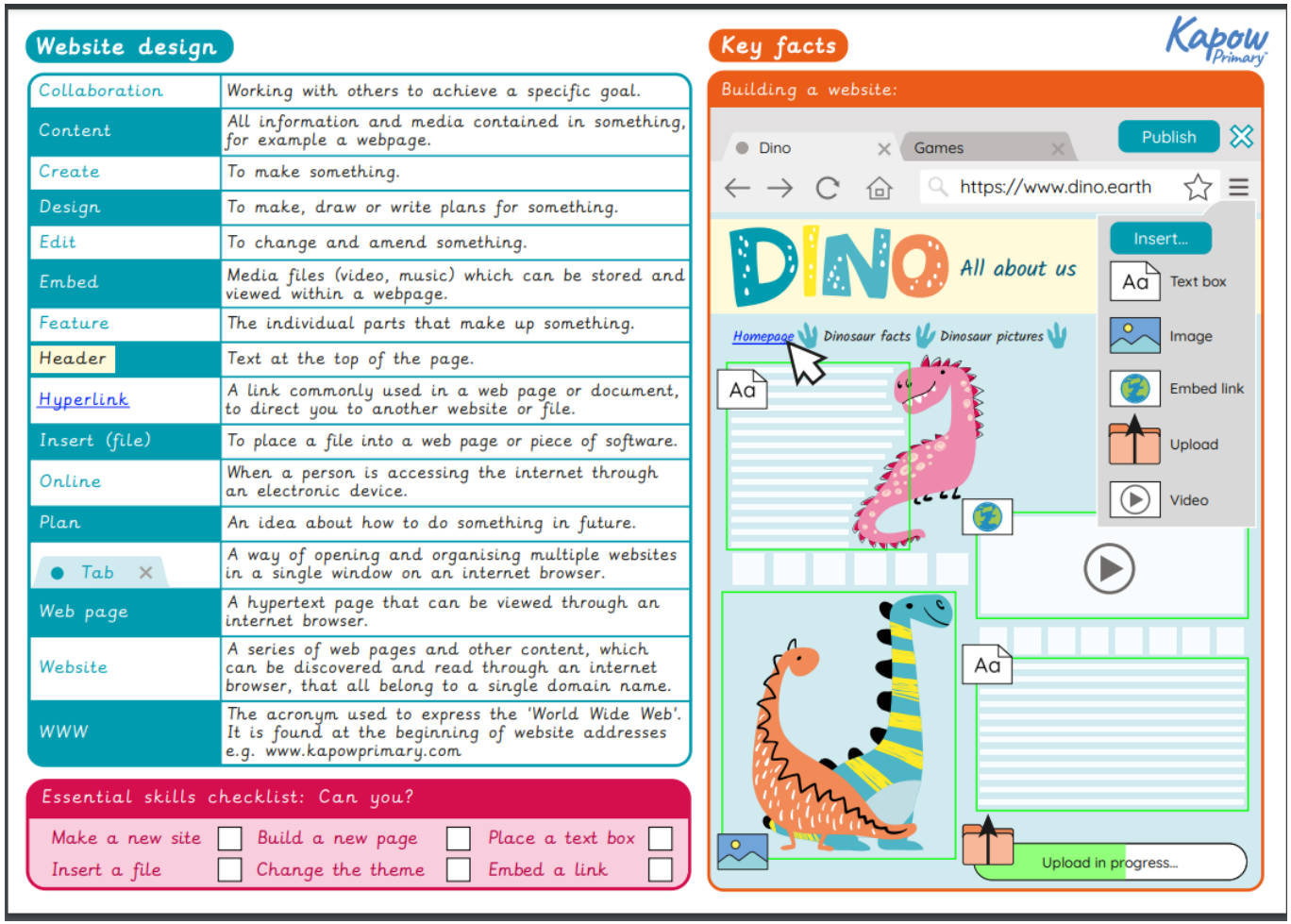
Spring 2

Computing

This half-term we will be completing a unit on Creating Media and Website Design.

At the end of the unit I will know:

- How, to explore the features of Google Sites to learn how to create content for a web page
- To plan content for a web page as a collaborative online piece of work
- To create a web page as part of a collaborative class website
- To plan and create a website
- To create a website and evaluate its success

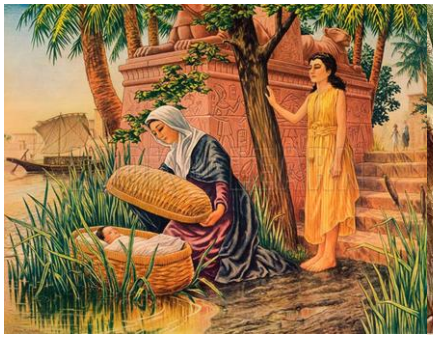


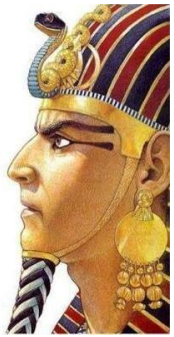
Spring 1

RELIGIOUS EDUCATION

In RE this term, the children will be learning about Judaism.

Spring 1 the children will be learning about the importance of Moses to the Jewish people, and the Exodus from Egypt.

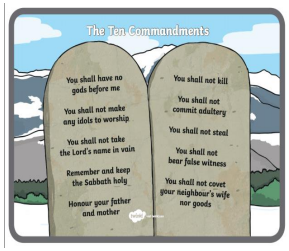




At the end of the unit I will know:

- The story of Moses and the exodus from Egypt.
- The importance of the story of Moses for Jewish people.
- The importance of the festival of Pesach. Pesach, sometimes called Passover, is one of the most important Jewish festivals. **Jews remember how the Israelites left slavery behind them when Moses led them out of Egypt** more than 3000 years ago

- Which food are used at the Seder meal and their significance. There are at least five foods that go on the seder plate: **shank bone (zeroa), egg (beitzah), bitter herbs (maror)**, vegetable (karpas) and a sweet paste called haroset. Many seder plates also have room for a sixth, hazeret (another form of the bitter herbs).
- The significance of the Ten Commandments and why these are important for the Jewish people.



Spring 2

RELIGIOUS EDUCATION

The children will continue to learn about Judaism, this term's focus in the Jewish home.

At the end of the unit they will know:

The importance of the home in Jewish life: keeping a kosher home and observing dietary laws

- understand what it means to keep a kosher home and the significance of this for Jews
- appreciate the importance of the home in Jewish life and practice
- reflect on what is special about their own homes

The Shema and the Mezuzah

- learn about the Shema and the Mezuzah: what they are and why they are so important in Jewish life

The Hebrew word SHEMA means hear or listen. The Mezuzah is a scroll which Jewish people keep inside a case. It is placed on doorframes to constantly remind Jewish people of God's presence.

- reflect on the values, beliefs and hopes that are important in their own lives

Observing Shabbat in the home (Shabbat is the Hebrew word for Sabbath, which Jewish people mark from nightfall on Friday night until nightfall on Saturday.)

- learn about the origins and importance of Shabbat

- reflect on the importance of rest in their own lives

- learn about the family ceremonies marking the beginning and end of Shabbat

- reflect on their own feelings associated with the beginning and end of the week end and learn about what happens during Shabbat and what is not permitted during Shabbat