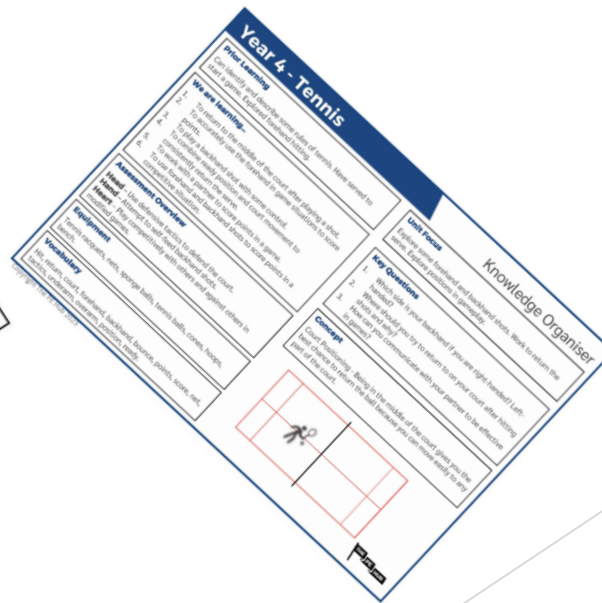# Year Knowledge Organisers

At South Hill, we have created 'Knowledge Organisers' to help pupils and parents to know what the children will be learning in each of our Foundation subjects. These contain essential vocabulary and facts for each topic.

Please see 'Knowledge Organisers' attached for Year 4 for the Spring term, which will also be in pupil's books and on working walls in school.

YEAR 5 SCIENCE – FORCES

KNOWLEDGE ORGANISER

What have we learnt in this topic before and what we will learn this year?

In Year 2, we learnt in our topic 'Use of Every day materials' to:
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

In Year 3, we learnt in our topic 'Forces and Magnets' to:
- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

In Year 5, we will learn to:
- 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.

TYPES OF FORCES

Gravity – the force that pulls things to the ground. Gravity also holds Earth and other planets in their orbits around the sun.

Friction – friction is a force between 2 surfaces that are sliding or trying to slide across each other. Friction works in the opposite direction to which the object is moving. It slows down the moving object and also produces heat. It can be helpful in certain situations but not helpful in others.

Air resistance – a type of friction between air and another material. Aeroplanes and cars are streamlined so that they can move through the air as easily as possible.

Water resistance – a type of friction between water and another material. When you go swimming there is friction between your skin and the water particles.

TYPES OF MECHANISM

Pulleys – they are used to reduce the amount of force needed to lift a load. The more wheels in a pulley the less force is needed to lift the weight.

PULLEY

Gears or cogs – are used to change speed, direction or force of a motion. When 2 gears are connected they always turn in the opposite direction to one another.

GEARS

Levers – can be sued to make a small force lift a lighter load. A lever always rests on a pivot or fulcrum.

LEVER

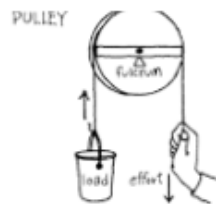### FOCUS SCIENTIST – ISAAC NEWTON - GRAVITY

Isaac Newton was born in 1643 and became famous for his work on gravity and his three laws of motion. He was also well known for his work on light and colour, and what is now called calculus (a branch of mathematics).
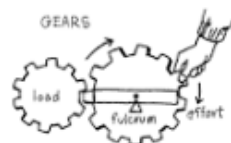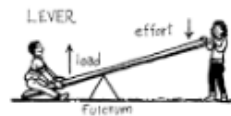
The famous story of an apple falling to the ground from a tree illustrates how Newton's work on gravity was inspired by things he observed in the world around him.

BALANCED AND UNBALANCED FORCES

Forces are just pushes and pulls in a particular direction.
Forces are shown by arrows in diagrams. The direction of the arrow shows the direction in which the force is acting. The bigger the arrow, the bigger the force.

Balanced forces
If two forces are balanced, it means the forces are the same size but are acting in opposite directions.If two balanced forces are acting on an object, that object will not change its motion. If it is still, the object will stay still or if it is moving, it will continue moving in the same direction and at the same speed.

Balanced Force
300 N — 300 N

Unbalanced forces
When two forces acting on an object are not equal in size, we say that they are unbalanced forces. Unbalanced forces do change the way something is moving. They can make objects start to move, speed up, slow down or change direction.

Unbalanced Force
400 N — 300 N

Key Vocabulary

force	gravity	air resistance	push	pull	balanced	mechanisms	friction	weight	mass	streamline	water resistance
fulcrum	pulley	pivot	opposite	gears	lever	Isaac Newton	Laws of motion	direction	force arrow	

YEAR 5 HISTORY - ANCIENT EGYPTIANS

KNOWLEDGE ORGANISER

What have we learnt in this topic before and what we will learn this year?

In Year 3, pupils studied The Stone Age. The Ancient Egyptians began around the same time as the Stone Age but lasted for a longer period.

In Year 4 pupils learnt about Ancient Rome this era was at a similar time to Ancient Egypt.

In Year 5, pupils will learn about the Ancient Egyptians and the role that people had in their hierarchy. We look at the importance of the Nile and why many Egyptians cities are still today alongside the river. We will study the art of mummification and how the Pharoahs came to have such elaborate sarcophagi. We also look at Howard Carter and his famous discovery.

Ancient Egyptian Timeline

3100 – 2950 BC - Hieroglyphics are First Used

2950 – 2575 BC - The First Egyptian pyramid is Built

2575 – 2150 BC - The Great Pyramids are Built

1539 – 1075 BC - Great Pharaohs

332 BC - Alexander the Great Conquers Egypt

196 BC - The Rosetta Stone is Carved

51 – 30 BC - Cleopatra: One of the most famous pharaohs of Ancient Egypt

30 BC - The Roman Empire Conquers Egypt: The Roman Empire, led by Octavian, conquered Egypt in 30 BC.

Howard Carter and the discovery of Tutankhamun

Tutankhamun reigned for roughly 10 years.(1333BCE- 1323BCE) He died around the age of 18 and was buried in a tomb in the Valley of the Kings. His burial place was hidden for many centuries. It was discovered by the Egyptologist Howard Carter in 1922. It contained many amazing artefacts, including Tutankhamun's famous golden death mask, a chariot and a dagger made from meteorite iron!

The discovery of Tutankhamun's tomb was an accident. Howard Carter's waterboy stumbled across some steps leading under the desert surface. Lady Carnarvon, a sponsor of Carter's work, was running low on patience at this point, and so if the discovery had not been made, then it is likely it would not have been discovered at all.

Anicent Egyptian Civilization and artefacts

Egypt, with a civilization that lasted over 7000 years, has a richness of antiquities that can be unearthed in temples and tombs beneath its soft sand throughout every inch of the Egyptian country. Archaeologists discover treasures every day and study them to learn more about this ancient civilization's incredible achievements and mysteries.

1.Amulets had the magical or miraculous power to protect the person who wore it.
2.Canopic Jars were vessels that store internal organs that have been removed from the body during the process of mummification.
3.Egyptian scarab was an amulet or seal in the shape of an abstract dung beetle
4.Papyrus was a paper made from papyrus reeds that have been used as a writing and painting medium for thousands of years.
5 .Pyramids are enormous buildings with a square or triangular base and sloping sides that culminate in a point at the summit that was erected of limestone as a royal mausoleum in ancient Egypt. They also served as the official symbol of Egypt for endless generations during their time of construction and use.

Crime and Punishment

The ancient Egyptian legal system was based on a set of written laws.

Punishment in ancient Egypt was often severe and could include physical punishment, fines, and even execution. The most common form of punishment was corporal punishment, which could include beating, flogging, and amputation. In some cases, criminals were also subjected to forced labor or imprisonment.

Death sentences in ancient Egypt were reserved for the most serious crimes, such as murder and treason. Execution could be carried out through methods such as hanging, beheading, or drowning.

Ancient Egyptian religion also played a role in crime and punishment. Many crimes were seen as offenses against the gods and could result in spiritual punishment as well as physical punishment. This could include being denied access to the afterlife or being punished in the afterlife.

BC   AD   ancient   amulet   pharaoh   canopic   embalming   sarcophagus   amulet   mummies

mummification   papyrus   afterlife   Hieroglyphs   scarab   irrigation

Year 5 Geography - Spring 2

What have we learnt in this topic before and what we will learn this year?

In Year 3 we learnt to identify features using a map, describe physical and human features and use grid references, compass directions and OS map symbols.

In Year 5, we are explaining how locations fit into their geographical locations with reference to physical and human geography. We will be creating a report about South America to showcase all of our learning including countries, climate and culture.

In Year 6, we will learn about biomes, tropics of cancer and Capricorn and how human activity has caused the environment to change. We will also describe human and physical features around the world.

SOUTH AMERICA

The Amazon Rainforest

There are 12 countries in South America. The Amazon Rainforest is in eight of these countries.

It is in the Southern Hemisphere.

To fly from London to Brazil it would take approximately 10 hours 45 minutes and London to Chile takes 14 hours and 45 minutes.

PHYSICAL GEOGRAPHY

Why is the Amazon Rainforest there?

The red line shows the equator and either side of the equator is the Tropic of Cancer, in the Northern Hemisphere, and the Tropic of Capricorn, in the Southern Hemisphere. In between these is known as 'the tropics' or tropical region.

This makes the Amazon Rainforest a tropical rainforest. This means that the climate is humid and warm all year round with temperatures consistently above 14 °C and precipitation all year round (often daily) between 1.5m and 3m every year.

The Amazon Rainforest sits in the Amazon basin. This is the area that drains into the Amazon River and it is the largest river basin in the world.

Why are the Andes mountains there?

The world is made of different tectonic plates and scientists believe these plates move at a maximum rate of around 1-2 inches per year.

The Andes is formed by a convergent plate boundary which can cause earthquakes, mountains and volcanoes.

Pacific Ring of Fire
75% of Earth's volcanoes are along the Pacific Ring of Fire which is a circle formed by subduction of tectonic plates. This is where plates overlap at convergent boundaries like that of the Nazca and South America plate.

The Andean Volcanic Belt is found along the Pacific Ring of fire and contains over 200 potentiall active volcanoes in four different zones.

CLIMATE CHANGE

Climate change is having significant impact throughout South America but this is particurlarly threatening for The Amazon Rainforest. In 2020 the rate of deforestation was at the highest in twelve years.

What does this mean?
- Loss of habitats for millions of species
- Contribution to global warming
- Loss of homes of indigenous people
- Increased carbon emissions (carbon stored in trunks released when cut down)
- Soil erosion because there are no trees tro protect it
- Decrease in precipitation

HUMAN GEOGRAPHY

The largest and most densely populated country is Brazil with just over 212,000,000 poeple.

There is a significant divide between the rich and the poor with 16 million people living in poverty.

On the outskirts of the city you will find extensive favela's where many people live in crowded and significantly poor living conditions.

← A Brazilian Favela

South America's biggest industry is agriculture for example:
- Bananas
- Coffee
- Timber
- Cattle for dairy produce and meat
- Wine
- Metals and metal ore such as gold and copper.

Key Vocabulary

Human geography   Physical geography   continent   country   equator   Tropic of Cancer   Tropic of Capricorn

climate   river basin   tectonic plates   industry   population   favela   climate change   global warming

YEAR 5 DT – EGYPTIAN SCARAB BEETLES

KNOWLEDGE ORGANISER

What have we learnt before in DT and what we will learn next?

In Year 3, we used stiff and flexible materials to make a Stone Age house.

In Year 4, we used the mouldable material of clay to make our very own Roman pots.

In Year 5, we are using clay to create a scarab beetle. We are aiming to refine and improve our product as we go through the process.

In Year 6, we will then take part in a project affiliated with Hemel Hempstead School using several mouldable materials.

History

Throughout history, humans have made use of natural materials including clay to make objects.
These are canopic jars made of pottery.

Scarabs were generally either carved from stone, or molded from Egyptian faience, a type of Ancient Egyptian quartz ceramic.

MOD-ROC

Mod-Roc is a mouldable material that is used in structures. It is versatile and can be wrapped and manipulated to fit to many different shapes.

Once wet, it is easily used and then as it dries it forms a rock hard plaster around the structure.

Mod-Roc is very similar to the product they use to create medical casts for broken bones.

Scribes carried their tools around in a box. This box has a moulded decoration and carvings to make it look attractive.

Key Vocabulary

Mod-Roc	mouldable	material	layering	form	sculpt	sculpture	texture	technique
Death mask	evaluate	refine	detailing	coats	symbolic	manipulate	decoration	

Year 5 ART and DT — SOUTH AMERICAN BAG

What have we learnt before in Art and what we will learn next?

In Year 4, we used early textile and sewing skills to make bunting. We looked at running stitch, back stitch, over sew stitch, blanket stitch and cross stitch (embroidery).

In Year 5, we are using textile and sewing skills as part of a project to make and decorate a bag in the style of Peruvian textiles. We will explore the use of a variety of stitches including running stitch, cross stitch, back stitch, embroidery and applique.

In Year 6, we will continue to develop skills to ensure work is precise and accurate and hide joins to improve the look of our product.

HISTORY OF TEXTILES IN SOUTH AMERICA

The earliest textile evidence dates back to 8000 BC in the modern day Peru. To this date, textile weaving is integral to livelihood and culture of Peruvian people and particularly the Quechua culture (those living in the highland regions of the Andes). Not only does it provide an income but weaving tells stories, shares feelings, preserves memories and recollects history.

Weaving is done utilizing a backstrap loom which is one of the oldest forms of loom in the world. The loom is completely non-mechanized and relies on one's body to keep the tension required.

The technique of weaving has been passed down through generations. They use yarn from local animals such as alpaca, vicuna and sheep.

DESIGN TECHNOLOGY- MAKING A BAG

1. Research different styles of bags and explore design options.

2. Design your bag including style, decoration and fastening technique.

3. Use paper and stapes to make a 3d prototype and refine design and measurements as necessary.

4. Make symmetrical pattern.
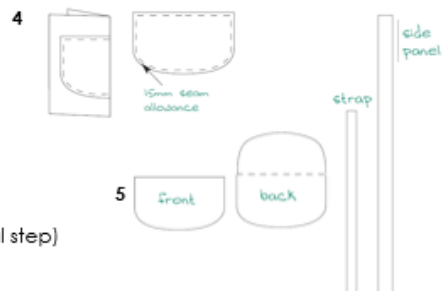
5. Cut all pieces of fabric.

6. Join edges together using an appropriate joining stitch.

7. Add embroidery or applique.

8. Add fastening technique (optional step)

PATTERNS AND DESIGNS IN PERUVIAN TEXTILES

The designs created would be unique to each weaver and certain patterns would be related to certain regions in Peru. Textiles often including animals, peoples, flowers and abstract designs.

Diamonds

Red and white circles represent footprints of the bull used to plough the land.

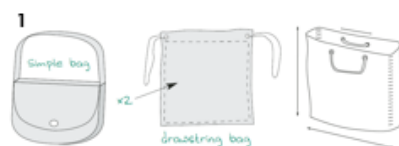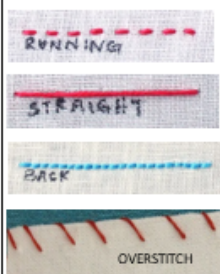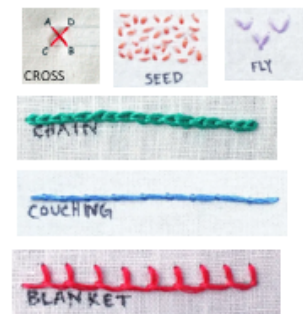Smaller white and yellow circles symbolize the eyes of the llama, an incredibly important animal in Peru.

Yellow 'S' is symbolic of the chira, an agricultural tool used to plough land by hand.

Black figures represent the birds who would warn farmers when foxes are in the area.

ART - SEWING

Joining Stitches

RUNNING
STRAIGHT
BACK
OVERSTITCH

Embroidery / Decorative Stitches

CROSS
SEED
FLY
CHAIN
COUCHING
BLANKET

Fastening Techniques

Button
Toggle
Press stud
Velcro

Key Vocabulary

Prototype   3D model   textiles   running stitch   cross stitch   back stitch   applique   embroidery   pattern
seam allowance   specification   tacking   annotated sketch   measurement   fastening   joining stitch   evaluate
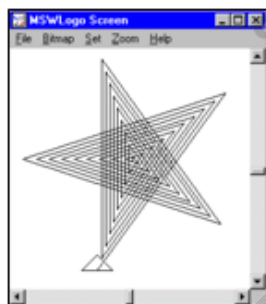
COMPUTING: PROGRAMMING KNOWLEDGE ORGANISER
Y5

Overview

Selection in Physical Computing

- Programming is when we make and input a set of instructions for computers to follow.

- Logo is a text-based program that we can use in order to create shapes and patterns.

- We use algorithms (a set of instructions to perform a task) which we can plan, model and test, in order to create accurate and imaginative shapes and patterns.

Microcontrollers, LEDs and Motors

-**Microcontrollers:** A microcontroller is a small device that can be programmed to control devices that are connected to it.

-One brand of widely used microcontroller is called a Crumble controller, which can be used to control many things, e.g. LEDs and motors.

LEDs:
-LEDs are output devices that are emit light. When electricity is passed through an LED it produces light. One type of LED light, controlled by a Crumble controller, is called a Sparkle.
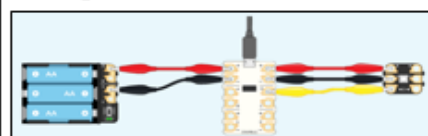
Motors:
-Motors are another output device. A motor can start, stop, spin forwards, spin backwards, and go at different speeds.

Creating Circuits:

-The USB port connects the microcontroller to a computer. Crocodile clips pass electricity and data through to the LED/motor.
-The + and - power pads on the Crumble should be connected with the + and - power pads on the Sparkle and battery box. The D pads on the Crumble and Sparkle should also be connected.

Programming Commands

-**Patterns:** Patterns are things that repeat in a logical way. In everyday life, patterns are everywhere!

-**Patterns in Logo:** Instead of typing in the code to create each individual shape, we can save time by repeating a sequence of instructions. We use the 'repeat' function.
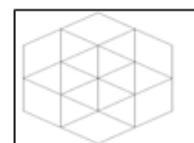
-**Repeat:** Type the command 'repeat' — this repeats commands a set number of times. The number following repeat is the number of times to repeat the code, and the code to be repeated is in square brackets, e.g. repeat 4 [FD 100 LT 90]

The above code will repeat FD 100 LT 90 four times.
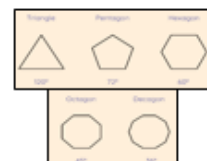
-**Creating Shapes and Loops:** To make shapes, we need to know the angles of corners of different shapes (see right). Using the repeat function with shapes can help us to make spirals.

Sequencing and Algorithms

-A **sequence** is a pattern or process in which one thing follows another.

-We design **algorithms** (sets of instructions for performing a task) to help us program the sequence that we require to achieve our desired outcomes.

-**Programming** is the process of keying in the code recognized by the computer (using your algorithm).

Trialling and Debugging

-Programmers do not put their computer programs straight to work. They **trial** them first to find any errors:

-Sequence errors: An instruction in the sequence is wrong or in the wrong place.
-Keying errors: Typing in the wrong code.
-Logical errors: Mistakes in plan/thinking.

-If your algorithm does not work correctly the first time, remember to **debug** it.

Important Vocabulary

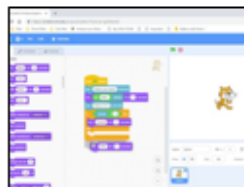Programming   Circuit   Electricity   Microcontroller   Code   LED   Algorithm   Motor   Sequence   Debugging

COMPUTING: PROGRAMMING

V5

KNOWLEDGE ORGANISER

Overview

Quizzes in Scratch

- Programming is when we make a set of instructions for computers to follow.

- Scratch is a program that we can use in order to code our own quizzes, stories, animations and games. We can input questions using the 'ask' command blocks. We can use selections and conditions in order to ensure that there are different outcomes depending upon a user's response.

- We use algorithms (a set of instructions to perform a task) to sequence movements, actions and sounds in order to program effective animations.

The Basics of Scratch

-**What is Scratch?** Scratch is a website/ app that lets us code our own quizzes, stories, games and animations.

-Scratch helps us to learn how to use programming language, whilst also being creative and using problem-solving skills.
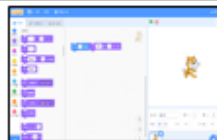
There are three main areas in Scratch:

-The Blocks Palette (on the left) contain all of the different blocks: puzzle piece commands which control the animation.
-Code Area (in the middle) is where the blocks are placed to create a program.
-Stage with Sprite (right) is where the output of the program is presented. The sprite is the character.

Attributes: There are three attributes of the sprite which we can change to make our animation: Code, Costumes, Sounds.
-**Event Blocks:**
Event blocks are coloured yellow and are used to sense different events that happen e.g., the green flag being clicked.
-**Action Blocks:** Action blocks include 'Motion' blocks, 'Sound' blocks and 'Looks' blocks. They make the sprite move, make sounds and change appearance.

Selections and Conditions

-**Creating Conditions:** The 'If-then' command block helps us to create conditions. It is one of the darker orange control blocks. Other blocks are placed inside the 'If-then' blocks to create conditions.

The 'senses' blocks (light blue) create the 'trigger' (e.g. when a certain key is pressed). We can change the trigger by pressing the downward arrow and selecting from the range of keys/ actions. The 'actions' blocks (e.g. motions, sounds, etc). are then used to program what will happen when the 'senses' command is triggered.

-**Different Outcomes:** The 'If-then-else' command block helps us to write programs that have selections with two outcomes.

-Actions to be carried out if the condition is 'true' (if the conditions of the 'sense' command are met) are placed below 'then.' Actions to be carried out if the condition is 'false' (e.g. if any other key is pressed) go below 'else.'

-The 'forever' block means that the command will happen continually.
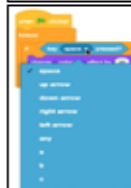
Asking Questions

-Questions can be included by using the 'ask' command blocks.

-If specific answers are needed (e.g. yes or no), these can be typed in when using the 'answer' sensing block within the = 'Operators' block – drag it into the first white space. In the second white space, we can then type in the desired answer.

-The 'say' command block (in looks) is used to inform the user if the response was correct.

Algorithms, Trialling, Debugging

-Designing an **algorithm** (set of instructions for performing a task) will help you to program the sequence that you require.
-Programmers do not put their computer programs straight to work. They **trial** them first to find any errors:
-Sequence errors: An instruction in the sequence is wrong or in the wrong place.
-Keying errors: Typing in the wrong code.
-Logical errors: Mistakes in plan/thinking.
-If your algorithm does not work correctly the first time, remember to **debug** it.

Important Vocabulary

| Programming | Scratch | Logical | Commands | Algorithm | Condition | Selection | Sequence | Trialling | Debugging |