

Year 6

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 6 for the Spring term, which will also be in pupil’s books and on working walls in school.

YEAR 4 SCIENCE – SOUND

KNOWLEDGE ORGANISER

How Does Sound Travel?

PE Knowledge Organiser

Year 4 - Tennis

Physical Learning

Unit Focus

Key Questions

Concepts

Assessment Opportunities

Equipment

Vocabulary

YEAR 4 HISTORY – ROMAN ENTERTAINMENT

KNOWLEDGE ORGANISER

ROMAN ARTIFACTS

ROMAN CHARIOTS

GLADIATORS

THE COLOSSEUM

YEAR 6 SCIENCE – EVOLUTION AND INHERITANCE

KNOWLEDGE ORGANISER



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

In Year 4 we learnt in our topic:

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things.

In Year 6 we will learn:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

EVOLUTION AND INHERITANCE

The theory of evolution by natural selection (first formulated in Darwin's book "On the origin of Species" in 1859) is the process by which organisms change over time as a result of changes in inheritable physical or behavioural traits.

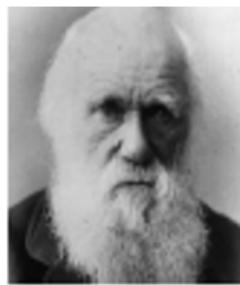


Inheritance refers to the characteristic traits that are genetically passed to offspring from their parents e.g. hair colour, eye colour, height etc. Darwin refers to this as natural selection when the strongest traits survive over generations.



FOCUS SCIENTIST – CHARLES DARWIN - EVOLUTION

Charles Robert Darwin (1809-1882) transformed the way we understand the natural world with ideas that, in his day, were nothing short of revolutionary. He and his fellow pioneers in the field of biology gave us insight into the fantastic diversity of life on Earth and its origins, including our own as a species. To this day, his theory of evolution by natural selection is accepted by the scientific community as the best evidence-based explanation for the diversity and complexity of life on Earth. The theory proposes that the 'fittest' individual organisms - those with the characteristics best suited to their environment - are more likely to survive and reproduce. They pass on these desirable characteristics to their offspring. Gradually these features may become more common in a population, so species change over time. If the changes are great enough they could produce a new species altogether.



Key Vocabulary

evolution	inherit	adaptation	fossil	organism	naturalist	geologist	paleontology	offspring	generation
origin	species	surroundings		environment	inhabitants	survival	habitat	prehistoric	impact

ADAPTATION

Living things are adapted to their habitats. This means that they have special features that help them to survive.

An African elephant, for example, lives in a hot habitat and has very large ears that it flaps to keep cool.

A polar bear, on the other hand, lives in a cold habitat and has thick fur to keep warm. It's not just animals that are adapted to their environment, plants are too. A cactus is well adapted for survival in the desert. They have long roots to collect water from a large area and a stem that can store water for a long period of time.



The animals and plants in one habitat are suited to live there and may not be able to survive in other habitats. When a habitat changes, the animals and plants that live there are affected.

FOSSILS

How are fossils formed and what do they tell us about animals and plants that used to inhabit the earth?



Fossils are the impressions of the remains of prehistoric animals or plants embedded in rock and preserved in petrified form. Animals change over time and adapt to the surroundings in which they live.

Darwin observed that there were many forms of finches that had different beak sizes and shapes. Once he considered the food sources of each finch, he noted the reason for the adaptations.



Consider: are all adaptations good? What is the impact of human intervention on evolution? What does this have on the wellbeing of the world and its inhabitants?

YEAR 6 SCIENCE – LIVING THINGS AND THEIR HABITATS KNOWLEDGE ORGANISER



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

In Year 4 we learnt in our topic:

Recognise that living things can be grouped in a variety of ways.
Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
Recognise that environments can change and that this can sometimes pose dangers to living things.

In Year 5 we learnt in our topic:

Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
Describe the life process of reproduction in some plants and animals.

In Year 6 we will learn:

Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.
Give reasons for classifying plants and animals based on specific characteristics.

CLASSIFICATION KEYS

Scientists, called taxonomists, sort and group living things according to their similarities and differences. This is called a Classification Key – a series of questions are used to classify a living thing.



FOCUS SCIENTIST – CAROLUS LINNAEUS - TAXONOMY

Carolus Linnaeus is the father of taxonomy, which is the system of classifying and naming organisms.

One of his contributions was the development of a hierachal system of classification of nature. This system includes eight taxa: domain, kingdom, phylum, class, order, family, genus and species.



Key Vocabulary

classification
invertebrate

organism
vertebrate

carbon
kingdom

nitrogen
phylum

microbiology
class

taxonomy
order

species
family

microorganism
genus
species

PLANT KINGDOM AND MICRO ORGANISMS

There are over 275,000 species of plants and microorganisms. All plants are included in one Kingdom (plantae) which is then broken down into smaller and smaller divisions based on several characteristics.



Microorganisms

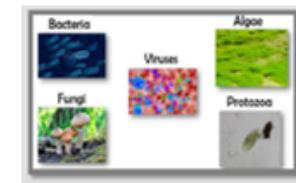
Are invisible to the naked eye, a powerful microscope is needed to see them.

Are everywhere around us, inside us, in our food, in our homes, in the air we breathe and the water we wash in.

Are mostly useful but some are harmful.

Have been around for 3.8 billion years.

The study of microorganisms is called microbiology. They are vital for life on Earth. They generate oxygen, are part of the carbon and nitrogen cycles and can survive the harshest conditions.



LINNAEAN SYSTEM OF CLASSIFICATION

Living organisms are classified into groups depending on their characteristics. This system was developed in the 18th century by Carl Linnaeus.

The classification of species allows the subdivision of living organisms into smaller and more specialised groups.

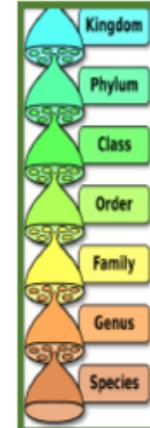
The first division of living things in the classification system is to put them into one of five kingdoms.

The five kingdoms are:

- animals (all multicellular animals)
- plants (all green plants)
- fungi (moulds, mushrooms, yeast)
- protists (Amoeba, Chlorella and Plasmodium)
- prokaryotes (bacteria, blue-green algae)

Further divisions

Living things can then be ranked according to: phylum, class, order, family, genus species



Year 6 Geography - Spring 1

YEAR 6 GEOGRAPHY — BIOMES

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

In Year 4, we completed our topic 'Where do we come from' by looking at the UK, as well as understanding the European Union and finding out about our own background and heritage.

In Year 5, we extended our knowledge through our topic 'Locating continents and oceans of the world.'

In Year 6, we will further develop our geography skills to describe the physical and human features of places around the world in relation to their biomes.

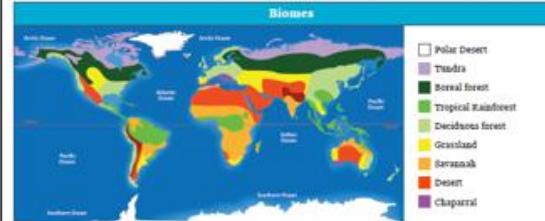
WHAT IS A BIOME?

Biomes are areas of our planet with similar climates, landscapes, animals and plants.

What lives in each biome depends on:

- how warm or cold it is
- how dry or wet it is
- how fertile the soil is

The animals in a biome depend upon plants for food. The plants in a biome often also depend upon the animals for spreading pollen and seeds so that new plants can grow. So both plants and animals rely on each other to stay alive.



INSPIRATIONAL DAY



We will be making our own self-contained biome.

A totally self-contained system of living (plants and animals) and non-living (water and minerals) components. The goal is to balance it such that it can survive with no input other than energy (light).

Is it possible? That is what we are trying to find out!

Key Vocabulary

Biome, equator, latitude, longitude, hemisphere, climate, precipitation, biodiversity, tundra, taiga, temperate forest, desert, savannah, rainforest, deforestation, climate change, eco system

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BIOMES OF THE WORLD

	Rainforest It can rain more than 250cm a year. It is difficult to grow crops. Lots of the world's wildlife can be found here.		Temperate forest Limited open spaces. Weather limits when plants can grow. Transport is difficult.
	Desert It is often dangerously hot or cold. It is difficult to find water. There are limited food sources		Tundra Dangerously cold in winter. Poor nutrients in the soil. It rarely rains.
	Savannah It rarely rains. It is difficult to find water. It is difficult to grow crops.		Taiga Limited open spaces. Transport is difficult. Cold in winter.

LAYERS OF THE RAINFOREST

 Emergent layer These are the tallest trees on the rainforest. Some can grow up to 50m tall.
Canopy layer The canopy is the thickest layer of the rainforest and is home to many birds and species of animals.
Understory layer This layer has shorter, young trees and some shrubs and bushes.
Undergrowth layer This layer is home to many insects and larger animals. This layer receives little sunlight but a few smaller plants and shrubs can grow here.

Year 6 Geography - Spring 2

YEAR 6 GEOGRAPHY — AFRICA

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

In Year 4, through our topic 'Where do we come from' we looked at the UK, as well as understanding the European Union and finding out about our own background and heritage.

In Year 5, we extended this knowledge through our topic 'Locating continents and oceans of the world.'

In Year 6, we will further develop our skills and knowledge through our study of Africa.

WHERE IN THE WORLD IS AFRICA?

Africa is the second largest continent on Earth. It has a land size of 30.37 million km². It is connected to Asia by the Middle East. Africa is bordered by the Atlantic Ocean to the west and the Indian Ocean in the east. Africa has 54 countries. Africa covers 6% of Earth's total surface area. With 1.3 billion people, it accounts for about 16% of the world's human population. Algeria is the largest country in Africa. This country is among the ten largest countries in the world.

Lagos in [Nigeria](#) is the largest city in Africa. With more than 22 million inhabitants, Lagos is also one of the biggest metropolitan cities in the world and is estimated to become the world's largest city by 2100 with more than 100 million inhabitants!



WHERE IS KENYA?

Kenya is located in east Africa:

- Population of 44 million.
- The capital city is Nairobi.
- Mombasa, situated in the coast, is one of Kenya's largest cities.
- The Tana river is the longest in Kenya.
- Mount Kenya is the highest mountain (5200m).
- Kenya's coastline is on the Indian Ocean.
- Swahili and English are the official languages.

Maasai People

Maasai people traditionally live in mud huts made from mud, sticks, grass and cow dung.

Many Maasai are farmers and own large herds of cows, goats and sheep.

The Maasai people love music and dance.

They often sing and the men perform a special jumping dance.



Key Vocabulary

Africa	continent	equator	latitude	longitude	tropic of Cancer	tropic of Capricorn	hemisphere	climate
		precipitation	biodiversity	desert	climate change	weather	native	

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GEOGRAPHICAL FEATURES OF AFRICA



Africa's major geographical features include the Nile River, Sahara Desert, Great Rift Valley, Mount Kilimanjaro and the Serengeti.

It is surrounded by the Atlantic Ocean and the Indian Ocean.

Africa is home to nine of the world's deserts:

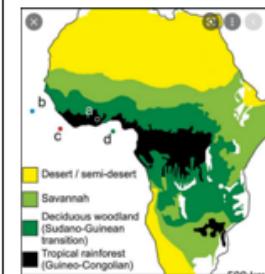
- Sahara Desert.
- Kalahari Desert
- Karoo Desert
- Danakil Desert
- Chalbi Desert
- Namib Desert
- Guban Desert
- Nyiri Desert.

BIOMES OF AFRICA

What biomes are found in Africa?

The [Savannah Biome](#) is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa.

Across the Equator the [tropical rainforest](#) is found in Africa.



Over one-third of the African continent is covered by [desert](#), from the Mediterranean to South Africa and the Indian to the Atlantic oceans. The deserts in Africa are home to some of the most extreme landscapes and stark conditions on Earth, as well as some of the most beautiful.

The [Sahara](#) is the largest desert in Africa, and the [largest hot desert in the world](#) – with summer temperatures reaching 122 °F (50 °C) – and stretching across 12 North African countries. The desert was created around 7 million years ago.

YEAR 6 DT – POP UP BOOKS

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

In Year 5, we revised our knowledge of Frame structures and we built a pneumatic bridge using a variety of truss designs.

In Year 6, we will extend our work in mechanisms by making Pop-up books, inspired by Matthew Reinhart, using a variety of folds and moving mechanisms.

In Secondary school, we will further our DT skills by continuing to develop a range of skills in textiles, woodwork and graphic design etc.

A HISTORY OF POP UP BOOKS



Paper pop-ups are fascinating three-dimensional books containing paper pieces that rise up or move when the book is opened and folded and which are then completely flat when the book is closed.

One of the first movable books was recorded in Spain during the 13th century that was made by Ramon Llull. Today's pop-up books still continue to fascinate readers of all ages such as those by the likes of author, illustrator and paper engineer Matthew Christian Reinhart (born September 21, 1971). His most recent books include 'Frozen: a Pop-up Adventure' and 'Lego Pop-up: A Journey to the Lego Universe'.

TYPES OF FOLDS

Pop-up books or cards use different types of folds to achieve different effects. Some examples include:

Slit angle fold

The most basic mechanism used for a single piece of paper is a slit. This is made by simply cutting and folding at certain angles so that portions of the paper will pop out when the folding angle is 90 degrees.



Pop up (tent, box, v, step folds)



The pop-up element is attached to facing pages and unfolds from the center of the page when the book is open; it collapses into itself when the book is closed.

Key Vocabulary

Pop-up book	paper	fold	slit angle fold	pivot	tent	box	step fold	facing pages	open	closed
collapses	3d	flap	pulley	rotator	sliding	pulled	pushed	slider	lever	linkage

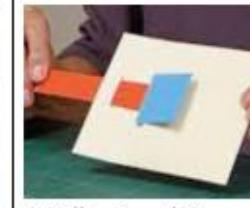
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FLAPS, PULLEYS AND ROTATORS



Flaps are additional pieces of paper added to a book by either gluing or folding.



A Pulley is a sliding paper tab, ribbon, or string which is pulled, pushed, and maneuvered to reveal a new image.



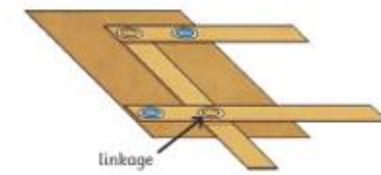
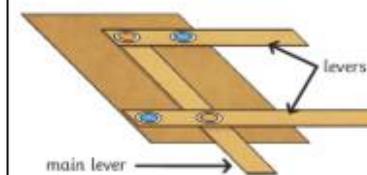
A Rotator is made up of several revolving circles. The circles are cut out and fastened together so that they can rotate upon each other as needed.

SLIDERS, LEVERS AND LINKAGES

- Sliders move in one direction - up/down or side to side.
- A lever is a rigid bar that moves around a pivot.
- A linkage is a bar joining one or more levers to produce the type of movement required.

The simplest type of mechanism. A lever is a stiff bar which moves around a pivot.

The part of the mechanism used to join one or more levers to produce the type of movement required.



YEAR 6 ART – MARK MAKING AND ILLUSTRATIONS

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

In Year 3, we used mix media to create Pirate boat collages.

In Year 4, we created mood by using colours and lines to create reflections in water.

In Year 5, we used our mark making skills to create mood and texture when drawing our 'Dragon eyes'.

In Year 6, we will continue to develop our mark making skills to draw our own creatures based on 'The Spiderwick Chronicles' which are imaginative and communicate emotion.

ARTIST – VINCENT VAN GOGH



Vincent Van Gogh was a 'Post- Impressionist' painter. Post impressionism focuses on line, colour and emotion. Between 1881 and 1890, van Gogh painted nearly 900 pictures but he only ever sold one or two! He began by painting peasants in dark colours but then started painting with bright colours. He is most famous for paintings of sunflowers, 'Starry Night' and lots of 'Self-Portraits'.

ILLUSTRATIONS AND TEXTILES



Artists use illustrations to communicate emotions through their sketches which they do to try to show a sense of self and imagination. Artists use a variety of different tools and use a variety of textiles (mixed media) to create emotions and bring the illustration to life.

Key Vocabulary

Vincent Van Gogh
mark making

Post-impressionist
Tony DiTerlizzi

line
illustrator

colour
annotating

emotion
pattern

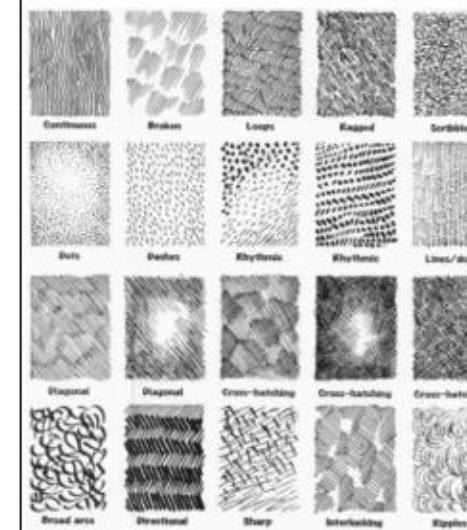
illustration
textures

tools
effects

mixed media
removing

textiles
surfaces

MARK MAKING



Mark making is a term used to describe the different lines, patterns, and textures we can create in art.

A number of different tools can be used to create different effects with your drawings, including erasers for removing marks and sponges for rubbing and smudging.

It is also important to consider a variety of surfaces to draw onto, creating interesting textures and backgrounds to drawings.

ILLUSTRATOR – TONY DiTERLIZZI

When he was 9 years old, Tony DiTerlizzi wrote and illustrated a book 30 – 40 pages long about one of his favorite topics – bugs.

Tony creates detailed pencil drawings and then adds thin coats of gouache paint – like watercolour but thicker so you need to water it down. As he drew the sketches, he wrote notes about the creatures, annotating his drawings to bring them to life with details such as how they moved and what they smelled like.



Year 6 PE - Spring 1



Year 6 – Gymnastics Unit 2

Knowledge Organiser

Prior Learning

Demonstrated accuracy, consistency, and clarity of movement. Arranged own apparatus to enhance work and vary compositional ideas. Experience flight on and off high apparatus.

Unit Focus

Perform increasingly complex sequences. Combine own ideas with others to build sequences. Compose and practise actions and relate to music. Show a desire to improve competency across a broad range of gymnastics actions.

We are learning...

1. to perform a 10-element sequence using both floor and apparatus.
2. to perform with equipment and respond creatively to music.
3. to create judging criteria and assess performances against it.
4. to create and perform interesting patterns as part of a group.
5. to select and apply the appropriate walk and presentation to start a sequence.
6. to perform a 10-element sequence with a 1-minute time limit.

Key Questions

1. Why is it a challenge to adapt your sequence to fit in with a timescale?
2. Which were your favourite elements to perform?
3. What is stimuli?
4. Can you suggest any different compositional ideas that may be used?

Equipment

Mats, hoops, cones, wall bars, beanbags, low apparatus, action cards, tabletops, box tops, stopwatch, music player.

Vocabulary

Half lever, box splits, bridge, broad jump, splits, dish, arch, bounce, competency, complex, stimuli, mirror, match.

Concepts

Stimulus is something that causes a reaction, especially interest, excitement or energy added into a gymnastics sequence such as music or objects including ribbons and balls.

Assessment Overview

Head - Compose a sequence that will achieve the highest score against the criteria.
Hand - Perform increasingly complex sequences.

Heart - Work independently and in small groups to make up sequences to perform to an audience.



Year 6 PE - Spring 1



Year 6 - Hockey

Knowledge Organiser

Prior Learning

Developed passing, dribbling and shooting skills. Can confidently select and apply basic skills in a game situation. Learnt ways of marking and defending.

Unit Focus

Choose and implement a range of strategies and tactics. Combine and perform more complex skills at great speed. Recognise and describe good individual and team performances.

We are learning...

1. To shoot under pressure from close range.
2. To perform long corner routines as part of a team.
3. To use goal-side marking to prevent an attacker from getting closer to the goal.
4. To use a banana run to force an oncoming attacker out wide.
5. To use a hit-out to successfully restart a game
6. Indian dribble and to play competitively using new skills.

Key Questions

1. What set plays did you use in a game, and were they successful?
2. When would you use Indian Dribble in a game situation?
3. What strategies did your team use to defend?

Equipment

Sticks, a range of balls (hard, foam or quick sticks balls), cones, goals, bibs, stopwatch.

Vocabulary

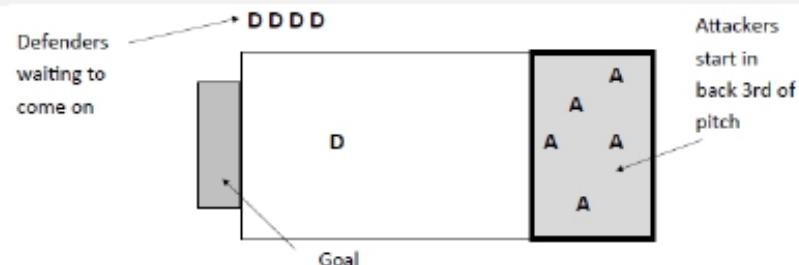
Power, distance, perform, consistent, fair play, tackle, covering, supporting.

Rules

- Implement a long corner for any ball unintentionally hit off the back line by the defence.
- If the attacking team hit the ball off the back line, take a hit out.

Assessment Overview

Head – Choose and implement a range of strategies to attack and defend.
Hand – Shoot from close range.
Heart – Use and apply boundary rules such as corners, self pass and sideline.



Year 6 PE - Spring 2



Year 6 – Dance Unit 2

Knowledge Organiser

Prior Learning

Worked collaboratively to include more complex compositional ideas. Talked about different dance styles with understanding, using appropriate language & terminology.

Unit Focus

Demonstrating narrative through contact and relationships. Showing tension through pattern and formation.

We are learning...

1. to portray the theme of gangs through our movements and gestures.
2. to use devices such as contrast and variation in a group dance.
3. to use formations to demonstrate tension in relationships between performers.
4. to use claps, stamps and slaps to perform a live aural setting.
5. to dance as opposing gangs attacking each other.
6. to show performance qualities in our gang dance and evaluate our work.

Key Questions

1. How do the movements you learned show an attack?
2. How did you create sounds here? How does the movement match the sound?
3. How did the aural setting impact the performances you watched of others?

Equipment

Videos of modelled movements, posters, music.

Vocabulary

Narrative, tension & relationships, aural setting, accompany, contact, quality, confidence.

Concepts

Aural setting = aural choices the choreographer decides upon in creating a work, i.e., music, the spoken word, sound effects, natural sound, found sound, the audible aspects of dancing, and silence.

Assessment Overview

Head - Identify in others and self where good performance qualities are achieved.

Hand - Practise and refine coordination skills through activities such as live aural setting.

Heart - Use facial expressions to communicate emotion and a further narrative.

Contrast

Two people or groups do opposite types of movement to each other

- High / Low
- Fast / Slow
- Using arms / Using legs

Can you think of any more?



Variation

Two people or groups do the same movement but in a slightly different way.

- Jolty / Smooth
- Sharp / Silky
- Pulsing / Graceful

Can you think of any more?



Prior Learning

Played effectively in a variety of positions and formations. Related a greater number of attacking and defensive tactics to gameplay. Attempted more skills when performing movements at speed.

Unit Focus

Choose and implement a range of strategies to attack and defend. Perform a wider range of more complex skills. Recognise and describe good performances. Suggest, plan and lead simple drills for given skills.

We are learning...

1. To set up a shooting opportunity for a teammate.
2. To restrict an opponent's space by defending with my partner.
3. To perform a penalty kick with power and accuracy.
4. To attack and shoot as a pair.
5. To perform the role of cover defender to stop the opposition's attack.
6. To use close control to keep possession of the ball under pressure.

Key Questions

1. Compare week 6's performance to week 1. Can you think of a way you have improved individually and as a team?
2. What is the role of the covering defender?
3. Which part of your foot is best to kick with for accuracy?

Equipment

Footballs, cones, goals, bibs, stopwatch.

Vocabulary

Fair play, tackle, covering, supporting, strategy, set up, assist, deny, set play, covering, defender.

Rules

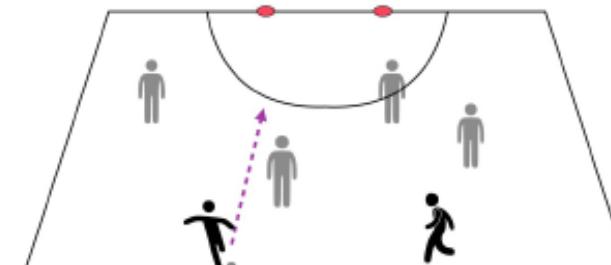
- Penalty awarded for a professional foul when defending.
- Free pass if a foul is committed outside of the penalty area.

Assessment Overview

Head – Devise a drill that develops a particular skill.

Hand – Apply correct body position when closing down a player to defend.

Heart – Collaborate with a partner to implement simple defensive techniques.





COMPUTING: PROGRAMMING

KNOWLEDGE ORGANISER



Overview

Variables in Games



- **Programming** is when we make and input a set of instructions for computers to follow.
- **Variables** are changeable elements of a program. Scratch is one app in which we can explore variables.
- We use **algorithms** which we can plan, model, trial and debug, in order to create accurate command sequences, that enable variables to be enacted in games.

Basic Variables

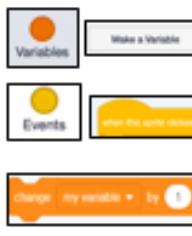
Variables: A variable is something that is changeable. A variable can be set and changed throughout the running of a program.



In computer programming we use variables to store information that might change and can be used later in our program. E.g. in a game a variable could be the current score of the player; we would add 1 to the variable whenever the player gained a point.

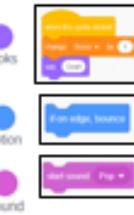
Making Variables in Scratch – The Basics

- Select 'Variables' (dark orange circle) from the menu on the left. Either choose from the available variables or 'Make A Variable.'
- Select 'Events' (light orange circle) from the menu on the left. Choose what needs to happen for the variable to change. E.g. 'When this sprite clicked' or 'when space key pressed.'
- Select 'Variables' again from the menu on the left. Choose what will happen when the event happens, e.g. 'change score by 1' (to add a point) or 'change score by -1' to remove a point.



More Complex Variables

- Variables should always have a value and an appropriate name.
- **Adding Callouts:** Select 'Looks' from the menu on the left. Add it to the variable program. Edit the text to change the callout.
- **Adding Motion:** Many games require sprites to change position. This is achieved using the 'Motion' commands. Select 'Motion' from the menu on the left. Choose from the available motion commands.
- **Adding Motion:** Many games require sprites to change position. This is achieved using the 'Motion' commands. Select 'Motion' from the menu on the left. Choose from the available motion commands
- **Adding Comments:** Comments are a good way of showing that you understand what your code is doing. Right click on the block that you want to comment on, and add in your comment.



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 sequences involving multiple output devices (e.g. LEDs and motors).
- **Programming** is the process of keying in the code recognized by the computer into the software (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

Variable

Scratch

Events

Code

LED

Algorithm

Motor

Modify

Debugging



COMPUTING: PROGRAMMING

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Overview



Using Micro:bits

- **Programming** is when we make a set of instructions for computers to follow.
- **Micro:bits** are small computers that perform different actions based on programs written on computer software. Programs are then downloaded to the micro:bit.
- Micro:bits have a range of input **sensors** that can be used as input triggers for different codes to run.
- Output devices on Micro:bits (e.g. LED displays) can be programmed to display words, pictures and numbers.

The Basics of Micro:bits

- **What is a Micro:bit?** A micro:bit is a pocket-sized computer. We can write programs on our computers which can then be transferred to micro:bits to run.

- Micro:bits have an LED light display, buttons, sensors and many input/output features that we can program.



The Parts of a Micro:bit - Front

1. A and B buttons: make things happen.



2. LED Display: shows words, pictures, numbers.

3. Light Sensor: Measures the light that falls onto the micro:bit.

4. Input and Output Pins: Connects the micro:bit to other devices.

The Parts of a Micro:bit - Rear

5. Temperature Sensor
6. Compass
7. Accelerometer – Detects movement
8. Radio Communication – to communicate with other micro:bits and devices.
9. USB Port – Connects device to computer.
10. Reset Button
11. Battery Socket – to power away from the computer.
12. Processor – The 'brain' of the device.



Important Vocabulary

Using Micro:bit Software

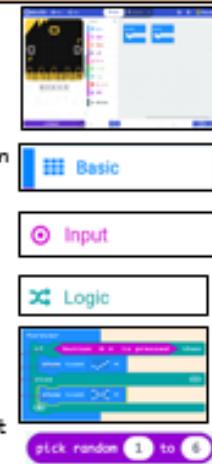
- **Software Interface**: Just like other programming software, the micro:bit interface has programming blocks and a programming area. The emulator gives a simulation for testing code.

- **Basic Blocks**: Can be used to do things like display images, text and pictures on the LED display. They should be placed into the 'on start' or 'forever' blocks.

- **Input Blocks**: Enables the user to create 'triggers' using different parts of the micro:bit device, e.g. 'on button ... pressed.'

- **Logic Blocks**: Allow conditions to be set. E.g. 'if, then, else' blocks allow us to set actions for when certain conditions are met (true), and alternative actions for when they are not met (false).

- **Math Blocks**: Includes numbers and sums in programs. The 'pick random number' block can allow different codes to run dependent on the random number generated.



Transferring to Micro:bit

Micro:bit can be connected to the computer using a USB cable.



1. Select 'download'
2. Locate the file in the downloads folder.
3. Copy the file from the MICROBIT drive.
4. Run the program on the micro:bit.



- Micro:bit will only run code that has been downloaded. If code is changed in the editor, it will need to be downloaded again in order to run on the micro:bit.

Sensing Inputs

- There are a number of input sensors on micro:bits, including the button, light sensor, accelerometer, compass, temperature sensor and GPIO pins.

- We can create algorithms that enable different codes to run depending upon what is detected by different sensors.

