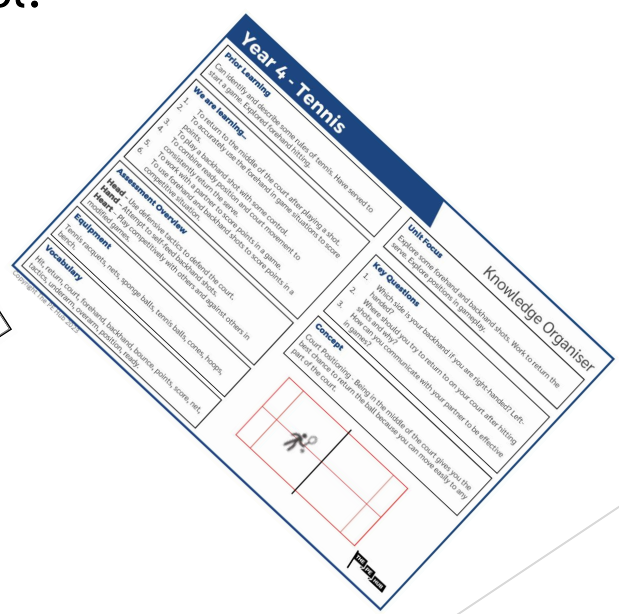
Year 4 Knowledge Organisers

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 autumn term, which will also be in pupil's books and on working walls in school.



YEAR 4 SCIENCE – SOUND

KNOWLEDGE ORGANISER

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

In EYFS, we learnt in our topic: to relate the sense of hearing to the ears.

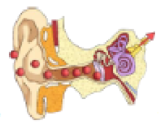
In Year 4, we will learn how to:

- Explain how sound sources vibrate to make sounds.
- Explain how vibrations change when the loudness of a sound changes.
- Explain how sounds travel to reach our ears.
- Describe the pitch of a sound.
- Describe patterns between the pitch of a sound and the features of the object that made the sound.
- Explain how sound travels through a string telephone.
- Identify the best material for absorbing sound.
- Create a musical instrument that can play high, low, loud and quiet sounds.
- Make observations and conclusions.
- Be able to answer questions based on your learning.

Sound

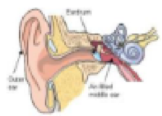
Sound Travels to the Ear

Sounds are made when objects **vibrate**. The vibration makes the air around vibrate, and the air vibrations enter your ear. Our brain hears the vibrations and turns this into a sound.

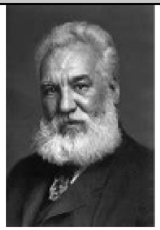


How Sound is Made

- Sound travels through the air in waves.
- When you clap your hands, the air around your hands shakes. This is the air molecules vibrating.
- When air molecules inside the ear vibrate, they shake tiny hairs on the insides of the ears. The hairs are connected to nerves under the skin.
- These nerves send messages to your brain to tell you that you heard a noise



FOCUS SCIENTIST –

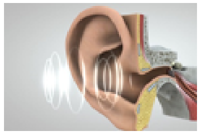


Alexander Graham Bell was born on March 3, 1847 in Edinburgh, Scotland. He died on August 2, 1922 at the age of 75. He is widely known for his invention of the first practical telephone. **Bell's** mother and wife were both deaf, this had a major influence on his work. His experiments in sound eventually allowed him to send voice signals down a telegraph wire. He managed to borrow money from investors so that he could hire someone to help him. His name was Thomas Watson. The two of them together came up with the telephone! The first words spoken were by Alexander on March 10, 1876. Any guesses what he said? Well he said, "Mr. Watson, come here, I want to see you."
In 1887, Bell and people who lent him the money for his experiments formed the Bell telephone company.

How Does Sound Travel ?

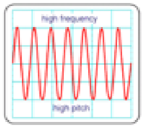
Sound can travel through solids, liquids and gases. Sound travels as a **wave**, vibrating the **particles** in the medium it is travelling in.
Sound travels much slower than light, whether in air or in water. You often hear things after you see them, for example, you see the lightning before you hear the thunder.

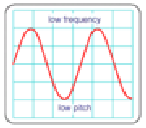
When you hit a drum, the drum skin vibrates. This makes the air particles closest to the drum start to vibrate as well. The **vibration** then pass to the next air **particle**, then the next, then the next. This carries on until the air **particle** closest to your ear vibrate, passing the **vibration** into your **ear.**



PITCH

Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-**pitched** sound. A rumble of thunder is an example of a low-**pitched** sound.





You can change the **pitch** of the sound in different ways depending on the type of instrument that you are playing. For example if you are playing a xylophone, struking the smaller bars will create faster **vibrations** and therefore a higher note. Striking larger bars will causes slower **vibrations** which produces a lower note.

Key Vocabulary

ear eardrum sound pitch volume vibrations medium insulation travel instrument particle soundproof

Year 4 Science - Autumn 2

YEAR 4 SCIENCE – ELECTRICITY

KNOWLEDGE ORGANISER

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

In Year 4, we will learn:

Electricity (Circuits and Components)

- 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.

In Year 6, we will develop this further and learn about:

- Electricity-Changing circuits and symbols.

ELECTRiCITY

Lightning and static electricity are examples of electricity occurring naturally but for us to use electricity to power appliances, we need to make it.

Electricity can be **generated** from wind power used to turn windmills and hydroelectric power from water used in dams. The Sun's rays can be converted into **electricity** by solar panels.

Coal, oil and natural gases are fossil fuels which, when burnt, produce heat which can be used to **generate electricity**.

Nuclear energy is created when atoms are split. This creates heat, which can be used to **generate electricity**. Geothermal energy is heat from the Earth that is converted into **electricity**.

CONDUCTORS AND INSULATORS

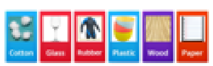
Materials can be **conductors** or **insulators**. Conductors allow electricity to pass through them easily whereas **electrical insulators** do not allow electricity to pass through them.

Electrical conductors

Many **metals**, such as **copper, iron and steel**, are good **electrical conductors.** That is why the parts of electrical objects that need to let electricity pass through are always made of metal.

Electrical Insulators

Plastic, wood, glass and **rubber** are good **electrical insulators, which is why** they are used to cover materials that carry electricity. The plastic covering that surrounds wires is an electrical insulator. It stops you from getting an electrical shock.

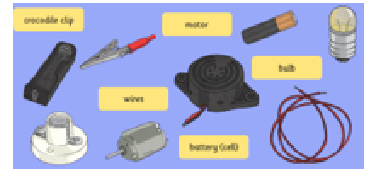


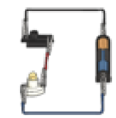
FOCUS SCIENTIST – GARRET MORGAN – TRAFFIC LIGHTS

Garrett Morgan was born on March 4, 1877, in Paris, Kentucky. He was an inventor and successful businessman. Many of his inventions helped to improve public safety. These included an early form of a gas mask and a type of traffic signal. In 1923, he created a new kind of traffic signal, one with a warning light to alert drivers that they would need to stop, after witnessing a carriage accident at a busy city T junction. Morgan quickly acquired patents for his traffic signal—a version of the modern three-way traffic light—in the United States, Britain and Canada, but eventually sold the rights to General Electric for $40,000.

CIRCUITS AND COMPONENTS

These are the components used to make a circuit.



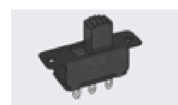


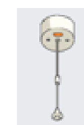
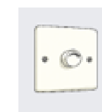
A pathway that **electricity** can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.

Electricity can only flow around a complete **circuit** that has no gaps. There must be wires connected to both the positiveand negative end of the power supply/**battery**.

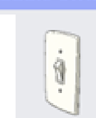
SWITCHES

There are wide varieties of switches that can be used. Below are a few examples.



slide switch	push button switch	pull switch	dimmer switch
paddle switch	selector switch	key switch	toggle switch




Switches can be used to open or close a **circuit**. When off, a switch 'breaks' the **circuit** to stop the flow of **electricity**. When on, a switch 'completes' the circuit and allows the **electricity** to flow.

Key Vocabulary

battery, cell, wires, switch, crocodile clips, buzzer, bulb, circuit, symbols, insulator, conductor, plastic, metal, appliance, component

YEAR 4 HISTORY – THE ROMAN EMPIRE

KNOWLEDGE ORGANISER

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

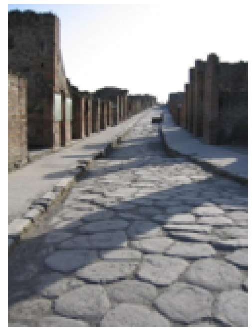
In Year 3, we learnt about 'Invaders of Britain'. They focused on groups who have invaded and changed Britain, from the Picts through to the Normans.

In Year 4, we will further this by looking more in depth at 'The Roman Empire' by learning why the Romans were so successful and how they have helped shape Britain today.

In Year 5, we will continue looking at the theme of 'invasion' by learning more about what life was like in Britain under the rule of the Anglo-Saxons.

WHAT HAVE THE ROMANS GIVEN US?

The Romans, even today, play an important part in our lives. Many of the things we do or have originated from the Romans:



- Central Heating - A hypocaust was the first ever central heating system in a building. It produced and circulated hot air below the floor of a room, and also warmed the walls with a series of pipes through which the hot air passed.
- Concrete - Romans invented concrete and it was used to build all over the empire. The concrete foundations of the Roman Amphitheatre in London were found to be 18 meters thick!! They even invented a concrete that could dry out and go hard under water.
- Roads - Roman roads were straight, this meant that you got to places faster than on a winding road. Many modern-day roads are built over the old Roman ones. There were 10,000 miles of Roman roads in Britain.
- Stinging nettles - Believe it or not, these were brought to Britain to make clothes from. They can also be eaten like spinach when cooked!

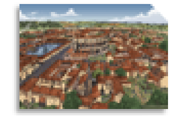
The Romans also gave us: language, the Calendar, laws and the legal system and much more!

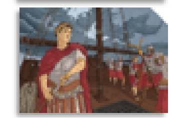
QUEEN BOUDICCA

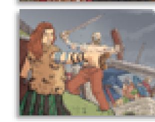
- Queen Boudicca led her army against the Romans in AD60. She is remembered as a strong leader and ferocious warrior.
- Boudicca was a Queen of the Iceni tribe led by her husband King Prasutagus. When the King died, he trusted the Romans and left half his land to them and half to Boudicca. But, the Romans took everything!
- She fought in a famous battle called the Battle of Watling Street, in Verulamium against the Romans when they came to take her land.
- Her army destroyed the Roman towns of St Albans, Colchester and London.
- The Roman army won the battle against Boudicca and her army. They ruled Britain for the next 350 years.

TIMELINE FOR THE ROMAN EMPIRE

753 BCE	The building of Rome begins, with the legend of Romulus and Remus
264 BCE	The Romans begin invading other parts of Italy and take control
146 BCE	The Romans begin invading other parts of the world, including 3 wars which are fought successfully
55 BCE	Julius Caesar invades Britain and fought the Celts, eventually taking over some parts of Britain a year later
1 CE	Jesus is born and the Romans reign
43 CE	Emperor Claudius invades Britain and, after years of fighting, takes control of more of the land
60-61 CE	Boudicca leads a rebellion with the Celts to try to overthrow the Romans but eventually fails
410 CE	Roman rule in Britain ends as many Roman soldiers are needed back in the Empire to defend it
476 CE	Roman rule ends when the Romans are conquered by the 'Barbarians'







THE ROMAN ARMY

The spread of the Roman Empire was partly due to the fact that the Roman army was so well organised. At the time of its invasion of Britain, the Roman army was the most disciplined and efficient killing machine that the ancient world had ever known. Its men were well-equipped and highly trained, and operated in strict formation on the battlefield. Roman soldiers were very strong and tough; they had to march over 20 miles a day with heavy things to carry. They had to carry equipment such as tents, food, cooking pots and weapons as well as wearing all their armour.

The Roman army was divided into two groups - legionnaires and auxiliary. The Roman legionnaire was a soldier who was a Roman citizen younger than 45. Legionnaires served in the army for 20 years. They were well-armed and well-trained fighting men They were also skilled engineers and craftsmen because they had to build roads, bridges and forts. The Auxiliaries of the Roman army were non-Roman citizens. They were recruited from tribes that had been conquered by Rome or were allied to Rome. Roman Auxiliaries were paid less than the legionnaires and had to serve for 25 years, after which they became

Key Vocabulary

The Roman Empire, legacy, invasion, Hypocaust, concrete, roads, Queen Boudicca, revolt, legionnaire, auxiliary, Verulamium, Iceni tribe, Battle of Watling street, Julius Caesar, Emperor Claudius, St. Albans, armour, citizen

Year 4 History - Autumn 2

YEAR 4 HISTORY – LIFE IN ROMAN TIMES

KNOWLEDGE ORGANISER

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

In Year 3, pupils learnt about the Stone age to the iron age and the houses and lifestyles of prehistoric people.

In Year 4, we will further this by looking more in depth at life in 'Roman times' including types of dwellings, entertainment and social classes.

In Year 5, we will continue looking at the theme of 'lifestyle' by learning more about what life was like for Anglo-Saxons once they had invaded Britain as well as social classes and lifestyle in 'Ancient Egypt.'

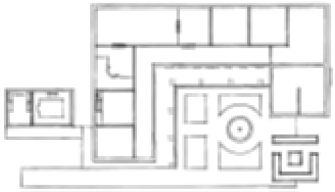
RICH AND POOR ROMANS

Lives were very different for rich and poor Romans:

	Rich Romans	Poor Romans
Food and drink	3 meals a day and fancy dinner parties including meat, fish, fruit and vegetables	Very little meat. Main food was a porridge called Puls
Homes	Large single homes called Domus or a Villa in the countryside	Cramped and badly built apartments called Insulas in the city
Clothing	White Toga made of wool or linen	A tunic which was like a long shirt
Punishment	Having to clean	Crucifixion or even drowning for serious crimes
Religion	Religion was important to all Romans	

ROMAN VILLAS

A Roman villa is a country house that was built and inhabited during the Roman Empire. Villas were owned by rich people. Some of them even had mosaics, glass windows, central heating system (called hypocaust), and their own baths. Rooms inside a Villa included:



- Vestibulum - A grand entrance hall to the house. On either side of the entrance hall might be rooms that housed small shops opening out to the street.
- Atrium - An open room where guests were greeted. The atrium typically had an open roof and a small pool that was used to collect water.
- Tablinum - The office or living room for the man of the house.
- Triclinium - The dining room. This was often the most impressive and decorated room of the house in order to impress guests that were dining over.

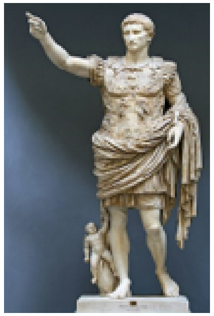
ENTERTAINMENT IN ROME

When the Romans wanted to have fun, they would go to the Colosseum to watch gladiators fight or to see plays. You can still see the Colosseum in Rome – it's not exactly like it was back in Roman times, but you can get an idea of how impressive it would have been back then!

The Colosseum was first called the 'Flavian Amphitheatre'. It was shaped like an oval, and is called an Amphitheatre because it does not have a roof. Chariot races were not held at the Colosseum but people would go to the Circus Maximus for that. It was as long as about six football pitches put together, and it had two rounded ends where the chariots would turn to complete another lap.

SOCIAL CLASSES IN ROME

Life in ancient Rome depended very much on which social class you belonged to. Roman society was hierarchical, meaning some people were considered to be much more important than others:



- Slaves were at the bottom of the social pyramid. They were the poorest people in society and had no rights and had to work constantly.
- Next came plebeians. They were the ordinary working people of Rome. Although they were poor, they were allowed to vote.
- Patricians were the aristocracy of Rome. They were rich and came from noble families.
- Senators were important people who helped make the laws of Rome.
- Two people were chosen every year to help run the empire. These people were called consuls.
- The emperor was the most important man in the whole empire. Ultimately, he had absolute power over everyone and everything in the the

Key Vocabulary

artefact, archaeologist, villa, insula, The Colosseum, gladiator, entertainment, social class, rich/poor, hierarchy, Flavian Amphitheater, Emperor, slaves, patricians, plebeians, senators, entrance, atrium, mosaic, coin

Year 4 Art - Autumn 1

YEAR 4 ART – MOSAICS

KNOWLEDGE ORGANISER

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

In Year 3, we made Venetian Masks focusing on creating texture and shape.

In Year 4, we will extend this by creating our own mosaic designs inspired by the Romans. We will create a mosaic using a motif, border and repeating pattern as well as learning how to adhesive and grout.

In Year 5, we will continue to develop our 3D/ Textiles skills by making 'Scarab Beetles' focusing on experimenting with and combining materials to design and make 3D form.

HISTORY OF ROMAN MOSAICS

The floors of Roman buildings were often richly decorated with mosaics, many capturing scenes of history and everyday life (as well as depicting Gods and Goddesses) or using symmetrical shape designs.

Some mosaics were bought 'off the shelf' as a standard design, while the wealthy villa owners could afford more personalised designs.

Some of the finest Roman mosaics in Britain can be seen at Fishbourne Roman Palace and Bignor Roman Villa. More locally, these can be seen at the 'Hypocaust' found in St. Albans 'Verulamium Park'.

MOSAIC DESIGNS AND COLOURS

Mosaic designs were always in neutral or 'earthy' colours. This was because local materials were often used to make mosaics.

Sandstone would produce yellow, orange and red mosaics whilst chalk and limestone were used for white and Purbeck marble for grey or blue.

MOSAIC BORDERS AND REPEATING PATTERNS

Borders were a popular way of framing designs, often using repeating patterns.

The guilloche is one of the most common Roman mosaic patterns made by interlacing 2 moving strand lines.

The Romans also commonly used Greek meanders which were symbols of eternity and unity.

GROUTING AND ADHESIVE

Rich Romans decorated the floors of their main rooms with mosaics. These were stuck to the floor and 'grouted' with mortar, a type of cement. Each mosaic used thousands of pieces to make a pattern called Tesserae.

In some Roman mosaic techniques, Beeswax was used as an adhesive to stick the tiles to the floor.

Key Vocabulary

Mosaic	design	everyday life	villa	wealthy	floor	Hypocaust	Verulamium park	repeating pattern
border	neutral/earthy	Guilloche	Greek meander	tesserae	mortar	adhesive	grout	print

Year 4 DT - Autumn 2

YEAR 4 DT – MAKING A TORCH

KNOWLEDGE ORGANISER

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

In Year 2, we will learn about shell structures by designing and making our own Emergency vehicles, with wheels and axels.

In Year 4, we will design and construct our own torch by making our own simple circuit, with a bulb, and attaching this to a shiny reflector. We will design our casing with a specific audience in mind.

In Year 5, we will extend our skills through by designing and making a pneumatic Bridge and focusing on joining and strengthening.

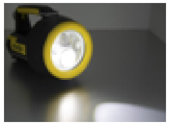
HISTORY OF TORCHES

Throughout history, humans have made use of portable light sources. Torches, candles, oil lamps and kerosene lamps were designed to be carried around but they could be dangerous because they used a flame as a source of light.

Inventions of the electric light bulb and of dry battery at the end of the 19th century enabled solution for this problem and this invention has become known as a torch.

There are many different types, which can be used for many different purposes.

TYPES OF TORCHES



Rechargeable torch

Right angle torch

Head torch

Tactical torch

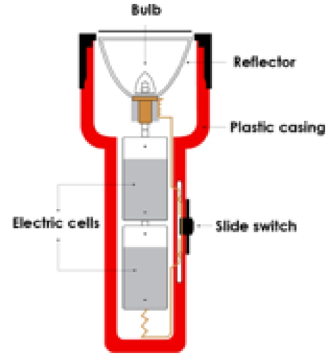
Penlight

Keychain and clip torches

PARTS OF A TORCH

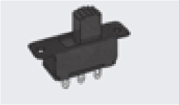
A torch is made up of many parts:

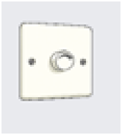
- The plastic casing holds all of the components together and the bulb is the source of light.
- The batteries rest on a small spring that's connected to two contact strips. These parts conduct electricity and complete the circuit when the switch is pushed to 'on'.
- The reflector part at the front is formed of plastic and coated with a shiny aluminum layer, which bends around the bulb, to direct the rays forward so they provide a steady light beam and this is protected by the lens.



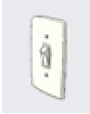
TYPES OF SWITCHES

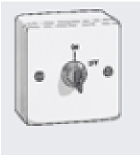
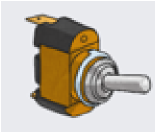
Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow.



slide switch	push button switch	pull switch	dimmer switch
paddle switch	selector switch	key switch	toggle switch



Key Vocabulary

portable	light source	purpose	rechargeable torch	right angle torch	head torch	tactical torch	penlight	keychain
switch	plastic casing	circuit	battery (cells)	on/off	reflector	beam	components	bulb

Year 4 PE - Autumn 1

Year 4 - Tennis

Knowledge Organiser

Prior Learning

Can identify and describe some rules of tennis. Have served to start a game. Explored forehand hitting.

We are learning...

1. To return to the middle of the court after playing a shot.
2. To accurately use the forehand in game situations to score points.
3. To play a backhand shot with some control.
4. To combine ready position and court movement to consistently return the serve.
5. To work with a partner to score points in a game.
6. To use forehand and backhand shots to score points in a competitive situation.

Assessment Overview

Head – Use defensive tactics to defend the court.
Hand – Attempt to self-feed backhand shots.
Heart – Play competitively with others and against others in modified games.

Equipment

Tennis racquets, nets, sponge balls, tennis balls, cones, hoops, bench.

Vocabulary

Hit, return, court, forehand, backhand, bounce, points, score, net, tactics, underarm, overarm, position, ready.

Unit Focus

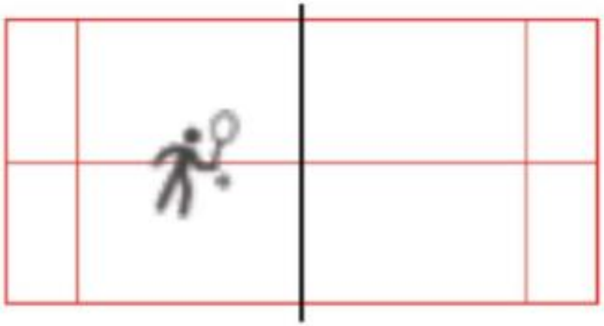
Explore some forehand and backhand shots. Work to return the serve. Explore positions in gameplay.

Key Questions

1. Which side is your backhand if you are right-handed? Left-handed?
2. Where should you try to return to on your court after hitting shots and why?
3. How can you communicate with your partner to be effective in games?

Concept

Court Positioning - Being in the middle of the court gives you the best chance to return the ball because you can move easily to any part of the court.



Year 4 PE - Autumn 2

Year 4 – Hockey

Knowledge Organiser

Prior Learning

Experienced different types of small-sided invasion games. Able to send and receive balls. Use a variety of techniques and tactics to play competitively, both attacking and defending.

Unit Focus

Consistently perform basic hockey skills such as dribbling and push passes. Implement the basic rules of hockey. Develop tactics and apply them in competitive situations. Increase speed and endurance during gameplay.

We are learning...

1. to perform a push pass with accuracy.
2. to perform a straight dribble to maintain possession.
3. to use reverse-stick to control a ball on the far side of our body.
4. to use a slap pass to send the ball over longer distances.
5. to turn to keep the ball under control and move into space.
6. to develop new skills in competitive situations and look to improve.

Key Questions

1. Why must we keep the ball close to our stick when turning or dribbling?
2. What happens in the game if the ball hits the back of your stick?
3. How can we produce more power to make slap hit go further?

Equipment

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

Vocabulary

Control, use space, defend, attack, dribble, pass, push, slap, reverse.

Rules

- No Contact.
- No touching the ball with their feet, the opposition gets a free pass where the offence occurred.
- The ball cannot touch the back of the stick.

Assessment Overview

Head - Decide as a team how to make things difficult for your opponent.
Hand - Attempt a slap pass in isolation.
Heart - Suggest ways to improve your and your team's performance.