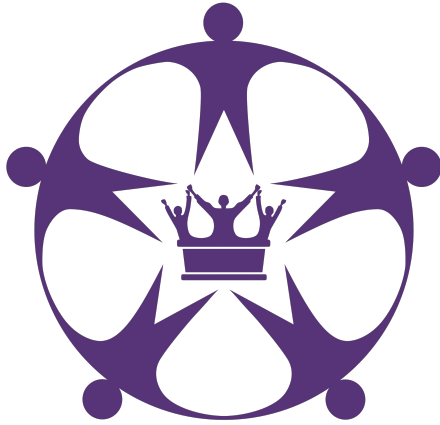




Science at Tyndale Community School

Subject Intent



We believe Science at Tyndale is all about exploring and investigating.. We believe learning science-facts only becomes embedded, useful and memorable when backed up by exploring that fact through a child-led investigation. Science teaching at Tyndale aims for a 70%-30% split between exploring and investigation and fact and knowledge acquisition.

In EYFS, exploration is at the heart of all we do. The children use their well resourced outdoor area to find out cause and effect in different situations. They have a host of opportunities to manipulate different materials and begin looking into the basics of sorting and grouping from their own observations in order to shape their Knowledge and Understanding of the World.

In key stage 1 and key stage 2, , children build on their previous scientific experiences, knowledge and vocabulary to ensure they develop into inquisitive, accurate and creative scientists. All of our science content for each year is linked to one of our 6 values. A good scientist also rarely works in isolation and so community and collaboration are key to our science work. Each year-group looks for ways to discuss and debate scientific questions each term.

Science is a wonderful subject that requires and uses both children's mathematical skills to calculate and their literacy skills to communicate what they have discovered. Science is a core part of learning at Tyndale throughout our weekly lessons, our projects and our after school science club.

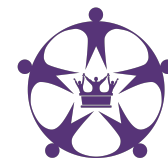
Subject Implementation



At Tyndale Community School, we believe that science should be purposeful. That's why Science is one of our 'ELC' subjects and in many projects is used to answer a BIG question.

- Every lesson starts with 'Bright Ideas Time' and uses resources from Explorify, Concept Cartoons or Thinking, Talking, Doing Science.
- Lessons are planned with support from [PLAN Assessment](#) knowledge matrices and enquiry skills progression documents.
- Teachers ensure that lessons are practical and accessible to all students.
- Science addresses misconceptions that children might have.

Subject Overview



	Autumn 1	Autumn 2	Spring 3	Spring 4	Summer 5	Summer 6
Year 1	What is the best material to make a toy from?	What makes a good King or Queen?	How do artists make a stand?	What is it like to live in the UK?	What would it be like to live on water?	What makes me, me?
Science	Everyday Materials	Seasonal Changes	Everyday Materials	Seasonal Changes & Animals including humans	Plants	Seasonal changes & Animals including humans
Year 2	What do we need to live a rewarding life?	Will it always be this way?	What makes Oxford University one of the best in the world?	Would my life look the same if I lived somewhere else?	What belongs in an Oxford garden?	How is music made?
Science	Animals including humans		Living things and their habitats	Living things and their habitats	Plants	Everyday Materials
Year 3	How do you recover from a natural disaster?	How did our story begin & how can we continue to tell it?	What does sustainable living look like?	How can we build a life on firm foundations?	How can we be of service?	What does it take to become an olympian?
Science	Rocks	Light	Forces and magnets		Plants	Animals including humans

Subject Overview



Year 4	Is true democracy possible?	How much is too much?	How can we be a source of light in the darkness?	Could robots replace us?	Do the ends always justify the means?	Who & what should be celebrated through art?
Science	Sound	Animals including humans	Living things and their habitats	Electricity	Plants	States of matter
Year 5	Is water ever truly pure?	Could humans ever live in space?	What is the lasting impact of an empire?	Why is our world worth saving?	Has Oxford always been a place of innovation?	Is Mythology still important today?
Science	Properties and changes of materials	Earth & Space	Forces	Living things and their habitats	Plants	Humans
Year 6	How did we all get here?	Is there only one way to worship?	How will we power our world now & in the future?	How do artefacts help to form identities today?	How can we live a life rich in colour?	How can we be a positive force for change?
Science	Evolution & Inheritance		Electricity	Living things and their habitats	Light	Animals including Humans

Subject Assessment Framework



Plants

Birth to three	Explore natural materials, indoors and outside.
Nursery	- Use all their senses in hands-on exploration of natural materials. - Explore collections of materials with similar and/or different properties. - Plant seeds and care for growing plants. - Understand the key features of the life cycle of a plant and an animal. - Begin to understand the need to respect and care for the natural environment and all living things.
Reception	- Draw information from a simple map. (Reception – Living things and their habitats) - Explore the natural world around them. (Reception – Living things and their habitats) - Describe what they see, hear and feel whilst outside. (Reception – Living things and their habitats) - Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats) - Understand the effect of changing seasons on the natural world around them. (Reception – Seasonal changes)
Year 1	- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. - Identify and describe the basic structure of a variety of common flowering plants, including trees.
Year 2	- Observe and describe how seeds and bulbs grow into mature plants. - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. - Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. - Investigate the way in which water is transported within plants. - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Year 4	- Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) - Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	- 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. (Y6 - Living things and their habitats) - Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Living things and their habitats

Birth to three	Explore natural materials, indoors and outside.
Nursery	- Use all their senses in hands-on exploration of natural materials. - Explore collections of materials with similar and/or different properties. - Begin to understand the need to respect and care for the natural environment and all living things.
Reception	- Draw information from a simple map. - Explore the natural world around them. - Describe what they see, hear and feel whilst outside. - Recognise some environments that are different to the one in which they live.
Year 1	- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) - Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) - Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	- Explore and compare the differences between things that are living, dead, and things that have never been alive. - Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. - Identify and name a variety of plants and animals in their habitats, including microhabitats. - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. - Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
Year 3	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	- 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. - Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Year 5	- 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.
Year 6	- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. - Give reasons for classifying plants and animals based on specific characteristics. - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. (Y6 - Evolution and inheritance) - Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Y6 - Evolution and inheritance)

Animals, including humans

Birth to three	- Explore natural materials, indoors and outside. - Make connections between the features of their family and other families. - Notice differences between people.
Nursery	- Use all their senses in hands-on exploration of natural materials. - Begin to make sense of their own life-story and family's history. - Understand the key features of the life cycle of a plant and an animal. - Begin to understand the need to respect and care for the natural environment and all living things.
Reception	- Talk about members of their immediate family and community. - Name and describe people who are familiar to them. - Recognise some environments that are different to the one in which they live.
Year 1	- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). - Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Year 2	- Notice that animals, including humans, have offspring which grow into adults. - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. (Y2 - Living things and their habitats)
Year 3	- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. - Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
Year 4	- Describe the simple functions of the basic parts of the digestive system in humans. - Identify the different types of teeth in humans and their simple functions. - Construct and interpret a variety of food chains, identifying producers, predators and prey.
Year 5	- Describe the changes as humans develop to old age. - Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) - Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. - Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. - Describe the ways in which nutrients and water are transported within animals, including humans. - 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. (Y6 - Living things and their habitats) - Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Evolution and inheritance

Birth to three	• Make connections between the features of their family and other families. • Notice differences between people.
Nursery	• Begin to understand the need to respect and care for the natural environment and all living things. (Nursery – Living things and their habitats)
Reception	• Recognise some environments that are different to the one in which they live. (Reception – Living things and their habitats)
Year 1	
Year 2	• Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (Y2 - Living things and their habitats) • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Year 3	• Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	• Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	• Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5)
Year 6	• 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.
Key Stage 3	• Heredity as the process by which genetic information is transmitted from one generation to the next. • A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. • The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Seasonal changes

Birth to three	•
Nursery	• Understand the key features of the life cycle of a plant and an animal. (Nursery – Plants & Animals, excluding humans)
Reception	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them.
Year 1	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.
Year 2	
Year 3	• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)
Year 4	
Year 5	• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	
Key Stage 3	• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

Materials

Birth to three	- Explore materials with different properties. - Explore natural materials, indoors and outside.
Nursery	- Use all their senses in hands-on exploration of natural materials. - Explore collections of materials with similar and/or different properties. - Talk about the differences between materials and changes they notice.
Reception	- Explore the natural world around them. - Describe what they see, hear and feel whilst outside.
Year 1	- Distinguish between an object and the material from which it is made. - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. - Describe the simple physical properties of a variety of everyday materials. - Compare and group together a variety of everyday materials on the basis of their simple physical properties.
Year 2	- 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.
Year 3	- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) - Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) - 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. (Y3 - Forces and magnets)
Year 4	- Compare and group materials together, according to whether they are solids, liquids or gases. - Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). - Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. - Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)
Year 5	- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. - Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. - Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. - Demonstrate that dissolving, mixing and changes of state are reversible changes. - Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Year 6	

Rocks

Birth to three	- Explore materials with different properties. - Explore natural materials, indoors and outside.
Nursery	- Use all their senses in hands-on exploration of natural materials. (Nursery – Living things and their habitats) - Explore collections of materials with similar and/or different properties. (Nursery – Living things and their habitats)
Reception	- Explore the natural world around them. (Reception – Living things and their habitats) - Describe what they see, hear and feel whilst outside. (Reception – Living things and their habitats)
Year 1	- Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) - Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) - Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
Year 2	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Year 3	- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. - Describe in simple terms how fossils are formed when things that have lived are trapped within rock. - Recognise that soils are made from rocks and organic matter.
Year 4	
Year 5	
Year 6	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)
Key Stage 3	- The composition of the Earth. - The structure of the Earth. - The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.

Light

Birth to three	• Repeat actions that have an effect.
Nursery	• Explore how things work. • Talk about the differences in materials and changes they notice.
Reception	• Describe what they see, hear and feel whilst outside.
Year 1	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)
Year 2	
Year 3	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change.
Year 4	
Year 5	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)
Year 6	• Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Forces

Birth to three	• Repeat actions that have an effect.
Nursery	• Explore how things work. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.
Reception	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside.
Year 1	
Year 2	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Year 3	• 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.
Year 4	
Year 5	• 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.
Year 6	

Sound

Birth to three	• Repeat actions that have an effect.
Nursery	• Explore how things work.
Reception	• Describe what they see, hear and feel whilst outside.
Year 1	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Year 2	
Year 3	
Year 4	• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.
Year 5	
Year 6	

Electricity

Birth to three	Repeat actions that have an effect.
Nursery	Explore how things work.
Reception	
Year 1	
Year 2	
Year 3	
Year 4	- 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.
Year 5	
Year 6	- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. - Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. - Use recognised symbols when representing a simple circuit in a diagram.
Key Stage 3	- Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. - Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. - Differences in resistance between conducting and insulating components (quantitative). - Static electricity.

Earth and space

Birth to three	Explore and respond to different natural phenomena in their setting and on trips.
Nursery	
Reception	- Explore the natural world around them. - Describe what they see, hear and feel whilst outside.
Year 1	- Observe changes across the four seasons. (Y1 – Seasonal changes) - Observe and describe weather associated with the seasons and how day length varies. (Y1 – Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. - Describe the movement of the Moon relative to the Earth. - Describe the Sun, Earth and Moon as approximately spherical bodies. - Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Year 6	

How we measure progress

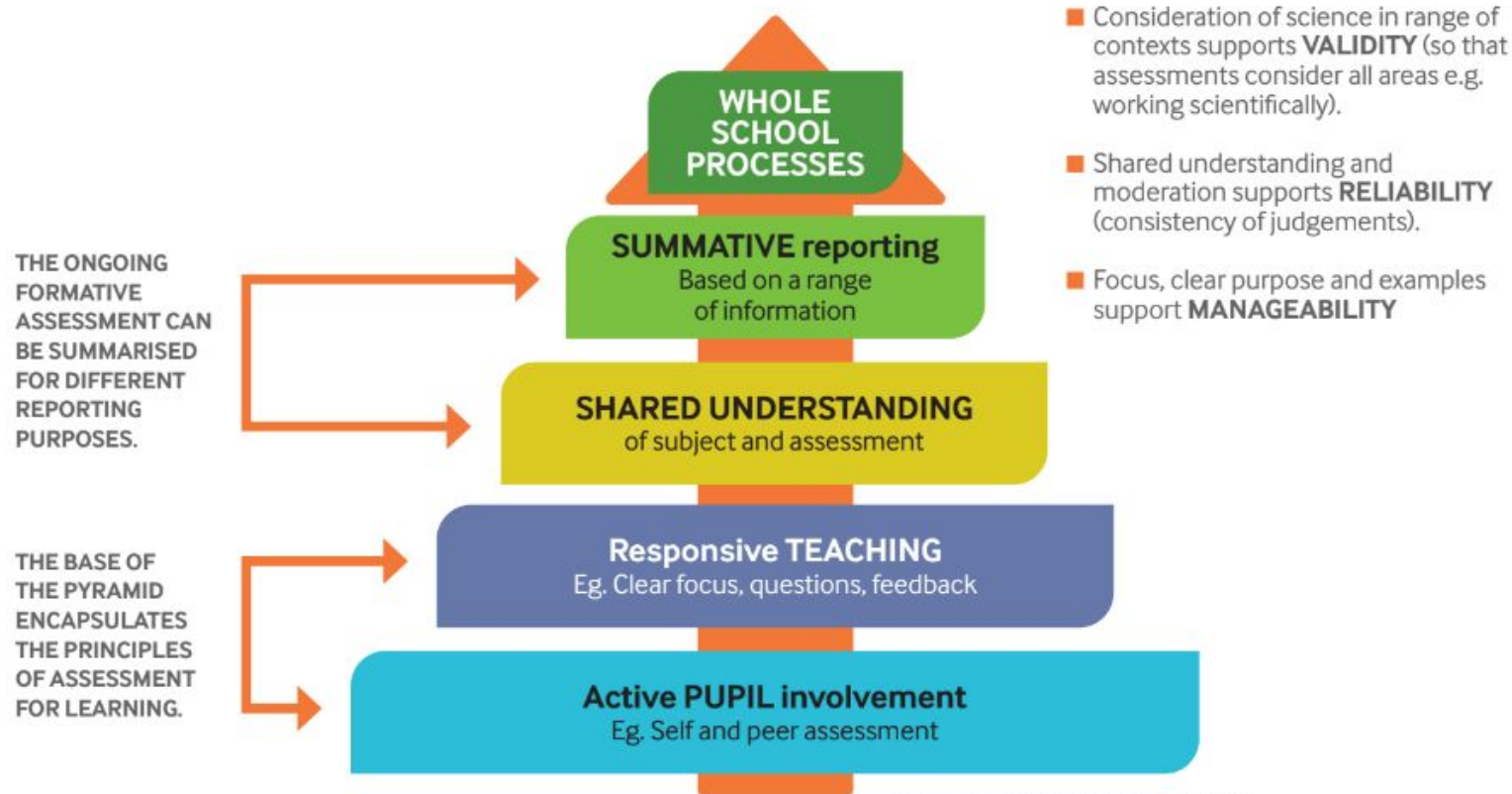
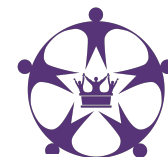


Figure 1: TAPS Key Principles Pyramid