

Topic: The Ancient Greeks.

Year 4/5– Puffins & Octopus

Strand: Science

What should I already know?

Recognise that animals have offspring and these grow into adults. Be aware that animals can be grouped in different ways and 'classified'. To know the names of many

Science Knowledge and Skills

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, particularly the difference between sexual and asexual reproduction

They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall

Record data and results of increasing complexity, using scientific diagrams and labels or classification keys

Identify scientific evidence that has been used to support or refute ideas or arguments

How do the life cycles of living things differ?

All living things can be grouped into different groups, each with their own set of characteristics.

The life cycle of mammals, amphibians, insects and birds are different depending on how they reproduce and what their habitats are like

Plants and animals reproduce sexually or asexually, depending on how species recreates. There are advantages and disadvantages to both

Sexual reproduction involves two genetically different organisms providing the genetic information needed to create offspring

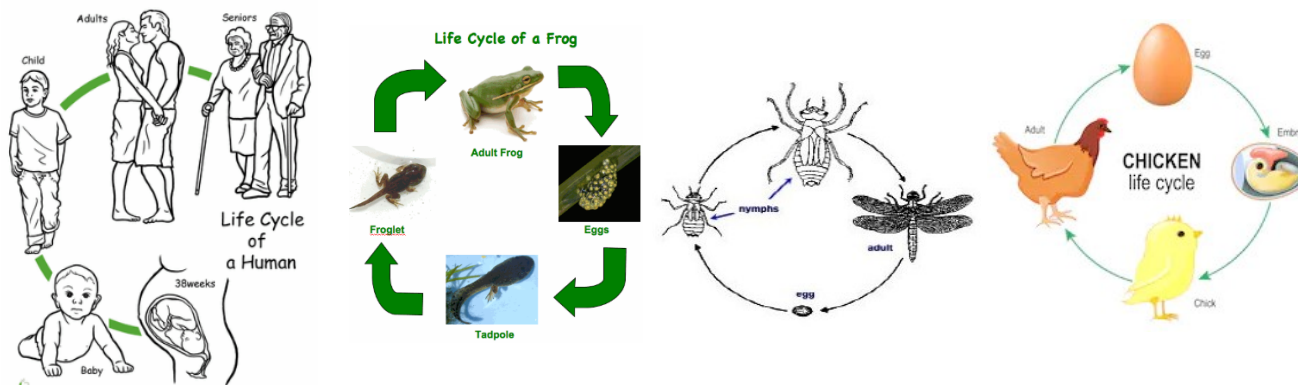
Asexual reproduction involves one organism replicating its genetic material to create a genetically identical offspring

Some people are famous as being expert naturalists or animal behaviourists and their knowledge is shared with other experts and the general public

Vocabulary

mammal	a vertebrate animal whose young are nourished with milk
amphibian	cold-blooded vertebrate typically living on land but breeding in water
insect	have segmented bodies, jointed legs, and external skeletons
bird	group of warm-blooded vertebrates characterized by feathers, toothless beaked jaws, and the laying of hard-shelled eggs
Life cycle	A series of changes in the growth and development of an organism
reproduction	the production of offspring
sexual	the process in which new organisms are created, by combining the genetic information from two individuals of different sexes
asexual	when an organism makes more of itself without exchanging genetic information with another organism
naturalist	an expert in natural history
seeds	Used by a flowering plant to reproduce
tubers	Part of a plant used for asexual reproduction
vertebrate	Having a backbone
offspring	The child or reproduced form of a mature organism
genetic information	The code used to reproduce an organism

Diagrams



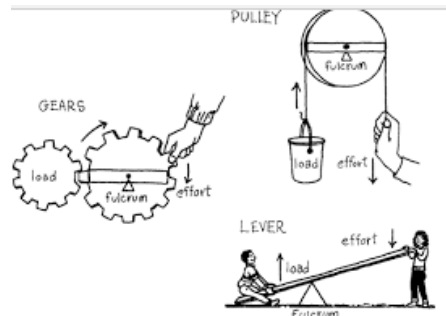
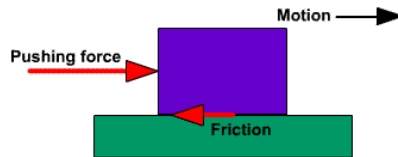
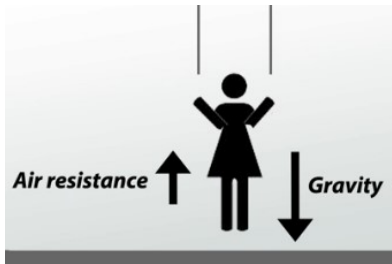
Topic: How do forces work?

Year 4&5

Strand: Science

What should I already know?	How do different forces act on objects?	Vocabulary	
<p>(Year 1) That the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>(Year 3) That some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>(Year 3) Recognise how things move on different surfaces</p>	<p>Gravity is a force that pulls objects down towards a mass.</p> <p>Different planets have different amounts of gravity, depending on how big they are and their mass.</p> <p>In space there is gravity but it is offset by the speed at which we are moving compared to Earth, which causes 'weightlessness'.</p> <p>When objects fall through air they can experience air resistance, which slows their descent.</p> <p>To know that friction is caused by two surfaces rubbing together and it can be increased or decreased as required</p> <p>To understand how water resistance can act upon objects, how it can be reduced and why this is important</p> <p>To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>	air resistance	The drag force that acts opposite to a falling object, thus slowing the object down
<p>Science Knowledge and Skills</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>		effort	The energy required to move a load
		friction	The resistance that one surface or object encounters when moving over another
		fulcrum	the point against which a lever is placed to get support
		gears	a toothed wheel that works with others to alter the speed of a driving mechanism (such as an engine) and the speed of the driven parts (the wheels)
		gravity	The force that pulls things to the ground on Earth (or other planets)
		levers	a simple machine made of a beam that moves at a fixed hinge, or fulcrum
		load	An object that is being lifted or moved
		mass	The quantity of matter which an object contains
		Newton	Equal to the force that would give one kilogram an acceleration of one metre per second
		Newton meter	A tool used to measure the amount of force acting on something
		pulleys	a small wheel with a rope or chain used to change the direction and point of use of a pulling force. It can increase the applied force for lifting weights
		water resistance	Water resistance is a type of friction between water and another material

Diagrams



Topic: Why is the planet melting?

Year 4/5—Puffin

Strand: Science—Properties of materials

What should I already know?

(Year 1) compare and group materials on the basis of their simple physical properties
 (Year 2) find out how the shapes of solid objects can be changed
 (Year 3) compare and group materials on the basis of whether they are attracted to a magnet
 (Year 4) construct a simple series electrical

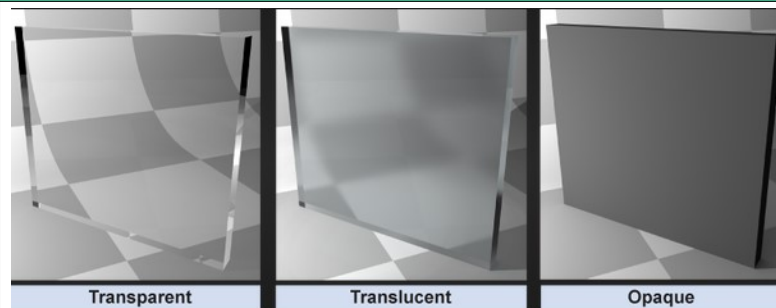
Science Knowledge and Skills

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
 Plan different types of scientific enquiries to answer questions, including recognising and con-

Why do we select particular materials for certain tasks?

Different materials have different properties, which make them suitable or unsuitable for particular tasks.
 Some materials allow lots of light through so you can see clearly through them (transparent), some light but not much detail (translucent) or they allow no light through (opaque).
 Materials can be insulators or conductors. Being a thermal conductor means heat passes through easily. An insulator does not allow heat to pass through. Other materials are electrical insulators and conductors, with lots of different reasons why you would use one or other for particular tasks.
 The level of absorbency of a material is the amount of liquid it can take up. It is possible to measure and compare the absorbency.
 Sometimes materials undergo changes, such as melting or chemical reactions. Some of these changes are reversible, the original materials can be recovered, and some are irreversible, the original

Images



Vocabulary

absorbency	The degree to which something is capable of taking up liquid, heat, light etc.
conductor	Anything that allows the passing of energy, especially heat (thermal) and electrical
dependent variables	A dependent variable is the variable in a scientific experiment that's being tested
independent variables	The independent variable is what is changed to determine its relationship to the dependent variable. More generally, the independent variable is the "cause," while dependent variable is the "effect"
insulator	Blocks or slows the passing of energy, especially thermal and electrical
irreversible change	Irreversible changes are permanent changes. Materials react to form an entirely new substance and cannot be reversed.
mixture	A substance consisting of two or more materials mixed together (not in fixed amounts and not with chemical bonding)
properties	The quality of a material such as whether it can be bent easily
reversible change	A reversible change is a change where no new materials are created and the original material can be recovered
solution	A mixture in which one or more materials are spread equally throughout another
thermal	Anything relating to heat
translucent	Allows light, but not detailed shapes, to pass through
transparent	Allowing light to easily pass through and detail can be seen through a material

Topic: Space

Year 4&5—Puffin

Strand: Science—Earth and Space

What should I already know?

(EYFS) Understand some important processes and changes in the natural world around them, including seasons and changing states of matter.
 (Year 1) Discuss how day length varies (using vocabulary like longer and shorter, mid-summer and mid-winter)

Science Knowledge and Skills

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

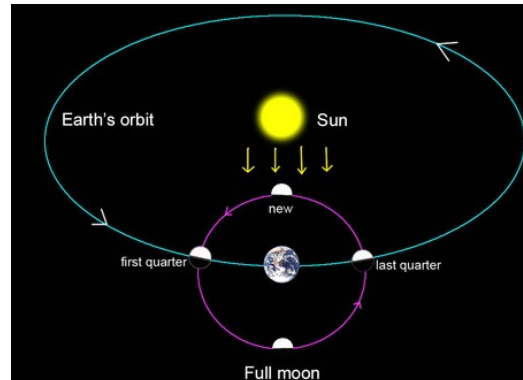
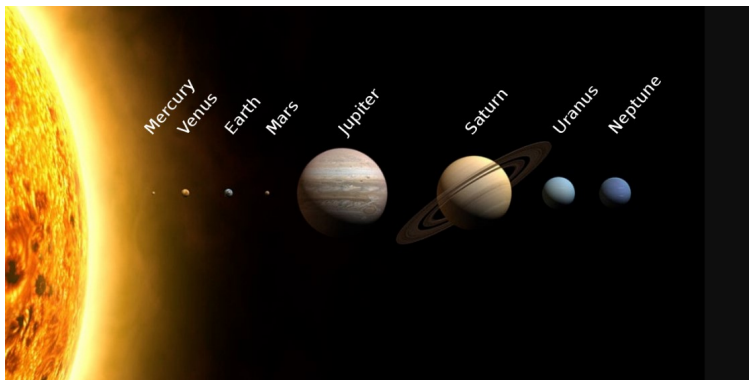
What is special about our planet?

The Earth orbits the Sun, a star at the centre of our solar system. This orbit is an elliptical shape, which changes the amount of light that reaches us throughout the year.
 As the Earth orbits it also rotates on its axis, which causes day and night. The tilt of the axis also causes seasons.
 The Sun appears to rise in the East and set in the West, as the Earth rotates anti-clockwise.
 The Moon is a smaller spherical body that orbits the Earth. The speed at which the Moon rotates on its axis matches the speed at which it orbits Earth, which means we only ever see one side of the Moon.
 The far side, or 'dark side' of the Moon is the side we never see from Earth.
 The orbit of the Moon causes tides on Earth due to the gravitational pull.

Vocabulary

anti-clockwise	To turn the opposite way to a clock
axis	A real or imaginary straight line going through the centre of a object that is spinning
day	The time when sunlight reaches us on the surface of Earth
Earth	The planet we live on
elliptical orbit	The shape of a stretched circle. An orbit is when one object goes around another.
horizon	The line at which the Earth's surface and the sky appear to meet
Lunar eclipse	When the Moon moves into the Earth's shadow.
Moon	A spherical body of rock orbiting Earth, it is around 4.6 billion years old
Moon phases	The change in the Moon's apparent shape based on where it is between Earth and the Sun
night	The time when we are facing away from the Sun and light does not reach us
Solar System	A solar system is a group of planets and other bodies that revolve around a star
sphere/spherical	A spherical shape is rounded in three dimensions, like a ball.
Sun	A yellow dwarf star that is around 110 times wider than Earth
Time zones	An area which observes a standard time

Diagrams



Topic: Were the Vikings vicious?

Year 4/5—Puffins

Strand: Science—Properties of materials

What should I already know?

(Year 1) compare and group 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

(Year 2) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Scientific objectives

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

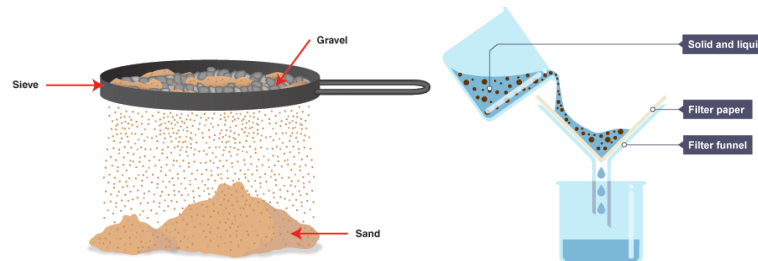
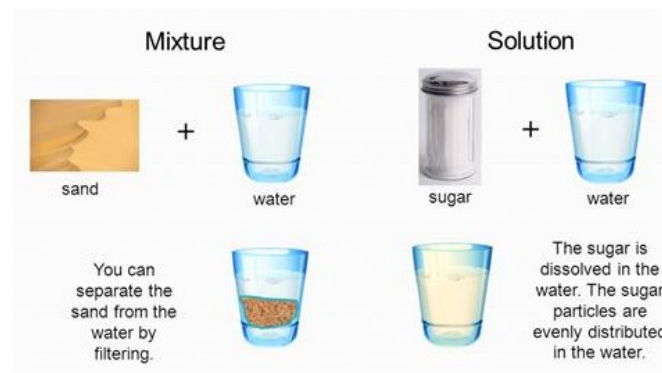
Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Plan different types of scientific enquiries to answer questions

Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

How can I sort materials based on their properties?

- Identify how materials are used and their key properties
- Plan an investigation to investigate properties of materials and compare the findings
- Complete an investigation into sorting materials, using their properties to support the selected method such as filtering and sieving
- Record and discuss the effect of changing variables when dissolving solids into a liquid



Vocabulary

evaporation	The process of turning a liquid into a
filtering	The process of removing solids from
gases	A material where the particles move
irreversible change	A change that cannot be reversed,
liquids	A material where particles move more
mixture	A substance consisting of two or more materials put together (not in fixed amounts or with chemical bonding)
particles	Tiny bits of matter that make up eve-
properties	The quality of a material such as
reversible change	A change that can be put back to the original parts, such as mixing two solids together
sieving	The process of separating solid parti-
solids	A material where the particles are closely bonded together and don't move easily
solution	A mixture in which one or more materials are distributed equally throughout another substance, they can usually be separated again fairly easily

Falmouth Primary Academy

Topic: Were all Vikings vicious?

Year 4/5—Puffins

Strand: Science—Properties of materials



Question 1: What are the properties of iron that make it good for an axe?

Start of unit:

End of unit:

Question 2: Draw the particles in a:

Start of unit:

End of unit:

Solid

Liquid

Gas

Question 3: Match these statements

Start of unit:

End of unit:

1. Filtering is when

A. heat is used to remove a liquid

2. Evaporation is when

B. larger particles are removed from a mixture of solids

3. Sieving is when

C. a liquid passes through a material and solids are removed

Question 4: Which variable do you change to investigate something? Tick one.

Start of unit:

End of unit:

Dependent variable

Independent variable

The control example

Falmouth Primary Academy

Topic: Were all Vikings vicious?

Year 4/5 —Puffins

Strand: Science—Properties of materials

A Viking needs to remove the salt from a sea water solution that also contains gravel and sand, how should they do this?

Start of
unit:

End of
unit:

Vikings should have made all of their weapons and armour out of gold, as it is a metal and they would look good. Do you agree?

Start of
unit:

End of
unit: