



Earth and Space
Year Group: 5
Term: Autumn 1



How does the Sun affect us on Earth?

What you should already know

- Days are longer in the summer and shorter in the winter.
- Weather changes through the year – getting hotter in the summer and colder in the winter.
- The Earth orbits the Sun. This takes 365 ¼ days which is a year.
- Light is a form of energy.
- We need light to see things and that darkness is the absence of light.
- Light travels in straight lines.
- The Sun gives off light and heat.

Investigations

How big are the different planets?

- Plan scientific enquiries to answer a question.
- Take accurate measurements.
- Record data using tables and then a line graph.
- Identify scientific evidence which has been used to support an idea.
- Report findings of an investigation – in written form.
- Use the results to develop a conclusion.
- Make further predictions based on the findings of the investigation.
- Ask further questions.

New Learning

Lesson 1:

- There are eight major planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- All planets in the solar system orbit the Sun and that the further away they are from the Sun, the longer the orbit takes.

Lesson 2

- A **celestial body** is a large object in the universe.
- A star is an exceptionally hot ball of gas. The Sun is a star.
- A planet (e.g. Earth) is a spherical celestial body that orbits a star.

Lesson 2:

- It was once thought that everything **orbited** the Earth, but scientists like Copernicus and Galileo used telescopes and measurements to show that the Earth orbited the Sun.

Lesson 4:

- A satellite orbits a planet and that moon are natural satellites.
- The Moon orbits the Earth roughly every 28 days.
- As the Moon **orbits** the Sun, different parts of it are lit up by the Sun which is why we see a different shape lit up on the Moon as the lunar cycle progresses.
- Humans have sent man-made satellites into orbit that assist with telecommunications.

Lesson 5:

- The Earth **spins** around an imaginary line through its centre called an **axis** and that this axis is **tilted**.
- Day and night are a result of the Earth rotating on its axis.

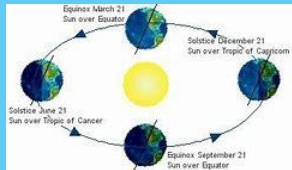
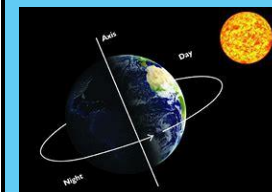
Lesson 6:

- The tilt of the Earth towards and away from the Sun's light as the Earth orbits the Sun leads to the seasons as during winter the light is spread over a wider area.
- *A solar eclipse occurs when the Moon is between the Sun and the Earth, casting a shadow on the Earth; a lunar eclipse occurs when the Earth is between the Sun and the Moon, casting a shadow on the Moon. (This can be mentioned through a quick video – does not need a whole lesson)*

Vocabulary

absorption	energy	
reflection	orbit	
	wave	
	Sun	
spring		summer
winter	autumn	
	planet	
	satellite	
sphere	solar system	eclipse

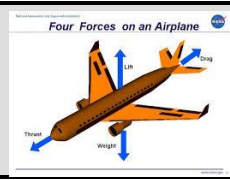
star universe
 constellation
 axis celestial



Satellite



Forces
Year Group: 5
Term: Autumn 2/Spring 1/Spring 2



What has force got to do with it?

What you should already know

- A force can be thought of as a push or pull.
- As an object moves across a surface there is friction when they rub against each other.
- Applying forces to objects can change their shape.
- There are three types of forces: Impact: two forces collide. Frictional: Two surfaces are already in contact. Strain: An elastic material is stretched or squashed.
- Objects move differently on rough and smooth surfaces.

Investigations

Does the size of a parachute affect how quickly it falls?

Do streamlined objects cause less water resistance?

- Ask questions and answer them by setting up a scientific enquiry.
- Set up a fair test with one variable.
- Use equipment to take measurements.
- Record results in a tables/bar charts.
- Write up findings from a scientific enquiry.
- Decide if it is necessary to repeat measurements.
- Draw conclusions from the results.
- Repeat measurements as necessary.
- Do the results support or refute the ideas of water and/or air resistance?

New Learning

Lesson 1:

- Force is measured in a unit called **Newton**s (named after Sir Isaac Newton).
- Pull forces are measured using a force meter.
- The amount of matter in an object is its mass.

Lesson 2 and 3:

- **Gravity** is a force that acts between all objects in the universe.
- Unsupported objects are pulled towards the Earth by the force of gravity.

Lesson 4 and 5:

- **Air resistance** is a force that is felt by an object as it moves through the air. It is caused as it bumps into the gas particles that make up the air. The quicker the object is moving, the more gas particles it bumps into and the more air resistance it experiences.

Lesson 6: (investigation)

- A parachute's shape increases the **air resistance** that a falling object experiences.

Lesson 7:

- **Water resistance** is a force felt by an object as it moves through water. It is caused by the object bumping into the water particles.

Lesson 8 and 9: (investigation)

- The shape of an object determines how much water or air resistance it experiences.
- Shapes of objects which experience little water or air resistance are described as being

Lesson 10 and 11:

- In a **force diagram**, the arrows represent the different arrows acting on an object.

Vocabulary

energy	matter
surface	particle
stretch	friction
smooth	force
	squash
	rough
	friction
	acceleration
air resistance	buoyancy
	force meter

Diagrams/Pictures

gravity mass
streamlined water resistance

Air resistance (upward arrow on parachute)

Gravity (downward arrow on parachute)

Upthrust of the water (upward arrow on boat)

Weight of the boat (downward arrow on boat)

Force (horizontal arrows on gift)

PUSH AND PULL FORCES (illustration of a person pushing a box)



Properties and Changes of Materials

Year Group: 5

Term: Spring 2/Summer 1

Changes

What you should already know

- An object is made of/from a material.
- Materials have useful properties for a given job, e.g. waterproof, strong, hard, soft, smooth, rough, flexible.
- There are three states of matter – solid, liquid and gas.
- Materials can change state when the temperature changes.
- The melting point of water is 0 degrees C and the boiling point is 100 degrees C.

Investigations

Which solids dissolve in water?

How can a mixture of sand, small stones, salt and water be separated?

- Plan scientific enquiries to answer a question.
- Record data using labelled diagrams and tables.
- Report findings of an investigation in written form.
- Use the results to develop a conclusion.
- Identify relationships between materials.
- Make further predictions based on results from the investigations.

New Learning

Lesson 1:

- Materials can be sorted in a variety of ways according to their properties.

Lesson 2:

- When surrounded by a liquid, the bonds within a solid material will break.
- The liquid absorbs the solid.
- The solid is then called a **solute**, the liquid is called a **solvent** and the result is called a **solution**.

Lesson 3:

- When a solid dissolves in a liquid, it is described as being **soluble**, e.g. sugar in water.
- When a solid will not dissolve in a liquid, it is described as being **insoluble**, e.g. sand in water.
- Liquid can only absorb a certain amount of solid before no more will dissolve – this then becomes **saturated**.

Lesson 4/5:

- A **reversible change** is one which can be reversed, e.g. mixing, dissolving and changes where no chemical reaction takes place.
- An **irreversible change** is one where the change of state cannot be reversed, e.g. where there is a chemical reaction and a new material is made – burning, boiling an egg.

Lesson 6:

- When a solvent is evaporated from a solution, the original solute is left behind.

Lesson 7/8:

- Filtering allows solids and liquids to be separated.
- Separating a mixture of sand, salt and small stones can be done by sieving, dissolving in water, filtering and evaporation.

Vocabulary

absorption condensation matter
 evaporation melting particle
 reversible freezing wood
 plastic boiling point
 melting point solid
 liquid

gas

irreversible dissolve

solvent solution solute

filter

sieve

Diagrams/Pictures



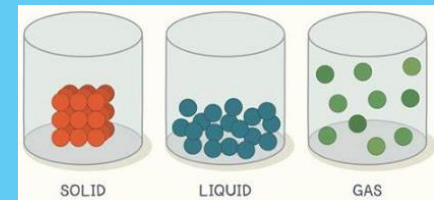
Sieving



Dissolving

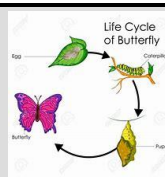


Evaporation





Living Things and Their Habitats
Year Group: 5
Term: Summer 2



Big Question: Do all living things have the same cycle of life?

What you should already know

- Living things move, grow, consume nutrients and reproduce.
- Fish, amphibians, reptiles, birds and mammals are similar – they have internal skeletons and organs. These are known as vertebrates – they have a back bone.
- Different parts of a plant have more than one function.
- The function of a flower is

Investigations

How do plants disperse their seeds?

- Make careful observations.
- Take measurement.
- Take photographs to collect the data.
- Produce a labelled diagram to record the results.
- Ask further questions.
- Write a scientific **conclusion**.

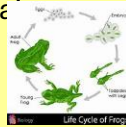
New Learning

Lesson 1:

- A **life cycle** of a living thing is a series of stages of development starting with a **fertilized egg** in animals or a seed in many plants.
- In most mammals (e.g. dogs) a fertilized egg develops in the womb into an **embryo** and is then born and fed on milk. It is then weaned and starts to eat food it is adapted to eat. It then develops to maturity where the process can begin again

Lesson 2:

- In amphibians (e.g. frog) a fertilized egg develops into an embryo and then hatches into a tadpole. The tadpole develops adult features, then **metamorphoses** into the adult form. Then it can **reproduce** and the cycle can begin again.



Lesson 3:

In many insects (e.g. butterflies) a fertilized egg develops into a wingless feeding form called a larva (caterpillar) which feeds and then becomes a pupa (chrysalis) with a protective cocoon. Inside the cocoon the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can start again.

Lesson 4/5:

- To reproduce, plants have to disperse their seeds. This is done by explosion, animals, water and wind.

Vocabulary

- decay
- amphibian
- stigma
- life cycle**
- womb
- metamorphosis
- reproduction
- mammal
- stamen
- life span**
- weaned**
- adolescence**
- fish
- nectar
- dispersal
- embryo**
- pupa

Diagrams/Pictures

