States of Matter
Year Group: 4
Term: Autumn 1

How do the states of matter change?

What you should already know

- An object is made from/of a material.
- Materials can be hard, soft, strong, weak, absorbent, heavy, light, solid, runny, smooth, rough – these are the properties of materials.
- Matter (stuff) is made from tiny building blocks.

Investigations

At what temperature does chocolate melt?

- Ask questions and use a form of enquiry to answer them.
- Set up a practical test which is **fair**.
- Make careful **observations**.
- Take accurate **measurements** (using thermometers)
- Collect **data** and present the results (data) in a table.
- Report on findings from an enquiry.
- Use the results to draw a **conclusion** which will answer the question.
- Make further predictions based on the results.

New Learning

Lesson 1:

- All things are in one of the states of matter – **solid, liquid or gas.** https://www.stem.org.uk/resources/elibrary/resource/30642/what-stuff-does

Lesson 2 and 3:

- Things are made of **particles** (tiny building blocks) that are organised differently in different states (solid, liquid or gas).
- There are bonds between the particles in a solid. When the temperature increases these particles **absorb energy** and can change into a liquid. With a further increase in **temperature**, the bond of the particles is broken down so the liquid changes to a gas.

Lessons 4 and 5: (Investigation here)

- **Solid to a liquid = melting. Liquid to a solid = freezing.**
- **Liquid to a gas = evaporation. Gas to a liquid = condensation.**

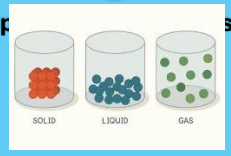
Lessons 5 and 6:

- Water flows around the world in a continuous process called the Water Cycle.
- Rain **condenses** in clouds and falls the earth as rain, snow or hail in a process called precipitation.
- **Melting point of water = 0 degrees Celsius.**
- **Boiling point of water = 100 degrees Celsius.**

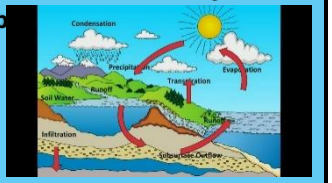
Vocabulary

absorb
dissolve
energy
evaporation
freezing
matter
melting
particle
temperature
ice
water
solid
bond
condensation
evaporation
reversible
boiling point
melting point
liquid
gas
water cycle

Diagrams/Pictures



Solid, liquid and gas particles.



The water cycle.

Melting (solid to liquid)

Freezing (liquid to solid)

Animals and Humans
Year Group: 4
Term: Autumn 2

How do animals (including humans) use their food?

What you should already know

- Proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy.
- Tooth decay can be caused by excess sugar.
- Living things move, grow, consume nutrients and reproduce.
- Plants absorb energy form the Sun.

Investigations

How do our digestive systems work?
How do different drinks affect our teeth?

- Ask questions and use scientific enquiries to answer them.
- Make careful observations.
- Present findings using a display.
- Record findings using drawings and annotated photographs.
- Report on findings from enquiries .
- Identify difference and similarities or changes related to scientific ideas and processed.
- Use scientific evidence to ask further questions.
- Make further predictions based on knowledge gained.

New Learning

Lesson 1

- Food passes through the body. **Nutrients** are taken out and waste products are excreted – this is called **digestion**.
- Digestion is when complex foodstuffs are broken down so theses can be **absorbed** by the body.

Lesson 2 and 3 (investigation here)

- The first part of digestion is when the food is chewed by the teeth and **saliva** is added.
- Each human has three types of teeth – **incisors (slice food), canine (tear food) and molars (grind food).**

Lesson 4 and 5 (investigation here)

- Food is then squeezed down the **esophagus** (food pipe) in a wave-like action.
- The stomach releases acid to continue breaking down the food.
- The stomach is an **organ**.
- The **small intestine** absorbs the nutrients.
- The **large intestine** absorbs water from any undigested food.

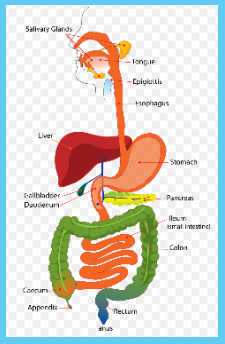
Lesson 6 and 7:

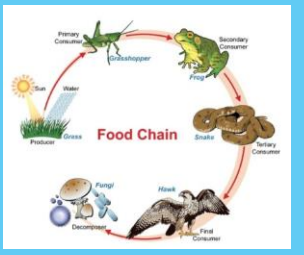
- All **energy** for a food chain starts with the sun.
- This energy is absorbed by plants which are called producers.
- An animal eaten by another animal is called **prey**.
- The first consumer in a food chain is called a **primary consumer**. The second is called a **secondary consumer** and the final one, a **tertiary consumer**.

Vocabulary

absorption		energy
nutrients	consumption	hygiene
herbivore	carnivore	organ
digestion	enzyme	
	anus	
small intestine	large intestine	bile
stomach	rectum	
	esophagus	
tongue	saliva	
	acid	
incisors	molars	
	prey	
predator	consumer	

Diagrams/Pictures





Animals and Humans - Habitats
Year Group: 4
Term: Spring 1

How have humans made an impact on the lives of animals?

What you should already know

- Living things move, grow, consume nutrients and reproduce.
- Polar bears are an example of an animal adapted to its environment.
- A trout is an example of a fish, a frog is an amphibian, a lizard is a reptile, a robin is a bird, rabbits and humans are mammals.
- Herbivorous animals eat plants, omnivorous animals eat plants and animals and carnivores eat meat.

Investigations

- Ask questions and use scientific enquiries to answer them.
- Make careful observations.
- Classify and present data.
- Record findings using drawings, labelling diagrams and tables.
- Report on findings from enquiries .
- Identify difference and similarities or changes related to scientific ideas and processed.
- Use scientific evidence to answer questions.

New Learning

Lesson 1:

- Animals can be grouped based on their physical features and based on their behaviour (meat eater/non-meat eater).

Lesson 2:

- Living things are divided into kingdoms – animal kingdom, plants, fungi, bacteria.
- A species is a group of living things that have many similarities.

Lesson 3:

- A classification key uses questions to sort and identify different living things.

Lesson 4:

- Changes to the environment make it more difficult for animals to survive and reproduce. This can lead to extinction.
- Climate change caused by pollution can change the environment for many living things.

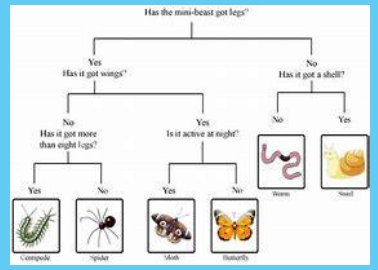
Lesson 5:

- A polar bear is an example of how environmental changes can endanger living things.
- As the climate changes and gets warmer, the sea ice where polar bears live is becoming smaller making it harder for them to survive.

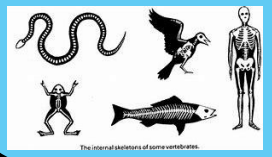
Vocabulary

decay
energy
habitat
herbivore
carnivore
omnivore
environment
reproduction
vertebrate
kingdom
classification key
species
fungi
bacteria
climate change
extinction
pollution

Diagrams/Pictures



Invertebrate



Vertebrate

Electricity
Year Group: 4
Term: Spring 2

Where did the power come from?

What you should already know

- Distinguish between an object and the material from which it is made from.
- 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.

Investigations

Which materials are conductors of electricity?

- Ask questions and use a form of enquiry to answer them.
- Set up a practical test which is **fair**.
- Make careful **observations**.
- Collect **data** and present the results (data) in a table.
- Use labelled diagrams.
- Report on findings from an enquiry.
- Use the results to draw a **conclusion** which will answer the question.
- Make predictions based on the results of the investigation.
- Ask further questions.

New Learning

Lesson 1:

- Exposure to high levels of electrical current can be dangerous.

Lesson 2:

- Electrical current can flow when there is a **complete circuit**.
- **More than one cell lined up to work together is called a battery.**

Lesson 3:

- A **switch** functions by completing or breaking a circuit.

Lesson 4 and 5: (Investigation lesson 5)

- **Electrical current** flows well through some materials (electrical conductors) and poorly through others (electrical insulators).
- Metals are good **electrical conductors.**

Lesson 6: Assessment

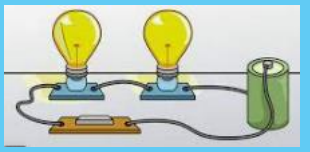
These ideas can be included as part of a lesson but do not need to be the main lesson focus.

- Electrical energy is one of many forms of electricity.
- **Static electricity** is an imbalance of charged particles on a material.

Vocabulary

component
conductor energy
material **circuit** **appliance**
electron **battery** **cell**
bulb **buzzer**
switch
wire **current**
electricity
static electricity **negative**
terminal
positive **terminal** **emit**

Diagrams/Pictures



Insulators and conductors

Sound
Year Group: 4
Term: Summer 1

How do we hear?

What you should already know

- Energy comes in different forms and cannot be created nor destroyed, only changed from one form to another.

Investigations

Which instrument is the highest pitch? Which is the lowest?

- Ask questions and use scientific enquiries to answer them.
- Make careful observations.
- Listen and compare the instruments.
- Record findings using labelled diagrams.
- Report on findings from enquiries orally.
- Identify difference and similarities or changes related to scientific ideas and processed.
- Use scientific evidence to answer questions.
- Draw conclusions from the investigation.

New Learning

Lesson 1:

- Sound is generated when an object vibrates.
- Some of the energy from the vibrating object is transferred to the air, making the air particles move.
- Sound is a form of energy in a wave.
- Sound travels through a medium (particles in the air).

Lesson 2:

- Sound waves are detected in the ear by humans and the brain interprets this as the sounds we hear.

Lesson 3:

- Sound travels at different speeds through different objects.
- Sound travels much slower than light. That is why we hear the thunder after we see the lightning.

Lesson 4:

- Pitch is how high or low a sound is and that depends on how many vibrations per second are being made by the vibrating object.
- The number of vibrations per second is called frequency.

Lesson 5:

- Volume is how loud or quiet a sound is and it depends on the amount of energy in a wave – how hard or soft a drum is hit.
- The volume of a sound is quieter if the listener is further away from the object.

Vocabulary

conductor	energy	
	insulator	
particle	vibration	percussion
frequency	volume	pitch
medium	vacuum	

Diagrams/Pictures