Animals and Humans
Year Group: 6
Term: Autumn 1

Heartbeat

What you should already know

- Living things move, grow, consume nutrients and reproduce.
- Animals need air, water and food to stay alive.
- People need to exercise often to help their body stay strong and fit.
- Keeping clean, including brushing teeth, is an important part of staying healthy.
- There are food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugars.
- Protein = growth. Carbohydrates = energy. Fruit and vegetables = vitamins and minerals.
- Fats and sugary foods should be eaten rarely.
- A balanced diet is getting the right amount of each food group.
- A lack of a nutrient can cause ill health.
- The process of digestions involves breaking complex foodstuffs in simpler building blocks that can be absorbed by the body.

Investigations

How quickly does the heart recover after exercise?

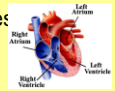
- Record results in a table and line graph.
- Plan how to answer the question using controlled variables.
- Use equipment – stopwatch.
- Record heartrate – resting, after exercise and after 5 minutes recovery.
- Write a scientific **conclusion.**
- Ask further questions.
- Make further predictions based on the outcome of the investigation.

New Learning

Lesson 1

- The heart and lungs are organs protected by the ribcage.
- The parts of the circulatory system are: The heart, blood and blood vessels.

Lesson 2:



- The heart has four chambers: two atria and two ventricles
- The aorta is the largest artery in the body and most major arteries branch from it.
- The heart beats pumping blood around the body and blood vessels carry the blood.
- Arteries carry the blood away from the heart and veins carry the blood towards the heart.

Lesson 3:

- Blood travels around the body transporting nutrients that have been absorbed into the blood stream .
- Blood carries oxygen around the body which is used to power the body.
- Capillaries are tiny blood vessels that connect arteries and veins.

Lesson 4 (investigation here):

- When we exercise our heart beats more frequently so that oxygen that is used around the body can be replenished.

Lesson 5:

- Drugs are chemicals that have an impact on the chemicals inside peoples' bodies.
- Drugs can be harmful or helpful depending on what they are and how they are used.
- All drugs can be harmful if over used.

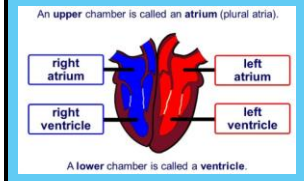
Lesson 6:

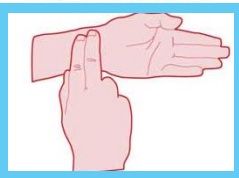
- People need to lead a healthy lifestyle.
- This includes eating a balanced diet and getting regular exercise.

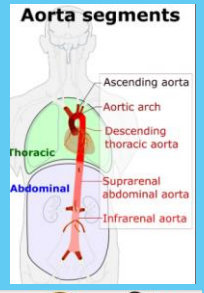
Vocabulary

energy
growth
survival
nutrients
skeleton
ribcage
protein
carbohydrate
fat
digestion
organ
artery
aorta
blood vessels
atria
capillaries
circulatory system
vein
pulse
ventricle

Diagrams/Pictures







Light
Year Group: 6
Term: Autumn 2

What colour is light?

What you should already know

- Light is a form of energy.
- Energy cannot be created nor destroyed – only changed.
- We need light to see. Darkness is the absence of light.
- Light travels in straight lines.
- Light is reflected when it travels from a light sources and then bounces off the object.
- The Sun is light source.
- The Moon is not a light source – it reflects the light of the Sun.
- Filaments in bulbs heat up until they glow – giving off light and heat.
- Looking a the sun directly can damage your eyes.
- Opaque objects block light – creating shadows.
- Light passes through transparent objects.
- As objects move towards a light source, the size of the object increases.

Investigations

Is light white?

- Make careful observations and draw scientific diagrams which show the colour split.
- Use a labelled diagram to show refraction.
- Make further predictions and use knowledge to explain everyday Science – why/how do rainbows occur?

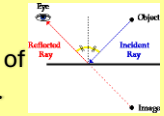
New Learning

Lesson 1:

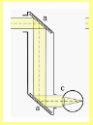
- **Translucent** objects allow some light to pass through them but some of the light changes direction as it passes through the object (something seen through a translucent object is not clearly defined).

- Light travels in a **straight line** from the **light sources** to the object and then into a persons' eyes.

Lesson 2:



- When light **reflects** off an object, the angle of incidence is equal to the angle of reflection.
- A periscope uses the **angles of incidence** and reflection allowing the image to the seen by the viewer.



Lesson 3:

- When light passes from one medium to another (e.g. from air to water), it changes direction. This is called **refraction**.

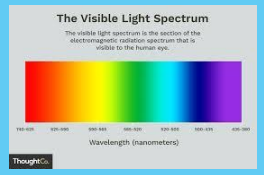
Lesson 4 and 5:

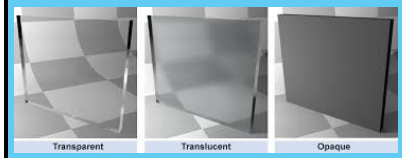
- White light comprises all the colours of light.
- White light refracted by two surfaces in a **prism** will spread out so that all of colours can be seen. This happens because the different colours of the white light, travel at different speeds. The array of colours that can be seen is called the **spectrum.**

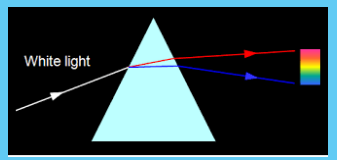
Vocabulary

absorption energy property
reflection wave mirror
incidence ray image
beam
opaque transparent
source
angle of incidence angle of reflection
spectrum translucent
medium periscope

Diagrams/Pictures







Living Things in Their Habitats
Year Group: 6
Term: Spring 1

Who lives with us on Earth?

What you should already know

- Animals can be grouped according to their **physical characteristics**.
- **Species** is a group of living things.
- A **classification key** can be used to identify living things.
- Know the features of **fish, amphibians, reptiles, birds and mammals**.

Investigations

What conditions are good for growing mould?

- Identify conditions which can be controlled.
- KnoMhow to make relevant predictions.
- Draw a table with collected data.
- Write a scientific conclusion.
- Produce annotated Scientific diagrams of the growth of the mould.
- Decide whether the results are reliable.
- Make further predictions and link to everyday growth of mould.

New Learning

Lesson 1:
Classify animals based on similarities and differences, for example vertebrates and invertebrates.
Sort animals into groups according to characteristics that can be observed.

Lesson 2:
Describe how living things are classified into groups.
Key Scientist – Carl Linnaeus

Lesson 3:
To identify the different characteristics of different types of animals (vertebrate, invertebrate, mammals, arachnids, fish, insects, amphibians, birds and reptiles).

Lesson 4:
Describe helpful and harmful microorganisms.
Sort microorganisms into those that are helpful to humans and those that are not. Justify the classification.
Sort microorganisms into virus, fungi and bacteria.

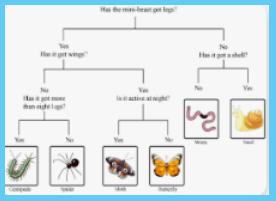
Lesson 5
What conditions are needed to for growing mould?
Set up the investigation and record the first observations.
Look at the growth every 3 days.

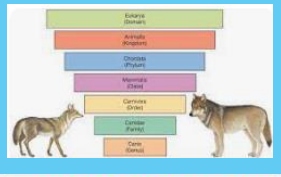
Lesson 6:
Review of microorganism investigation.
See whether the results are reliable.
Make further predictions linked to everyday growth of mould.

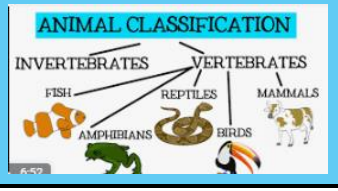
Vocabulary

Fish
Bird
Amphibian
Reptile
Mammal
Species
Bacteria
Insect
Vertebrate
Invertebrate
Classification Key
Virus
Micro-organism
Fungi
Kingdom
Genus
Domain

Diagrams/Pictures







Electricity
Year Group: 6
Term: Spring 2 and Summer 1

How do the lights in our houses work?

What you should already know

- An object is made from/of a material.
- Electricity is a form of energy.
- Static electricity is an imbalance of charged particles.
- Electrical current flows well through some materials (conductors).
- When electrical current flows through a circuit, components start to work.
- High levels of electrical current can be dangerous.

Investigations

Does the length of the wires affect the brightness of the bulb?

- Identify **conditions** which can be **controlled**.
- Plan how to answer the question.
- Draw a **table** with collected **data**.
- Record observations by producing a Scientific diagram (using the correct symbols)
- Make further predictions.
- Write a scientific **conclusion.**

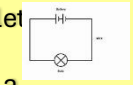
New Learning

Lesson 1:
- What are the dangers of electricity? Recap

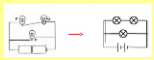
Lesson 2:
- Circuit diagrams are used to represent the components in a circuit.
- Each of components in a circuit are represented by a symbol.

Lesson 3: Investigation
- **Does the length of the wires affect the brightness of the bulb?**

Lesson 4:
- Two bulbs in a circuit can be wired up to create a series circuit.
- If one bulb blows in a series circuit, then the other will not work because the circuit is no longer complet



Lesson 5:
- Two bulbs in a circuit can be wired up to create a parallel circuit.
- If one bulb does not work in a parallel circuit, there will still be a complete circuit for the other bulb so it will continue to shine.
- Parallel circuits are used in the home.

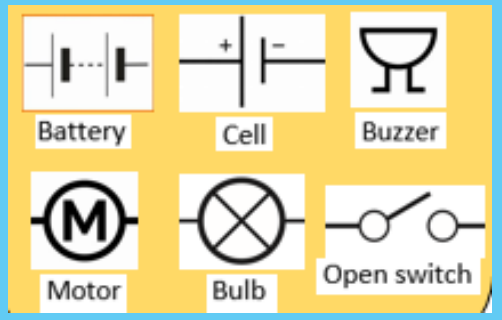


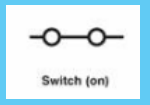
Lesson 6:
- Voltage is the measure of the power of a cell to produce electricity. It is the measure of the push of an electrical current.
- As the number and voltage of cells in a circuit increases, the brightness of the bulb will increase

Vocabulary

Circuit
Component
Conductor
Insulator
Particle
Material
Appliance
Battery
Cell
Bulb
Buzzer
Switch
Wire
Positive
Negative
Voltage
Series Circuit
Parallel Circuit
Resistance

Diagrams/Pictures





Evolution and Adaptation
Year Group: 6
Term: Summer 2

Our Changing World

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 – thick fur (warmth), oily pads (they don't freeze on the ice). Sharks – smooth skin and streamlined for quick swimming and gills for breathing underwater.
- Cacti (an example of how a plant has adapted to its environment – think skin keeps a store of water safe; sharp spikes stop animals from stealing the water.
- Frogs live in ponds – they need somewhere safe to lay their eggs.
- A species is a group of living things that have many similarities.
- Human activity – such as climate change caused by pollution – can change the environment for many living things, endangering their existence.
- Polar bears are affected by climate change.

Investigations

Which is the best beak?

- Record results in a table.
- Ask further questions.
- Present findings in diagrams with annotations.
- How to draw a **table** with collected **data**.
- Write a scientific **conclusion.**

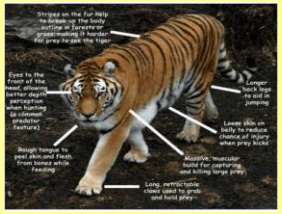
New Learning

Lesson 1: Inheritance

- Inheritance are characteristics that are passed from parent to offspring.
- Offspring vary and are not identical to their parents.

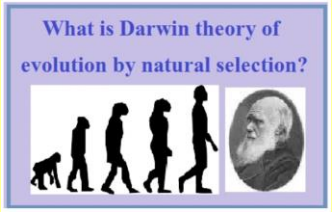
Lesson 2: Adaptation/Natural Selection

- Adaptations are special features that plants and animals develop to suit the place where they live. For example: camels, fish, plants.
- Natural selections works – across a species there is natural variation within a species.
- Within each species there is competition to survive and reproduce and that member of a species with advantageous characteristics survive and reproduce.



Lesson 3: Evolution

- Charles Darwin was the first to discuss the theory of evolution by natural selection.
- The gradual change of species over millions of years can be observed by looking at examples of fossils.



Lesson 4: Investigation

This should be dripped into each lesson.

- **All life on life began from a single point around 4.5 billion years ago.**
- **Living things change over time.**
- **This gradual change is called EVOLUTION.**

Vocabulary

birth	decay	energy
	irreversible	
extinction	microhabitat	life cycle
food chain	source	nutrients
reproduction	consumption	
environment	species	
adaptation		
evolution	natural selection	
variation	advantageous	

Diagrams/Pictures