



Common Misconceptions in Science

Year 1

Scientific Concept	Children may think...	Instead of thinking...
Plants	Plants get their food from the soil.	Plants are actually called producers because they make their own food by using sunlight.
	Trees are not plants.	Trees are plants.
	Plants are not alive.	Plants are alive, even though they are different from animals.
	Leaves take in water.	Roots take in water. The main function of leaves is to carry out photosynthesis.

Scientific Concept	Children may think...	Instead of thinking...
Everyday Materials	Plastic is not breakable.	Plastics can be broken. Different types of plastics have different properties.
	Solid is another word for hard.	Many solids are not hard such as a banana.
	Materials that are good heat insulators are non-conductors.	Materials that are good insulators of heat still conduct heat, albeit poorly.

Scientific Concept	Children may think...	Instead of thinking...
Seasonal Changes	Day and night is caused by the movement of the Earth around the Sun or the movement of the Sun around the Earth.	Day and night is caused by the rotation of the Earth around its axis.
	It always snows in Winter.	It can snow during any season of the year.
	There are only flowers in Spring and Summer.	Some flowers bloom in Winter such as Jasmine, Iris and Christmas Cactus.

	It is always sunny in Summer.	We can experience all weather conditions in the Summer including rain, sleet and snow.
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Scientific Concept	Children may think...	Instead of thinking...
Animals Including Humans	All ocean creatures are 'fish'.	Whales, dolphin, jellyfish and shellfish are not fish, but seahorses and sea dragons are fish!
	All fish lay eggs.	Some fish give birth to live young e.g. guppy, swordtails and most types of sharks.
	Humans are not animals.	Humans are mammals.
	Differences between vertebrates and invertebrates.	Vertebrates are animals with backbones e.g. birds, fish, mammals, reptiles and amphibians. Invertebrates do not have backbones e.g. insects, worms and molluscs.
	Spiders are insects; any tiny creepy crawly is an insect.	Spiders are arachnids not insects. They belong to the same group as scorpions. They have four pairs of legs and two body segments whilst insects have three pairs of legs and three body segments.
	Turtles and penguins are amphibians.	Turtles are reptiles and penguins are birds.
	Only large animals are consumers.	Small animals can be consumers e.g. The black widow spider is a consumer.
	Male animals are always bigger and stronger than females.	That is not true for all animals in the animal kingdom. For example, queen ants and bees are much bigger than the males.

Scientific Concept	Children may think...	Instead of thinking...
Living things and their habitats	An animal's habitat is just its home.	A habitat is an environment that contains all an animal needs to survive such as food and shelter.
	Fire is living.	Fire is not a living thing.
	Plants are not alive as they cannot be seen to move.	Plants are living things as they respire, and reproduce.

Year 2

Scientific Concept	Children may think...	Instead of thinking...
Plants	All plants start out as seeds.	Some plants such as ferns and mosses grow from spores.
	Seeds and bulbs need sunlight to germinate.	Most seeds germinate best under dark conditions.
	Seeds are not alive.	Seeds are alive, even though they are different from animals.

Scientific Concept	Children may think...	Instead of thinking...
Everyday Materials	Only fabrics are materials.	There are many materials that are not fabric such as plastic and rock.
	Only 'building' materials are materials.	There are a lot of materials that are not used in building houses.

Scientific Concept	Children may think...	Instead of thinking...
Animals Including Humans	Respiration means breathing	Respiration is actually a chemical process in the body.
	All animals are born looking like their parents.	Some animals look like their parents and some do not. Tadpoles and caterpillars look nothing like their parents.

Scientific Concept	Children may think...	Instead of thinking...
Living things and their habitats	An arrow in a food chain means 'eats'	The arrow can show that an animal eats another but does not always. It shows which way the energy and nutrients flow.

Scientific Concept	Children may think...	Instead of thinking...
Forces	Heavy objects will always travel faster than light objects.	There are many variables that impact how fast something will travel such as shape, weight and material.

Year 3

Scientific Concept	Children may think...	Instead of thinking...
Rocks and Soils	Rocks are all hard in nature.	Not all rocks are hard. Soft rocks do exist for example, soapstone.
	A fossil is an actual piece of the extinct animal or plant.	Fossils can be remains or traces of ancient life that have been preserved, However, fossils are also mineral and sediment that have replaced the bones of animal.
	Certain found artefacts such as old bits of pottery or coins are fossils.	These are artefacts that can tell us a lot about what life was like however, they are not fossils.

Scientific Concept	Children may think...	Instead of thinking...
Plants	Flowers are just decorative parts of the plant and have no purpose.	The primary purpose of the flower is reproduction.
	Plants eat food.	Plants make or produce their own food.

Scientific Concept	Children may think...	Instead of thinking...
Light	We can still see even where there is an absence of any light.	We cannot see if there is a complete absence of light.
	The moon is a light source.	The moon reflects light from the sun, it does not create its own light.
	Shadows contain details of the object.	Shadows are an outline of the shape but do not mirror detailed features.

Scientific Concept	Children may think...	Instead of thinking...
Animals including humans	Certain food groups such as fats are 'bad' for you.	Not all fats are alike. Lots of unsaturated fats can actually protect your health.
	Diet and fruit drinks are 'good' for you.	Lots of diet drinks contain artificial sweeteners that are not healthy.
	Invertebrates have no form of skeleton.	Some invertebrates have an exoskeleton that protects their bodies.
	Snakes are similar to worms so they must be invertebrates.	Snakes have a very long spine, made up of hundreds of vertebrae.

Scientific Concept	Children may think...	Instead of thinking...
Forces and Magnets	The bigger the magnet the stronger it is.	The material the magnet is made from also has an impact on the strength of the magnet.
	All metals are magnetic.	Not all metals are magnetic. For example, copper is not magnetic.

Year 4

Scientific Concept	Children may think...	Instead of thinking...
Living things and their habitats	There is always plenty of food for wild animals.	Some wild animals often have to go without food for days.
	Animals are only land-living creatures.	Animals include living things that live underwater.
	All changes to habitats are negative.	Habitats can also change in positive ways for example cleaning lakes and seas.

Scientific Concept	Children may think...	Instead of thinking...
Electricity	Electricity flows out of both ends of a battery.	Electricity flows out of the positive terminal of a battery and back into the negative terminal.
	Electricity flows to bulbs but not through them.	Electricity flows through the bulb to complete the circuit.

Scientific Concept	Children may think...	Instead of thinking...
Animals including humans	Food is digested only in the stomach.	The digestive system is comprised of different organs such as the mouth, oesophagus, stomach, pancreas, small intestine, large intestine, gallbladder and anus.
	The food you eat becomes 'poo' and the drink becomes 'wee'.	Water can be excreted through sweating but also leave the body through 'poo' and 'wee'.
	Your stomach is where your belly button is.	Your stomach is located in your upper abdomen on the left side of your body.
	When you have a meal your food goes down one tube and your drink goes down another.	Air, food and drink all go down the throat.

Scientific Concept	Children may think...	Instead of thinking...
States of Matter	All particles have the same properties.	Particles in a solid, liquid and gas act very differently.
	Gases do not have a mass.	Gases have mass.
	Not all gases are matter because you cannot see them.	Even gases we cannot see are made of matter.

Scientific Concept	Children may think...	Instead of thinking...
Sound	Sound is only heard by the listener.	Sound is heard by all within range of the sound.
	Sound only travels in one direction from the source.	Sound travels outwards in all directions.
	Sound can't travel through solids and liquids.	Sound can travel through both liquids and solids.
	High sounds are loud and low sounds are quiet.	Pitch and volume are often confused however, the pitch of a sound does not determine its volume.

Year 5

Scientific Concept	Children may think...	Instead of thinking...
Living things and their habitats	Only birds lay eggs.	There are a range of animals that lay eggs that are not birds such as crocodiles, snakes and frogs.
	Plants that grow from bulbs do not have seeds.	Some bulbs naturally create seeds by themselves.

Scientific Concept	Children may think...	Instead of thinking...
Forces and Magnets	Smooth surfaces have no friction.	Smooth surfaces have less friction than rough surfaces but still do experience friction.
	A non-moving object has no forces acting upon it.	A non-moving object has forces acting upon it that are acting in equal and opposite directions.
	Heavy objects sink and light objects float.	Some heavy objects such as boats can float yet a small metal ball will sink.
	Forces always act in pairs that are equal and opposite.	Forces do not always act in equal and opposite directions.

Scientific Concept	Children may think...	Instead of thinking...
Animals including humans	A baby grows in a mother's tummy.	A baby grows in the uterus which is also called the womb.

Scientific Concept	Children may think...	Instead of thinking...
Earth and Space	The Earth is flat.	The Earth is an approximately spherical body.
	The Sun is a planet.	The Sun is a star not a planet.
	The Sun rotates around the Earth.	The Earth revolves around the sun and completes a full revolution in a year.
	The Moon only appears at night.	The moon spends as much time in the daytime sky as night time sky but is more visible at night.
	The Sun moves across the sky during the day.	The Earth rotates making it look like the sun is moving across the sky when it is in fact not moving.

Scientific Concept	Children may think...	Instead of thinking...
Properties of Materials	Thermal insulators warm things up.	Thermal insulators retain heat well but do not create their own warmth.
	Solids dissolved in liquids have vanished and so you cannot get them back.	Dissolving is a reversible process and the solid can be recovered using evaporation.
	Lit candles only melt, which is a reversible change.	Once a candle has melted it cannot be reversed.



Year 6

Scientific Concept	Children may think...	Instead of thinking...
Living things and their habitats	All micro-organisms are harmful.	Not all micro-organisms are harmful. Some help us digest food and protect us against infection.
	Mushrooms are plants	Mushrooms are fungi not plants.

Scientific Concept	Children may think...	Instead of thinking...
Electricity	Larger sized batteries make bulbs brighter.	Batteries with a higher voltage will create a brighter bulb not necessarily larger.
	A complete circuit uses up electricity.	No current is used up in this process as it is a continuous process.
	Components in a circuit that are closer to the battery get more electricity.	The electrical current flows through all components with no component getting more than another.

Scientific Concept	Children may think...	Instead of thinking...
Animals including humans	Your heart is on the left side of your chest.	Your heart is located in the front of your chest slightly behind and slightly to the left on your sternum.
	The heart makes blood.	The heart pumps blood around your body but does not create it.
	All drugs are bad for you.	Not all drugs are bad for you and many are used to heal the body.
	We just eat food for energy.	Food provides us not just with energy but also nutrients that keep our bodies healthy.
	Some blood in our body is red and some is blue,	All blood in our body is red.



Scientific Concept	Children may think...	Instead of thinking...
Light	Light can only be reflected from shiny surfaces.	All objects reflect light to some degree.
	Objects cannot both absorb and reflect light.	All objects absorb and reflect light to different degrees.

Scientific Concept	Children may think...	Instead of thinking...
Evolution and Inheritance	Evolution is just a 'theory' not a fact.	Evolution is a well-supported and broadly accepted scientific theory based on extensive evidence.
	Humans evolved from monkeys.	We share common ancestors but we did not evolve from monkeys.
	Humans were around at the same time as dinosaurs.	Dinosaurs inhabited the earth and became extinct 65 million years before humans existed.