

Science Curriculum – Year 5

Working scientifically (Skills objectives across all units):

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Animals including Humans

Learning objectives:

- I can describe the changes as humans develop to old age.
- I understand that all living things have lifecycles.

Challenge:

- I name the reproductive organs.
- I understand that the reproductive process begins with cells and that all living things are made from cells.
- I can compare reproduction in plants with reproduction in animals.

Investigation ideas:

- How does the average height of a class change as they get older?
- How does a baby's size change over time?
- How are different animals born? Video based investigation - observations recorded, research to find out extra details, compare and contrast exercises, conclusions written.

Resources you may need:

- The BBC have a collection of KS2 video clips to support PSHE around the subject of growing up - check for suitability:
- www.bbc.co.uk/education/topics/z3xxsbk
- Tape measures/height measurers.
- Clipboards
- Video's of birth in a variety of animals - kangaroo (amazing), try to include mammal, reptile, bird, fish and amphibian to compare and contrast.

Living things and their habitats

Learning objectives:

- I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- I can describe the life process of reproduction in some plants and animals.

Investigation ideas:

- Investigating the stages in a sunflower's life.
- Comparing sexual and asexual reproduction in plants and animals.
- Investigating Seed dispersal

Resources you may need:

- Access to the internet to research life cycles of animals.
- Stop watches
- Seeds - variety of
- Metre rulers
- Video clip of types of seed dispersal

Properties and changes of materials

Learning objectives:

- I can 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
- I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- I can demonstrate that dissolving, mixing and changes of state are reversible changes
- I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Investigation ideas:

- Which material is the hardest? (Scratch testing with iron nail and magnifying glass)
- Which material dissolves best in water? (comparing the time for salt, sugar, flour, washing powder to dissolve)
- What factors affect how quickly a solid dissolves? (Different sized particles of sugar/ different temperatures)
- What happens to the transparency of a material as it gets thicker? (data logger to measure light intensity with increasing layers)
- Which material is the best thermal insulator?
- Which material is most magnetic? (Measure the distance in mm that a material can move towards a magnet before it experiences a force)

Resources you may need:

- Funnels and filters
- Selection of materials
- Insulating materials and cups for thermal investigation.
- Light meter/data logger
- Solids for dissolving, beakers, stirring rods, stop watches
- Magnets and a range of magnetic materials
- Kettle, ice, various containers, water cycle model

Earth and Space

Learning objectives:

- I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- I can describe the movement of the Moon relative to the Earth
- I can describe the Sun, Earth and Moon as approximately spherical bodies
- I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Challenge:

- I can explain the seasons and the Earth's tilt, day length at different times of year, in different hemispheres
- I can define gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)
- I know that our Sun is a star, and there are other stars in our galaxy, and other galaxies

Investigation ideas:

- Investigating trends in planetary data eg. Size vs distance from the Sun or Temperature vs. Distance from the Sun.
- How does the Moon appear to change over a month? - keep a moon diary.
- Investigating the movement of the Sun in the Sky. (Ping pong ball on a stick)
- Investigating shadows over a day.
- Investigating the link between mass and weight on Earth - comparing with other places in space.
- Why does the moon appear in different shapes and sizes?
- Can the world survive without the sun?

Resources you may need:

- Planetarium Visit
- Space Night - sleep over in school.
- Different pictures of the moon (half-moon, full moon/eclipses)

Forces

Learning objectives:

- I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Investigation ideas:

- What shape would be best for a sensor that you want to fall to the bottom of the ocean? Different shaped plasticine shapes -time they fall - could change liquid and look at viscosity.
- Which surface gives the greatest friction? Measuring the angle of the slope that will make an object move.
- Best grip for shoes.
- What is the best design for a rocket? Changing nose cone shapes and investigating effect on distance travelled.
- Which boat shape or sail shape would reduce friction forces the most?

Resources you may need:

- Rocket Kits / 2 litre bottles /foot pumps.
- Measuring cylinders
- Plasticine
- oil and other liquids
- stop watches
- Different surfaces on plank - foam, sandpaper, carpet, wool
- Balloons, plastic rods, magnets
- water bowl and objects that float and sink
- cars on ramps etc
- Drainpipes for testing boats,

