



Life Science

Cells

- Differences and similarities between animal and plant cells.

Multicellular Organisms

- Specialized cells.
- Grouping to form tissue
- Tissue grouping to form organs.
- Each type of cell, tissue, and organ has a distinct structure and set of functions.

The Human Body

- Skeleton & main organs: location and function.

Human Body Systems

- Skeleton
- Muscles
- Digestion
- Circulation
- Respiration
- Reproduction
- Nervous, excretion, and endocrine. Function and simple structure.

Body Feedback Mechanisms

- Homeostasis.
- Temperature control.

Organisms and their Environment

- How organisms are adapted to their environment.

Physiological Needs

- Food, drink,
- Sleep
- Oxygen
- Reproduction
- Freedom of movement
- A moderate temperature.

Response to Stimuli 1

- The behavioral response of different organisms to common stimuli (temperature, light, pressure, moisture).

Response to Stimuli 2

- Tropism in plants.

Characteristics of Living Things

- Main characteristics - locomotion as difference between plants and animals.

Heredity Traits 1

- Genes. Inheritance and environmental traits.

Heredity Traits 2

- Inheritance and Variation.

Genetics

- Variation,
- Selective breeding in plants

Reproduction

- Similarities and differences between sexual and asexual reproduction.

Ecosystems and Habitats

- Abiotic and biotic aspect of ecosystems and their interactions.

Ecosystem Energy Chain

- Food chains and food webs.

Classification

- Main subsections.
- Simple keys.

Producers, Consumers and Decomposers

- Nutrient cycles

Ecosystems 2



- Effect of change on ecosystems and populations.

Photosynthesis

- Basic equation and factors affecting photosynthesis.
- Testing for photosynthesis.

Biological Adaptations

- Accounting for diversity of species.
- Natural selection.

Biological Diversity

- Evidence of common ancestry.
- Natural selection.

Extinction

- Causes of extinction.
- Fossils.

Earth/Space Science

Land Formation

- Land is formed by a combination of destructive and constructive forces.
- Destructive: weather and erosion.
- Constructive: crustal deformation, volcanic eruption, and deposition of sediment.

Weathering and Erosion

- Weathering (physical, chemical and biological)

The Rock Cycle

- Weathering
- Erosion
- Transportation
- Deposition
- Burial
- Compression/cementation, heat/pressure, melting, cooling, exposure.

Rock Types

- Igneous, sedimentary and metamorphic.
- Characteristics and features.

Soil Composition

- Layers relating to depth.
- Different in different environments.
- Involves weathered rock and decomposed organic matter.

Oil Pollution

- Causes and effects of oil pollution.
- Cleaning methods.

Plate Motion

- Lithospheric plates.
- Major geological events occur at plate boundaries.

The Water Cycle

- The water cycle

Earth's Atmosphere

- Composition.
- Change of composition at different heights.

Ground/ Surface Water

- Definitions.
- Link between surface and ground water.
- Importance of ground water.

Climate

- Difference between weather and climate.

Clouds

- Types of cloud.
- Formation of clouds.



- Effect on weather and climate.

Ocean Systems

- Effect on climate.
- Energies in the earth's oceans.
- Major systems in the earth's oceans.

Solar System

- Classification of the main parts: star, planets, moons, asteroids, comets.
- Motion is regular and predictable.

The Moon and Asteroids

- Phases of the moon.

Seasons

- Due to tilt and rotation of the earth.
- Amount of sunlight hitting surface depends on the season.

Impact of the Sun's Energy

- The sun is the major source of energy for: growth of plants, winds, ocean currents, the water cycle.
- The sun loses energy by transmitting light.
- Conduction, convection and radiation.

Renewable and Non-Renewable Energy

- Fossil fuels, alternative sources.
- Workings of a simple power station.

Gravity

- Force acting at a distance.
- Depends upon mass and distance.
- Path of object moving under gravity.
- Tides.

The Universe

- Solar systems, relative movement, overall shape.
- The light-year.

Physical Science

States of Matter

- Properties of solid, liquid, gas.
- Molecular behavior.

Properties of Matter

- Volume, shape, density, solubility, compressibility, ease of flow.
- Boiling point.

Changes in Properties of Matter

- Effect of temperature and pressure.

Elements and the Periodic Table

- What is an element.
- The periodic table: groups and periods.
- Metals and non-metals.

Mixtures

- Definitions of mixtures.
- How to separate mixtures.
- Evaporation, distillation, filtration, chromatography.

Structure of Atoms

- Nucleus: neutrons and protons.
- Electron shells.
- Properties of an Atom
- Relationship to electron population and configuration.

Chemical reactions

- Displacement, neutralization.

Compounds

- Naming conventions.



- Substances react chemically in characteristic ways with other substances to form new compounds.
- Mass is conserved in a chemical reaction.

Heat from Reactions

- Exothermic and endothermic.

Formulae and Equations

- Origin of symbols.
- Words to symbols.
- Balancing equations.

Effects of Force

- Name of forces.
- Change of shape, change of motion
- Classification of forces: at a distance, direct.
- Units of measurement.

Friction

- Opposes motion, produces heat, can be useful.
- Lubrication.
- Depends on both surfaces.
- Microscopic appearance of a surface.
- Units of measurement.
- Air resistance.

Speed and Velocity

- Simple distinction.
- Distance and displacement time graphs.
- Energy
- Types of energy: Heat (thermal), light, sound, electrical, chemical, kinetic, elastic p.e., gravitational p.e., nuclear, {stored energy}.
- Conservation of energy.
- Transformation of energy.
- The Joule

Work and Energy

- Work = force x distance.
- PE gain = mgh.
- Weight = mg

Newton's Laws of Motion

- Newton 1, 2 and 3.
- Newton's Third Law concerns pairs of forces that act on two different bodies.

Waves

- Mechanical waves and electromagnetic waves.

Light Rays

- Light is complex but it can sometimes be explained with a simple model.
- Light travels in straight lines
- Shadows (Umbra and penumbra), reflection, refraction, color.
- Speed of light.

Simple Machines

- What is a machine
- Mechanical advantage.
- Efficiency.

Acceleration

- Rate of change of velocity
- Velocity time graphs.

Nature of Science

Laboratory Safety

- General and specific safety precautions.

Conducting an Experiment



- Independent and dependent variables.
- Control variables.
- Fair test.

The Scientific Method

- Designing an experiment,
- Observations, Evidence, Communicating Results, Conclusions. (Evaluation)

Using a Microscope

- Parts of a standard microscope.

History of Science Innovation

- Timeline, major events of science

Science and Technology

Design and Problem Solving

- Stages: Design solutions, test and improve,
- Benefits/consequences,
- Contribution of the individual.

Transportation/Space Exploration

- Describe types of equipment and transportation needed for space travel.

Contributors to Science and Technology

- Research how men and women of all countries and cultures have contributed to the development of science.

Science in Personal and Social Perspectives

Science in our World

- Construction
- Transportation
- Measurement

Diet

- Balanced diet.

Exercise

- Effect of exercise.

Health

- Good health requires: regular exercise, accident and injury prevention, avoiding tobacco, alcohol, drugs, eating a balanced diet, avoiding hazardous environments,
- Relationship, and the risk of disease.

Populations, Resources and the Environment

- Overpopulation causes environmental degradation.
- Causes of environmental degradation vary from place to place.

Natural Hazards

- Famine, flood, earthquake, cyclone etc.
- Human activities.