National Curriculum for

GENERAL SCIENCE

Grades IV-VIII

2006

GOVERNMENT OF PAKISTAN
MINISTRY OF EDUCATION
ISLAMABAD

6.2 Grade - V

Learning Contents and Students' Learning Outcomes (Knowledge, Skills, Attitudes and STSE)

Contents	*Students' Learning Outcomes*
CLASSIFICATION OF LIVING THINGS • Introduction of the Main Kingdoms (Bacteria, Algae, Fungi, Plants, Animals) • Classification • Classification and Characteristics of Animals (Vertebrates and Invertebrates) • Classification and Characteristics of Plants (Flowering and Non-Flowering Plants) • Classification of Flowering Plants (Monocotyledonous & Dicotyledonous Plants) • Characteristic of Monocot and Dicot Plants (Leaf Shape, Venation, Seed and Number of Floral Leaves)	*All the students will be able to:* • Define classification. • Explain the need and importance of Classification. • Differentiate between vertebrates and invertebrates according to key characteristics. • Identify vertebrates and invertebrates from their surroundings. • Classify vertebrates into mammals, reptiles, fish, birds and amphibians on the basis of their characteristics. • Identify key characteristics of worms and insects. • Compare flowering and non flowering plants. • Classify the flowering plants into two major groups and give examples of each group. • Compare the structure of a monocot and a dicot seed. • Compare the structure of a monocot and a dicot leaf in terms of its shape and venation. • Differentiate between the structure of monocot and dicot flower in terms of number of floral leaves.
MICROORGANISMS • Virus, Bacteria and Fungi • Usefulness (for Food, in Laboratory) and Harmfulness of Microorganisms (Infection, Transmission and Protection)	• Define microorganisms. • Identify the main groups of microorganisms and give examples for each. • Describe the advantages and disadvantages of microorganisms in daily life. • Define infection. • Identify ways by which microorganisms can enter the human body. • Suggest ways to avoid infections.

Contents	*Students' Learning Outcomes*
SEEDS: STRUCTURE AND GERMINATION • Structure and Germination of French Bean Seed • Structure and Germination of Maize Seed • Functions of Cotyledons • Conditions Necessary for Germination	• Compare the structure and function of French bean and Maize seed. • List the functions of cotyledons. • Identify the conditions necessary for germination. • Predict what would happen to plant, if conditions necessary for germination are not fulfilled; Conduct an investigation to assess your prediction.
ENVIRONMENTAL POLLUTION • Pollution • Kinds of Pollution (Water, Air and Land) • Main Sources of Pollution (Smoke, Sewage Water, Solid Wastes, Industrial Wastes) • Measures to Reduce Pollution • Biodegradable and Non-Biodegradable Materials	• Define pollution. • Describe different kinds of pollution. • Explain main causes of water, air and land pollution. • Explain the effects of water, air and land pollution on environment and suggest ways to reduce them. • Plan and conduct a campaign to bring awareness to a problem of environmental pollution in their surroundings. • Differentiate between biodegradable and non-biodegradable materials. • Explain the impact of non-biodegradable materials on the environment. • Suggest ways to reduce the impact of non-biodegradable materials.
MATTER AND CHANGES IN ITS STATES • Matter • Arrangement of Particles in Solids, Liquids and Gases • Effect of Heat on Arrangement of Particles • Processes Involving Change in States (Melting, Freezing, Boiling, Evaporation and Condensation)	• Describe the properties of the three states of matter on the basis of arrangement of particles. • Demonstrate the arrangement of particles in the three states of matter through models. • Investigate the effect of heat on particle motion during a change in states. • Demonstrate and explain the processes that are involved in the change of states. • Describe the role of evaporation and condensation in the water cycle.

Contents	*Students' Learning Outcomes*
• Application of Condensation and Evaporation in Nature (Water Cycle)	• Identify and describe forms of moisture in the environment (e.g. dew, snow, fog, frost, rain).
FORCES AND MACHINES • Friction • Advantages and Disadvantages of Friction • Methods to Reduce Friction • Gravitational Force • Mass and Weight • Balanced and Unbalanced Forces • Inertia • Simple Machines (Wedge, Inclined Plane) • Lever • Kinds of Lever (Scissors, Hammer, Pliers, Wheel-Barrow, Tweezers, Tong) • Uses of Lever in Daily Life	• Describe friction and its causes. • Explain the advantages and disadvantages of friction. • Suggest methods to reduce friction. • Identify what cyclists; swimmers and parachutists do to reduce friction. • Explain the gravitational force using different examples. • Distinguish between mass and weight. • Differentiate between balanced and unbalanced forces. • Describe the effects of balanced and unbalanced forces on the motion of an object. • Describe the term inertia. • Demonstrate how wedge and inclined plane are used to move the objects. • Compare the three kinds of levers using examples. • Describe how lever makes work easier by giving examples of its uses from daily life.
PROPERTIES AND BEHAVIOUR OF LIGHT • Luminous and Non Luminous Objects • Transparent, Opaque and Translucent Objects • Light Travels in Straight Lines • Shadow Formation • Eclipse Formation • Pinhole Camera • Phases of Moon	• Differentiate between luminous and non-luminous objects. • Identify and differentiate between transparent, opaque and translucent objects in their surroundings. • Investigate that light travels in a straight line. • Explain the formation of shadows and eclipses. • Predict the location, size and shape of a shadow from a light source relative to the position of objects. • Explain the scientific principle that works in a pinhole camera. • Identify different phases of moon.

Contents	*Students' Learning Outcomes*
ELECTRICITY AND MAGNETISM • Electric Current • Electrical Circuits & its Components • Fuse & its Uses • Static Electricity (Lightening as an Example) • Charges and their Properties • Magnetic Lines of Force & Magnetic Field • Electromagnets • Earth's Magnetism • Magnetic Compass	• Describe flow of electric current in an electrical circuit. • Describe fuse and its importance in any electric circuit. • Explain the phenomenon of lightening. • Explain the production of static electrical charges in some common materials. • Conduct an experiment to show the magnetic field of a bar magnet. • Make an electromagnet with the help of a cell, iron nail and wire and show its working. • Explore different electromagnetic devices used in their daily life. • Describe the relationship between electricity and magnetism in an electromagnetic device. • Explain the earth's magnetic field and relate it with the use of a magnetic compass. • Make a magnetic compass and show it's working.
SOILS • Characteristics of Soil • Types of Soil • The Decomposers • Life in the Soil	• Describe the characteristics of soil. • Identify similarities and differences among the different types of soil. • Investigate and describe soil components. • Describe the effect of moisture on soil characteristics (e.g. how it hold together, texture, colour). • Compare the absorption of water by different soils. • Observe and describe the effects of moving water on different soils. • Investigate and describe how living things affect and are affected by soils.
SOLAR SYSTEM • Stars and Planets • Solar System (Sun and Planets)	• Differentiate between a star and a planet. • Explain that the Sun is a star.

Contents	***Students' Learning Outcomes***
• Natural Satellites in Solar System	• Describe the solar system and its planetary arrangement showing position of Earth in our solar system. • Explain the relative size of the planets and their distance from the sun using a model. • Compare the sizes of Earth, sun and moon. • Investigate the moons of different planets of the solar system.