ICATS CONTESTS

SCIENCE: COURSE OUTLINE AND LEARNING OUTCOMES

GRADE 1-2

1. HUMAN BODY SYSTEM

(a) PARTS OF BODY

- Identify and name common parts of the body, such as head, arms, legs, hands, feet, eyes, nose, mouth, ears, and fingers.
- Understand the basic functions of these body parts, such as the head for thinking and the hands for grasping objects.
- Differentiate between left and right sides of the body.

(b) FIVE SENSES

- Name and describe the five senses: sight (vision), hearing (audition), taste (gustation), smell (olfaction), and touch (tactile).
- Understand the basic functions of each sense, e.g., sight is for seeing, hearing is for listening, taste is for experiencing flavors, smell is for detecting odors, and touch is for feeling textures and temperature.
- Identify the sense organs associated with each sense (e.g., eyes for sight, ears for hearing, tongue for taste, nose for smell, and skin for touch).
- Recognize the importance of each sense in daily life and how they help us perceive the world around us.

(c) ORGAN NAMES

- Identify and name some major organs in the human body, such as the heart, lungs, brain, stomach, liver, and kidneys.
- Understand the basic functions of these organs (e.g., the heart pumps blood, the lungs help us breathe, the brain controls our body, the stomach digests food, etc.).
- Recognize the importance of keeping these organs healthy through good nutrition and exercise.

2. STATES OF MATTER

(a) SOLID

- Define solids as objects that have a fixed shape and volume.

- Identify common examples of solids, such as a book, a desk, or a toy.

(b) LIQUID

- Define liquids as substances that have a fixed volume but take the shape of their container.
- Recognize common examples of liquids, such as water, milk, or juice.

(c) GAS

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Additional Concepts:

Change of State:

- Understand that matter can change from one state to another. For example, water can change from a solid (ice) to a liquid and then to a gas (steam) when heated.

Properties of Matter:

- Begin to recognize basic properties of matter, such as color, texture, and whether an object is solid, liquid, or gas.

Comparison of States:

- Compare and contrast the properties of solids, liquids, and gases. For example, recognize that solids have a definite shape, while liquids and gases take the shape of their containers.

Observation and Experimentation:

- Engage in simple experiments or observations to identify and categorize objects and substances into their respective states of matter.

3. POLLUTION

Students should be able to:

- Define pollution as the introduction of harmful substances into the environment.
- Identify and differentiate between common types of pollution, such as air pollution, water pollution, and land pollution.
- Recognize examples of pollutants for each type, such as smoke and emissions for air pollution, litter and chemicals for land pollution, and sewage or chemicals for water pollution.

Causes and Effects:

- Understand some of the common causes of pollution, like the release of harmful gases from vehicles and factories or the improper disposal of waste.
- Begin to grasp the basic effects of pollution, such as harm to the environment, wildlife, and human health.

(a) TYPES OF POLLUTION

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(b) WAY TO REDUCE POLLUTION

Reduce, Reuse, Recycle:

- Learn the importance of the "3 R's" (reduce, reuse, recycle) as strategies to reduce pollution.
- Understand that reducing waste and reusing items can help lower the amount of trash in landfills, reducing land pollution.

Conservation:

- Discover the concept of conservation and how it can help reduce pollution.
- Learn about conserving resources like water and energy to lower water and air pollution.

Proper Disposal:

- Understand the importance of disposing of waste and hazardous materials properly.
- Recognize that disposing of garbage in designated bins and recycling centers helps prevent pollution.

Planting Trees and Green Practices:

- Learn how planting trees and maintaining green spaces can reduce air pollution.
- Recognize that green practices, like using public transportation or carpooling, can help reduce air pollution.

Clean-Up Efforts:

- Engage in activities that promote clean-up efforts in local communities, such as picking up litter in parks and along streets.

4. SHAPES

Identification of Basic Shapes:

- Recognize and name common two-dimensional shapes, including circles, squares, triangles, and rectangles.
- Identify these shapes in everyday objects and in the environment.

Properties of Shapes:

- Describe the properties of basic shapes, such as the number of sides and corners (vertices). For example, a square has four sides and four corners.

Sorting and Classifying Shapes:

- Sort and classify objects into different shape categories. For instance, group objects that are circular, square, or triangular.

Creating Shapes:

- Use materials like paper, clay, or drawing tools to create and reproduce basic shapes.
- Combine shapes to create more complex shapes or objects.

Patterns and Shapes:

- Recognize and create simple patterns using shapes, such as alternating square-triangle-square.

Real-World Applications:

- Understand how shapes are used in the real world, such as recognizing circles in wheels or squares in windows and doors.

Miscellaneous:

- Begin to use geometric vocabulary, including terms like sides, corners, straight, and curved, to describe shapes and their attributes.
- Develop spatial awareness by understanding concepts such as inside, outside, above, below, and between in relation to shapes and objects.

- Solve simple problems involving shapes, such as finding shapes with a given number of sides or matching objects with their corresponding shapes.

5. HARD AND SOFT

Definition and Identification:

- Define and explain the concepts of "hard" and "soft" to young students.
- Identify and differentiate between objects or materials that are hard and soft.

Examples and Recognition:

- Provide examples of common hard objects (e.g., rock, metal, wood) and soft objects (e.g., sponge, cotton, clay).
- Recognize and classify various objects or materials based on their hardness or softness.

Comparative Skills:

- Develop the ability to compare and contrast objects in terms of their hardness or softness.
- Engage in activities that involve sorting objects into hard and soft categories.

Tactile Skills:

- Enhance tactile skills by touching and feeling different objects to determine if they are hard or soft.
- Describe the texture and feel of objects, noting whether they are smooth or rough, rigid or flexible.

Vocabulary Development:

- Build vocabulary related to the concept of hardness and softness, using words like "firm," "solid," "squishy," and "pliable."

Everyday Applications:

- Apply the knowledge of hardness and softness to everyday situations, such as choosing the right pillow, identifying suitable materials for art projects, or understanding the properties of objects in their environment.

Safety Awareness:

- Understand the importance of recognizing hard and soft objects for safety reasons. For example, recognizing that running into a soft, padded area is safer than colliding with a hard surface.

Hands-On Activities:

- Engage in hands-on activities that involve interacting with hard and soft materials. These activities can include molding clay, touching various textures, and experimenting with different types of fabric.

Language and Communication:

- Develop the ability to communicate with peers and teachers about the hardness or softness of objects, using descriptive language.

Problem-Solving and Critical Thinking:

- Encourage critical thinking skills by asking questions like, "Why is this object hard?" or "How can we make this soft material firmer?"
- Foster problem-solving skills by exploring ways to change the hardness or softness of materials (e.g., by applying pressure or using different tools).

Creative Expression:

- Use the knowledge of hard and soft materials in art and creative activities, such as sculpting, choosing appropriate art supplies, and selecting materials for crafting projects.

Safety and Caution:

- Teach students to be cautious around hard or sharp objects and to handle them safely.

6. HEAVY AND LIGHT

Define Heavy and Light:

- Understand the basic concepts of "heavy" and "light."
- Define "heavy" as something that weighs a lot and "light" as something that weighs very little.

Comparison Skills:

- Develop the ability to compare and contrast the weight of different objects.
- Practice comparing two objects to determine which one is heavier and which one is lighter.

Use of Measurement Tools:

- Introduce simple measurement tools such as scales or balances.
- Use these tools to measure and compare the weight of objects.

Categorization:

- Categorize objects into groups based on their weight, such as heavy objects and light objects.
- Understand that this categorization is relative and depends on the objects being compared.

Real-Life Application:

- Apply the concept of heavy and light to real-life situations, such as packing a school bag.
- Make decisions based on the weight of objects, like choosing between heavy and light snacks.

Comparison Words:

- Learn and use comparison words such as "heavier," "lighter," "heaviest," and "lightest" to describe the weight of objects.

Language Development:

- Develop vocabulary related to weight and measurement, including words like "weight," "balance," "compare," "equal," and "unequal."

Problem Solving:

- Solve simple problems involving the weight of objects, such as determining which object to use as a paperweight.

Practical Activities:

- Engage in hands-on activities to reinforce the concept, such as weighing objects, sorting them by weight, and discussing the results.

Safety Awareness:

- Understand that some objects may be heavy and require caution when lifting or carrying.
- Promote safe practices when handling heavy objects.

Estimation Skills:

- Develop basic estimation skills by making educated guesses about the weight of objects before measuring them.

Math Connections:

- Connect the concept of heavy and light to math concepts, such as addition and subtraction (e.g., "If we add this heavy book to the stack, will it be heavier?").

7. WEATHER

Understanding Weather:

- Define weather as the conditions in the atmosphere at a specific place and time.
- Recognize that weather can change from day to day and season to season.

Observation and Description:

- Develop the ability to observe and describe different types of weather conditions, such as sunny, rainy, cloudy, windy, and snowy.
- Use basic weather instruments like a thermometer, windsock, or rain gauge to measure and record weather conditions.

Weather Elements:

- Identify and understand key elements of weather, including temperature, precipitation (rain, snow, etc.), wind, and cloud cover.

Seasons:

- Recognize the four seasons (spring, summer, fall, and winter) and understand how weather patterns change with each season.
- Identify the typical weather associated with each season, such as warm and sunny in summer and cold and snowy in winter.

Daily and Weekly Weather Patterns:

- Begin to understand and predict daily and weekly weather patterns based on observations and simple weather forecasts.

Safety Awareness:

- Learn about weather-related safety measures, such as staying indoors during thunderstorms, dressing appropriately for cold or hot weather, and the importance of sun protection in sunny weather.

Natural Phenomena:

- Understand that different weather conditions can lead to natural phenomena, such as rainbows after rain or frost on cold mornings.

Impact on Daily Life:

- Explore how weather affects daily life, including clothing choices, outdoor activities, and the need for shelter during extreme weather conditions.

8. FORCES

- Understand that light is a form of energy that allows us to see things.
- Recognize that light can come from various sources, such as the sun, lamps, and flashlights.
- Learn about the concept of shadows and understand that they are formed when an object blocks light.

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10. LIVING ORGANISMS

Identify Living Organisms:

- Recognize that living organisms are things that are alive, including animals, plants, and some microorganisms.
- Understand that living organisms can grow, reproduce, and respond to their environment.

Classify Living Organisms:

- Classify living organisms into basic categories, such as animals, plants, and microorganisms.
- Differentiate between animals and plants based on observable characteristics.

- Recognize examples of each type of living organism, such as cows (herbivores), lions (carnivores), and humans (omnivores).
- Identify and classify living organisms into three main categories: herbivores, carnivores, and omnivores.

Basic Needs of Living Organisms:

- Identify the basic needs of living organisms, including air, water, food, and a suitable habitat.
- Understand that living organisms require these basic needs to survive and thrive.

Animal Classification:

- Categorize animals based on their observable characteristics, such as the number of legs, presence of fur or scales, and the method of movement (e.g., walking, flying, swimming).
- Identify common animals and differentiate between mammals, birds, reptiles, amphibians, and fish.

Plant Classification:

- Recognize the different parts of a plant, including roots, stems, leaves, flowers, and fruits.
- Identify common plants and differentiate between trees, shrubs, flowers, and grasses.

Life Cycles:

- Understand the concept of a life cycle as the stages in the growth and development of living organisms.
- Recognize and describe the life cycles of some common organisms, such as butterflies (egg, larva, pupa, adult) and plants (seed, seedling, mature plant).

Habitats:

- Explore and understand different types of habitats, such as forests, oceans, deserts, and wetlands.
- Learn about the types of living organisms that can be found in specific habitats and how they adapt to their surroundings.

Ecosystem Awareness:

- Recognize that living organisms interact with each other and their environment in ecosystems.
- Understand the basic concept of a food chain, where some organisms eat plants and other animals.

Conservation Awareness:

- Develop an awareness of the importance of protecting and conserving living organisms and their habitats.
- Learn about simple ways to help preserve the environment for living organisms, such as reducing waste and not littering.

11. ENVIRONMENT

Understanding the Environment:

- Define the term "environment" as the surroundings in which living organisms, including humans, live.
- Recognize that the environment includes natural elements like land, water, air, and living things.

Caring for the Environment:

- Understand the importance of taking care of the environment to ensure a healthy and sustainable planet.
- Identify basic ways to care for the environment, such as not littering and conserving resources.

Natural and Artificial Environment:

- Differentiate between natural environments (e.g., forests, rivers, oceans) and artificial environments (e.g., homes, schools, buildings).
- Identify examples of both natural and artificial environments in their surroundings.

Local Environment Exploration:

- Explore and observe the local environment, such as a schoolyard or nearby park.
- Describe the features of the local environment and identify living organisms found there.

Responsibility and Stewardship:

- Develop a sense of responsibility towards the environment.
- Understand that humans have a role as stewards of the environment, caring for it to ensure its well-being.

Components of the Environment:

- Describe the main components of the environment, including soil, water bodies, air, and living organisms.
- Recognize the interdependence of these components in sustaining life.

Effects of Human Activity:

- Recognize that human activities can have both positive and negative effects on the environment.
- Understand that pollution and deforestation can harm the environment.

Conservation and Protection:

- Learn about the importance of conservation and protection measures for the environment.
- Identify actions that help protect the environment, such as recycling, reducing waste, and saving energy.

Local Ecosystems:

- Explore and study local ecosystems, such as ponds, gardens, or urban green spaces.
- Observe and describe the various living organisms and their roles within these ecosystems.

Impact on Biodiversity:

- Understand that human actions can impact biodiversity, leading to the loss of species.
- Recognize the importance of biodiversity in maintaining a balanced and healthy environment.

Environmental Stewardship:

- Develop a sense of environmental stewardship by actively participating in activities that benefit the environment.
- Engage in hands-on projects or initiatives related to environmental conservation and sustainability.

12. TEMPERATURE

Understanding Temperature:

- Recognize that temperature is a measure of how hot or cold something is.
- Differentiate between hot and cold by using sensory perceptions.

Measuring Temperature:

- Learn how to use a simple thermometer to measure temperature.
- Understand that thermometers have a scale that shows temperature.

Temperature Scales:

- Be introduced to temperature scales, such as Fahrenheit and Celsius.
- Realize that different countries may use different temperature scales.

Comparing Temperatures:

- Compare and contrast temperatures to determine which is hotter or colder.
- Use terms like "warmer" and "cooler" to describe temperature differences.

Daily Temperature Changes:

- Observe and discuss how temperature changes during the day and night.
- Understand that the temperature is often warmer during the day and cooler at night.

Temperature in Different Seasons:

- Learn that the temperature varies in different seasons (e.g., summer is hotter, and winter is colder).
- Begin to associate specific weather conditions with each season.

Temperature and Clothing:

- Understand the importance of wearing appropriate clothing for different temperatures.
- Recognize that you wear warmer clothing in cold weather and lighter clothing in warm weather.

Thermometer Reading:

- Begin to read and interpret thermometer readings on common temperature scales.
- Identify temperature values on a thermometer and associate them with weather conditions.

Recording Temperature:

- Practice recording daily temperatures, either verbally or in a simple chart or graph.
- Understand the concept of a temperature log or record.

Safety in Extreme Temperatures:

- Recognize the need to stay safe during extreme temperatures, such as heatwaves or cold snaps.
- Learn simple safety measures like staying hydrated in hot weather and dressing warmly in cold weather.

13. NATURAL RESOURCES

- **Identification:** Students should be able to identify various natural resources found in their environment, such as water, air, soil, sunlight, trees, and rocks.
- **Classification:** Students should understand that natural resources can be categorized into different types, such as water resources, mineral resources, and energy resources.
- **Importance:** Students should recognize the importance of natural resources in meeting basic human needs, including water for drinking, air for breathing, soil for growing food, and sunlight for warmth and energy.
- **Conservation:** Students should be introduced to the concept of conserving natural resources by not wasting them and by using them responsibly. They should understand the importance of reducing water and energy consumption and protecting natural habitats.
- **Renewable vs. Non-renewable:** Students should differentiate between renewable resources (e.g., sunlight, wind, and trees) that can be naturally replenished and non-renewable resources (e.g., fossil fuels like coal and oil) that are finite and will eventually run out.
- **Examples:** Students should be able to provide examples of how natural resources are used in daily life, such as using sunlight to generate electricity through solar panels or using water to irrigate crops.

14. NATURAL RESOURCES

- **Identification:** Students should be able to identify common artificial resources, such as toys, books, buildings, and vehicles.
- **Understanding the Origin:** Students should understand that artificial resources are created by humans using natural resources and their creativity.

- **Function:** Students should learn about the functions and purposes of different artificial resources, such as books for learning, vehicles for transportation, and buildings for shelter.
- **Manufacturing Process:** Students should be introduced to the idea that making artificial resources often involves using natural resources, for example, wood from trees to build houses or paper from trees to make books.
- **Responsible Use:** Students should be taught about using artificial resources responsibly, taking care of their belongings, and the importance of recycling or reusing when possible.
- **Examples:** Students should provide examples of artificial resources in their daily lives, such as toys, clothes, and school supplies.