

1

Chapter

The Wonderful World of Science

We'll cover the following key points:

- Science Universe
- Scientific Method



Hi, I'm EeeBee

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the QR code.



Learning Outcomes

By the end of this chapter, students will be able to:

- Develop a sense of wonder about the world and feel motivated to ask questions.
- Identify science as a method of observing, questioning, and investigating.
- Utilize observation, forming hypotheses, conducting experiments, and analyzing results to address challenges.
- Relate everyday observations to scientific principles and discover the relevance of science in daily life.

For the Teacher

Teachers can spark interest in science by encouraging students to explore their surroundings and inquire about how things function. Use relatable examples to stimulate curiosity and introduce the scientific method as a structured process for answering questions. Make the lesson interactive by incorporating hands-on experiments and real-life examples, helping students connect theoretical concepts to practical applications in their daily lives.

Curricular Goals and Competencies

This chapter focuses on the following curricular goals and skills:

- **CG-3 (C 3.1, 3.2, 3.3, and 3.4):** Investigates the living world and its relationship with the non-living environment from a scientific perspective.
- **CG-6 (C 6.1 and 6.2):** Explores the fundamentals and advancements in science, fostering scientific inquiry and understanding through observation and experimentation.

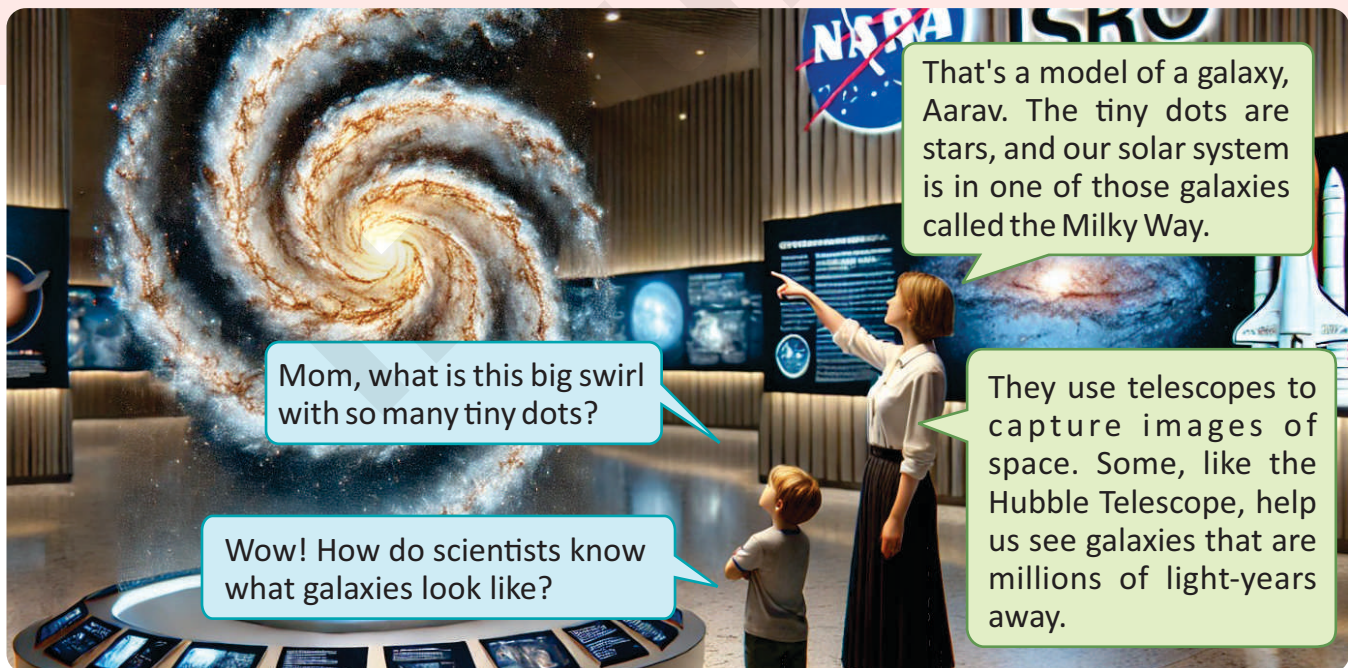
Introduction

From the moment we are born, humans exhibit an innate sense of curiosity about the world around them. This fundamental characteristic drives us to explore, question, and seek understanding. This curiosity is evident even in the earliest stages of life, as babies and toddlers constantly engage with their environment. They touch, taste, listen, and observe with unrelenting enthusiasm, learning through every experience.

Whether they are trying to understand the texture of a surface, the taste of an unfamiliar object, or the movement of light and shadows, their actions reflect an instinctual desire to make sense of the unknown.

Science Universe

A mother, Maya, takes her son, Aarav, to a science museum. Aarav sees a model of a galaxy and starts asking questions.



What is Science?

Science is a systematic approach to understanding the universe and everything within it. It revolves around observing the world, formulating questions, making predictions (hypotheses), conducting experiments, and interpreting the results. This process helps us uncover the mysteries of nature and solve complex problems.

In History...

The universe began 13.8 billion years ago with the Big Bang, a massive explosion that started time, space, and matter. In moments, it expanded rapidly, forming particles that combined into hydrogen and helium. Over time, gravity pulled these together, creating stars and galaxies. Around 4.6 billion years ago, the Solar System formed, and Earth emerged as a rocky planet supporting life. Single-celled organisms like bacteria appeared 3.5 billion years ago, evolving into complex life. About 66 million years ago, a mass extinction wiped out the dinosaurs, paving the way for mammals. Humans evolved around 300,000 years ago, eventually achieving space exploration.

At its core, science is driven by curiosity—a deep desire to learn and comprehend the world better. This curiosity is not limited to professional scientists; it exists in all of us. From asking simple questions about everyday phenomena to conducting experiments to find answers, we all engage in science in some way or another.

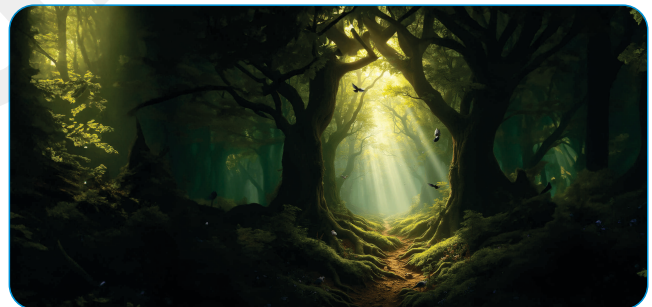
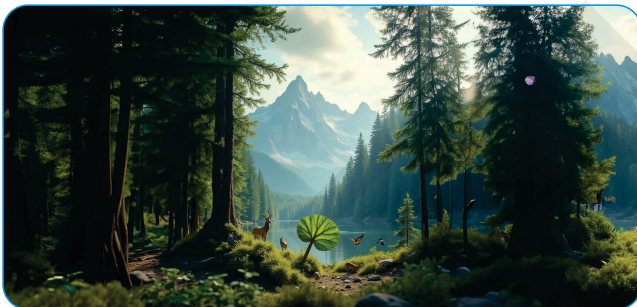
Curiosity as the Foundation of Science:

Curiosity is the driving force behind every scientific endeavor. It is the urge to explore, investigate, and understand the unknown. For example, think about the time you disassembled a toy just to see how it works. That act of exploring the toy's mechanics was science in its simplest form. Every time you wonder about how or why something happens, you are embarking on a scientific journey.



Science is Everywhere

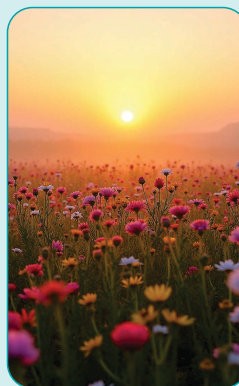
Science surrounds us in every aspect of our lives, whether we realize it or not. From the smallest grain of sand to towering mountains, from the delicate structure of a single leaf to the complexity of an entire forest, science explains how these things exist and function. It is present in the natural world, in the technologies we use, and in the processes that sustain life.



Examples of Science Around Us



Stars twinkling in the night sky: Science explains that stars shine due to nuclear reactions happening deep within their cores. These reactions produce immense amounts of energy, which we perceive as the light we see from Earth.



Flowers blooming in a garden: Flowers bloom in response to environmental factors like light and temperature, with processes like photosynthesis guiding their growth. This adaptation demonstrates how plants adjust to their surroundings.

The Practical Impact of Science:

Science is more than theoretical knowledge; it has tangible applications that benefit humanity. For instance, understanding how plants grow and thrive has revolutionized agriculture, enabling farmers to cultivate better crops and increase yields. Similarly, scientific discoveries have improved medicine, technology, and countless other aspects of human life, making the world a better place to live.

In essence, science is a way of seeing, understanding, and interacting with the world. It enriches our lives, satisfies our curiosity, and helps us find solutions to challenges—making it an indispensable part of human existence.

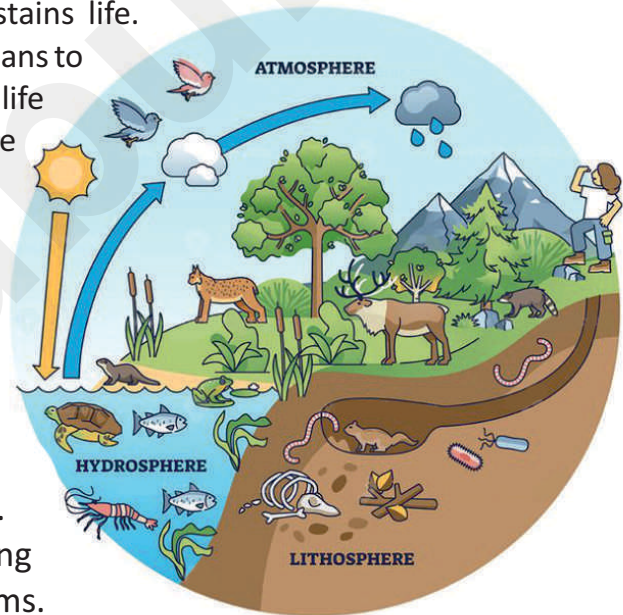
Exploring Our Home, Planet Earth

Planet Earth is a unique and remarkable place, the only planet we know that supports life. It is home to an extraordinary variety of living organisms, environments, and ecosystems. The Earth provides everything that living beings need to survive—air, water, soil, and sunlight—forming a delicate balance that sustains life.

Each corner of the planet, from the depths of the oceans to the peaks of mountains, hosts a rich diversity of life forms and plays a critical role in maintaining the planet's natural equilibrium.

Earth: A Living Planet

Earth's ability to support life is due to its perfect combination of resources and conditions. From its breathable atmosphere, which provides oxygen and carbon dioxide for animals and plants, to its abundant water supply. The planet's environments range widely, creating the perfect habitats for different kinds of organisms.



Examples:

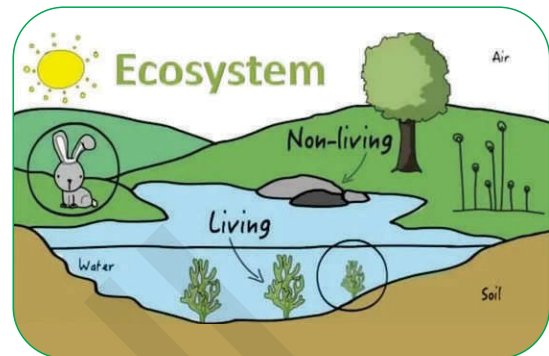
Plants: The journey of a seed growing into a plant is one of nature's simplest yet most awe-inspiring processes. A tiny seed, with the right combination of water, sunlight, and nutrients from the soil, grows into a thriving plant. This process, known as germination, is essential for maintaining life on Earth, as plants produce oxygen, food, and shelter for countless organisms.

Animals: Consider the fascinating transformation of a caterpillar into a butterfly. This process, called metamorphosis, in which the caterpillar undergoes a series of developmental stages to emerge as a beautiful butterfly. Such transformations showcase the complexity and adaptability of life on Earth.

Ecosystems: The Web of Life

Ecosystems are diverse environments where living organisms interact with each other and their surroundings. These systems include forests, oceans, deserts, wetlands, grasslands, and tundras. Each ecosystem has its unique plants, animals, and environmental conditions, creating a network of life that depends on interconnection and balance.

Ecosystems are vital for the survival of all living organisms. They regulate essential processes such as air and water purification, climate control, and nutrient cycling. Different ecosystems play distinct roles in supporting biodiversity and providing habitats for countless species.



Examples:

In a dense forest, trees serve as homes for animals such as birds, insects, and monkeys, while their leaves release oxygen into the atmosphere during photosynthesis. The forest floor is teeming with life, from fungi breaking down dead material to small animals foraging for food. Together, these elements work harmoniously to sustain the ecosystem.

Why Understanding Earth Matters

Exploring and understanding Earth's environments and ecosystems help us appreciate the planet's beauty and complexity. It also reminds us of our responsibility to protect it. By learning about the processes that keep Earth alive, we become more aware of how our actions impact the planet. Whether it's conserving water, reducing waste, or protecting forests, every small action helps in preserving the delicate balance of life on Earth.

Earth is not just our home; it is a shared space for millions of species. By studying and caring for it, we ensure that future generations can continue to thrive in harmony with the planet's natural wonders.

The Importance of Food and Water

Food and water are essential components of life. They provide the energy and resources we need to grow, survive, and thrive. While food nourishes our bodies and supports growth, water is crucial for hydration and maintaining various bodily functions. Together, they form the foundation of a healthy and sustainable lifestyle.

KEYWORDS

Ecosystems: An ecosystem is a community of living organisms interacting with each other and their non-living environment.

Food

Food is the primary source of energy for all living beings. It not only fuels our bodies but also helps in growth, repair, and maintaining overall health. The **diversity** of food available to us reflects the richness of nature and human culture. In India, for example, the variety of food is **immense**, with every region offering its unique flavors, **ingredients**, and dishes. This diversity showcases the strong relationship between food, culture, and the environment.



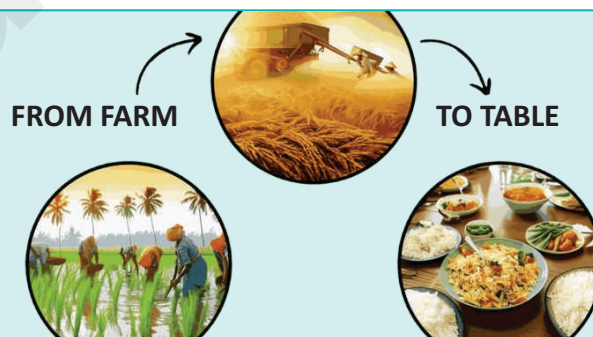
Questions to Ponder:

- What makes up the food we eat?
- How are the ingredients grown or sourced?
- How do different regions in the world use the same ingredients to create unique dishes?

Exploring these questions helps us appreciate the effort that goes into producing and preparing food. It also encourages **mindfulness** about where our meals come from and how they impact our health and the planet.

Example:

The next time you eat a meal, take a moment to think about the origins of each ingredient. Consider how rice is grown in paddy fields, how vegetables are cultivated in farms, or how spices are derived from seeds, roots, or flowers. This simple act deepens our connection to nature and the people who make our food possible.



KEYWORDS

Diversity: In science, diversity refers to the variety and variability of life forms, ecosystems, or genetic materials, essential for maintaining ecological balance and resilience.

Mindfulness: Here it means being aware of food origins, health impacts, and environmental sustainability.

Immense: It means vast or extensive, highlighting the enormous diversity of food across regions.

Ingredients: Here it refers to the raw materials or components used to prepare unique regional dishes.

Water

Water is vital for all forms of life. It is the most important natural resource on Earth, and without it, survival would be impossible. From hydrating our bodies to supporting ecosystems and agriculture, water plays a critical role in maintaining life.

Why Water is Essential:

- Water regulates body temperature, keeps us hydrated, and helps in the digestion of food.
- It acts as a medium for transporting nutrients and oxygen to cells and removing waste from the body.
- Beyond personal health, water is essential for growing crops, generating electricity, and sustaining natural habitats.



Example:

Imagine a hot summer day when rain suddenly cools the atmosphere. The water cycle—evaporation, condensation, and precipitation—makes this possible. Or think about how farmers rely on water to irrigate crops, ensuring that we have food on our plates. These examples highlight the intricate connection between water and life

Materials Around Us

Every day, we interact with a variety of objects that are made from different materials. These materials are selected based on their unique properties and suitability for a specific purpose. Think about the things you use daily—paper for writing, metal keys for opening locks, plastic rulers for measuring, rubber erasers for correcting mistakes, and clothes to keep you comfortable. Each of these items serves a different function because of the material it is made from.

Materials like metal, plastic, rubber, fabric, wood, and glass play an integral role in our lives. They are everywhere—from the tools we use to the buildings we live in. Each material has specific characteristics that make it suitable for certain applications. For example, metals are strong and durable, making them ideal for tools and machinery, while fabric is soft and flexible, perfect for clothing and upholstery.

Why Understanding Materials Matters

Knowing about the materials around us helps us appreciate how everyday items are designed and manufactured. It also enables us to choose the right material for a task and encourages mindful consumption by understanding the impact of different materials on the environment.

How Do We Separate Different Materials?

Separating materials is a crucial step in recycling and **waste management**. By identifying the properties of materials, such as their texture, weight, or whether they are **biodegradable**, we can effectively sort and recycle them. This helps in reducing waste, conserving resources, and minimizing environmental damage.



Why Is Recycling Important?

Recycling reduces the need for raw materials, such as trees for paper or petroleum for plastic, thereby conserving natural resources. It also decreases the energy required for manufacturing new products and reduces pollution caused by waste disposal. By separating and recycling materials, we contribute to creating a sustainable environment for future generations.

Example of Material Separation:

Imagine you are recycling household waste. You notice that there are plastic bottles, aluminum cans, and glass jars mixed in a single bin. To recycle effectively, you first separate the items into three categories: plastic, metal, and glass. After sorting, each group is sent to a recycling facility where the materials are processed and reproduced into new products.

KEYWORDS

Waste Management: The process of collecting, treating, and disposing of waste materials to minimize environmental impact and promote sustainability.

Biodegradable: Substances that can naturally break down into simpler, non-toxic compounds by the action of microorganisms like bacteria and fungi.

Let's recall what we know

Apply Concept in Real-Life Context

Apply

1. Why is curiosity considered the foundation of science? Share an example where curiosity led to a significant scientific discovery.
2. How does science help us understand the materials we use in daily life?
3. What are the key factors that make Earth a unique planet in the universe?

Skills Covered: Critical and logical thinking, Brainstorming, Applicative thinking, Research

Examine Further

Analyse

1. Using the Internet, explain why Earth is called the "Blue Planet."
2. Investigate and explain how water cycles through the environment and supports life.

Skills Covered: Critical and logical thinking, Applicative thinking, Brainstorming, Research

Self-Assessment Questions

Evaluate

1. Why do we need food and water for survival?
2. How does the study of materials around us improve our quality of life?
3. Do scientists mean when they say "science is everywhere"?
4. What is the role of exploration in understanding our planet and the universe?

Skills Covered: Evaluation, Critical thinking, Logical reasoning

Creative Insight

Create

Think of a question related to our planet or the universe that you are curious about. Create a plan or steps you would take to find the answer to your question. Share your plan with your classmates.

Skills Covered: Creativity, Critical and logical thinking, Brainstorming, Applicative thinking, Curiosity, Organisation

SCAN TO ACCESS



Take a Task

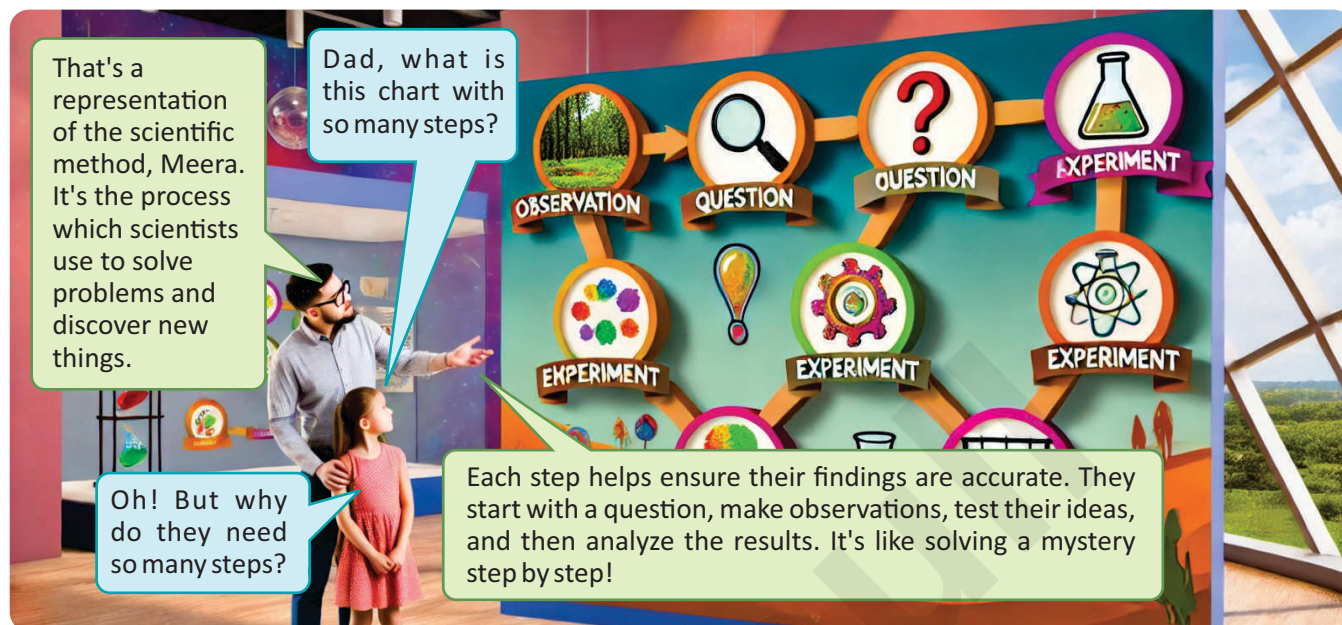


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**Bloom's
Taxonomy**

The Scientific Method

A father, Rohan, takes his daughter, Meera, to a science museum. Meera sees an exhibit about experiments and the scientific method.



The scientific method is a systematic and structured process that scientists use to explore the world, find answers to questions, and solve problems. It serves as a reliable approach to uncovering truths about nature, enabling us to understand complex phenomena by following logical and consistent steps. These steps are not only applicable in scientific research but can also be used in everyday problem-solving situations. The process ensures that conclusions are based on evidence and **rational analysis** rather than assumptions or guesses.

The steps of the scientific method are outlined below:

1. Observation

The first step in the scientific method begins with keen observation. This involves noticing something intriguing, unusual, or unclear in the environment. It could be a natural phenomenon, a recurring pattern, or a specific event that raises curiosity. Careful observation helps identify what needs to be studied or understood better.



Example: Imagine you notice that a plant in your house always grows in the direction of sunlight, regardless of where it is placed. This behavior sparks your interest and motivates further inquiry.

KEYWORDS

Rational analysis: It includes following procedures: Observation, Hypothesis, Experimentation, Inference, Data Analysis, Variables, Control Group, Scientific Method, Empirical Evidence

2. Question

Once an observation has been made, the next step is to ask questions about it. Questions help frame the investigation by focusing on specific aspects of what was observed. They often start with words like "why," "how," or "what," and guide the direction of further exploration.

Example: After observing that the plant grows toward the light, you might ask, "Why does the plant grow toward the light? Is it responding to sunlight in some way?"

Asking the right questions lays the foundation for finding meaningful answers.

3. Hypothesis

The third step is to propose a hypothesis, which is an educated guess or prediction that attempts to answer the question raised. A hypothesis is based on prior knowledge, observations, or logical reasoning. It provides a starting point for the investigation and is formulated in a way that can be tested.

Example: You might hypothesize, "The plant grows toward the light to maximize sunlight absorption, which is essential for photosynthesis."

A good hypothesis is clear, concise, and testable, enabling scientists to design experiments that validate or refute it.

4. Experiment

The next step in the scientific method is conducting an experiment. This step is crucial as it tests the hypothesis through a controlled and systematic process. Experiments are designed to collect data and observe outcomes under specific conditions, helping to determine whether the hypothesis is valid or needs to be reconsidered.

To perform an effective experiment, it's essential to create a controlled environment where only the variable in question is changed while all other factors remain constant. This ensures that the results are directly linked to the hypothesis being tested.

Example: If your hypothesis is that plants grow toward light to maximize sunlight for photosynthesis, you can test this by placing plants in different lighting conditions. Observe how the plants grow when exposed to bright light, dim light, or complete darkness over a period of time.

Experiments may need to be repeated multiple times to ensure consistent and reliable results. This helps eliminate errors and improves the accuracy of the findings.

5. Analysis

After the experiment is completed, the next step is to analyze the results. This involves examining the data collected during the experiment and comparing it to the expectations outlined in the hypothesis. During analysis, patterns, trends, and relationships within the data are identified and studied to draw meaningful conclusions.

It is critical to approach this step objectively, as the goal is to determine whether the experimental results support or contradict the hypothesis. Sometimes, the results may partially align with the hypothesis, requiring further exploration.

Example: You compare the growth patterns of plants in different lighting conditions. Did the plants in brighter light grow toward the light source as predicted? Were there any unexpected behaviors or **anomalies**? For instance, if plants in dim light also showed slight growth toward the light, this observation may suggest additional factors influencing their behavior.

Analysis often involves using graphs, tables, or charts to visually represent the findings, making it easier to identify trends and share the results with others

6. Conclusion

The final step of the scientific method is drawing a conclusion based on the analysis of the experimental data. This step answers the initial question and evaluates the hypothesis. A conclusion provides clarity on whether the hypothesis was correct, partially correct, or entirely incorrect.

If the experimental results support the hypothesis, it becomes a valid explanation for the observed phenomenon. However, if the results contradict the hypothesis, this is not a failure—it simply means that the initial assumption needs to be rethought or that additional experiments may be required.

Example: If the plants in brighter light consistently grew toward the light source while those in darkness did not, the hypothesis is supported. If the results were inconsistent or showed unexpected outcomes, the hypothesis may need to be revised to include additional factors, such as the influence of temperature or **humidity**.

KEYWORDS

Anomalies: Something that is different from what is normal or usual.

Humidity: The concentration of water vapor present in the air.

Importance of the Scientific Method

The scientific method plays a critical role in helping us find reliable answers to questions and solving problems in an organized manner. By following this systematic approach, we can avoid assumptions and base our understanding on evidence and logic. It ensures that our conclusions are accurate and rooted in observation and experimentation, making it a powerful tool for advancing knowledge and improving our understanding of the world.



Example of the Scientific Method

Problem: Flashlight Doesn't Turn On

1. Observation

You notice that your flashlight does not turn on when you press the power button. This is unexpected, as the flashlight was functioning properly the last time you used it. The light failing to work is the starting point for identifying the issue.

2. Question

The next step is to ask, "Why isn't the flashlight turning on?" This question focuses your investigation on the possible reasons behind the problem. The flashlight could have multiple issues, and asking this question narrows your focus to specific possibilities.

3. Hypothesis

Based on prior knowledge, you hypothesize that the flashlight's batteries might be dead. This is a logical guess since flashlights rely on batteries to operate, and batteries tend to lose their charge over time.

4. Experiment

To test your hypothesis, you replace the old batteries in the flashlight with new ones and try turning it on again. If the flashlight starts working, your hypothesis is correct. If it still doesn't work, you know the issue lies elsewhere, and you may need to revise your hypothesis.

5. Analysis

After replacing the batteries, you observe the flashlight's behavior. If it lights up, you can confirm that dead batteries were indeed the problem. However, if it remains off, you need to analyze further by considering other possibilities, such as a loose connection or a faulty bulb.

For example, if the flashlight still doesn't work, you could inspect the bulb to see if it is broken or check if the battery compartment has corrosion that might be disrupting the power supply.



6. Next Steps

If your analysis shows that the batteries were not the issue, you form a new hypothesis and test it. For instance, you might guess that the bulb has burned out. To test this, you replace the bulb with a new one and check if the flashlight works. If it does, you have successfully identified the problem and solved it.

If replacing the bulb doesn't work either, you might investigate further by checking the flashlight's wiring or considering whether the power button itself is **malfunctioning**.

Importance of this Example

This process **illustrates** how the scientific method is not limited to complex laboratory experiments—it can be applied to everyday problem-solving situations. By systematically observing, questioning, hypothesizing, experimenting, and analyzing, you can identify and resolve problems efficiently. It also highlights how each step builds on the previous one, ensuring logical progression and reliable conclusions.

KEYWORDS

Malfunctioning: Fail to operate in the normal or usual manner.

Illustrates: To explain or make something clear by providing examples, diagrams, or visual representations.

Let's recall what we know

Apply Concept in Context

Apply

1. Why is observation the first step in the scientific method? Provide an example of how careful observation led to a major scientific discovery.
2. How can asking the right questions during an experiment improve its outcome?
3. What role does a hypothesis play in guiding scientific research?

Skills Covered: Critical and logical thinking, Brainstorming, Applicative thinking, Research

Examine Further

Analyse

1. Using the Internet, find an example of a famous scientific experiment and explain the hypothesis behind it.
2. Investigate and describe how scientists analyze the results of an experiment to draw meaningful conclusions.

Skills Covered: Critical and logical thinking, Applicative thinking, Brainstorming, Research

Self-Assessment Questions

Evaluate

1. Why is it important to ask questions in the scientific method?
2. How does forming a hypothesis help in predicting the results of an experiment?
3. Why do scientists repeat experiments before accepting a conclusion?
4. What is the importance of analyzing data in solving scientific problems?

Skills Covered: Evaluation, Critical thinking, Logical reasoning

Creative Insight

Create

Think of a simple problem or question you encounter in daily life. Create a hypothesis for it and outline the steps you would take to experiment, analyze, and conclude. Share your plan with your classmates.

Skills Covered: Creativity, Critical and logical thinking, Brainstorming, Applicative thinking, Curiosity, Organisation

SCAN TO ACCESS



Take a Task



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SUMMARY



Introduction

- Humans are naturally curious, which drives exploration and learning, forming the basis of scientific inquiry.
- Science is about observing phenomena, asking questions, experimenting, and expanding knowledge.
- Curiosity fuels progress and innovation, encouraging us to question and understand the universe.

2. Science Universe

- Science explains the universe through observation and technology, such as telescopes that help us understand galaxies.
- Everyday phenomena, like plants growing toward light, are examples of scientific principles in action.

3. What is Science?

- Science is a systematic approach to understanding the world.
- Science surrounds us—from blooming flowers to shining stars—demonstrating its practical impact on daily life.

4. Exploring Our Home, Planet Earth

- Earth supports diverse life due to its unique resources like air, water, and sunlight.
- Examples include plant germination and animal metamorphosis, highlighting adaptation and survival.
- Ecosystems are interconnected webs of life that regulate processes like air and water purification.

4. Importance of Food and Water

- **Food:** Fuels growth and repair, providing essential nutrients. Cultural diversity in food reflects nature's richness.
- **Water:** Vital for hydration, agriculture, and ecosystems. Its properties, such as existing in three states, make it indispensable.

6. The Scientific Method

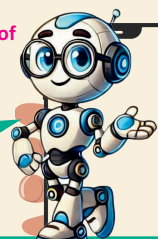
- A structured process for exploring problems and finding solutions.
- Steps:
 - Observation: Identify something intriguing.
 - Question: Frame specific inquiries.
 - Hypothesis: Form educated guesses.
 - Experiment: Test hypotheses systematically.
 - Analysis: Examine results to find patterns.
 - Conclusion: Validate or revise hypotheses

EeeBee: Your AI Buddy

Explore! **The Wonderful World of Science** with EeeBee AI Buddy.

Hi Friend! Use prompts to ask me questions about the chapter we just finished! eeee, lets go!

Start by Scanning this QR Code:





EXERCISE

That turn curiosity into confidence—let's begin!



Gap Analyzer™
Take a Test

A. Choose the correct answer.

1. What drives scientific inquiry?

(a) Laziness

☐

(b) Curiosity

☐

(c) Habit

☐

(d) Guesswork

☐

2. Which tool is commonly used to observe distant galaxies?

(a) Microscope

☐

(b) Stethoscope

☐

(c) Telescope

☐

(d) Thermometer

☐

3. What is an example of an ecosystem process?

(a) Cooking food

☐

(b) Air purification

☐

(c) Traveling

☐

(d) Painting

☐

4. Which property of water makes it indispensable for life?

(a) It is colorful

☐

(b) It has three states

☐

(c) It is heavy

☐

(d) It is sticky

☐

5. What is the first step in the scientific method?

(a) Analysis

☐

(b) Hypothesis

☐

(c) Observation

☐

(d) Experiment

☐

B. Fill in the blanks.

1. The systematic study of the world around us is called ____.

2. Telescopes help us understand ____ and other celestial bodies.

3. Food provides energy and helps in ____ and repair.

4. Materials like metal and plastic are chosen for their specific ____.

5. The steps of the scientific method include observation, hypothesis, and ____ testing.

C. Write True or False.

1. Science only involves observing nature without conducting experiments.

2. Recycling materials reduces waste and conserves resources.

3. Earth supports life due to its unique resources like water, air, and sunlight.

4. Food is not essential for growth and repair of the body.

5. Hypotheses in science are tested through experiments.

D. Define the following terms.

- | | | |
|----------------|--------------|---------------|
| 1. Science | 2. Ecosystem | 3. Hypothesis |
| 4. Observation | 5. Materials | |

E. Match the columns.

Column A

1. Telescope
2. Ecosystem
3. Food
4. Scientific method
5. Materials

Column B

- (a) Plastic and Paper
- (b) Observing galaxies
- (c) Growth and repair
- (d) Interconnected life web
- (e) Structured problem-solving

F. Give reasons for the following statements.

1. Curiosity is essential for scientific progress.
2. Conservation of food and water is important for sustainability.
3. Recycling helps reduce environmental waste.
4. Understanding ecosystems ensures balanced resource usage.
5. The scientific method is vital for solving problems systematically.

G. Answer in brief.

1. Why is curiosity considered the driving force behind science?
2. How does understanding materials contribute to conservation?
3. What role do ecosystems play in maintaining life on Earth?
4. Describe the practical importance of water for humans and ecosystems.
5. How does observation help in the scientific method?

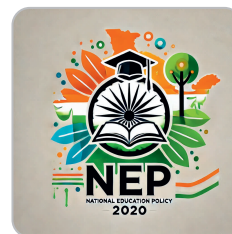
H. Answer in detail.

1. Explain the importance of science in understanding the world around us.
2. Describe the steps of the scientific method with examples.
3. How do ecosystems support and regulate life processes on Earth?
4. Discuss the significance of conserving food and water for future generations.
5. How does science improve daily life through technology and innovation?



**No More Rote Learning!**

NEP 2020 emphasizes understanding and creativity over memorization. Your projects, activities, and practical knowledge matter more than cramming for exams.



Skill-based Activity

**Curious Minds at Work****STEM**

Observe your surroundings and form a question related to a natural phenomenon, like why certain leaves change color or how animals adapt to seasonal changes. Write the steps of the scientific method you would use to find the answer to that question. Present your findings to the class.

Skills Covered: Critical and logical thinking, Brainstorming, Analytical thinking, Problem-solving, Curiosity, Observation, Decision-making skills.

Flavors of Culture**Art**

Identify and research a unique cultural dish or food tradition in your region. Sketch and describe its preparation method and significance in local culture. Present your findings in class.

Skills Covered: Creativity, Critical and logical thinking, Applicative thinking.

Science in Action**Group Activity**

Divide the class into groups of four and investigate how energy is used in your school premises, such as electricity, solar energy, or mechanical energy. Identify one scientific principle that supports its operation and explain its significance in the class.

Skills Covered: Critical and logical thinking, Brainstorming, Teamwork, Communication, Applicative thinking, Decision-making skills.

Technology in Focus**Case to Investigate**

Explore and write about how renewable energy sources like wind, solar, or hydroelectric power are used in daily life. Explain how these sources help in reducing environmental impact.

Skills Covered: Critical and logical thinking, Brainstorming, Research, Applicative thinking.

Sustainability Spotlight

Aligning with SDGs

Research a new innovation or technology aimed at reducing carbon emissions. Highlight its key features and how it aligns with sustainable development goals. Present your findings in the class.

Aligned with: SDG 13 – Climate Action, SDG 9 – Industry, Innovation, and Infrastructure, Target 13.3.

Skills Covered: Critical and logical thinking, Brainstorming, Research, Problem-solving, Ethics.

Mapping Diversity

Integrated Learning

Using the Internet, identify areas in India where specific crops, like tea, wheat, or spices, are predominantly grown. Map these regions and explain how the climate of each area supports these crops.

Integrated Learning: Geography

Skills Covered: Critical and logical thinking, Brainstorming, Analytical thinking, Applicative thinking.