

Year 7 Science

Independent Learning Tasks 2024/25

Contents

Instructions for Presenting Work	3
Option 1: Creating a Poster	4
Option 2: Creating a PowerPoint Presentation	5
Year 7.1 Independent Learning	6
Task: Create a Science Lab Safety Poster	6
Year 7.2 Independent Learning	7
Year 7.3 Independent Learning	8
Year 7 Homework Task Sheet: Model Cell	8
Year 7.4 Independent Learning	10
The Skeleton and Muscles	10
Year 7.5 Independent Learning	12
The Particle Model.....	12
Year 7.6 Independent Learning	14
Separation Techniques.....	14
Year 7.7 Independent Learning	16
Forces, Motion, and Speed	16
Year 7.8 Independent Learning	18
Reproduction	18
Year 7.9 Independent Learning	20
Acids and Alkalis	20
Year 7.10 Independent Learning	22
Light	22
Year 7.11 Independent Learning	24
Sound	24
Year 7.12 Independent Learning	26
Ecosystems.....	26
Year 7.13 Independent Learning	28
Earth Science	28
Year 7.14 Independent Learning	30
Space.....	30

Background

Within this booklet, you will find all of your Independent Learning Tasks for the year. There are a range of different activities for you to complete according to the Independent Learning Calendar, which can be found on our website.

For research tasks, you can decide on your preferred method to present your findings. Some suggestions have been provided.

If you have any questions, please speak to your class teacher.

Instructions for Presenting Work

Option 1: Creating a Poster

1. Title and Theme:

- **Title:** Ensure your poster has a clear and bold title at the top.
- **Theme:** Stick to the theme of your research and make it visually engaging.

2. Content:

- **Introduction:** Write a brief introduction to your topic.
- **Main Points:** Break down your research into key points. Use bullet points or short paragraphs.
- **Visuals:** Include images, diagrams, or charts to support your points.
- **Conclusion:** Summarise your findings in a concise manner.

3. Layout:

- **Sections:** Divide your poster into sections (e.g., Introduction, Methods, Results, Conclusion).
- **Balance:** Ensure there's a good balance between text and images.
- **Readability:** Use large fonts and clear headings to make your poster easy to read from a distance.

4. Design:

- **Colours:** Use contrasting colours for background and text to make it readable.
- **Consistency:** Keep a consistent style throughout your poster.
- **Spacing:** Leave enough space between sections so that the poster doesn't look cluttered.

5. Proofreading:

- Check for spelling and grammar errors.
- Make sure all information is accurate and well-presented.



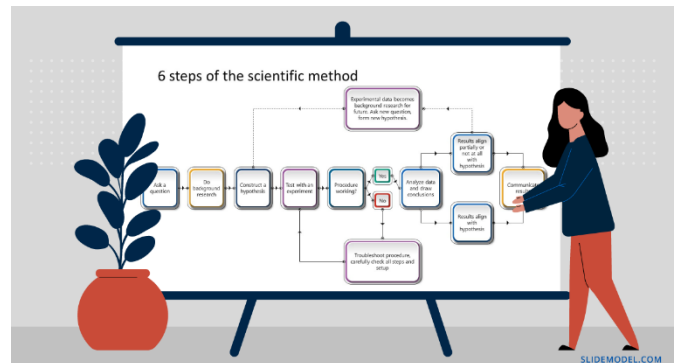
Option 2: Creating a PowerPoint Presentation

1. Title Slide:

- **Title:** Include the title of your presentation.
- **Your Name:** Add your name and class.
- **Date:** Include the date of the presentation.

2. Content Slides:

- **Introduction Slide:**
 - Briefly introduce your topic.
- **Main Points Slides:**
 - Use one slide per main point.
 - Include bullet points to list key information.
 - Add images, diagrams, or charts to support your points.
- **Conclusion Slide:**
 - Summarize your findings.
 - Include a final image or thought-provoking question.



3. Design:

- **Templates:** Use a consistent template for all slides.
- **Fonts:** Use large, clear fonts. Avoid overly fancy fonts.
- **Colours:** Use contrasting colours for text and background.
- **Animations:** Use animations sparingly to keep the focus on the content.

4. Visuals:

- **Images and Diagrams:** Make sure all visuals are high-quality and relevant.
- **Charts and Graphs:** Use charts and graphs to present data clearly.

5. Practice:

- **Rehearse:** Practice presenting your slides to ensure smooth delivery.
- **Timing:** Make sure your presentation fits within the given time limit.
- **Q&A:** Prepare for potential questions from your audience.

Year 7.1 Independent Learning

Task: Create a Science Lab Safety Poster

1. Title and Theme:

- **Title:** "Science Lab Safety Rules"
- **Theme:** Emphasize the importance of safety in a fun and engaging way.

2. Content:

- **List of Rules:** Include essential safety rules. For example:
 - Always wear safety goggles.
 - Tie back long hair.
 - No eating or drinking in the lab.
 - Know the location of safety equipment (fire extinguisher, first aid kit, etc.).
 - Report any spills or accidents immediately.



3. Visuals:

- **Images/Icons:** Use pictures to illustrate each rule (e.g., a picture of safety goggles, a fire extinguisher, etc.).
- **Colours:** Use bright colours to grab attention.

4. Layout:

- **Organize:** Arrange the information in a clear and logical order.
- **Balance:** Ensure there's a good balance between text and images.

5. Creativity:

- Be creative with their designs. They can use drawings, stickers, or digital tools to create their posters.

6. Review and Edit:

- **Proofread:** Make sure all text is clear and free of errors.
- **Feedback:** Have students show their posters to peers or teachers for feedback before finalizing.

Year 7.2 Independent Learning

Choose one of the following tasks:

Task 1: Research a Famous Scientist

1. Choose a Scientist:

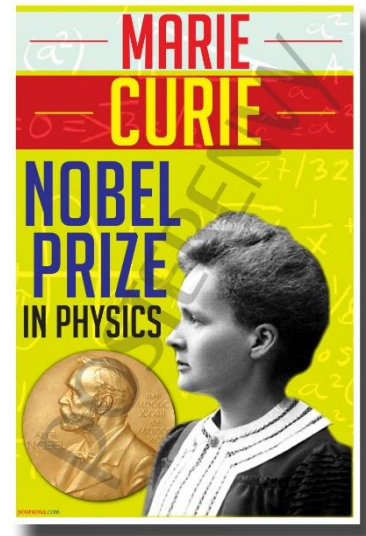
- Select a scientist from any field (e.g., Marie Curie, Albert Einstein, Rosalind Franklin).

2. Research:

- Find out the following information about the scientist:
 - Full name
 - Date of birth and death
 - Field of study
 - Major contributions or discoveries
 - Why they are famous

3. Present Your Findings:

- Create a short biography (150-200 words).
- Include a picture of the scientist.



Task 2: Conduct a Simple Experiment

1. Choose an Experiment:

- Select a simple, safe experiment to perform at home (e.g., baking soda and vinegar reaction, making a paper bridge).

2. Materials Needed:

- List all the materials you will need for the experiment.

3. Procedure:

- Write down the steps you will follow to conduct the experiment.

4. Observations:

- Record what happens during the experiment.
- Take pictures if possible.

5. Conclusion:

- Write a short paragraph explaining what you learned from the experiment.

Year 7.3 Independent Learning

Year 7 Homework Task Sheet: Model Cell

To create a 3D model of a cell and understand the different parts and functions of a cell.



Task 1: Choose Your Cell Type

1. Select a Cell Type:

- Decide whether you want to create a model of an animal cell or a plant cell.

Task 2: Research Cell Components

1. Identify Key Parts:

- Research the main components of your chosen cell type. Here are some to get you started:

For Animal Cells:

- Cell membrane
- Nucleus
- Cytoplasm
- Mitochondria
- Ribosomes

For Plant Cells:

- Cell wall
- Cell membrane
- Nucleus
- Cytoplasm
- Mitochondria
- Ribosomes
- Chloroplasts
- Vacuole

2. Functions:

- Write a brief description of the function of each component.

Task 3: Gather Materials

1. Materials Needed:

- Find materials around your home or use craft supplies to make your model. Here are some ideas:
 - Clay or playdough
 - Styrofoam balls
 - Cardboard
 - Pipe cleaners
 - Beads
 - Paints or markers
 - Glue
-

Task 4: Build Your Model

1. Construct the Cell:

- Use your materials to create a 3D model of your chosen cell type.
- Make sure each part is labelled clearly.

2. Label the Parts:

- Create small labels or flags to identify each part of the cell on your model.
-

Task 5: Create a Key

1. Key:

- Create a key or legend that explains each part of the cell and its function. You can do this on a separate piece of paper or as part of your model display.

The Skeleton and Muscles

Objective:

To understand the structure and function of the human skeleton and muscles, and how they work together to support movement.

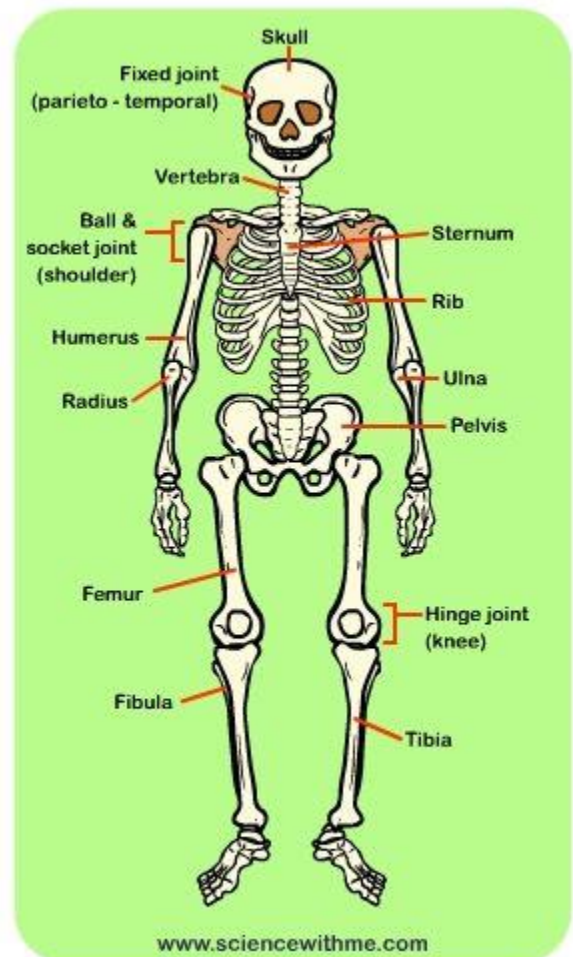
Task 1: Research the Human Skeleton

1. Identify Key Bones:

- Research and identify at least 10 major bones in the human body. Here are some to get you started:
 - Skull
 - Ribcage
 - Spine (vertebrae)
 - Pelvis
 - Femur (thigh bone)
 - Tibia (shin bone)
 - Fibula
 - Humerus (upper arm bone)
 - Radius (forearm bone)
 - Ulna

2. Functions:

- Write a brief description of the function of each bone you have identified.



Task 2: Research the Muscular System

1. Identify Key Muscles:

- Research and identify at least 5 major muscles in the human body. Here are some to get you started:
 - Biceps
 - Triceps

- Quadriceps
- Hamstrings

2. Functions:

- Write a brief description of the function of each muscle you have identified.
-

Task 3: Create a Diagram

1. Draw the Skeleton:

- Draw a simple diagram of the human skeleton.
- Label the major bones you have researched.

2. Draw the Muscles:

- Draw a simple diagram of the human muscular system.
 - Label the major muscles you have researched.
-




Task 4: Explain How They Work Together

1. Interaction:

- Write a short paragraph explaining how the skeleton and muscles work together to enable movement.
- Include examples of how specific bones and muscles interact (e.g., how the biceps and triceps work together to move the arm).

The Particle Model

To understand the particle model and how it explains the properties of solids, liquids, and gases.

	Solid	Liquid	Gas
Arrangement of particles	Close together	Close together	Far apart
	Regular pattern	Random arrangement	Random arrangement
Movement of particles	Vibrate on the spot	Move around each other	Move quickly in all directions
Diagram			

Task 1: Research the Particle Model

1. Basic Principles:

- Research and write down the basic principles of the particle model. Include the following key points:
 - All matter is made up of particles.
 - Particles are in constant motion.
 - The arrangement and movement of particles differ in solids, liquids, and gases.

Task 2: Describe the States of Matter

1. Solids:

- Describe the arrangement and movement of particles in a solid.
- Explain why solids have a fixed shape and volume.

2. Liquids:

- Describe the arrangement and movement of particles in a liquid.
- Explain why liquids take the shape of their container but have a fixed volume.

3. Gases:

- Describe the arrangement and movement of particles in a gas.

- Explain why gases fill the entire space of their container and can be compressed.
-

Task 3: Create Diagrams

1. Draw Particle Diagrams:

- Draw a simple diagram to show the arrangement of particles in a solid, liquid, and gas.
 - Label each diagram clearly.
-

Task 4: Explain Changes of State

1. Melting:

- Explain what happens to the particles when a solid turns into a liquid (melting).

2. Evaporation:

- Explain what happens to the particles when a liquid turns into a gas (evaporation).

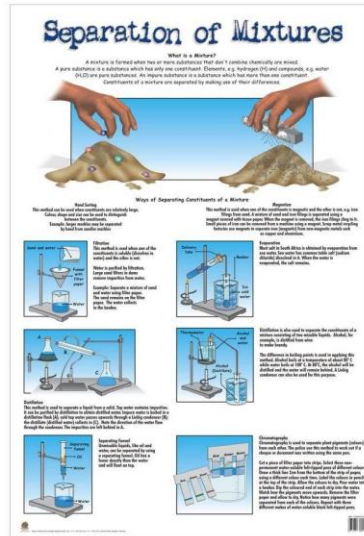
3. Condensation:

- Explain what happens to the particles when a gas turns into a liquid (condensation).

4. Freezing:

- Explain what happens to the particles when a liquid turns into a solid (freezing).

Separation Techniques



To understand and explore various techniques used to separate mixtures into their individual components.

Task 1: Research Separation Techniques

1. Identify Key Techniques:

- Research and write a brief explanation of the following separation techniques:
 - Filtration
 - Evaporation
 - Distillation
 - Chromatography
 - Magnetic Separation

Task 2: Describe Each Technique

1. Filtration:

- Describe how filtration works.
- Give an example of a mixture that can be separated using filtration.

2. Evaporation:

- Describe how evaporation works.

- Give an example of a mixture that can be separated using evaporation.
 - 3. Distillation:**
 - Describe how distillation works.
 - Give an example of a mixture that can be separated using distillation.
 - 4. Chromatography:**
 - Describe how chromatography works.
 - Give an example of a mixture that can be separated using chromatography.
 - 5. Magnetic Separation:**
 - Describe how magnetic separation works.
 - Give an example of a mixture that can be separated using magnetic separation.
-

Task 3: Create Diagrams

1. Draw Diagrams:

- Draw a simple diagram to illustrate how each separation technique works.
 - Label each diagram clearly.
-

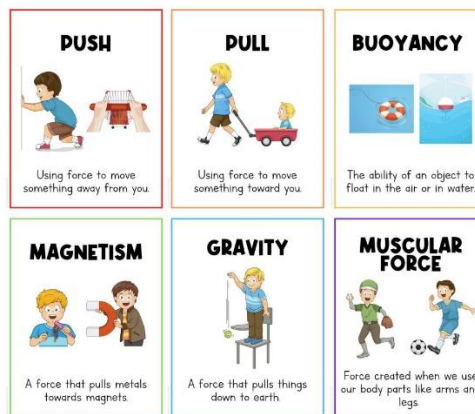
Task 4: Practical Activity (Optional)

1. Conduct a Separation Experiment:

- Choose one of the separation techniques and perform a simple experiment at home (e.g., filtration with a coffee filter, evaporation by boiling saltwater).
- Record your observations and take pictures if possible.
- Write a short paragraph explaining what you did and what you observed.

Forces, Motion, and Speed

FORCES



To understand the concepts of forces, motion, and speed, and how they are related to each other.

Task 1: Research Forces

1. Identify Key Forces:

- Research and write a brief explanation of the following types of forces:
 - Gravity
 - Friction
 - Air resistance
 - Tension
 - Normal force

2. Examples:

- Provide one example of each type of force in everyday life.
-

Task 2: Understand Motion

1. Describe Motion:

- Write a brief description of motion and how it is influenced by forces.

2. Newton's First Law:

- Explain Newton's First Law of Motion (Inertia) in simple terms.

- Provide an example to illustrate the law.
 - 3. **Balanced and Unbalanced Forces:**
 - Describe the difference between balanced and unbalanced forces.
 - Provide an example of each.
-

Task 3: Calculate Speed

1. **Speed Formula:**
 - Write down the formula for calculating speed:
 2. **Example Calculation:**
 - Provide an example calculation. For instance:
 - If a car travels 150 kilometres in 3 hours, what is its speed?
-

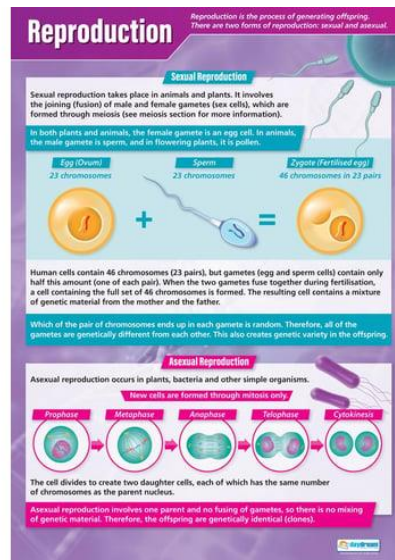
Task 4: Create Diagrams

1. **Force Diagrams:**
 - Draw simple diagrams to show the forces acting on an object (e.g., a book on a table, a parachute in the air).
 - Label the forces clearly.
 2. **Speed Graphs:**
 - Draw a graph to show the relationship between distance and time for an object moving at constant speed.
 - Label the axes and the line on the graph.
-

Task 5: Practical Activity (Optional)

1. **Conduct a Speed Experiment:**
 - Measure the speed of an object (e.g., a toy car rolling down a ramp).
 - Record the distance it travels and the time it takes.
 - Calculate its speed using the formula.
 - Write a short paragraph explaining what you did and what you observed.

Reproduction



To understand the principles of reproduction, including human and plant reproduction, as well as the differences between asexual and sexual reproduction.

Task 1: Research Human Reproduction

1. Key Concepts:

- Research and write a brief explanation of the following key concepts:
 - Male and female reproductive systems
 - Fertilisation
 - Development of the embryo
 - Birth

2. Diagrams:

- Draw and label the male and female reproductive systems.
- Include important parts such as the testes, ovaries, uterus, and fallopian tubes.

Task 2: Research Plant Reproduction

1. Key Concepts:

- Research and write a brief explanation of the following key concepts:

- Parts of a flower (e.g., stamen, pistil, petals, sepals)
- Pollination
- Fertilisation
- Seed dispersal

2. Diagrams:

- Draw and label the parts of a flower.
 - Show the process of pollination and fertilisation in plants.
-

Task 3: Asexual vs. Sexual Reproduction

1. Definitions:

- Define asexual reproduction and sexual reproduction.

2. Examples:

- Provide examples of organisms that reproduce asexually (e.g., bacteria, certain plants) and sexually (e.g., humans, animals, flowering plants).

3. Comparison:

- Create a table to compare and contrast asexual and sexual reproduction. Include aspects such as genetic diversity, speed of reproduction, and examples.
-

Task 4: Create Diagrams and Explanations

1. Human Reproduction:

- Draw diagrams of the male and female reproductive systems.
- Label each part and write a brief explanation of its function.

2. Plant Reproduction:

- Draw a diagram of a flower, showing the key parts involved in reproduction.
- Label each part and write a brief explanation of its function.

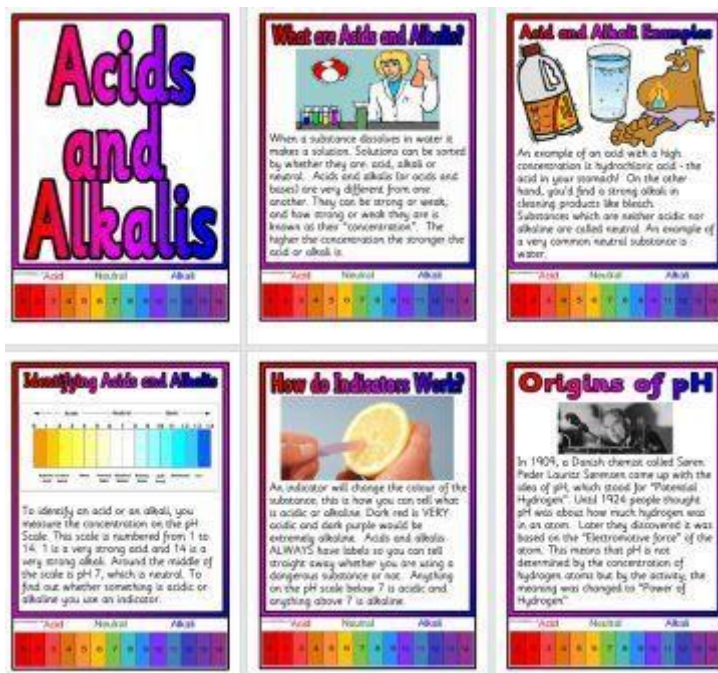
3. Asexual vs. Sexual Reproduction:

- Create a table comparing asexual and sexual reproduction with examples.

Year 7.9 Independent Learning

Acids and Alkalis

To understand the properties of acids and alkalis, how they are used, and how to handle them safely.



Task 1: Research Acids and Alkalis

1. Definitions:

- Write a brief definition of acids and alkalis.
- Include examples of common acids (e.g., vinegar, lemon juice) and alkalis (e.g., baking soda, soap).

2. pH Scale:

- Explain what the pH scale is and how it is used to measure the acidity or alkalinity of a substance.
- Identify the pH range for acids (0-6), neutral substances (7), and alkalis (8-14).

Task 2: Properties and Uses

1. Properties:

- Describe the general properties of acids (e.g., sour taste, corrosive) and alkalis (e.g., bitter taste, slippery feel).

2. Uses:

- List at least three common uses of acids and alkalis in everyday life.
 - For example, acids are used in food preservation, cleaning products, and car batteries. Alkalis are used in baking, cleaning products, and antacids.
-

Task 3: Safety Measures

1. Handling Acids and Alkalis Safely:

- Write down safety measures for handling acids and alkalis, including:
 - Wearing protective equipment (e.g., gloves, goggles).
 - Working in a well-ventilated area.
 - Knowing the location of safety equipment (e.g., eye wash station, first aid kit).

2. First Aid:

- Explain what to do in case of an accidental spill or contact with skin or eyes.
-

Task 4: Conduct a Simple Experiment (Optional)

1. Experiment:

- Perform a simple experiment to test the pH of common household substances (e.g., vinegar, baking soda solution, lemon juice, soap solution).
- Use pH strips or a homemade indicator (e.g., red cabbage juice) to determine the pH.

2. Record Observations:

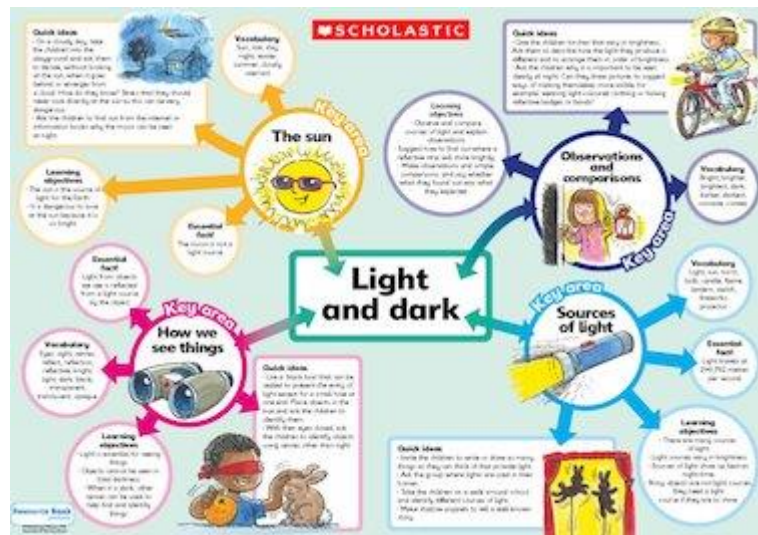
- Create a table to record the substance tested, its predicted pH, and the actual pH observed.

3. Conclusion:

- Write a short paragraph explaining your findings and what you learned from the experiment.

Light

To understand the properties of light, how it travels, and how it interacts with different materials.



Task 1: Research the Properties of Light

1. Basic Properties:

- Research and write down the basic properties of light. Include the following key points:
 - Light travels in straight lines.
 - Light can be reflected, refracted, and absorbed.
 - Light is a form of energy.

Task 2: Understand Reflection and Refraction

1. Reflection:

- Describe how light reflects off surfaces.
- Explain the law of reflection (angle of incidence equals angle of reflection).
- Provide an example of reflection in everyday life (e.g., a mirror).

2. Refraction:

- Describe how light bends when it passes from one medium to another.
- Explain why refraction occurs (change in speed of light).

- Provide an example of refraction in everyday life (e.g., a straw appearing bent in a glass of water).
-

Task 3: Investigate Shadows

1. Create and Observe Shadows:

- Use a flashlight and various objects to create shadows.
- Observe how the size and shape of the shadow change when the distance between the object and the light source changes.

2. Record Observations:

- Draw diagrams to show your observations.
 - Write a short explanation of how shadows are formed and how their size changes.
-

Task 4: Colour and Light

1. White Light and Spectrum:

- Explain that white light is made up of different colours (spectrum).
- Describe how a prism can be used to split white light into its component colours.

2. Colour Absorption and Reflection:

- Explain why objects appear to be different colours (e.g., an apple appears red because it reflects red light and absorbs other colours).
- Provide examples of objects and the colours they reflect and absorb.

Sound

To understand the principles of sound, how it is produced, and how it travels through different mediums.



Task 1: Research the Basics of Sound

1. What is Sound?

- Research and write a brief explanation of what sound is.
- Include key points such as:
 - Sound is a type of energy made by vibrations.
 - These vibrations travel through a medium (e.g., air, water, solids).

2. How is Sound Produced?

- Explain how sound is produced by vibrating objects.
- Provide examples of different sources of sound (e.g., musical instruments, vocal cords).

Task 2: Describe How Sound Travels

1. Sound Waves:

- Explain what sound waves are and how they travel.
- Include the concepts of compression and rarefaction in your explanation.

2. Mediums:

- Describe how sound travels through different mediums (air, water, solids).
 - Explain why sound travels faster in some mediums than others.
-

Task 3: Explore the Properties of Sound

1. Pitch and Frequency:

- Explain the relationship between pitch and frequency.
- Provide examples of high-pitched and low-pitched sounds.

2. Volume and Amplitude:

- Explain the relationship between volume and amplitude.
- Provide examples of loud and soft sounds.

3. Echo and Reflection:

- Explain how echoes are produced.
 - Describe how sound reflects off surfaces.
-

Task 4: Create Diagrams

1. Sound Wave Diagram:

- Draw a simple diagram of a sound wave, labelling the compression and rarefaction parts.

2. Sound Travelling Through Mediums:

- Draw diagrams showing how sound travels through air, water, and solids.
 - Label each diagram clearly.
-

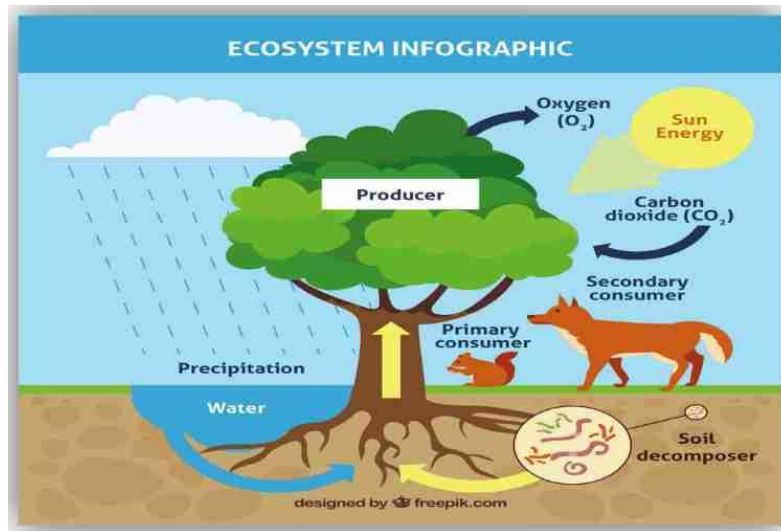
Task 5: Practical Activity (Optional)

1. Experiment with Sound:

- Conduct a simple experiment to explore sound (e.g., using a tuning fork, making a simple string telephone).
- Record your observations and take pictures if possible.
- Write a short paragraph explaining what you did and what you observed.

Ecosystems

To understand the components and dynamics of ecosystems, and the interactions between living organisms and their environment.



Task 1: Research the Components of an Ecosystem

1. Key Components:

- Research and write a brief explanation of the following components of an ecosystem:
 - **Producers:** Organisms that produce their own food through photosynthesis (e.g., plants, algae).
 - **Consumers:** Organisms that eat other organisms for energy (e.g., animals).
 - **Decomposers:** Organisms that break down dead material for energy (e.g., fungi, bacteria).
 - **Abiotic Factors:** Non-living components of the ecosystem (e.g., sunlight, water, soil, temperature).

2. Examples:

- Provide examples of each component within a specific ecosystem (e.g., a forest, a pond, a desert).

Task 2: Describe Food Chains and Food Webs

1. Food Chain:

- Write a description of what a food chain is.
- Create a simple food chain with at least four organisms. Label each trophic level (producer, primary consumer, secondary consumer, tertiary consumer).

2. Food Web:

- Write a description of what a food web is.
 - Create a food web that includes multiple food chains within the same ecosystem.
-

Task 3: Explore Energy Flow

1. Energy Pyramid:

- Draw an energy pyramid and label the different levels (producers, primary consumers, secondary consumers, tertiary consumers).
 - Explain how energy is transferred from one level to the next and why energy decreases at higher trophic levels.
-

Task 4: Human Impact on Ecosystems

1. Research Human Activities:

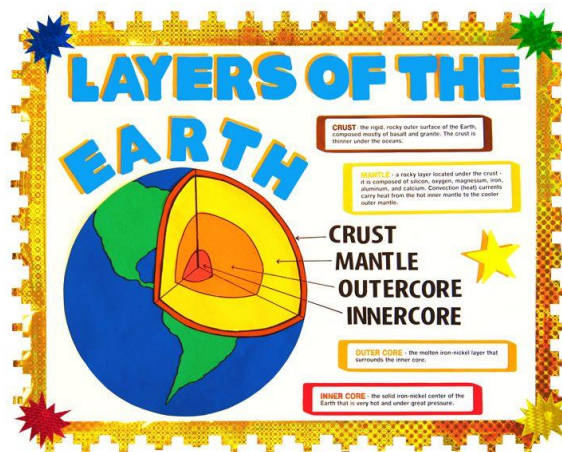
- Research and write about how human activities can impact ecosystems (e.g., deforestation, pollution, urbanisation).
- Provide specific examples of positive and negative impacts humans have on ecosystems.

2. Conservation Efforts:

- Research and describe some conservation efforts that are in place to protect ecosystems (e.g., national parks, wildlife reserves, pollution control measures).

Earth Science

To understand the different components and processes of Earth Science, including the structure of the Earth, the rock cycle, and the importance of natural resources.



Task 1: The Structure of the Earth

1. Research the Layers:

- Write a brief description of the four main layers of the Earth:
 - Crust
 - Mantle
 - Outer Core
 - Inner Core

2. Diagram:

- Draw a labelled diagram of the Earth's layers.

Task 2: The Rock Cycle

1. Identify Rock Types:

- Write a brief description of the three main types of rocks:
 - Igneous
 - Sedimentary
 - Metamorphic

2. Rock Formation:

- Explain how each type of rock is formed.

3. Diagram:

- Create a diagram of the rock cycle showing the processes that change one type of rock into another (e.g., melting, cooling, erosion, heat, and pressure).
-

Task 3: Natural Resources

1. Types of Resources:

- List and describe the difference between renewable and non-renewable resources.
 - Renewable: e.g., Solar energy, wind energy, water.
 - Non-renewable: e.g., Coal, oil, natural gas.

2. Importance:

- Write a short paragraph on why natural resources are important for human life and the environment.
-

Task 4: Environmental Impact

1. Human Impact:

- Research and describe one way human activities impact the environment (e.g., deforestation, pollution, climate change).

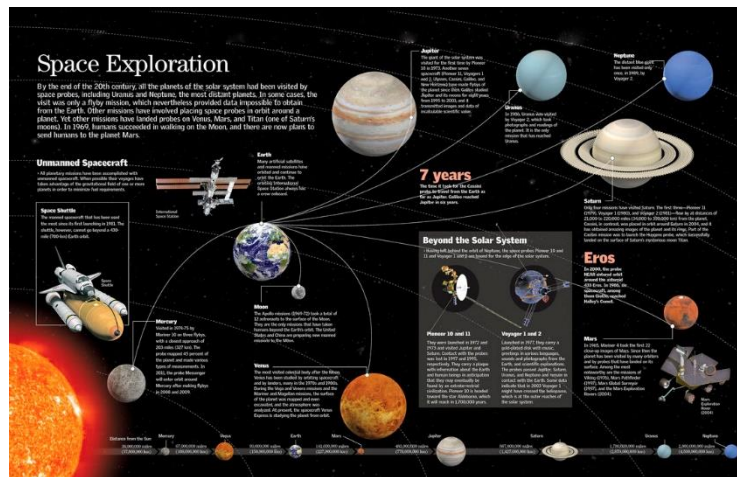
2. Solutions:

- Suggest one way to reduce the negative impact of human activities on the environment.

Year 7.14 Independent Learning

Space

To understand the basic concepts of space, including the solar system, stars, and the universe.



Task 1: The Solar System

1. Identify Planets:

- Research and list all the planets in our solar system in order from the sun.
- Write a brief description of each planet, including key facts such as size, composition, and any unique features.

2. Draw a Diagram:

- Draw a simple diagram of the solar system.
- Label each planet and the sun.
- Include the asteroid belt.

Task 2: The Moon and Its Phases

1. Phases of the Moon:

- Research and describe the different phases of the moon (e.g., new moon, crescent, first quarter, gibbous, full moon).
- Explain why the moon appears to change shape over the month.

2. Create a Moon Phases Chart:

- Draw a chart or diagram showing the different phases of the moon.
- Label each phase clearly.

Task 3: Stars and Constellations

1. What Are Stars?:

- Write a brief explanation of what stars are, including how they are formed and what they are made of.

2. Identify Constellations:

- Research and identify at least three constellations.
- Write a brief description of each constellation, including any myths or stories associated with them.

3. Draw Constellations:

- Draw diagrams of the three constellations you have researched.
 - Label the stars and the constellation name.
-

Task 4: The Universe

1. Galaxies:

- Write a brief description of what a galaxy is.
- Identify and describe the galaxy we live in.

2. The Big Bang Theory:

- Write a brief explanation of the Big Bang Theory and how scientists believe the universe began.