





SCIENCE

YEAR 7

LEARNING AND ASSESSMENT PROGRAMME

GOVERNMENT OF MALTA
MINISTRY FOR EDUCATION, SPORT, YOUTH, RESEARCH AND INNOVATION
DIRECTORATE FOR STEM AND VET PROGRAMMES

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Learning and Assessment Programme (LAP)

The **Learning Outcomes Framework (LOF)** promotes flexibility in teaching and learning, allowing educators to address specific needs and build on students' strengths within the diverse contexts of schools and colleges. This flexibility is central to the framework, which acknowledges the impact of external factors—such as poverty and social exclusion—on learner achievement. By fostering creativity, critical thinking, entrepreneurship, and innovation, the LOF aims to enhance the learning experience and make learning more meaningful and relevant to students' lives. This, in turn, helps develop a positive attitude toward learning and a deeper appreciation of its practical value.

The **Learning and Assessment Programme (LAP)** for Science includes:

- **Learning Outcomes Framework (LOF):** A set of subject Learning Outcomes (SLOs) that describe what learners are expected to know, understand, and be able to do following a learning process. These outcomes are designed for flexible implementation across various teaching contexts and delivery methods. They focus on the intended learning results rather than prescribing how learning should occur.
- **Notes on Pedagogy and Assessment:** These provide guidance on effective teaching and assessment strategies aligned with the learning outcomes. The outcomes are structured to support informed pedagogical decisions and set clear expectations for assessment. Educators are encouraged to adapt these guidelines to suit the needs of their learners while promoting best practices.

Cross-Curricular Themes

As outlined in the *National Curriculum Framework for All (2012)*, the cross-curricular themes for the Junior and Secondary school cycles include:

- Literacy
- Digital Literacy
- Learning to Learn and Co-operative Learning
- Education for Sustainable Development
- Education for Entrepreneurship, Creativity and Innovation
- Education for Diversity

5E Instructional Model

The Science programme supports these themes through an inquiry-based, student-centred approach, where experiments and other practical activities are kept at the heart of the teaching and learning process. All this follows the scientific process, grounded in the **5E instructional model**:

- **Engage:** Spark students' interest and curiosity.
- **Explore:** Encourage observation, questioning, prediction, planning, and hands-on investigation.
- **Explain:** Guide students to interpret data and communicate findings.
- **Elaborate:** Extend understanding by connecting prior knowledge to new concepts and applying them in different contexts.
- **Evaluate:** Encourage reflection and self-assessment. Teachers assess students' strengths and areas for improvement based on their performance.

Throughout, health and safety must be prioritised during all experimental work.

SCIENCE SKILLS AND COMPETENCIES

LEARNING OUTCOMES

Scientific Inquiry and Experimental Design

1. I can ask scientific questions that can be investigated through practical work.
2. I can investigate scientific questions both independently and as part of a group.
3. I can plan an investigation.
4. I can identify and describe the variables in an investigation.
5. I can carry out a fair test with guidance from my teacher.
6. I can predict the outcome of an experiment and suggest scientific explanations.
7. I can discuss and carry out an experiment with my group, sharing tasks and results.

Practical Skills and Safety

8. I can select suitable equipment for an investigation.
9. I can use common scientific equipment safely and correctly.
10. I can make accurate measurements using appropriate instruments and units.
11. I can use digital tools for measurement and data collection purposes.
12. I can assess basic health and safety risks and follow safety rules during practical work.

Data Handling and Communication

13. I can draw and label a scientific diagram.
14. I can record my observations and results in a table.
15. I can present and interpret data from a table of results, bar graphs and pie charts.
16. I can describe patterns or relationships between two variables in an investigation.
17. I can complete a simple scientific report, including results and conclusions.
18. I can use digital tools, including AI, to research science ethically, while citing sources.

Science in Context

19. I can recognise how different branches of science work together in everyday contexts.
20. I can relate scientific knowledge, skills and competencies to STEM careers.

KEY WORDS

question, hypothesis, prediction, fair test, investigation, independent variable, dependent variable, control variable, method, procedure, plan

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equipment, apparatus, measurement, volume, mass, length, time, temperature, accuracy, safety, risk assessment, digital tools, laboratory rules

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observation, table, results, diagram, graph, bar chart, pie chart, pattern, relationship, conclusion, scientific report, interpret, data analysis

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branches of science, STEM, STEAM, careers, application, technology, engineering, mathematics, real-world relevance.

Subject:
Science

Year:
7

LOF Subject Focus:
What Do Scientists Do?

Unit Code:
SCI LOF 7.1

Unit 7.1

Doing Science

This unit introduces students to the practical application of scientific concepts, focusing on laboratory safety, the scientific method, the use of apparatus, and the safe use of the Bunsen burner. Students will explore the relevance of science in everyday life, learn about famous, contemporary and local scientists, and develop essential skills in conducting experiments and ensuring safety in the lab.

UNIT OBJECTIVES

1. reinforce awareness of the relevance of science in everyday life;
2. expose students to specific apparatus and provide opportunities for its appropriate use in experiments;
3. guide students to follow the scientific method while performing experimental tasks;
4. guide the students to identify potential hazards and take safety precautions accordingly;
5. teach students to light and use a Bunsen burner safely;
6. engage students to explore combustion and use the fire triangle to describe a safe way of putting out a fire.

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs ‘revisit’ and ‘reinforce’ in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- Practical work is integral to the scientific process. Every concept taught should ideally be connected to a practical activity, demonstration, or observation.
- Be aware of health and safety requirements when carrying out experiments.
- More learning outcomes related to skills and competences are found at the beginning of this document. Guide students to make progressive improvement from one practical to the next.
- Teachers are to use their professional judgement to decide when to include opportunities to practise and assess specific skills and competencies.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- × all scientists are old, male and wear lab coats;
- × our science understanding never changes;
- × if a prediction is wrong, the experiment failed;
- × if a negative result is obtained, the experiment failed;
- × the term ‘technology’ only refers to digital devices like phones (manual or non-powered equipment such as a thermometer or a bicycle are not technology).

RESOURCES

lab coats, safety glasses, test tubes, boiling tubes, test tube racks, test tube holders, beakers, conical flasks, funnels, measuring cylinders, stands, stirrers, spatulas, pipettes, Bunsen burners, heat-proof mats, wire gauzes, tripods, thermometers, balance, stopwatches, rulers, chemical bottles, fire extinguisher, fire blanket, candles, wooden splints, items showing different hazard symbols

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Importance of science & technology:	https://www.britannica.com/Science-Tech
Science is fun:	https://www.sciencekids.co.nz/
Famous scientists:	https://www.famousscientists.org/
Maltese Scientists:	https://en.wikipedia.org/wiki/Category:Maltese_scientists
Science research in Malta:	https://thinkmagazine.mt/research-matters/science/
Women scientists:	http://womenshistory.about.com/od/airspacesciencemath/tp/Famous-Women-Scientists.htm
Latest inventions:	https://www.snexplores.org/
Fire safety:	https://sparky.org/
Safety in the lab:	https://www.bbc.co.uk/bitesize/articles/z794g7h#zrck4xs
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Explore key aspects of practical work: measuring, taking precautions, fair testing, and repeating readings.
- Make and record simple observations.
- Light and use a Bunsen burner safely.
- Measure the time taken to heat 50 ml of water to 80°C.
- Measure the volume of a stone using water displacement.
- Investigate fire using a candle.
- Observe how oxygen is used in burning (candle in a closed container over water).

[Unit 7.1] DOING SCIENCE

LEARNING OUTCOMES

Science & Society

1. I can give examples of the relevance of science and technology in everyday life.
2. I can give examples of how our understanding of science evolves over time.
3. I can name some scientists, including contemporary and local ones, and describe their work.

Scientific Method

4. I can recall and follow key laboratory safety rules.
5. I can recognise hazard symbols and suggest appropriate safety procedures.
6. I can apply the scientific method including making predictions, experimenting and analysing results.
7. I can identify variables and precautions, conduct a safe and fair test, and report my findings.
8. I can use apparatus to perform simple experimental tasks.

Using Fire Safely

9. I can identify and label the main parts of the Bunsen burner.
10. I can light and use a Bunsen burner safely.
11. I can identify the three components needed to start a fire by using a fire triangle.
12. I can use the fire triangle to identify ways of putting out a fire.

KEY WORDS

scientist, discovery, invention, research

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safety rules, safety goggles, lab coat, safety precaution, hazard symbol, flammable, health hazard, serious health hazard, corrosive, explosive, dangerous to the environment, poisonous (toxic), contamination

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prediction, hypothesis, method, observations, variable, fair testing, result, conclusion

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apparatus, test tube, boiling tube, test tube rack, test tube holder, beaker, conical flask, funnel, measuring cylinder, stand, stirrer, spatula, pipette, thermometer, balance, stopwatch, ruler, measurement, units of temperature (°C), units of volume (cm^3, mL, L), units of mass (g, kg), units of time (s, min), units of length (mm, cm, m, km), meniscus, eye level, flat surface

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Bunsen burner, heat-proof mat, wire gauze, tripod, yellow flame, blue flame, safety flame

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fire triangle, fuel, oxygen, heat, combustion, fire extinguisher, fire blanket

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

Subject:
Science

Year:
7

LOF Subject Focus:
Life on Earth

Unit Code:
SCI LOF 7.2

Unit 7.2

OUR NATURAL ENVIRONMENT

In this unit the diversity and grouping of organisms will be explored, using the vital functions as the distinguishing set of factors between living and non-living things. Students will investigate adaptations, food chains, and energy flow within ecosystems, while learning about plant and animal roles as producers and consumers. The unit also covers the impact of human activity on the environment and the importance of conservation. Additionally, students will familiarise themselves with endemic, indigenous, alien, endangered, and extinct species.

UNIT OBJECTIVES

1. guide students to understand the significance of the theory of evolution;
2. reinforce the seven vital functions to distinguish living and non-living things;
3. show that living things are grouped into plants, animals, fungi and small micro-organisms;
4. revisit sorting animals into vertebrates and invertebrates;
5. revisit sorting vertebrates into fish, amphibians, reptiles, birds and mammals;
6. introduce key examples of invertebrate groups;
7. engage students into exploring plant and animal adaptations;
8. guide students to identify types of feeding relationships through food chains and food webs;
9. explain the process of photosynthesis;
10. guide students to identify and describe some local habitats;
11. guide students to identify examples of human impact on the environment;
12. guide students to understand the impact of climate change, and distinguish between greenhouse effect and global warming;
13. discuss conservation of habitats and species;

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs ‘revisit’ and ‘reinforce’ in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- Be aware of health and safety issues if students are to handle some animals or plants.
- It is suggested that this unit is planned along **‘Unit 7.3 Investigating Local Habitats’** due to overlapping themes. Other out of class activities besides the fieldwork include, a visit to a nature reserve, the Natural History Museum or to one of the Natura2000 sites.
- Take every opportunity to include reference to local examples of animals, plants and habitats wherever possible.
- Note that the terms endothermic and ectothermic are more scientifically accurate and should be used instead of warm-blooded and cold-blooded.
- It would be useful to consider a cross-curricular approach (such as with Geography / Environmental Studies) for some aspects of this unit.
- Most students are aware of the 3R’s, but most identify various waste management initiatives as recycling even though they might be a reduction or reuse of waste material.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- some animals such as snakes and mice do not have a skeleton;
- associate the term ‘animals’ exclusively with mammals while failing to consider that birds, fish, amphibians, reptiles and all invertebrates, are also animals;
- spiders are insects;
- microbes are always harmful;
- adaptations are conscious choices (e.g., a bird decides to change the shape of its beak to eat seeds that became more abundant);
- the term ‘respiration’ refers to the breathing mechanism;
- photosynthesis requires the sun and not light energy;
- greenhouse effect is solely a harmful man-made process, rather than a required, naturally occurring process;
- greenhouse effect, global warming and climate change mean the same thing;
- classify various waste management practices as recycling even though they might be examples of reduction or reuse of waste material.

RESOURCES

fossils, pictures (e.g., Għar Dalam fossils, Galapagos Islands species, variety of organisms, etc.), posters of animal groups, model of the human skeleton, other vertebrate skeletons, pH meter, thermometer, climate change data, leaflets of environmental NGOs.

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Images of animals:	http://www.sciencephoto.co.uk/
Images of plants:	http://www.digitalphoto.pl/en/plants/flowers/
Charles Darwin and Theory of Evolution:	http://www.sciencekids.co.nz/sciencefacts/scientists/charlesdarwin.html
Plant & Animal adaptations:	http://www.mbgnet.net/bioplants/adapt.html https://kids.nationalgeographic.com/search?q=adaptations&location=srp&type=manual
Adapting to climate change / Food chain:	http://www.livescience.com/3863-animals-plants-adapting-climate-change.html https://climatekids.nasa.gov/ https://climatekids.nasa.gov/heat-islands/
Environment and Resources Authority:	https://www.era.org.mt https://era.org.mt/air-quality-widget/
Local environmental NGOs:	http://www.naturetrustmalta.org/ http://www.birdlifemalta.org/ https://www.ramblersmalta.org/ http://www.foemalta.org/home/ https://www.zibel.org/ http://new.faa.org.mt/
International environmental groups:	https://www.worldwildlife.org/ https://www.nature.org/en-us/ https://iucn.org/ https://www.rspb.org.uk/
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Investigate animal adaptations by exploring suitable habitats (e.g. woodlice in different environments).
- Observe and describe key animal features and adaptations.
- Observe and describe plant features and adaptations.
- Visit a natural site or museum (e.g. nature reserves, Għar Dalam, or Natural History Museum).
- Carry out simple experiments to investigate photosynthesis.
- Investigate the burning of a fuel.
- Model the effect of acid rain on limestone using eggshells or marble chips.
- Test for the presence of carbon dioxide.
- Explore the urban heat island effect.
- Collecting particulate matter.
- Model the greenhouse effect in a simple experiment.
- Produce recycled paper.

[Unit 7.2] OUR NATURAL ENVIRONMENT

LEARNING OUTCOMES

Evolution & Classification

1. I can identify evolution as the ongoing process through which living things change over time.
2. I can use the seven vital functions to identify living and non-living things.
3. I can group a variety of living things based on similarities and differences in their physical features.
4. I can group living things into different kingdoms including animals, plants, fungi and bacteria.
5. I can name examples of viruses and state that they are usually classified as non-living things (as they do not perform all vital functions).

Vertebrates & Invertebrates

6. I can name the five vertebrate groups and list characteristic features of each.
7. I can name some examples of invertebrates and identify some groups including molluscs and arthropods.
8. I can list one characteristic feature of molluscs and arthropods.

Adaptations & Food Webs

9. I can describe some animal and plant adaptations in relation to their habitat.
10. I can categorize plants as producers and animals as consumers (herbivores, carnivores and omnivores).
11. I can explain that during photosynthesis plants use light, carbon dioxide and water to make sugars and oxygen.
12. I can describe how energy flows through a food chain.
13. I can identify predators and prey and list some adaptations related to these roles.
14. I can draw and interpret food chains and food webs.

KEY WORDS

evolution, fossils, living things, non-living things, seven vital functions, living characteristics, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, physical features, classification, kingdoms, plants, animals, fungi, bacteria, viruses, species

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vertebrate, skeleton, endothermic, ectothermic, fish, reptiles, birds, amphibians, mammals, invertebrate, mollusc, soft body, shell, arthropods, exoskeleton, segmented body

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adaptation, habitat, producer, consumer, herbivore, carnivore, omnivore, photosynthesis, light, carbon dioxide, water, sugars, oxygen, energy flow, food chain, food web, predator, prey

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endemic, indigenous, alien, endangered, extinct, conservation, biodiversity, woodland, garigue, lakes, sea, marine environment, forest, rainforest, sandy seashore, rocky seashore, cliffs, valley, cultivated fields

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Local Habitats & Biodiversity

15. I can define the terms endemic, indigenous, alien, endangered and extinct species, and name local examples of each.
16. I can define the term extinct species and name examples.
17. I can identify and describe some local habitats such as garigue, valleys, freshwater areas, marine environment, coastal zones, cultivated fields, nature reserves and woodland.

Human Impact on the Environment

18. I can discuss examples of positive and negative human impact on the environment.
19. I can describe sustainable practices to reduce pollution.
20. I can explain how the intensified greenhouse effect contributes to global warming.
21. I can use the term carbon footprint to describe my impact on the environment.
22. I can explain what climate change is and identify some of its signs and effects.
23. I can describe the importance of nature reserves in the protection of biodiversity.
24. I can describe the role of Environmental NGOs (ENGO) and name some local examples.

pollution (air, water, land), fossil fuels, greenhouse effect, global warming, climate change, carbon footprint, deforestation, sustainability, SDGs, separation of waste, 3R's, recycle, reduce, reuse, waste management, environmental NGO, nature reserve

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

Subject:
Science

Year:
7

LOF Subject Focus:
Life on Earth

Unit Code:
SCI LOF 7.3

Unit 7.3

INVESTIGATING LOCAL HABITATS

In this hands-on unit, taught experientially through fieldwork, students explore a local natural habitat - such as garigue, woodland, or coastal area - engaging directly with the ecosystem through observation, species identification, and data collection using quadrats as sampling techniques. As they investigate endemic, indigenous, and alien species and examine the role of features like rubble walls, students collect, present, and analyse ecological data, gaining insight into biodiversity, adaptation, and human environmental impact.

UNIT OBJECTIVES

1. facilitate student exploration of different types of habitats and living organisms through fieldwork;
2. support students in the collection, presentation and interpretation of data during fieldwork;
3. engage students in the identification of local species and their adaptations;
4. guide students to investigate a particular habitat using quadrats for sampling;
5. discuss human impact on the habitat being investigated.

POINTS TO NOTE

- During preparation, treat this unit as a continuation of the previous one.
- Prepared worksheets can be used to guide students through the various stages of fieldwork.
- Including a sampling activity using quadrats is a compulsory activity during fieldwork.
- Fieldwork may be carried out in various locations such as Buskett, Majjistral Park, Foresta 2000, Xrobb l-Għaġin, Pembroke Nature Trail, Mistra and Selmun, Dwejra (Gozo), Comino, as well as various valleys, woodland areas, sandy beaches, rocky seashores and yacht marinas.
- Consider a cross-curricular approach by organising the fieldwork trip in conjunction with other subjects.
- Ensure all logistics, safety precautions and parent consent forms are addressed when planning a fieldwork activity.
- **Assessment**: The learning outcomes for this unit are intended to be covered during a fieldwork trip and **will not** be assessed in the annual examination paper. However, work related to the fieldwork activity will contribute **10% of the final global mark**. Students who were absent from the fieldwork trip for a valid reason and did not have the opportunity to join another group must complete an **additional fieldwork question paper** during the annual examination. An **extra 15 minutes** should be allocated for this paper.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- ✗ the quadrat should not be thrown in areas where the organism being studied is not present;
- ✗ there is no difference between the terms indigenous and endemic.

RESOURCES

quadrats, hand lens, observation containers, species identification guidebook, gloves, measuring tape, anemometer/wind meter, pH meter, thermometers (air and soil), fieldwork worksheets, others (depending on the activities included).

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Introducing sampling with quadrats:	https://www.thenational.academy/teachers/programmes/science-secondary-ks3/units/biodiversity/lessons/ecological-sampling-using-a-quadrat?sid-052da2=6gyf1gbGpM&sm=0&src=4#slide-deck
Local plants identification:	https://www.maltawildplants.com/
Fauna and Fungi identification:	https://www.maltawildplants.com/fauna.php
Malta's national species:	https://era.org.mt/topic/national-species/
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Investigate the role of rubble walls in the local ecosystem.
- Explore the impact of urbanisation (e.g. construction, habitat loss, pollution).
- Identify different types of pollution in the area.
- Study the effects of introduced (alien) species and their competition with local species.
- Measure environmental conditions such as temperature, humidity, pH, and wind speed.
- Identify local plants and animals, including endemic, indigenous, and endangered species.
- Participate in a silent observation exercise.
- Use additional sampling techniques such as line transects and pitfall traps (optional).
- Identify natural and man-made features in the local environment.
- Investigate local conservation initiatives and their impact.
- Conduct marine fieldwork: measure water pH, temperature, and visibility.
- Use methods such as surveys for data collection and analysis.

[Unit 7.3] INVESTIGATING LOCAL HABITATS

LEARNING OUTCOMES

Biodiversity

1. I can explore and observe a habitat and its living organisms through fieldwork activities.
2. I can observe a variety of living things including any endemic, indigenous and alien species.
3. I can identify adaptations that help some animals and plants survive in the habitat investigated.

Fieldwork Skills

4. I can collect data accurately during fieldwork activities.
5. I can present and interpret the data collected. (refer to LOs related to skills and competencies on page 4).
6. I can analyse data gathered during fieldwork.
7. I can explain the importance of sampling in field investigations.
8. I can use sampling techniques including the quadrat.

Environmental Awareness

9. I can evaluate the ecological importance of rubble walls in local habitats.
10. I can identify examples of positive and negative human impact on the environment.

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

KEY WORDS

habitat, fieldwork, living things, endangered, endemic, indigenous, alien species, adaptation

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data collection, interpretation, analysis, sampling techniques, quadrat

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rubble walls, conservation, pollution, human impact, environment

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garigue, valley, freshwater, marine, coastal, cultivated fields, woodland, sandy seashore, rocky seashore, nature reserves

Subject:
Science

Year:
7

LOF Subject Focus:
Chemical Science

Unit Code:
SCI LOF 7.4

Unit 7.4

UNDERSTANDING MATTER

Students explore the three main states of matter through experiments, real-life examples, and particle model simulations. By observing physical changes such as melting, freezing, evaporation and condensation – particularly using water as an example - they investigate how particle arrangement and movement explain the properties and behaviour of solids, liquids, and gases. Through practical activities, students also examine how materials expand or contract with temperature changes, deepening their understanding of state changes and the particle model.

UNIT OBJECTIVES

1. revisit the three states of matter and guide students to describe that matter is made up of tiny particles;
2. reinforce the properties of solids, liquids and gases;
3. revisit the changes of state of matter;
4. guide students to describe the arrangement and movement of particles in solids, liquids and gases;
5. discuss expansion and contraction in relation to everyday scenarios.

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs ‘revisit’ and ‘reinforce’ in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- This unit provides simple opportunities to reinforce the scientific method. While studying the theory of particles emphasise that:
    - hypotheses are predictions that must be tested;
    - investigations refine hypotheses.
    - evidence can evolve a hypothesis into a theory;
    - this approach highlights the evidence-based nature of science.
- Use the term ‘particles’ consistently rather than introducing the terms ‘atoms’ and ‘molecules’ to help students remain focused on the concept.
- Some students might have difficulty with interpreting negative temperature values.
- Clarify the differences between the meaning of the terms ‘boiling’ and ‘evaporation’, and between ‘water vapour’ and ‘steam’.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- × particles in solids don’t move at all;
- × gases have no mass;
- × the terms ‘melting’ and ‘dissolving’ (in Maltese ‘jdub’ and ‘jinħall’), refer to the same type of physical change;
- × particles get bigger on expansion and smaller on contraction.

RESOURCES

glassware, thermometers, Bunsen burners, tripods, wire gauze, heat-proof mats, ice, water, kettle, plastic syringe, particle model kits, ball and ring, bimetallic strip, bottle and balloon

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Properties of gases:	http://phet.colorado.edu/en/simulation/gas-properties
The particle model of matter:	https://www.bbc.co.uk/bitesize/subjects/znxtyrd
Particles and matter:	https://www.acs.org/middleschoolchemistry.html
Hypothesis versus theory:	https://www.diffen.com/difference/Hypothesis_vs_Theory
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Investigate states of matter
- Understand the particle model using rice and marbles
- Observing changes of state
- Thermal expansion: ball and ring and bimetallic strip
- Expansion of liquids and gases
- Melting wax demonstration

[Unit 7.4] UNDERSTANDING MATTER

LEARNING OUTCOMES

States of Matter

1. I can group objects as solids, liquids and gases and identify these three states of matter.
2. I can identify some properties of solids, liquids and gases.
3. I can link some properties of solids, liquids and gases to examples of their everyday use.

Water & Physical Changes

4. I can identify the different forms in which water can be found.
5. I can state the melting point and boiling point of pure water.
6. I can define and use the terms melting, freezing, evaporation, condensation and boiling.
7. I can interpret data on melting and boiling points to determine the state of a substance at a given temperature.
8. I can link heating and cooling with the change of state of matter, using simple examples.
9. I can describe and explain how materials expand when heated and contract when cooled.

The Particle Model

10. I can state that materials are made up of tiny particles.
11. I can draw and describe how particles are arranged in the three states of matter.
12. I can relate the kinetic theory of matter to the particle movement in solids, liquids and gases.
13. I can apply the particle model to explain the properties of solids, liquids and gases.
14. I can apply the particle model to describe what happens when there is a change of state.

KEY WORDS

matter, solid, liquid, gas, three states of matter, properties, room temperature, shape, volume, flow, compress, pressure, everyday use.

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ice, water, water vapour (steam), melting point, boiling point, melting, evaporation, condensation, freezing, boiling, heating, cooling, change in temperature, change of state, energy, reversible change, expansion, contraction, physical change.

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particles, kinetic theory of matter, particle model

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

Subject:
Science

Year:
7

LOF Subject Focus:
Chemical Science

Unit Code:
SCI LOF 7.5

Unit 7.5

ACIDS AND ALKALIS

In this unit, students investigate the properties of acids and alkalis through hands-on experiments. They will use common chemicals and indicators to test pH, identify reactions, and explore real-world applications of neutralisation. They learn to recognise hazard symbols, work safely with corrosive substances, and use the pH scale and indicators like litmus and universal indicator to classify solutions. By observing reactions such as acid-metal and neutralisation, students link chemical behaviour to everyday uses and safety considerations.

UNIT OBJECTIVES

1. reinforce hazard symbols and laboratory safety procedures in the context of handling acids and alkalis;
2. familiarise students with common acids, alkalis and neutral solutions, their properties and their safe use;
3. engage students to use indicators and the pH scale to distinguish between strong and weak acids and alkalis, and neutral solutions;
4. engage students to conduct metal-acid reactions and test for hydrogen as the gas produced;
5. engage students to investigate neutralisation.

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs ‘revisit’ and ‘reinforce’ in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- Ensure the necessary safety precautions are used when handling acidic and alkaline solutions. Use small quantities of dilute solutions and wear protective equipment. In addition, apply standard laboratory safety rules. Inspect laboratory first aid and eye wash stations before the start of the unit.
- Concentrated acids and alkalis should only be handled by the teacher and used in a fume cupboard. Lab technicians must provide Material Safety Data Sheets (MSDS) for each commercial chemical and make them readily available in case of emergency. Laboratory technicians must be familiar with emergency procedures in case of acid or alkali spillage.
- Adding water to an acid or an alkali will change the pH to go towards pH 7. So, acids become less acidic while alkalis become less alkaline. However, note that only upon diluting the solution by 10 times the volume, the pH will change by 1 unit.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- × assuming that all acids are dangerous;
- × assuming that all alkalis are not dangerous;
- × confusing concentration with strength (e.g., thinking all acids of low pH are highly dangerous regardless of dilution);
- × neutralisation always results in a neutral pH (not realising it depends on proportions).

RESOURCES

common laboratory glassware, pipettes, stirring rods, tongs, pH scale chart, lab coats and safety goggles, magnesium ribbon, zinc, dilute hydrochloric, sulfuric, nitric, citric and ethanoic acid, dilute sodium hydroxide solution, dilute ammonia, distilled water, wooden splints, limewater, litmus paper, universal indicator, beetroot or red cabbage, common household acids and alkalis, diluted lime scale remover, antacid e.g. milk of magnesia, liquid soap.

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Acids, alkalis and the pH scale:	https://www.bbc.co.uk/bitesize/articles/zcnhxbk https://www.youtube.com/watch?v=SWcDFE_Nm4w https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale_en.html https://phet.colorado.edu/en/simulation/acid-base-solutions
Neutralisation:	https://www.youtube.com/watch?v=LFQdD0e3L9I https://www.youtube.com/watch?v=gOB-q3xwhrE https://www.youtube.com/watch?v=lAh4ihSS_1E
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Make natural indicators (e.g. red cabbage)
- Test substances with litmus paper
- React magnesium or zinc with acids
- Produce and test hydrogen gas
- Measure pH using universal indicator
- Explore neutralisation reactions (e.g. filter paper circles, indicator rainbow)

[Unit 7.5] ACIDS AND ALKALIS

LEARNING OUTCOMES

Chemical Safety

1. I can recognise common hazard symbols and follow basic safety procedures when handling chemicals.
2. I can relate the degree of corrosiveness of some acids and alkalis with the level of hazard and work safely with dilute acids and alkalis.

Examples & Properties

3. I can name some common acids and alkalis found around us and in the lab.
4. I can describe some properties of acids including the presence of hydrogen particles, being corrosive, having a sour taste, and reacting with certain metals.
5. I can describe some properties of alkalis including their corrosiveness and having a soapy texture.

Indicators & the pH Scale

6. I can identify indicators as chemicals that change colour in acidic and alkaline solutions.
7. I can conduct a test with litmus and interpret the results, to detect acidic, alkaline and neutral solutions.
8. I can illustrate the pH scale as a measure of the acidity or alkalinity of a solution.
9. I can conduct a test with universal indicator to find the pH of acids, alkalis and neutral solutions.
10. I can identify some common laboratory and household chemicals as strong or weak acids or alkalis, based on their pH.

Reactions with Acids & Alkalis

10. I can relate the rate of a chemical reaction to the strength of the acid or alkali involved.
11. I can identify hydrogen gas as the product of a reaction between an acid and certain metals.
12. I can conduct the test for hydrogen and identify it by the ‘pop’ sound it makes when it burns.

KEY WORDS

hazard symbols, safety precautions, corrosive, irritant, dilute and concentrated (solution)

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acid, alkali, neutral, hydrochloric acid, sulfuric acid, ethanoic acid (acetic), citric acid, lemon juice, citrus fruit, vinegar, sodium hydroxide, ammonia solution, ammonium hydroxide, sodium hydrogen carbonate, baking soda, bleach, toothpaste, soap

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litmus, indicator, universal indicator, pH paper, pH scale, pH meter, strong and weak (pH)

---

rate of chemical reaction, metal, hydrogen, chemical reaction, burns with a pop, lit splint

---

neutralisation

Neutralisation

13. I can identify the reaction between an acid and an alkali as a neutralisation reaction.
14. I can give examples of neutralisation reactions in everyday life.
15. I can use an indicator to follow the progress of a neutralisation reaction between an acid and alkali.

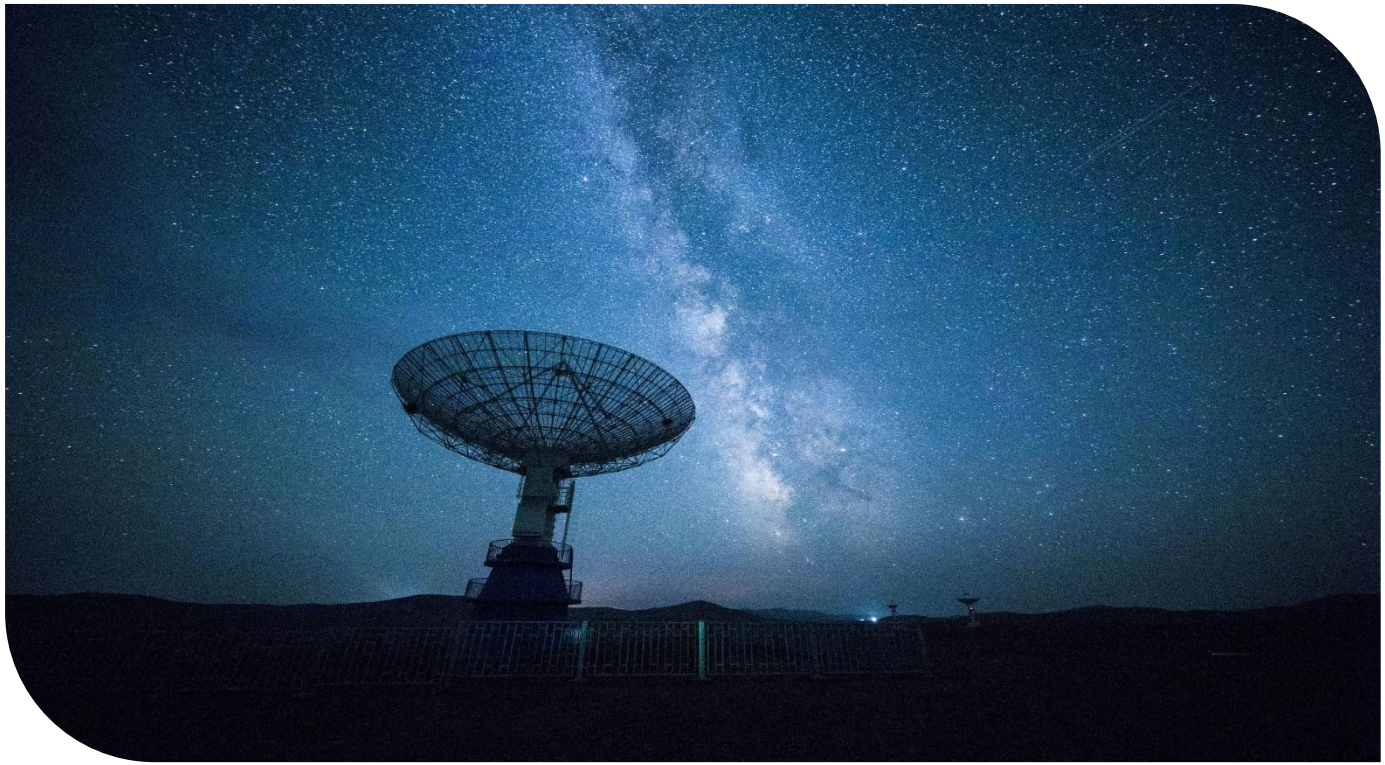
Note: Other LO's related to broad skills and competencies in science can be found on page 5.

Subject:
Science

Year:
7

LOF Subject Focus:
Earth and Space

Unit Code:
SCI LOF 7.6



Unit 7.6

EARTH AND SPACE

In this unit the movement of the Earth, Moon, and planets within our solar system will be explored. Students will learn how these motions create day and night, seasons, and eclipses. They will also understand gravity and its effects on mass and weight. Students will be led to discover the significance of space exploration in everyday life. Students will develop a deeper understanding of our place in the universe and the scientific principles that explain it.

UNIT OBJECTIVES

1. revisit the movement of the Earth around the Sun and relate this to day/night and the year;
2. revisit how the seasons and daytime length are related to the Earth's tilt, rotation on its own axis and orbit around the Sun;
3. revisit the orbiting of the Moon around the Earth and the moon phases;
4. describe and model the solar and lunar eclipses;
5. present the Sun's role as a star and a light source, central to the solar system;
6. name and classify the planets of the solar system;
7. expose students to the concept of speed of light and distances in space;
8. revisit the concept of gravity and guide students to recognise how the gravitational pull keeps objects in orbit.
9. revisit the difference between mass and weight.
10. engage students to delve into space exploration and describe some of its benefits.

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs 'revisit' and 'reinforce' in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- This unit offers an excellent opportunity to include a visit to the Planetarium at Esplora.
- Students may struggle with describing the phases of the Moon.
- Pluto is no longer classified as a planet. When using dated resources, be aware that Pluto may still be considered as a planet. This can also be a potential opportunity to discuss how scientific understanding evolves.
- Be aware that students tend to confuse rotation (spinning on axis) with revolution (orbiting the Sun);
- Some online sources and occasionally textbooks of other subjects may confuse mass and weight and refer to weight in terms of kg.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- ✗ seasons are caused by Earth moving closer or farther from the Sun;
- ✗ the terms 'weight' and 'mass' mean the same thing;
- ✗ weight is measured in kg;
- ✗ there is no gravity on the moon and the planets;
- ✗ believe that space exploration has little impact on everyday life.

RESOURCES

rotating model of the Sun, Earth and moon system, source of light, 2 balls of different sizes, polystyrene ball and a stick, darkened room, beachball, tennis ball, mass balance, bathroom scales, power supply, light bulb, simulation software, photographs/videos, globe, moon phases calendar, basic telescope.

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Esplora Interactive Science Centre:	http://esplora.org.mt/
Planetariums:	http://www.stellarium.org/ https://stellarium-web.org/
European Space Agency:	https://www.esa.int/kids/en/home https://www.youtube.com/@EuropeanSpaceAgency https://www.youtube.com/@esaeducation
Mass & weight explained:	http://www.design-simulation.com/ip/curriculum/misccontent/demoinstructions/weightmassandgravity.php https://www.youtube.com/watch?v=rFdbY_V7vIo
NASA:	http://www.nasa.gov/ https://www.nasa.gov/space-technology-mission-directorate/technology-transfer-spinoffs/
Spotting the International Space Station from Malta:	https://spotthestation.nasa.gov/sightings/view.cfm?country=Malta&region=None&city=Valletta
Life on other planets:	https://www.bbc.com/news/articles/c39jj9vkr34o
The Sun:	https://science.nasa.gov/sun/ http://www.youtube.com/watch?v=TOErr4xntHE
Newton' story:	http://www.youtube.com/watch?v=jwPc0kK9VHU&feature=related
Space research and exploration:	https://www.youtube.com/watch?v=1mcYIzg1GT8 https://science.nasa.gov/solar-system/
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Measure mass and weight
- Observe and record Moon phases
- Visit to the planetarium (Esplora)

[Unit 7.6] EARTH AND SPACE

LEARNING OUTCOMES

Earth's Movement & Time

1. I can recall that the Earth takes 24 hours to spin once (one day) and 365 days to go around the Sun (one year).
2. I can describe the Earth's orbit around the Sun.
3. I can explain how the spinning of the Earth on its axis causes day and night.
4. I can identify the four seasons and explain how they are linked to the tilt of the Earth's axis and its orbit around the Sun.
5. I can describe the summer solstice as the longest day of the year and the winter solstice as the shortest, and how this varies in the Northern and Southern hemisphere.

The Moon

6. I can state that the moon is the natural satellite of the earth.
7. I can describe the phases of the Moon over its 28-day orbit around the Earth.
8. I can explain why from Earth we always see the same side of the Moon.
9. I can describe what happens during a solar and a lunar eclipse.

Solar System & Beyond

10. I can distinguish between luminous and non-luminous objects in space.
11. I can describe the Solar System as the Sun (star) and the planets orbiting it.
12. I can name the rocky and gaseous planets of the Solar system in their correct order and describe some features of each.
13. I can describe how our Solar System is part of the Milky Way galaxy, which, along with other galaxies, makes up the Universe.
14. I can define a light year as the distance travelled by light in one year and use it to appreciate distances in space.

KEY WORDS

year, day, axis, spinning, Earth, Sun, orbit, seasons, tilt of Earth, summer solstice, winter solstice, leap year, Northern Hemisphere, Southern Hemisphere, direct sunlight

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Moon, phases of the Moon, full Moon, new Moon, half-moon, natural satellite, solar eclipse, lunar eclipse

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Solar System, planet, rocky planets, gaseous planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, asteroids, asteroid belt, galaxy, Milky Way, universe, light year, telescope, stars

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gravity, gravitational pull, mass, weight, weightlessness, balance, Newton meter, kilogram (kg), Newton (N), atmosphere, path, rotation, day, night

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space shuttle, astronaut, rocket, artificial satellite, International Space Station (ISS), GPS

Gravity, Mass & Weight

15. I can describe weight as the downward force caused by gravity.
16. I can identify gravitational pull as the force that keeps things in orbit.
17. I can describe the relationship between the gravitational pull and the distance between objects.
18. I can describe the relationship between the gravitational pull and the mass of an object.
19. I can measure mass and weight using appropriate measuring instruments and units.
20. I can explain the difference between mass and weight of an object and describe the relationship between them.

Space Exploration

21. I can evaluate the significance of key events in space exploration.
22. I can research and explain some benefits of space exploration including the use of GPS, weather forecasting and communication.

light, shadows, luminous and non-luminous objects, reflection.

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

Subject:
Science

Year:
7

LOF Subject Focus:
Cells and Body Systems

Unit Code:
SCI LOF 7.7

Unit 7.7

CELLS AND REPRODUCTION

Students will explore the building blocks of life by using magnifying tools, including the microscope, to observe and understand plant and animal cells, their structures, and functions. They will learn about reproduction in flowering plants as well as human reproduction. Students will also gain insight into the human body's organisation. Through this unit, students will develop a clearer picture of how living things grow, develop, and reproduce.

UNIT OBJECTIVES

1. teach students to use a light microscope effectively, including basic magnification calculations;
2. explain the concept of cells as the basic unit of life, and identify examples of plant and animal cells under a light microscope;
3. guide students in identifying, drawing and labelling plant and animal cells and describe the functions of key organelles;
4. explore a variety of specialised cells;
5. introduce the major human organs and respective systems;
6. guide students to identify the main plant organs and their functions;
7. guide students to describe the structure of a typical flower and understand plant reproduction;
8. guide students to identify specialised human reproductive cells and describe the structure and function of the human reproductive organs;
9. guide students to identify and understand body changes during puberty and adolescence;
10. help students to understand in simple terms human development between fertilisation and birth.

POINTS TO NOTE

- Refer to the introductory notes about the 5E approach to science teaching and learning.
- The action verbs ‘revisit’ and ‘reinforce’ in some objectives suggest that students have previously encountered this subject matter through the Primary Science Curriculum. These objectives offer an opportunity to consolidate their understanding or explore the content further.
- Some students may struggle to understand the microscopic scale of cells. The exercise of viewing familiar objects (such as a plastic ruler) under the microscope might help students to develop a sense of scale.
- Approach the topic of human reproduction with appropriate sensitivity, coordinating with the school’s Guidance and PSCD departments to align with any sex education policies. Create a safe, respectful space for open and appropriate discussion. While the syllabus focuses on the biological aspects, integrating values and mutual respect is essential and inseparable from the scientific content.

COMMON MISCONCEPTIONS

Be aware that students may hold the following common misconceptions:

- × living things contain cells rather than being made of cells;
- × confuse cells with atoms/particles;
- × menstruation and the menstrual cycle are the same thing;
- × the first day of the menstrual cycle is the first day of the month.

RESOURCES

light microscope, magnifying glasses, prepared slides, blank slides, cover slips, various visuals (posters, diagrams, models and videos)

USEFUL DIGITAL RESOURCES

This list of digital resources was deemed valid at the time of this document's original publication. Educators are encouraged to review and evaluate the relevance and suitability of these resources before use.

Biology:	https://www.ducksters.com/science/biology/
Cells:	https://kids.britannica.com/kids/article/cell/352933
Microscope:	https://www.youtube.com/watch?v=ghdWc94ZIYU https://www.bbc.co.uk/bitesize/guides/zg9mk2p/revision/5 https://www.bbc.co.uk/bitesize/guides/zg9mk2p/revision/6 https://www.bbc.co.uk/bitesize/topics/znyycdm/articles/zbm48mn#zm33f82
Body organs:	http://urbanext.illinois.edu/gpe/ https://www.bbc.co.uk/bitesize/articles/zrp3ydm#z2sfp4j
Male & female reproductive systems:	https://www.bbc.co.uk/bitesize/articles/zwb6xbk#zm33f82
Foetal development:	www.justthefacts.org
The Flower life cycle:	http://www.crickweb.co.uk/ks2science.html https://www.bbc.co.uk/bitesize/topics/zxfrwmn/articles/zfn6t39
Resources to support inclusion:	https://www.ucl.ac.uk/teaching-learning/publications/2019/aug/inclusive-teaching http://www.communication4all.co.uk/

SUGGESTED PRACTICAL ACTIVITIES

- Observe cells under the microscope
- Prepare microscope slides
- Dissect a flower

[Unit 7.7] CELLS AND REPRODUCTION

LEARNING OUTCOMES

Microscopy

1. I can use magnifying glasses to observe small things.
2. I can name the basic parts of a light microscope and explain their functions.
3. I can use the microscope to observe even smaller things such as cells.
4. I can carry out simple magnification calculations.

Cells

5. I can describe cells are the basic building blocks of life.
6. I can identify a typical plant and animal cell as seen under the light microscope.
7. I can draw and label diagrams of typical plant and animal cells as seen under the light microscope.
8. I can state the function of the nucleus, cytoplasm, cell membrane, cell wall, vacuole and chloroplast.
9. I can identify examples and state the function of specialised plant and animal cells.

Plant Structure & Reproduction

10. I can state the functions of roots, stems, leaves and flowers as the main plant organs.
11. I can identify the main parts of a typical flower.
12. I can briefly describe the process of plant reproduction and the importance of pollination.
13. I can describe fertilisation as the fusion of the male and female reproductive cells.

KEY WORDS

magnifying glass, microscopic, light microscope, slide, eyepiece lens, objective lens, stage, magnification

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cell, plant cell, animal cell, nucleus, cytoplasm, cell membrane, cell wall, vacuole, chloroplast, specialised cells, nerve cell, blood cells, root hair

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tissue, organ, system, organism

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plant organs, roots, stem, leaves, flower, fruit, sepal, petal, stamen, anther, filament, pistil/carpel, ovary, stigma, pollen, ovule, pollination, germination

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main body organs, brain, nervous system, stomach, intestines, digestive system, heart, circulatory system, lungs, respiratory system

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Human Body & Reproductive Structure

14. I can describe the organisation of multicellular living things using the terms cells, tissues, organs, systems and organism.
15. I can name major human organs and body systems including the brain/nervous system, the stomach and intestines/digestive system, the heart/circulatory system and the lungs/respiratory system.
16. I can identify the sperm and the egg as the male and female human reproductive cells.
17. I can label the parts of the male and female reproductive systems.

Fertilisation, Pregnancy & Sexual Maturity

18. I can describe what happens during the menstrual cycle.
19. I can explain that puberty and adolescence are periods of rapid growth and sexual maturity.
20. I can list some changes that occur during puberty in boys, girls or both.
21. I can describe the sperm and the egg as the male and female reproductive cells in humans.
22. I can outline how a fertilised egg becomes an embryo, develops into a foetus, and grows into a baby during forty weeks of pregnancy.
23. I can label a diagram of a foetus inside the uterus, identifying the placenta, umbilical cord, sac, foetus and uterus.
24. I can explain in simple terms the function of the placenta, umbilical cord and the sac.
25. I can describe in simple terms what happens during a typical pregnancy and birth.
26. I can identify habits that may harm a developing baby inside the uterus.

reproductive system, sperm, egg, reproductive cell, reproductive organs, sperm tube, testes, penis, egg tube, ovary, uterus, cervix, vagina, fertilisation, intercourse, semen

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puberty, adolescence, sexual maturity, menstrual cycle, period, ovulation, hormones

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conception, embryo, foetus, placenta, umbilical cord, sac, pregnancy, baby, sexual reproduction

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smoking, alcohol, drugs, bad nutrition, lack of sleep

Note: Other LO's related to broad skills and competencies in science can be found on page 5.

SCIENCE

YEAR 7 Core Curriculum Programme (CCP)

LEARNING AND ASSESSMENT PROGRAMME

GOVERNMENT OF MALTA
MINISTRY FOR EDUCATION, SPORT, YOUTH, RESEARCH AND INNOVATION
DIRECTORATE FOR STEM AND VET PROGRAMMES

Year 7

Unit Code: SCI CCP LOF 7.1

Unit 7.1 Doing Science

This unit illustrates the application of science and technology in everyday life. It introduces students to basic laboratory equipment, safety procedures, and hazard symbols. Learners become familiar with emergency contact number and understand the principles of fair testing in experiments. The unit also covers the parts of a Bunsen burner and explains fire safety using the fire triangle.

LEARNING OUTCOMES

Science Around Us

1. I can give simple examples of how science and technology are used in everyday life.
2. I can give simple examples of how science helps us to stay healthy, safe, or comfortable.

Safe and Fair Experiments

3. I can identify and use simple equipment and measuring instruments.
4. I can follow basic safety rules in the science lab and recognise hazard symbols.
5. I can identify 112 as the emergency telephone number.
6. I can follow instructions and use apparatus to perform a simple experiment
7. I can understand the importance of a fair test and apply it to experiments.

Using Fire Safely

8. I can label and identify the main parts of the Bunsen Burner.
9. I can use the Bunsen burner safely in experiments
10. I can use the fire triangle to describe how to start or stop a fire.

KEY WORDS

science, technology, everyday life, appliance, electricity, medicine, equipment, measure, thermometer, beaker, measuring cylinder, ruler, stopwatch, balance

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safety rules, lab coat, goggles, gloves, hazard, hazard symbol, warning sign, emergency, 112, fair test, variable, control, repeat, reliable, prediction

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Bunsen burner, base, barrel, air hole, collar, gas inlet, safety flame, heating flame, fire triangle, heat, fuel, oxygen, fire safety, extinguish

*Where appropriate, educators may also supplement instruction with additional learning outcomes from '**Unit 7.1 Doing Science**' in the mainstream syllabus.*

Year 7

Unit Code: SCI CCP LOF 7.2

Unit 7.2 Exploring Nature

This unit introduces students to the characteristics of living things and how to classify them. It explores the differences between vertebrates and invertebrates, plant parts and their functions, and how living things are suited to their habitats. Students learn about food chains, feeding relationships, and the impact of human activity, supported by hands-on exploration through fieldwork activities.

LEARNING OUTCOMES

Grouping Living Things

1. I can use the seven vital functions to identify living and non-living things.
2. I can sort living things according to their characteristics.
3. I can differentiate between vertebrates and invertebrates and give some examples of each.
4. I can identify and describe the five vertebrate groups.

Habitats and Adaptations

5. I can link some characteristics of plants and animals to their habitats.
6. I can name parts of a plant, including the stem, leaves and roots.
7. I can match the stem, leaves and roots to their basic functions.

Ecology

8. I can identify different feeding relationships such as herbivores, carnivores and omnivores.
9. I can interpret food chains.
10. I can give examples of how human behaviour can help or harm the environment.
11. I can explore and observe a habitat and some living organisms through a Fieldwork activity.

KEY WORDS

living, non-living, seven life processes, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, classify, characteristics, vertebrate, invertebrate, fish, amphibian, reptile, bird, mammal, insect, spider, worm

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habitat, environment, shelter, survival, adaptation, roots, stem, leaf, function, support, photosynthesis, anchorage, absorption, water, sunlight, nutrients, air, soil

---

herbivore, carnivore, omnivore, predator, prey, food chain, energy, consumer, producer, environment, pollution, litter, protect, recycle, care, harm, fieldwork, observe, explore

*Where appropriate, educators may also supplement instruction with additional learning outcomes from '**Unit 7.2 Our Natural Environment**' and **'Unit 7.3 Investigating Local Habitats**' in the mainstream syllabus.*

Year 7

Unit Code: SCI CCP LOF 7.3

Unit 7.3 Chemical Matters

This unit covers the properties of solids, liquids, and gases, changes of state, and their everyday applications. It also addresses the safe handling of chemicals, the use of indicators to test acids, alkalis, and neutral substances, and the process of neutralisation. Students will also learn how to test for hydrogen gas produced in reactions between acids and certain metals.

LEARNING OUTCOMES

States of Matter

1. I can group things as solids, liquids, or gases and give examples of each.
2. I can identify some properties of solids, liquids and gases.
3. I can link some properties of solids, liquids and gases to examples of their everyday use.
4. I can show that water can be found in different forms.
5. I can identify changes of state like melting, freezing, evaporation, boiling and condensation.

Acids, Alkalis and Indicators

6. I can handle chemicals safely.
7. I can name some common acids and alkalis we use at home or in the lab.
8. I can identify some properties of acids and alkalis.
9. I can use litmus or universal indicator to identify acids, alkalis or neutral solutions.

Chemical Changes

10. I can recall an everyday example of a neutralisation reaction.
11. I can use an indicator to follow the reaction between an acid and an alkali.
12. I can use the chemical test to identify hydrogen as the gas produced between the reaction of some acids with some metals.

KEY WORDS

solid, liquid, gas, state, particle, property, shape, volume, water, ice, steam, melting, freezing, evaporation, condensation, temperature, heat, change of state.

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chemical, acid, alkali, neutral, vinegar, lemon juice, soap, bicarbonate, hydrochloric acid, sodium hydroxide, lab, litmus, universal indicator, red, blue, green, pH, pH scale, safety, gloves, goggles

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neutralisation, reaction, mix, indicator, colour change, hydrogen, gas, fizz, pop test, metal, acid, test tube, chemical change, observe, evidence

*Where appropriate, educators may also supplement instruction with additional learning outcomes from '**Unit 7.4 Understanding Matter**' and '**Unit 7.5 Acids and Alkalis**' in the mainstream syllabus.*

Unit 7.4 Earth and Space

This unit introduces students to key ideas about Earth and space. Learners explore how the Earth's movements cause day, night, and the seasons, and how the Moon changes appearance as it orbits Earth. They learn about the Sun, planets, stars, and gravity, and begin to understand the importance of space exploration in our daily lives.

LEARNING OUTCOMES

Earth, the Sun, and the Moon

1. I can say that the Sun is a star and gives us natural light.
2. I can describe the orbit of the Earth around the Sun.
3. I can describe day and night in terms of the spinning of the Earth on its axis.
4. I can recall that the Earth takes 24 hours to spin once (one day) and 365 days to go around the Sun (one year).
5. I can say that the Moon orbits the Earth and that we see it in different phases.
6. I can recall that the four seasons occur due to the tilt of the Earth.

Solar System and Beyond

7. I can describe the Solar System as made up of the Sun and the planets orbiting it.
8. I can name the planets of the Solar System.
9. I can identify stars as distant light sources.
10. I can say that gravity is the force that keeps things in orbit.

Space Exploration

11. I can appreciate how space exploration can be useful in everyday life.

KEY WORDS

sun, star, light, Earth, orbit, axis, spin, rotation, day, night, year, 24 hours, 365 days, Moon, phases, full moon, tilt, seasons, summer, winter, spring, autumn

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solar system, planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune

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gravity, force, weightlessness, satellite, astronaut, rocket, space station, GPS, weather, communication, telescope, exploration

*Where appropriate, educators may also supplement instruction with additional learning outcomes from '**Unit 7.6 Earth and Space**' in the mainstream syllabus.*

Year 7

Unit Code: SCI CCP LOF 7.5

Unit 7.5 Cells and Reproduction

This unit introduces students to cells as the basic building blocks of life. Learners explore plant and animal cells using microscopes, identify major body organs, and appreciate how living things grow and reproduce. The unit delves into plant and human reproduction, and covers changes during puberty, fertilisation, pregnancy. It also highlights the importance of a healthy lifestyle during pregnancy.

LEARNING OUTCOMES

Observing Cells

1. I can use a magnifying glass and a light microscope to look at small things.
2. I can say that all living things are made of cells.
3. I can identify a typical animal and plant cell as seen under the light microscope.

Organs and Reproduction

4. I can describe the role of the flower in plant reproduction.
5. I can name some human organs.
6. I can identify the correct position of the main organs on the human torso.
7. I can identify the male and female reproductive organs and label some parts.

Growth and Development

8. I can identify some body changes taking place in boys and girls during puberty.
9. I can identify the male and female sex cells.
10. I can describe that fertilisation is the fusion of the male and female sex cells.
11. I can describe that the fertilised egg grows into a baby during nine months of pregnancy and at the end of which the baby is born.
12. I can name examples of good and bad practices during pregnancy.

KEY WORDS

magnifying glass, light microscope, cells, animal cell, plant cell

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flower, reproduction, pollen, ovary, petal, organs, brain, heart, lungs, stomach, intestines, torso, male reproductive system, female reproductive system, penis, vagina, testicles, ovaries

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puberty, body changes, menstrual cycle, period, sperm, egg, fertilisation, embryo, foetus, uterus, pregnancy, birth, healthy habits

*Where appropriate, educators may also supplement instruction with additional learning outcomes from '**Unit 7.7 Cells and Reproduction**' in the mainstream syllabus.*