



Learning Outcomes Framework

Year 7 - Form 1

includes Core Curriculum Programme

SCIENCE - level 7 – Learning & Assessment Programme



Directorate for Quality and Standards in Education
Department of Curriculum Management

The LOF will allow for flexibility in teaching and learning programmes in order to address specific needs and to build up strengths within the context of the learning communities in different colleges and schools. This concept of flexibility is promoted throughout the entire framework. While acknowledging that out-of-school factors such as poverty and social exclusion affect learner achievement, the LOF seeks to improve learners' learning experience by encouraging creativity, critical literacy, entrepreneurship and innovation at all levels. This will allow learners to reach their potential by connecting what they have learnt to their individual contexts. Consequently, this will help learners develop a positive attitude towards learning and a greater appreciation of its usefulness.

The Learning and Assessment Programme (LAP) for Science comprises:

- **The Learning Outcomes Framework (LOF)** – this encompasses a set of subject learning outcomes (SLOs) that set out what a learner is expected to know, understand or be able to do as a result of a process of learning. The LOF will allow for flexibility in teaching and learning programmes in order to address specific needs and to build upon strengths within the context of the learning communities in different colleges and schools. These learning outcomes are designed to be used in a range of delivery contexts and taught using different methods. They state the end result rather than describe the learning process of the learning activities.
- **Notes on Pedagogy and Assessment** – the learning outcomes are written in a way that informs pedagogy and, in conjunction with the assessment strategies related to each outcome, set a clear assessment expectation. This document sets down good practice of teaching and assessment guidelines which educators may wish to take on board and adapt to meet the needs of their learners.

SCIENCE - level 7

	LOF SUBJECT FOCUS	UNIT TITLE	Year 7 <i>Form 1</i>	Year 8 <i>Form 2</i>
1	WHAT DO SCIENTISTS DO?	Scientists at work Forensic Science	✓	✓
2	CELLS AND BODY SYSTEMS	Cells and Reproduction Healthy Living	✓	✓
3	SENSES	Light and Sound		✓
4	ENERGY	What is energy? Electricity	✓ ✓	
5	LIFE ON EARTH	Living things and the environment Climate Change Fieldwork	✓	✓ ✓
6	CHEMICAL SCIENCE	Understanding matter Elements, Compounds and mixtures Separating mixtures Acids and Alkalis	✓ ✓	✓ ✓
7	EARTH AND SPACE	Earth and space		✓

YEAR 7 – FORM 1

CODE	Page	UNIT TITLE	LOF SUBJECT FOCUS
SCI LOF 7.1*	7	Scientists at Work	What do scientists do?
SCI LOF 7.2	10	Living things and the environment	Life on Earth
SCI LOF 7.3	14	Understanding matter	Chemical Science
SCI LOF 7.4	17	What is energy?	Energy
SCI LOF 7.5	19	Electricity	Energy
SCI LOF 7.6	21	Acids and Alkalis	Chemical Science
SCI LOF 7.7	24	Cells and Reproduction	Cells and Body Systems

* SCI LOF 7.1 ...Science LOFs – Year 7 (form 1); 1st unit

CROSS CURRICULAR THEMES

The National Curriculum Framework for All (2012) established the Cross Curricular Themes for the Junior and Secondary School cycles of education to be Literacy; Digital Literacy; Learning to Learn and Co-operative Learning; Education for Sustainable Development; Education for Entrepreneurship, Creativity and Innovation and Education for Diversity.

The Science programme promotes an inquiry based and student centred methodology, based on the 5E model in which students engage, explore, explain, elaborate and evaluate. Experiments should be part and parcel of the scientific process. **ENGAGE** students' interest and curiosity. Students observe, **EXPLORE**, predict, plan and conduct investigations, collect and interpret data and give **EXPLANATIONS**. Students are then challenged to **ELABORATE** on their understanding by linking known with new and by applying concepts and skills in new contexts. Students are encouraged to **EVALUATE** their understandings and competences. Assess the areas of strengths/weaknesses exposed by the student performance in the activity. Be aware of health and safety issues when carrying out experiments.

LEARNING OUTCOMES RELATED TO SKILLS AND COMPETENCIES

The following learning outcomes may not be linked to any particular topic but may be reached throughout other subject focus. They are more about skills and competencies rather than subject content and thus students are expected to show progressive improvement in such skills.

1. I can ask simple scientific questions which I can investigate in practice.
2. Collaboratively and individually I can investigate a scientific problem from a provided resource.
3. I can use scientific knowledge to predict the result of an experiment and give a possible explanation.
4. I can identify the variables in a given investigation and carry it out with teacher guidance.
5. I can identify / plan a fair test / investigation.
6. I can assess basic health and safety issues.
7. I can complete a table of results and use it to present my observations.
8. I can explain results from pie charts and bar graphs.

9. I can fill in / write/ complete a simple scientific report of my experiment.
10. I can describe relationships between two properties measured in an investigation.
11. I can discuss and carry out an experiment with my group.
12. I can link different branches of science to different STEM related careers.
13. I can use some common science apparatus and handle this apparatus safely.
14. I can choose the equipment I need for an experiment.
15. I can use appropriate measuring instruments to make accurate measurements of volume, time, length, mass and temperature and express the reading using appropriate units.
16. I can use digital technology to take measurements.
17. I can follow teacher's instructions and put apparatus back in place after finishing an experiment / a practical task in the laboratory.

Subject: **SCIENCE**
LOF Subject Focus: **WHAT DO SCIENTISTS DO?**
Unit code and title: **SCI LOF 7.1 SCIENTISTS AT WORK**

Year 7 /Form 1

OBJECTIVES Teacher will:

1. introduce the relevance of science in everyday life.
2. introduce the students to simple apparatus (glassware) and thus be able to use this apparatus in simple experiments.
3. introduce the students to measuring instruments and thus be able to use them correctly.
4. guide students to perform simple experimental tasks.
5. guide the students to identify safety issues in the laboratory.
6. teach students to light and use a Bunsen Burner safely.
7. engage students to explore combustion and use the fire triangle to describe fire.
8. guide students to use the fire triangle to describe a safe way of putting out a fire

Key words

scientist, glassware, measurement, instruments, apparatus, test tube, test tube rack, beaker, flask, funnel, measuring cylinder, microscope, Bunsen burner, heat-proof mat, thermometer, stand, spatula, balance and stopwatch, safety rules, Bunsen burner, yellow flame, blue flame, safety flame, heat-proof mat, poisonous (toxic), irritant, flammable, corrosive, fire triangle, fuel, oxygen, heat, fire extinguisher, fire blanket, variable, fair testing, boiling tube, explosive, harmful to the environment

Points to note

This curriculum promotes an inquiry based and student centred methodology, based on the 5E model in which students engage, explore, explain, elaborate and evaluate. Experiments should be part and parcel of the scientific process. Be aware of health and safety issues when carrying out experiments.

Learning outcomes related to skills and competences are found in pages 5 & 6. Guide students to make progressive improvement from one practical to next and may guide students to pay particular attention to one skill or another.

Resources

test-tubes, test-tube rack, holder, beakers, flask, pipette, chemical bottle, spatula, stirrer, evaporating dish, funnel, metre ruler, stopwatch, measuring cylinder, digital balance, thermometer, Bunsen burner, tripod, wire gauze, Bunsen burner, tripod, wire gauze, fire extinguisher, fire blanket, candle or wooden splint, chemical bottles showing different hazard labels, magnesium

Importance of science & technology

<http://answers.yahoo.com/question/index?qid=20080613195630AAP4E2E>

Science is fun

<http://writeoutloud.edublogs.org/2010/04/24/learning-is-fun-two-interactive-science-games/>

Famous scientists and Science in Malta

<http://www.zephyrus.co.uk/famousscientist.html>

Women scientists

<http://womenshistory.about.com/od/airspacesciencemath/tp/Famous-Women-Scientists.htm>

Scientists and latest inventions

<http://www.infoniac.com/famous-scientists-and-their-inventions.html>

Fire safety

<http://www.firefacts.org/>

Safety in the lab

<http://www.baruch.cuny.edu/tutorials/weissman/chemlab/>

Resources to support inclusion

<http://www.communication4all.co.uk/>

LEARNING OUTCOMES

SCI LOF 7.1 - Unit: SCIENTISTS AT WORK - Focus: WHAT DO SCIENTISTS DO?

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can give examples of the relevance of science and technology in everyday life.
2. I can recall and follow important laboratory safety rules.
3. I can name some scientists, including contemporary and local ones, and describe their work.
4. I can use apparatus to perform simple experimental tasks as instructed.
5. I can label and identify the main parts of the Bunsen burner.
6. I can light and use a Bunsen burner safely.
7. I can identify hazard symbols on chemicals and suggest safety procedures.
8. I can identify the three components needed to start a fire by using a fire triangle.
9. I can use the fire triangle to identify ways of putting out a fire.

Subject: **SCIENCE**
LOF Subject Focus: **LIFE ON EARTH**
Unit code and title: **SCI LOF 7.2 LIVING THINGS AND THE ENVIRONMENT**

Year 7 /Form 1

OBJECTIVES Teacher will:

1. guide students to understand the significance of fossils and be aware of the theory of evolution.
2. explain that the seven vital functions distinguish living and non-living things.
3. show that living things are grouped into plants, animals, fungi and small microbes.
4. teach students to sort animals into vertebrates and invertebrates.
5. teach students to sort vertebrates into fish, amphibians, reptiles, birds and mammals.
6. guide students to identify types of feeding relationships
7. guide students to interpret food webs.
8. engage students to explore plant and animal adaptations.
9. guide students to explore different types of habitats and living organisms through a fieldwork /site visit activity.

Key words

living things, non-living things, plants, animals, micro-organisms (microbes), fossils, vertebrate, invertebrate, extinct, adaptation, evolution, living characteristics, seven vital functions, skeleton, fish, reptiles, birds, amphibians, mammals, woodland, garigue, lakes, sea, forest, rainforest, sandy seashore, rocky seashore, cliffs, valley, endemic, endangered, hibernation, producer, consumer, food chain, food web, herbivore, carnivore, omnivore, photosynthesis.

Points to note

Refer to 5E approach to teaching and learning of science. Be aware of health and safety issues if students are to handle some animals or plants. Link this unit about living things with the unit about ecology through a fieldwork activity, a visit to a nature reserve, the Natural History Museum or to one of the Natura2000 sites. Note that some students may find it difficult to:

- recognise the presence of a skeleton in some animals such as snakes and mice.
- identify invertebrates, birds, fish, amphibians and reptiles as animals. For some, 'animals' is another word for 'mammals'!
- distinguish between breathing and respiration.
- relate microbes to beneficial aspects.

Note that the terms (cold and warm blooded) may be misleading for some.

Refer to 5E approach to teaching and learning of science.

Be aware of health and safety issues if students are to handle some animals or plants.

Resources

fossils; pictures showing Ghar Dalam, animals from Galapagos Islands, variety of animals, plants and other organisms; model (or chart) of the human skeleton and skeleton of other vertebrates.

Images of animals:

<http://www.sciencephoto.co.uk/> <http://animalphotos.info/a/>

Images of plants:

<http://www.digitalphoto.pl/en/plants/flowers/>

Charles Darwin and Theory of Evolution

<http://science.discovery.com/interactives/literacy/darwin/darwin.html>

<http://www.sciencekids.co.nz/sciencefacts/scientists/charlesdarwin.html>

Wonders of the World

<http://sevensnaturalwonders.org/about/declaration-committee>

Plant & Animal adaptations

<http://www.mbgnet.net/bioplants/adapt.html>

Adapting to climate change / Food chain

<http://www.livescience.com/3863-animals-plants-adapting-climate-change.html>

Resources to support inclusion

<http://www.communication4all.co.uk/>

Local environmental NGOs

<http://www.naturetrustmalta.org/>

<http://www.birdlifemalta.org/>

<http://www.bicref.org/>

<http://www.ramblersassociation.blogspot.com/>

<http://www.foemalta.org/home/>

<http://new.faa.org.mt/>

International environmental groups

<https://www.worldwildlife.org/>

<https://www.rspb.org.uk/>

LEARNING OUTCOMES

SCI LOF 7.2 - Unit: LIVING THINGS AND THE ENVIRONMENT – Focus: LIFE ON EARTH

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can describe that living things change over time and that this change is an ongoing process.
2. I can explain the significance of fossils and be express the significance of the theory of evolution.
3. I can use the seven vital functions to identify living and non-living things.
4. I can group a variety of living things based on similarities and differences in structural features.
5. I can group living things as animals, plants, fungi and small microbes.
6. I can name some examples of micro-organisms (microbes) and invertebrates.
7. I can sort animals as vertebrates and invertebrates.
8. I can describe the five groups of vertebrates.
9. I can link some plants and animals with their habitats.
10. I can describe the function of some animal and plant adaptations.
11. I can identify and describe some local habitats.
12. I can identify some locally occurring animals and plants.
13. I can sort some feeding relationships as herbivores, carnivores and omnivores.
14. I can categorize animals as consumers and plants as producers.
15. I can describe photosynthesis in a simple way.
16. I can draw and explain a food chain.

17. I can interpret food chains and food webs.

18. I can describe that energy flows through a food chain.

19. I can explore and observe a habitat and some living organisms through a Fieldwork activity/ site visit.

20. I can explain the word 'endemic' and name some examples of local endemic species.

21. I can explain the meaning of the words 'extinct' and 'endangered' and give some examples of each.

Subject: **SCIENCE**
LOF Subject Focus: **CHEMICAL SCIENCE**
Unit code and title: **SCI LOF 7.3 UNDERSTANDING MATTER**

Year 7 /Form 1

OBJECTIVES Teacher will:

1. guide students to identify three states of matter and describe that matter is made up of tiny particles.
2. guide students to explore the properties of solids, liquids and gases.
3. guide students to explore the change of state of matter.
4. guide students to describe the arrangement of particles in solids, liquids and gases.

Key words

matter, tiny particles, atoms, solid, liquid, gas, change in temperature, reversible change, three states of matter, theory, compress, flow, expansion, contraction, melting, evaporation, condensation, freezing.

Points to note

Refer to notes re 5E approach to science teaching and learning.

(Note: the following information is for the teacher only – In dealing with the theory of particles, this unit gives an opportunity to show the scientific method in which ideas about things are tested i.e. the process when forming a theory. A scientist will propose a **hypothesis** to explain a phenomenon. The hypothesis must be able to be tested. Investigations are designed to test the prediction made in a hypothesis. Repeated tests produce more accurate predictions until an accurate hypothesis forms an overall **theory**. A theory is a more certain way of explaining things. A hypothesis is a tentative explanation for something and often involves questioning and making a prediction. For more info https://www.diffen.com/difference/Hypothesis_vs_Theory

At this point one should stick to the term of ‘particles’ rather than atoms or molecules.

Properties of gases

<http://phet.colorado.edu/en/simulation/gas-properties>

Interactive simulations – properties of materials

<http://www.bbc.co.uk/schools/ks2bitesize/science/materials/>

Structure of matter

<http://www.strangematterexhibit.com/structure.html>

Particles and matter

<http://www.middleschoolchemistry.com/lessonplans/chapter1/lesson1>

Resources to support inclusion

<http://www.communication4all.co.uk/>

LEARNING OUTCOMES

SCI LOF 7.3 - Unit: UNDERSTANDING MATTER – Focus: CHEMICAL SCIENCE

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can group objects as solids, liquids and gases.
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 identify three states of matter.
5. I can state that materials are made up of tiny particles.
6. I can draw and describe the arrangement of tiny particles in the three states of matter.
7. I can identify the different forms in which water can be found.
8. I can use and explain the terms melting, freezing, evaporating, condensing and boiling.
9. I can link heating and cooling with the change of state of matter, using simple examples.
10. I can discuss and show how materials expand or contract when heated or cooled.
11. I can use the particle model to explain the properties of solids, liquids and gases.
12. I can describe how particles move in solids, liquids and gases.
13. I can use the particle model to describe what happens when there is a change of state.

Subject: **SCIENCE**
LOF Subject Focus: **ENERGY**
Unit code and title: **SCI LOF 7.4 WHAT IS ENERGY?**

Year 7 /Form 1

OBJECTIVES Teacher will:

1. guide the students to explore the main forms of energy and that energy is measured in Joules.
2. engage students to discover that energy can be changed from one form to another and that not all energy changes are useful.
3. help students to recognise that food is a source of energy and investigate food for its energy content.

Key words

energy sources, stored energy, movement, heat, electrical energy, light, sound, nuclear, potential, chemical, calories, joules, kilojoules, energy transfer,

Points to note

Refer to the note re the 5E approach to teaching and learning of science. Link this unit with *SCI LOF 7.5 Electricity*. Energy as a concept is difficult to teach because of the underlying concepts of what energy is. In this unit energy is treated as something that is found in various forms and is transferred to make things happen. Another important point is the fact that energy cannot be created nor destroyed.

Health & Safety:

Burning food experiment – make sure that no one is allergic to any of the foods being burnt. For example, some students may be allergic to nuts. Remind students not to eat any of the foods.

Resources

Different types of food (actual or pictures), different food labels (actual or pictures), clockwork toy, bicycle dynamo, torch, photovoltaic cell, filament bulb, energy saving bulb, LED, Bunsen burner, stand, beaker half full of water, thermometer, digital balance.

Forms of energy:

http://sciencewiz.com/Portal/portal_to_Energy.php

Energy in food:

<http://www.practicalchemistry.org/experiments/energy-values-of-food,225,EX.html>

LEARNING OUTCOMES

SCI LOF 7.4 Unit: WHAT IS ENERGY? – Focus: ENERGY

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can identify different forms of energy such as stored, movement, heat, electrical, light and sound.
2. I can associate forms of energy with their source.
3. I can classify examples of stored energy as nuclear, potential and chemical energy.
4. I can state that energy is measured in Joules.
5. I can describe that energy is neither created nor destroyed but can be changed from one form to another.
- ~~6.~~ I can describe that during energy transfer some energy is wasted.
7. I can illustrate an inefficient energy transfer.
8. I can identify features that would make a building more energy efficient.
9. I can use energy transfer diagrams to show how forms of energy change in different situations.
10. I can identify the form of energy input, and useful / wasted output in some common household devices.
11. I can identify food as a source of energy.
12. I can select foods with the most/least energy content.
13. I can carry out and describe a fair test to investigate food for its energy content.

Subject: **SCIENCE**
LOF Subject Focus: **ENERGY**
Unit code and title: **SCI LOF 7.5 ELECTRICITY**

Year 7 /Form 1

OBJECTIVES Teacher will:

1. guide students to use electrical components to construct basic circuits.
2. teach students to use symbols to represent electrical circuits.
3. help students to explore series and parallel circuits.
4. engage students to identify conductors and insulators and relate them to issues of safety.

Key words

symbol, electric circuit, bulb, switch, battery, ammeter, voltmeter, complete/incomplete circuit, series, parallel, current, voltage, component, conductor, insulator.

Points to note

Refer to 5E approach to teaching and learning of science.

Be aware of health and safety issues when using electricity. The use of the interactive white board (IWB) for simulations is recommended.

At this level there is no need to distinguish between cells and battery. Refer only to batteries.

Some students may experience difficulty in distinguishing voltage from current. If necessary, use a circuit and show voltage and current readings.

Keep in mind that in Maltese most students use the term 'dawl' (light) instead of electricity. Some students mix the terms plug and socket.

Link this unit to the previous unit and initially present electricity as one of the forms of energy. Note that most programmes / textbooks treat energy and electricity as one topic.

Resources

circuit boards; batteries; bulbs; switches; wires; materials including copper, iron, aluminium, wood, plastic, paper, glass; data loggers, Christmas light set

Electrical circuits: http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/electric_current_voltage/revision/1/

Building circuits: <http://phet.colorado.edu/en/simulation/circuit-construction-kit-dc>

http://www.cleo.net.uk/consultants_resources/science/circuitWorld/circuitworld.html

Using electricity safely: <http://www.switchedonkids.org.uk/>

LEARNING OUTCOMES

SCI LOF 7.5 - Unit: ELECTRICITY – Focus: ENERGY

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can identify main energy changes in a power station resulting in the production of electricity.
2. I can use electrical components to construct basic electrical circuits.
3. I can describe the purpose of a battery.
4. I can name basic electrical components and use symbols to represent electrical circuits. These include wire, battery, bulb and a switch.
5. I can explain how switches can be used to control circuits.
6. I can identify and draw series and parallel circuits.
7. I can set up simple series and parallel circuits.
8. I can describe the characteristics of series and parallel circuits.
9. I can apply knowledge about circuits to practical situations.
10. I can distinguish between electrical conductors and insulators.
11. I can design and perform an experiment to identify conductors and insulators.
12. I can describe practical uses of conductors and insulators and relate their use to issues of safety.
13. I can link conductors and insulators with examples of everyday use.
14. I can identify applications of conductors and insulators in everyday use.
15. I can describe basic safety procedures when handling electricity.

Subject: **SCIENCE**
LOF Subject Focus **CHEMICAL SCIENCE**
Unit code and title: **SCI LOF 7.6 ACIDS AND ALKALIS**

Year 7 / Form 1

OBJECTIVES Teacher will:

1. familiarize students with common acids, their properties and their safe use.
2. familiarize students with common alkalis, their properties and their safe use.
3. guide students to use indicators to distinguish between acids, alkalis and neutral solutions.
4. engage students to investigate the strength of common laboratory and household acids and alkalis using universal indicator coupled with the pH scale.
5. engage students to investigate the neutralisation of an acid with an alkali.

Key words

acid, alkali, metal, chemical reaction, corrosive, strong and weak (pH), dilute and concentrated, hydrogen, neutralisation, indicator, litmus, universal indicator, pH paper, hydrochloric acid, sulfuric acid, ethanoic acid (acetic), sodium hydroxide, ammonia, ammonium hydroxide, common household items such as lemon, vinegar, bleach, toothpaste, soap.

Points to note

Refer to notes re 5E approach to teaching and learning of science.

Ensure the necessary safety precautions are used when handling acid and alkali solutions. Use small amounts and wear protective equipment (lab coats and safety specs). In addition, apply standard laboratory safety rules. Inspect laboratory first aid and eye wash kits before the start of the unit.

Concentrated acid 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 aware of an emergency procedure in case of acid or alkali spillage.

Link this unit with *SCI LOF 7.3 Understanding Matter*.

Note: Adding water to an acid or an alkali will not change its pH but will affect its concentration (i.e. it becomes more dilute thus more safe).

Therefore do not confuse strong / weak (i.e. pH) with concentrated / dilute.

Resources

Common laboratory glassware, lab coats and safety goggles. magnesium, zinc, dilute hydrochloric, sulfuric, nitric and ethanoic acid, dilute sodium hydroxide solution, dilute ammonia, distilled water, small marble slab, calcium carbonate, 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.

Acids, alkalis and the pH scale

http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/acids_bases_metals/revise1.shtml

<https://phet.colorado.edu/en/simulation/acid-base-solutions>

Neutralisation

<https://www.youtube.com/watch?v=LFQdD0e3L9I>

Resources to support inclusion

<http://www.communication4all.co.uk/>

LEARNING OUTCOMES

SCI LOF 7.6 - Unit: ACIDS AND ALKALIS – Focus: CHEMICAL SCIENCE

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can recognise the hazard symbols and recall basic safety procedures when handling chemicals.
2. I can name some common acids and alkalis.
3. I can recognise that some acids/alkalis can be more dangerous than others and relate the degree of corrosiveness with their hazards.
4. I can work safely with dilute acids and identify some of their properties (corrosiveness, sour taste and their reaction with some metals).
5. I can work safely with dilute alkalis and identify some of their properties (corrosiveness, soapy texture).
6. I can identify indicators as chemicals which change colour in acids and alkalis.
7. I can use litmus to identify acids, alkalis or neutral solutions.
8. I can relate the rate of a reaction to the strength of an acid or an alkali.
9. I can name the gas produced from a reaction between an acid and (some) metals as hydrogen.
10. I can carry out the test for hydrogen and identify hydrogen as the gas which burns with a pop.
11. I can link the above test to the properties of hydrogen.
12. I can use universal indicator coupled with the correct interpretation of the pH scale to find the pH of some common acids and alkalis.
13. I can identify some common laboratory and household chemicals as strong or weak acids and alkalis.
14. I can recall everyday examples of neutralisation.
15. I can identify the reaction between an acid and an alkalis as a neutralisation reaction.
16. I can use an indicator to follow the reaction between an acid and alkali.

Subject: **SCIENCE**
LOF Subject Focus: **CELLS AND BODY SYSTEMS**
Unit code and title: **SCI LOF 7.7 CELLS AND REPRODUCTION**

Year 7 / Form 1

OBJECTIVES Teacher will:

1. teach students to use a light microscope effectively and understand that cells are the basic unit of life.
2. help student to recognise plant and animal cells and be able to observe simple cells under a light microscope.
3. guide students to identify the main human organs and systems and their function.
4. guide students to identify the main plant organs and their function.
5. guide students to describe the structure of a typical flower.
6. guide students to identify specialised human reproductive cells and describe the structure and function of the human reproductive organs.
7. guide students to identify and understand the body changes during puberty and adolescence.
8. help students to understand that fertilisation is the fusion of the male and female reproductive cells.
9. guide students to understand and describe what happens during pregnancy and birth.

Key words

cell, organ, body, animal, plant, microscope, slide, multicellular, nucleus, cell membrane, cytoplasm, cell wall, vacuole, chloroplast, tissue, organ, system, organism, magnification, eyepiece lens, objective lens, stage, specialized cells (such as muscle, nerve, sex, blood), main body organs, sperm, egg, sex cell, sexual intercourse, sex organs, main structures of reproductive organs (sperm tube, testis, penis, egg tube, ovary, uterus, cervix, vagina), fertilisation, semen, puberty, adolescence, menstrual cycle, period, embryo, sexual reproduction, placenta, umbilical cord, sac, main plant organs (leaves, flower, stem, fruit and roots) and main structures of a flower (sepal, petal, stamen, stigma, pollen, ovule)

Points to note

Refer to notes re 5E approach to science teaching and learning.

Note that students often think that living things contain cells rather than being made of cells. Be aware that some students might confuse cells with atoms. Some students may find it difficult to understand the small size of cells. The exercise of viewing known objects (such as a plastic ruler) under the microscope might help.

This is a good opportunity for students to ask questions that may be worrying them. Liaison with PSCD department and be familiar with the school policies on sex education. Refer to the fact that values and respect are also part and parcel of human relationships in addition to the biological aspect of reproduction.

Resources

student light microscope, prepared slides, human torso, organ tunic

Biology:

www.biology4kids.com

Cells:

http://www.bbc.co.uk/schools/ks3bitesize/science/organisms_behaviour_health/cells_systems/activity.shtml

Microscope

<http://www.udel.edu/biology/ketcham/microscope/scope.html>

Under the microscope:

<http://micro.magnet.fsu.edu/optics/intelplay/simulator/index.html>

Body organs:

www.sciencenetlinks.com/interactives/systems.html

<http://urbanext.illinois.edu/gpe/>

Male & female reproductive systems:

http://www.ksscience.co.uk/revision/reproduction/reproduction_index.htm

http://www.bbc.co.uk/schools/ks3bitesize/science/organisms_behaviour_health/reproduction/activity.shtml

Foetal development:

www.justthefacts.org

The Flower life cycle

http://www.bbc.co.uk/schools/ks2bitesize/science/living_things/life_cycles/play.shtml

<http://www.crickweb.co.uk/ks2science.html>

Resources to support inclusion

<http://www.communication4all.co.uk/>

LEARNING OUTCOMES

SCI LOF 7.7 - Unit: CELLS AND REPRODUCTION – Focus: CELLS AND BODY SYSTEMS

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can use magnifying glasses to observe small things.
2. I can use the microscope to magnify small things such as cells.
3. I can recall the basic parts and function of a light microscope.
4. I can perform simple calculations regarding magnification.
5. I can describe that cells are the basic unit of life.
6. I can identify a typical plant and animal cell as seen under the light microscope.
7. I can draw and label 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 some examples and function of specialized cells.
10. I can link the main plant organs with their function.
11. I can identify the main parts of a typical flower and briefly describe the process of plant reproduction.
12. I can name some human organs and body systems (such as brain/nervous system; heart/circulatory; lungs/breathing system)
13. I can identify the position and the function of the main organs on the human torso.
14. I can label and distinguish between the male and female human reproductive cells.
15. I can identify the different parts of the male/female reproductive systems.
16. I can describe what happens during the menstrual cycle.
17. I can describe that fertilisation is the fusion of the male and female reproductive cells.

18. I can describe puberty and adolescence as a period of rapid growth and reaching sexual maturity.
19. I can recall in simple terms that the fertilised egg grows into a baby during forty weeks of pregnancy.
20. I can label a diagram showing the foetus inside the uterus and identify the placenta, umbilical cord, sac, foetus and uterus.
21. I can identify the function of the placenta, umbilical cord and sac.
22. I can describe in simple terms what happens during a normal pregnancy and birth.
23. I can identify habits that may harm the developing baby.



Directorate for Learning and Assessment Programmes
Department for Curriculum, Lifelong Learning and Employability

Integrated Science Curriculum Core Curriculum Programme

YEAR 7 – FORM 1
APPENDIX

SCI CCP LOF 7.1 YOUNG SCIENTIST AT WORK
SCI CCP LOF 7.2 LIVING THINGS AND THE ENVIRONMENT
SCI CCP LOF 7.3 CHEMICAL PROPERTIES
SCI CCP LOF 7.4 ENERGY AROUND US
SCI CCP LOF 7.5 CELLS AND REPRODUCTION

LEARNING OUTCOMES - Core Curriculum Programme

SCI CCP LOF 7.1 - Unit: SCIENTISTS AT WORK - Focus: WHAT DO SCIENTISTS DO?

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can recall that science and technology has implications on everyday activities.
2. I can identify simple glassware and measuring instruments.
3. I can recall and follow important laboratory safety rules.
4. I can identify 112 as the emergency telephone number.
5. I can label and identify the main parts of the Bunsen Burner.
6. I can identify hazard symbols on chemicals.
7. I can identify the three components needed to start a fire by using a fire triangle.

LEARNING OUTCOMES - Core Curriculum Programme

SCI CCP LOF 7.2 - Unit: LIVING THINGS AND THE ENVIRONMENT - Focus: LIFE ON EARTH

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can use the seven vital functions to identify living and non-living things.
2. I can recognise differences / characteristics between living organisms.
3. I can identify a variety of living things.
4. I can differentiate between vertebrates and invertebrates.
5. I can identify and describe some vertebrate groups.
6. I can link some characteristics of plants and animals to their habitats.
7. I can identify the main parts of a plant.
8. I can identify different feeding relationships such as herbivores, carnivores and omnivores.
9. I can interpret food chains.
10. I can explore and observe a habitat and some living organisms through a Fieldwork activity/ site visit.

LEARNING OUTCOMES - Core Curriculum Programme

SCI CCP LOF 7.3 - Unit: CHEMICAL PROPERTIES - Focus: CHEMICAL SCIENCE

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can sort objects in solids, liquids and gases.
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 use the terms melting and freezing.
6. I can identify the corrosive hazard symbol and know basic safety procedures when handling chemicals.
7. I can name one common acid and alkali.
8. I can identify some properties of acids and alkalis.
9. I can use litmus to identify acids, alkalis or neutral solutions.
10. I can recall one example of a neutralisation reaction.
11. I can use an indicator to follow the reaction between an acid and an alkali.
12. I can identify hydrogen as the gas produced between the reaction of some acids with some metals.
13. I can use the chemical test to identify hydrogen.

LEARNING OUTCOMES - Core Curriculum Programme
SCI CCP LOF 7.4 - Unit: ENERGY AROUND US - Focus: ENERGY

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can identify different forms of energy such as stored, movement, heat, electrical, light and sound.
2. I can identify one energy change for a familiar device.
3. I can state that energy can be measured in Joules.
4. I can identify the form of energy input and output in some common household devices.
5. I can identify food as a source of energy.
6. I can identify foods with the most/least energy content through a simple experiment.
7. I can name basic electrical components and identify their symbols.
8. I can use basic components to construct a simple electrical circuit.
9. I can identify series and parallel circuits.
10. I can use a simple circuit to classify materials as conductors and insulators.
11. I can identify safety issues when handling electricity.

LEARNING OUTCOMES - Core Curriculum Programme

SCI CCP LOF 7.5 - Unit: CELLS AND REPRODUCTION - Focus: CELLS AND BODY SYSTEMS

Note other Learning Outcomes related to skills and competencies (p5 & 6)

1. I can use magnifying lenses to observe small things.
2. I can use the microscope to magnify small things invisible to the naked eye.
3. I can identify a typical animal and plant cell as seen under the light microscope.
4. I can name most important human organs.
5. I can identify the correct position of the main organs on the human torso.
6. I can identify the male and female reproductive organs and label some parts.
7. I can identify some body changes taking place in boys and girls during puberty and adolescence.
8. I can identify the male and female sex cells.
9. I can describe that fertilisation is the fusion of the male and female sex cells.
10. I can identify some examples of good and bad practices for a pregnant woman.
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.