

# Making Teacher Education relevant for 21<sup>st</sup> Century Africa

## Integrating ICT into classroom activities



### Introduction

The following table sets out some ideas for how the use of ICT could be integrated into classroom activities in primary science. The assumption is made that the teacher has access to a laptop and a projector and a smart phone or tablet capable of taking pictures and videos and making audio recordings. Access to the internet is not assumed, but it is hoped that teachers will take the laptop to places where they might get internet access and take the opportunity to download resources. Alternatively, the school may have access to a BRCK (or similar) on which content from the internet has been loaded.

TESSA Module	Curriculum area	Science activity	How ICT could be included
Science, Module 1, section 1	Classifying living things	Suggested activities include making a classroom display to represent living and non-living things, making models to highlight the characteristics of animals and plants and how they adapt to their environment, researching the life cycle of a bean or animals such as grasshopper, butterfly, frog, turtle, mosquito, beetle, elephant, bird and fish	Use the laptop and projector to display photos of animals that might be unfamiliar to the children to stimulate discussion about where they live and how they are adapted to their environment. Use projector to show videos of the life-cycle of a butterfly or a butterfly emerging from a chrysalis (YouTube).
Science Module 1, section 2	Focus on plants	Observe plants, dissect a flower in order to identify the parts of a plant, identify local plants and create a local nature trail	Teacher could take photos of plants in the local area and display them. Children could guess where the photo was taken and try to identify the plants.
Science Module 1, section 3	Investigating animals – the hunters and the hunted	Close observation over time of a local ecosystem (eg a pond) and food chains; observing animals and discussing how they are adapted for their environment; observe local animals and birds and their behaviour	Teachers could take photos of local animals and birds and display them Children could guess where the picture was taken. Numerous video clips available on You Tube. If there is a computer lab the children could research different species using Wikipedia or similar.
Science Module 1, section 4	Plants and animals adapting to survive	Observing a pond over time; collecting mini-beasts and recording information about them; thinking about adaptations; project work on moving through the air	Teacher creates a spreadsheet on their laptop. Children add information about their observations to the spreadsheet – things seen, how many, where they were, adaptations, what they eat etc.

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			Show pictures/films of different sorts of habitats and discuss how animals adapt to live there. Install mind-mapping software on a laptop or tablet – collect children’s ideas and display as a mind-map.
Science Module 1, section 5	Developing environmental awareness	Examine and discuss ancient artefacts – flints, bones etc, think about how early-man lived; endangered species, collect newspaper articles about environmental issues; plan an environmental project	Show a film about an endangered species; find news items on line from other parts of Africa; encourage children to take photos (on mobile phones) of local environmental issues (eg litter, polluted water) and display them on the teacher’s laptop; let a group prepare a presentation on their issue and show it to the class (overtime, make sure all children get a go at this). Film the presentations and show to other classes or in school assembly to raise environmental awareness in the school.
Science Module 2, section 1	Investigating and classifying materials	Scavenger hunt (in groups students have to find the same set of material objects); classifying materials in the classroom/school; finding examples of solids, liquids and gases; investigating unknown materials	Use cameras on mobile phones to photograph local examples; show video on forensic science – how identifying materials can be used to solve crimes; gather and record examples of a range of different materials on a spreadsheet.
Science Module 2, section 2	Exploring solids	Thinking about where common solids (glass, bricks etc.) come from; investigating the properties of a range of solids; investigating irreversible changes	Find and show videos about common industrial processes (YouTube eg smelting iron in Africa). Collect photos from the local area of solids made as a result of irreversible changes. Make a class spreadsheet of solid materials, how they are made and their properties.
Science Module 2, section 3	Exploring liquids	Exploring water wheels and the power of water; focus on drinking water and where it comes from; investigation – the best way to dry a cloth	Download and project photographs of water wheels, research extraordinary facts about water, look at the website ‘dihydrogen monoxide’ which makes the case for banning this ‘dangerous chemical’, using word or excel to record results of the investigation and generate graphs.
Science Module 2, section 4	Investigating air	Introducing air through simple experiments, exploring the properties of air – paper aeroplanes, a model for air and what it is made from	Download and show simulation which show the particulate nature of air, record results of experiments with paper aeroplanes on a spreadsheet, research facts about air.

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Science Module 2, section 5	Wise use and re-use of materials	Renewable and non-renewable, products from crude oil; surveying local pollution, making compost; whole school survey on pollution and recycling; making something useful from waste	Download and show a simulation of the distillation of crude oil, show pictures of oil refinery, write a quiz about renewable and non-renewable materials and collect the results on a spreadsheet – give the quiz to other classes and establish awareness of this issue. Take photographs of local pollution and solutions (eg recycling centres), write a survey and report the results on a spreadsheet or table in word, download and show videos of recycling centres sorting materials, research ways of making compost. Analysing survey data. Research and show pictures of products made from waste.
Science Module 3, section 1	Everyday forces and movement	Forces in everyday life, recognising where forces are acting; games to demonstrate forces and the vocabulary of forces; investigating friction and how to reduce it	Download and show relevant videos eg bungee jumper, Take and show pictures of people doing everyday tasks and discuss the forces involved (eg pushing a wheelbarrow), collect data from experiments on friction – record and display it.
Science Module 3, section 2	Exploring sounds and music	Stories and games to stimulate thinking about sounds; conducting investigations of sound and making instruments; looking at traditional African instruments and designing their own instrument	Record everyday sounds on a phone and ask the class the guess what they are. Show sound waves as they appear on a cathode ray tube to explain pitch, frequency, loudness etc; show videos of people using home-made instruments; set up a class spreadsheet to record data from an investigation into how far sound travels; research traditional African instruments and show pictures; Allow some group to create a presentation on the laptop; take photographs of instruments students have created to use as a resource in the future and/or to organise peer review/feedback.
Science Module 3, section 3	Investigating electricity	Investigating simple circuits in groups; class experiments with limited resources; Investigating electromagnetism	Download and show simulations to explain how circuits work (eg PHET website); Download and show videos of applications of electro-magnets eg recycling metals; research how electricity is generated in your local area; record results of electro-magnetism investigation on a spreadsheet.



Science Module 3, section 4	Looking at light and shade	Investigating shadows and how they change their size and shape; investigating reflection; making shadow puppets and periscopes.	Collect and record data on the length of shadows at different times of the day. Display the data in different ways, discuss the most effective way. Download simulations to show how a periscope works; show pictures of people using periscopes.
Science Module 3, section 5	From Earth to the stars	Using models to explore night and day; observing the moon; investigating the solar system	Download pictures/simulations to illustrate differences across the world – eg the midnight sun, living in permanent darkness; research and present interesting facts about the solar system; download and show video of people walking on the moon; download and show a simulation explaining the phases of the moon; take a sequence of photos of the moon on a phone and display.

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