UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER MAY 2012:    BED III PRIMARY

COURSE NUMBER:    PEC 377

COURSE NAME:    CURRICULUM STUDIES: SCIENCE

TIME ALLOWED:    3    HOURS

INSTRUCTIONS:    1.    THIS PAPER HAS SIX QUESTIONS.

2.    ANSWER ANY **THREE** QUESTIONS.

3.    EACH QUESTION IS WORTH 25 MARKS

4.    DOCUMENTS REFERRED TO IN SOME OF THE QUESTIONS ARE ATTACHED. IF YOU DO NOT FIND THEM, ASK FOR THEM.

5.    ANY PIECE OF WRITTTEN WORK WHICH IS NOT FOR MARKING PURPOSES MUST BE CROSSED OUT CLEARLY.

THIS PAPER MUST NOT BE OPENED UNTIL PERMISSION IS GIVEN BY THE INVIGILATOR

Answer any **four** questions from this paper.

## Question 1

*The traditional view of science is that scientific knowledge is neutral and independent from human factors. Meanwhile Science Technology and Society (STS) education claims that science cannot be neutral and should be taught within the human context.*

a) Discuss this idea justifying the claims made. Your discussion should include strength and weaknesses of the STS education. (15)

b) Write down the advantages and disadvantages of using the STS approach to teaching science at the primary school level. (10)

**Total**      **25 Marks**

## Question 2

a) Discuss the use, value and disadvantages of electronic resources in teaching science in Swaziland. (15)

b) Give an outline of **five** other types of teaching resources used in teaching science. (10)

**Total**      **25 Marks**

## Question 3

a. Describe Vygotsky's theory of social constructivism and show how it explains the role of language in dealing with misconceptions in science. (15)

b. Develop an activity aimed at ensuring concept development in a science class. (10)

**Total**      **25 Marks**

## Question 4

a. Explain 'curriculum change' as a concept and indicate how it affects teachers. (15)

b. Differentiate between a 'null curriculum' and 'the hidden curriculum' giving examples of each in the case of the Swaziland science curriculum. (10)

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**Total**            **25 Marks**

## Question 5

a) Describe the features of a 'good examination' and show the importance of assessment.

(10)

b) Construct a five item test and its marking guide for a lesson shown in appendix A (see attachment). The test should have at least one of each of the following types of questions: multiple choice question(s) of higher order, structured question(s) and open ended question(s) (15)

**Total**            **25 Marks**

## Lesson 28
# Technology awareness

## Objectives
The pupils will be able to:
1. identify various objects developed through technology
2. give the function of different objects developed through technology
3. build a model car.

## Skills developed
- observing
- manipulating
- communicating
- designing
- manipulating
- drawing

## Before the lesson
You and the pupils should make a collection of various technological objects that can be displayed. You could include wire cars, a home sling-catapult (*silingi*), *ingula*, *makhweyane*, a mouse/rat trap (*sochaka*), *silulu* (chicken nest), a cell phone, a portable radio, a walkman, a calculator, etc. Where it is not possible to get the actual items, pictures may be used.

Tell the pupils to bring in items such as cardboard, paper, string, plastic, tin cans, rubber bands, wire or anything that they might need to build a model car. You may also need to supply some of the items yourself if resources are limited.

## Precautions
Ensure that the items brought by pupils are well secured so that none go missing or get broken. Monitor the use of objects, such as the mousetrap, that could hurt any of the pupils.

## Practical activities

*Activity 1*
Pass around some of the items for the pupils to manipulate/handle and observe. Monitor this activity to guard against damage or incorrect use. Allow about five minutes before collecting in the items. Inform pupils that these are all examples of objects made by people to do something useful or interesting in our lives. Technology is the use of science to make things that we need or want in order to improve our lives.

This lesson introduces pupils to the exciting world of technology. Pick up one object at a time and ask the class to name the item. Encourage pupils to give the English

and SiSwati names. Place the correctly identified items in one group and those that have not been correctly identified in another. Go through each of the items in the incorrectly named group and write the name of each of these items on the chalkboard.

### Activity 2
This is an extension of Activity 1, but now ask the pupils to describe the uses of each of the items. List all the items on the chalkboard. Ask the pupils to describe what each one is used for. Again, accept responses in SiSwati. The descriptions need not be detailed, for example, with a clay pot (*ludziwo*), pupils could just say that it is used for drinking home made brew or *mahewu*. This activity should proceed as in Activity 1, and you should put aside items where the functions are not known until the end of the lesson when you should briefly describe what each of these items is used for.

It is important to emphasise that some technology is traditional (homemade) and some is modern. Ask the pupils to say which tools belong to traditional technology and which to modern technology. Bring out a poster showing a computer with each part labelled, i.e. monitor, keyboard, central processing unit, printer and mouse. There is no need to state the function of each part of the computer at this stage, but simply describe the general uses of a computer.

### Activity 3
Pupils should turn to page 93 of the *Pupil's Activity Book* to look at the pictures of various technological items. Tell them to work on their own. Encourage pupils to fill in the table in pencil so that wrong answers can be corrected.

### Activity 4
Divide the class up into small groups. Each group must use readily available resources to build a model car that moves. Encourage the pupils to be creative, and help them if they have problems with their design. When all the groups have completed this activity, let one representative from each group demonstrate their model car to the rest of the class. The pupils must then complete this activity by working through page 94 of *Pupil's Activity Book*.

### Evaluation
Find out if pupils can:
1. name examples of traditional and modern technology.
2. describe the uses of these items.
3. design and build a model car that moves.

# Technology awareness

## Objectives
5.T.1   Given statements/diagrams, pupils will explain the meaning of technology

5.T.2   Given statements/objects/diagrams, pupils will explain how technology influences people's lives

5.T.3   Given statements/objects/diagrams, pupils will state advantages and disadvantages of technological objects

## Background information
This unit focuses on the application of Science in everyday life. Up till now there has usually been a gap between the Science taught in schools and the practical application of Science in the working environment and the home. People tend not to use the Science they are taught to solve everyday problems. All over the world, this problem has encouraged educationists to develop skills-based Science programmes that include technology.

Technology can be indigenous or modern. People apply all the knowledge and skills available in their society to solve problems in order to improve their lives and to satisfy their needs. If the knowledge and skills used are indigenous, the technology is indigenous technology. If people apply skills and knowledge gained from the Science that they learn, the technology is modern technology. In modern technology people apply and develop scientific ideas to make new things like machines, tools, medicines, and modes of transport and communication. In this unit, pupils are asked to recall what indigenous technology they learned about in Grade 4. They are then introduced to some of the objects that are the products of modern technology, with which they may be familiar in their daily lives.

The unit consists of only one lesson. This is a challenging lesson that encourages the pupils to think about the advantages and disadvantages of technology. An effort has been made to contextualise the lesson by using familiar examples. Lesson 5.1 pays special attention to technological objects that can be used in education, for instance computers, televisions and videos.

# Technology changes our lives

## Objectives
The pupil should be able to:

1. describe some of the ways in which technology has changed our lives

2. differentiate between the advantages and disadvantages of various technological objects.

## Skills developed
- observing
- comparing
- communicating
- manipulating
- modelling

## Before the lesson
Collect articles and pictures from magazines about new and interesting examples of modern technology that you can discuss with the pupils.

Some pupils may wish to use clay for their project. Find out whether you have clay in your area. Collect the clay with the help of pupils and local people where possible. Encourage pupils to use different materials for their bowl, and have a variety of different materials such as grass, wood, wire and plastic for them to look at and to give them ideas.

## Precautions
Be sensitive to the fact that some pupils will not have much knowledge or experience of some of the examples of modern technology that you might refer to in your lesson. Encourage the pupils who do know about these items to explain what they are and how they work – this will help the other less sophisticated pupils in the class.

## Teacher's notes
Technology has changed our lives in various ways. It has improved education, communication, transport, cooking, agriculture, health and weaponry. Technology has many advantages, but also has disadvantages. Our views on technology will be influenced by what we believe is important in life. There is no correct view – people are entitled to their own personal opinions based on their individual experiences of technology. For example, people who value their privacy might feel too much information is available about them through Internet technology, and thus view it

with deep suspicion. Some disabled people, who are isolated in their homes, might find that Internet technology offers them a way of communicating with the rest of the world, and so are very grateful for it.

## Practical activities

*Activity 1 (Try this!)*
Ask the pupils what they remember about technology from Grade 4. Find out if they remember the names of any of the objects and what the objects are used for. Remind them that technology is the use of tools and materials to produce something that we need or want and that can improve our lives.

Pupils may mention some of the following objects: car (for transport), television (for entertainment, learning and communication), typewriter (for typing), cell phone (for communication, calculating and entertainment), *silulu* (where a hen lays and hatches its eggs), *ingula* (for making sour milk), camera (for taking pictures), *litje lekusila* (for grinding maize), calculator (for calculating), computer (for learning, entertaining, typing, communicating).

Tell the pupils to discuss the objects illustrated in the *Pupil's Book* with their partner and to answer the questions. Go over the answers with the whole class. Some pupils will be more familiar with some of the objects than others, so let these pupils share their knowledge with everyone else.

Explain that each of the objects discussed has helped to improve people's lives. Ask them to imagine what life was like before each of the objects were invented and think about how people managed without them.

The objects for discussion are:

- chainsaw used for felling trees (previously used handsaw or axe)
- electric shaver for shaving facial hair (previously used scissors or sharp knife)
- car used for transport (previously used donkey, horse, bicycle)
- tractor used for ploughing and pulling heavy loads (previously used oxen and donkeys)
- antacid used to relieve indigestion (previously used ash mixed with water).

*Activity 2*
In this activity, pupils have to think about the advantages and disadvantages of different methods used to write out/print a poem. The time taken using each method will be different and so will the final product. The pupils have to think about what they want as their final product – this will determine what method they prefer to use. We don't always have to use the latest technology. Sometimes the older methods produce the results that we want. For example, a hand-written poem can

be decorated with pictures – this could be a work of art. A person receiving a poem written to them might prefer to see it hand-written, as this shows them that the writer has put in a lot of effort and cares about the person they are writing to.

The advantages and disadvantages of each method may include personal opinions like this example. These opinions are valid – you should not look for right or wrong answers but encourage the pupils to discuss the reasons for their answers.

Now tell the pupils to look at the next set of illustrations in the *Pupil's Book*. Let them discuss the advantages and disadvantages of each object, and then instruct them to write their answers in their exercise books. Their answers could be in the form of a table like the one below:

| Object | Advantages | Disadvantages |
|---|---|---|
| Computer | Lots of information can be stored.<br><br>Notes are neat and well presented.<br><br>Mistakes are easy to correct.<br><br>Can be used for work and for games.<br><br>Can be used for communication with other people (e-mail).<br><br>Can be used to access/find information (Internet). | Is very expensive to buy and to maintain.<br><br>When things go wrong, it's not easy to fix.<br><br>Needs to be upgraded regularly.<br><br>Needs a supply of electricity.<br><br>Needs a printer.<br><br>If it crashes (breaks down), lots of information can be lost. |
| Cell phone | Can be used by people who don't have access to a landline.<br><br>Can receive and send messages.<br><br>Allows voicemail if you are busy.<br><br>Has other functions (e.g. calculator, clock and games). | Is expensive to buy and to maintain.<br><br>Cell calls are more expensive than landline calls.<br><br>Not everyone can access the network.<br><br>People can get hold of you at any time, even if you do not want to be reached. |

| Object | Advantages | Disadvantages |
|---|---|---|
| Television | Provides entertainment every day.<br><br>Shows educational programmes.<br><br>Informs people about what's going on in the country and in the world. | Quite expensive to buy and to maintain.<br><br>Needs electricity.<br><br>People can spend too much time in front of the television, and not enough time attending to other important things in their lives. |
| Video | Enables people to watch programmes they would otherwise miss.<br><br>Cheaper for a family than going to the cinema. | Quite expensive to buy and to maintain.<br><br>Needs electricity.<br><br>Can be used to show undesirable films. |
| Wire toy car | Easy to get the materials needed to make it.<br><br>Cheap to make.<br><br>Won't break easily. If it does break, it is easy to fix.<br><br>Doesn't need electricity – will work anywhere.<br><br>Trains the mind on some driving skills. | Doesn't have all the bells and whistles!<br><br>Encourages children to play on the roads, which can be dangerous. |

*Activity 3 (Find out!)*
Cut up as many pieces of paper as there are pupils in your class. Write "good" on half of the pieces of paper and write "bad" on the other pieces of paper. Put all the pieces of paper into a box. Tell each pupil to take one piece of paper out of the box. The pupils with "good" on their piece of paper will form one group and the pupils with "bad" will form another group.

The "good" group must find out as many reasons as possible why technology is good for us. The "bad" group must find out as many reasons as possible why technology is bad for us. Give the pupils time to ask members of their families and of their community for their views.

Tell each group to choose two pupils who will represent them. These pupils must give a short presentation to everyone in the class, explaining why they think technology is good or bad.

Tell the rest of the pupils to listen to the two presentations carefully. At the end of each presentation, allow the pupils time to write the advantages/disadvantages that they learned about in their tables.

Tell each pupil to tick all the points that they agree with and then to decide whether they think technology is good for us or bad for us. Find out how many pupils support each view in a class vote.

*Activity 4 (Stretch and stretch!)*
This activity is an extension of the previous one. Use this activity to find out whether the pupils understand the effect that technology has on our lives and also whether they are able to state the advantages and disadvantages of technology.

*Activity 5 (Project)*
This is a project which the pupils must do at home individually.

Tell the pupils to design and make a bowl that can carry fruit. They can use any material they like. They should decorate the bowl to make it attractive.

Tell the pupils to bring their bowls to class for assessment. Give them a chance to show their bowls to the rest of the class. Ask the pupils to evaluate their own bowls, and to explain how they think they could make a better bowl if they were given a chance to do it again.

Pick out the bowls that are the most effective for holding fruit. Give a reason for each of your choices.

**Note:** Don't be too strict in your evaluation. The purpose of this activity is to give the pupils a chance to make something useful – not everyone's first effort works out.

## Evaluation
Find out if the pupil can:

1. state how technology has changed people's lives.

2. describe the advantages and disadvantages of some technological objects.