

APPENDIX D

RESEARCH LEARNING PROGRAMMES

(These lessons give a synopsis of the kind of activities used during the pre- and post-test at school B.)

LESSON 1

1. **Learning programme:** Natural Sciences.
2. **Phase Organiser:** Personal development and Empowerment.
3. **Areas of knowledge:** Communication.
4. **Programme organiser:** Sexually transmitted diseases.
5. **Main specific outcome:** Use scientific knowledge and skills to support responsible decision-making AC, 182.
6. **Related specific outcomes:** NSSO2, AC1, LSO5, ACS 1&2
7. **Facilitator's Activities**
 - Divide the 64 learners into 8 jigsaw groups.
 - Introduce the programme organiser.
 - Facilitates.
8. **Learner Activities**
 - Discuss four kinds of sexually transmitted diseases in their jigsaw group, which are gonorrhoea, syphilis, genital herpes, and HIV.
 - Divide themselves into specialized groups and the four diseases separately.
 - The learners from each jigsaw group are assigned one topic to discuss in a group, i.e. two groups of eight discuss one topic.
 - Learners go back to their jigsaw group. Two learners responsible for a particular topic assist each other to explain to the rest of the group what they understand about the topic.

- In particular learners had to gather information in order to answer the following question about each of the diseases.
 - ~ What is the organism causing the disease?
 - ~ What are the symptoms of the disease in men and in women?
 - ~ How is the disease treated?
 - ~ What can people do to prevent themselves from being infected with STD's?

Learners then present their finding to others in the class.

9. Assessment Strategy

The following checklist is used. Can a learner;

- Identify STD's?
- Gather and prepare scientific information from various sources?
- Acknowledge non-scientific issues?
- Consider alternative?
- Make decisions?
- Communicate their findings and ideas to others?

LESSON 2

1. Learning programme: Natural Sciences
2. Phase organiser: Personal Development and empowerment.
3. Areas of knowledge: Communication.
4. Programme organizer: Avoiding pregnancy.
5. Main specific outcome: SO5. ACs 1, 2, 3, 4, 5, 6, use scientific knowledge and skills to support responsible decision-making.
6. Related specific outcomes: NS SO2, AC1
 - NS SO7, ACs 1, 2, 3,4.
 - NS SO8, ACs 134.
 - LO SO3, ACs 1&2.
 - EMSSO1, AC 1.

7. Facilitator's activities

- Divide the 64 learners into 7 jigsaw groups consisting of 9 learners and 1 group consisting of 10 learners.
- Introduces the topic.

8. Learners activities

- Learners discuss the different forms of contraception in their jigsaw groups, which are abstinence, cap, condom, contraceptive pill, intra uterine device (IUD), rhythm method, sterilization, spermicidal, and vasectomy.
- The 9 learners divide the 9 topics among themselves and then learners with the same topic from the specialized group for that topic and discuss it in detail.
- After some time, learners go back to their jigsaw groups. Each learner explains his specialization topic to the group until all of them understand all the topics. Learners in each group answer the following questions.
 - ~ Which method of contraception needs surgery?
 - ~ Which methods are the most expensive?
 - ~ Which methods are cheapest?
 - ~ If the couple definitely does not want any more children, which method of contraception would be more suitable? Give a reason for your answer.
 - ~ Which methods of contraception are made safer by spermicidal?
 - ~ How is the IUD different from other methods of contraception?
 - ~ For which methods does the women take contraceptive precaution?
 - ~ For which methods does the men take contraceptive precaution?

9. Assessment strategy

The following checklist is made. Can learners;

- Outline the various methods of contraception?
- Assess the effectiveness of different methods in different circumstances?
- Use their knowledge to make choices for themselves?
- Identify the contribution of peoples' research to contraception?
- Consider the ethical issues related to contraception?

LESSON 3

1. **Learning programme:** Natural sciences
2. **Phase organizer:** Personal development and empowerment
3. **Areas of Knowledge:** Communication
4. **Programme organizer:** From fertilization to birth.
5. **Main specific outcome:** SO1, AC 1, 2, 3, 4, 5, and 6, use process skills to investigate phenomena related to the natural sciences.
6. **Related specific outcomes:** NS SO 2, AC 1

NS SO 5, ACs 1,2,3,4,5,6

LO SO5, ACs 1,2,3,4

LO SO6, AC 1

MLMMS SO2, ACs 1,5

MLMMS SO₆, ACs 1,2,3,5

LLC SO1, AC 1

7. **Facilitator's Activities**

- Divide the 64 learners into 8 jigsaw groups.
- Introduces the programme organizer.
- Facilitates.

8. **Learners Activities**

- Discuss the following words in groups: after birth, amniotic fluid, contract, contraction, implanted, placenta and umbilical cord.
- Perform an experiment to find out how amniotic fluid protects a foetus as follows: -
 1. Place a doll in a plastic bag. (The plastic should be at least twice as big as the doll)
 2. Tie the end of the plastic bag. Roll the bag around.
 - (a) What happens to the doll?
 - (b) What would happen if this doll were a living foetus?

3. Untie the bag. Fill it with water. Tie the bag tightly so that the water does not leak out. (The water represents the amniotic fluid). Roll the bag around.

(a) What happens to the doll?

(b) What can you conclude from your observations?

- Learners do another activity to compare milk from different sources as follows:

The newborn baby is fed milk. Study the information on human and cow's milk in the table below:

Useful Substance	Human milk g/100ml	Cow's milk g/ml
Water	88,00	88,00
Protein (for growing)	1,30	3,30
Fat (for energy)	4,10	3,80
Sugars (for energy)	7,20	4,70
Iron (for blood)	0,007	0,0005
Calcium (for bones)	0,34	0,120

(a) Draw a bar graph to compare these two kinds of milk.

(b) A baby needs 20g of protein a day. How much milk would he or she need per day?

(c) Study the information on a tin of infant formula. Copy the table into your exercise book. Include a column for the information on the infant formula.

(d) Draw a graph to compare the three different types of milk.

(e) Which milk would you choose to feed a baby? Give reasons for your choice.

- Learners then continue to do another activity whereby they write one or two sentences to describe the following words! Premature, miscarriage, incubator, caesarian and abortion.

- In the last activity learners research different careers as follows:

The following people can play an important part in the health of the mother, her pregnancy and the birth of the baby:

(a) Midwife (b) community nurses, (c) gynecologist, (d) radiologist, (e) pediatrician, (f) anesthetist, and (g) obstetrician. Find out what these people do. Write short paragraphs describing each person's job.

- After the learners have done the activities in their jigsaw groups they divide the activities amongst themselves and form specialized groups. After discussion at the specialized groups learners go back to their jigsaw groups and explain their findings to each other. The group representative then explains the findings of each group to the rest of the class.

9. **Assessment strategy**

The following checklist is made. Can learners

- Describe the steps of development of a baby?
- Describe the three stages of birth?
- Find meanings of words?
- Assess different careers?
- Record information from a source on a table?
- Draw suitable graphs?
- Interpret information from graphs?
- Use scientific knowledge to make decisions?
- Discuss their decisions with others?
- Respect other people's choices, ideas and decisions?

10. **Resources**

- Doll, water, plastic bag
- Tins of infant formula.

11. **Duration:** 6 periods

LESSON 4

1. **Learning Programme**: natural sciences.
2. **Phase organizer**: environment.
3. **Areas of knowledge**: systems and control.
4. **Programme organizer**: making static electricity.
5. **Main specific outcome**: SO1, ACs 1,2,3,4,5,6, use process skills to investigate phenomena related to the natural sciences.
6. **Related specific outcomes**: SO2, AC 1.
: SO3, ACs 1,2,3,4,5,6,7,8.
7. **Facilitator's activities**
 - Divide learners into jigsaw groups.
 - Introduces the topic.
 - Facilitates.
8. **Learners activities**
 - Discuss static electricity and terminologies in their jigsaw groups which are atom, attract, electron, negative, positive, proton, repel, static electricity, lightning, spark.
 - Make static electricity by blowing up a balloon. Tie it's opening securely. Tear up tissue paper into small pieces place them on a table. Hold the balloon near (but not touching) the pieces of tissue. Does the tissue paper move? Rub the balloon with a woolen cloth. Hold it near the pieces of tissue again. What happens?
 - In the next activity learners find out whether various charged objects have the same or different charges. They choose various objects that are made from glass, Perspex (clear rulers), polyphone (plastic bags), and PVC (polyvinyl chloride) rods. Rub them with different materials. Record their observation and findings.
 - The other activity requires learners to create a spark. They do the activity in the darkened room.
 - (a) Choose a learner who has long, clean, dry hair. Blow up and tie a balloon. Rub the balloon against this learner's hair for two minutes. Quickly pull the balloon away from the hair. What happens to the learner's hair?

(b) Wear a woolen jersey over a nylon shirt. Rub the jersey against the shirt for two minutes. Take the jersey off. Record what you see and hear.

- In the last activity learners write a story about lightning.

Learners divide themselves into specialist groups with two learners from each jigsaw group being responsible for one activity. After the investigation in the specialized groups learners go back to their jigsaw groups.

Discuss their findings to each other and then to the rest of the class.

9 **Assessment strategy**

Assessment checklist is made. Can learners

- Identify features of static electricity?
- Ask questions about electricity?
- Explain how charged objects affect each other?
- Collect data by doing experiments?
- Interpret findings?
- Use a model of the atom to explain how objects become electrically charged.
- Show how static electricity form sparks?
- Explain how sparks and lightning form?
- Communicate their findings and ideas?

10 **Resources**

- Balloon, tissue paper, woolen cloth, glass, clear ruler, plastic bag, woolen jersey, nylon shirt.

11 **Duration:** 3 periods

LESSON 5

1. **Learning Programme**: Natural Science
2. **Phase organizer**: Environment
3. **Areas of knowledge**: Systems and control
4. **Programme Organizer**: Comparing forms of electricity
5. **Main Specific outcome**: SO1, ACs 1, 2, 3, 4, 5, 6

Use process skills to investigate phenomena related to the Natural Science.

6. **Related Specific outcomes**: SO2, AC 1
SO3, ACs 1, 2, 3, 4, 5

7. **Facilitator's Activities**

- Divide learners into jigsaw groups
- Introduce current electricity
- Facilitates

8. **Learners Activities**

- Make electric circuit to show current electricity in their jigsaw groups as follows;
 - (a) Cut two 200mm pieces of plastic coated electric copper wire. Remove 20mm of plastic from each end of the pieces of wire.
 - (b) Using sticky tape, stick the copper wire of one electric wire to the positive (+) terminal of a 1,5 v torch cell. Stick the other end of this wire to the side of the metal base of a torch bulb.
 - (c) Stick the end of the second piece of copper wire to the negative (-) of the torch cell and the other end to the bottom of the metal base of bulb.
 - (i) What happens to the light bulb?
 - (ii) From where does the electricity come?
 - (iii) How does the electric current reach the bulb?
 - (iv) Could you use the sparks you made in the previous activity to light up the bulb? Explain your answer.
 - (v) In what ways are the charges produced by the cell different from those caused by static electricity?
- Learners then observe a light bulb as follows;

Look carefully at a light bulb. Describe its shape and colours. What materials is it made from?

(a) Draw a labeled drawing of a light bulb.

(b) Place a light bulb in a lamp and plug the lamp into the wall socket. Switch the light on.

(i) What happens?

(ii) Which part of the lamp light on?

(d) Hold your hand near (but do not touch) the lighted bulb.

(i) What do you feel?

(ii) What kind of energy is the bulb giving off?

(e) Switch the lamp off.

(i) What happens?

(ii) Why do you think this happens?

- After the activities are done in the jigsaw groups they divide into specialized groups. Each specialized group does its activity and discusses its findings. They then go back to their jigsaw groups where they cooperatively share their findings. Each jigsaw group then share its finds with the rest of the class through its representative or group leader.

9. **Assessment Strategy**

An assessment checklist is made. Can learners:

- Identify features of static and current electricity?
- Ask and answer investigative questions about these forms of electricity?
- Collect data?
- Analyze and interpret data?
- Compare different forms of electricity?
- Communicate their ideas and findings with others?

10. **Resources**

- copper wire, bulb, torch cell, sticky tape, and lamp.

LESSON 6

1. **Learning programme**: Natural Sciences
2. **Phase organizer**: Environment
3. **Areas of knowledge**: Systems and control
4. **Programme organizer**: conductors and insulators
5. **Main specific outcome**: SO1, ACs 1, 2, 3, 4, 5, 6 use process skills to investigate phenomena related to the Natural Sciences.
6. **Related specific outcomes**: SO2, AC1
7. **Facilitators activities**
 - Divide the learners into jigsaw groups.
 - Introduces the topic
 - Facilitates
8. **Learners activities**
 - Discuss the topic in their jigsaw groups
 - Find out which materials conduct electricity as follows:
 - (a) Twist one end of a piece of copper wire around the metal part of a torch bulb.
 - (b) Attach the other end of the copper wire to the negative terminal of a torch cell.
Place the cell upright on a table so that the attached copper wire is underneath it.
 - (c) Touch the base of the bulb on the positive terminal of the cell. The bulb lights up.
 - (d) Place a piece of paper between the base of the bulb and the positive terminal.
Does the bulb light up?
 - (e) Place various items, such as safety pin, the graphite end of a sharpened pencil, a piece of chalk, and a plastic pen between the base of the bulb and the positive terminal of the cell.
 - (f) Copy this table into your exercise book. Complete the table by recording whether the light bulb lights up or not, and whether the material tested is an insulator or a conductor.

Material	Effect on light bulb	Conductor or insulator
Paper		
Safety		
Pencil graphite		
Chalk		
Plastic pen		

9. **Assessment Strategy**

An assessment checklist is made. Can learners

- Identify insulators and conductors?
- Show the effect of conductors and insulators on an electric current?

10. **Resources**

- Torch cell, bulb, paper, safety pin, pencil, chalk, plastic pen, copper wire.

LESSON 7

1. **Learning programme**: Natural Science
2. **Phase Organizer**: Environment
3. **Areas of knowledge**: Processing
4. **Programme Organizer**: Series and parallel circuits
5. **Main specific outcome**: SO1, ACs 1, 2, 3, 4, 5, 6 use process skills to investigate phenomena related to the Natural Sciences.
6. **Related specific outcomes**: NS SO2, AC 1
NS SO3, ACs 1, 2, 3, 4
TECH SO1, ACs 1, 2, 3, 4

7. **Facilitators Activities**

- Divide learners into jigsaw groups
- Introduces the topic
- Facilitates

8. Learners Activities

- Make their own circuit board in each jigsaw group as follows:
 - (a) They use a cardboard to make a box on their circuit board that can hold two cells tightly together so that the positive terminal of one cell touches the negative terminal of the other cell.
 - (b) Use bottle tops as stand for torch bulbs.
 - (c) Make a switch with a piece of wire between two nails.
- In the next activity learners compare series and parallel circuits.
 - (a) They use their circuit boards to make circuits with light bulbs in series and in parallel. Is there any difference between the brightness of the bulbs in parallel and those in series?
 - (b) Open the switch on your circuit. What happens to the other light bulb?
 - (c) Close the switch. Remove one cell. What happens?
 - (d) Replace the cell. Remove one light bulb. What happens to the other light bulbs?
 - (e) Draw circuit diagrams of your circuits with light bulbs in series and light bulbs in parallel.
 - (f) Which circuit do you think is used in homes, offices and schools? Explain your answer.
- They divide the activities into specialized subsections and discuss their findings. After that they go back to their jigsaw groups as specialist of their subsections

9. Assessment strategy

An assessment checklist is made. Can learners

- Identify circuits with bulbs in series and in parallel?
- Ask questions about bulbs in series and in parallel?
- Make a circuit board that works?
- Collect relevant data?
- Compare different circuits?
- Analyze and interpret data?
- Communicate findings with others?

10. Resources

- Wooden board, cardboard, nails, bottle tops.