Interactive Learning and Teaching

Module Three

Questioning Skills

Module Four

Doing Investigations

Roger Federer Foundation

Acknowledgements

Parts of Module Three are adapted from the following:

1. Teacher Education for Sub Saharan Africa (TESSA). Key Resource: Using questioning to promote thinking. TESSA English Africa. http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=80326
2. University of Fort Hare (UFH) (1999). A whole language approach. *Core Learning Areas. Language, Literacy and Communication (2nd Umthamo).* University of Fort Hare (UFH) & East Cape Department of Education Distance Education Project. http://www.oerafrica.org/FTPFolder/Teachered/UFH/language.umthamo2-a-whole-language-approach.pdf

Parts of Module Four are adapted from the following:

1. Teacher Education for Sub Saharan Africa (TESSA). Science – looking at life. TESSA English All Africa. Section 2: A closer look at plants. Pp 5,6,12 http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=80658
2. Teacher Education for Sub Saharan Africa (TESSA). Investigating number and pattern. *Numeracy Module 1.* TESSA English All Africa. Section 3 Ways to solve number problems http://www.open.edu/openlearnworks/mod/oucontent/view.php?id=81142
3. University of Fort Hare (UFH) (1998). Classroom management: Group work. *Core Education Studies. Helping Learners Learn (1st Umthamo).* University of Fort Hare (UFH) & East Cape Department of Education Distance Education Project. http://www.oerafrica.org/FTPFolder/Teachered/UFH/helpinglearnerslearn.umthamo1-classroom-management-group-work.pdf
4. University of Fort Hare (UFH) (1999b). What's happening here? *Core Learning Areas. Natural Science (2nd Umthamo).* University of Fort Hare (UFH) & East Cape Department of Education Distance Education Project. http://www.oerafrica.org/FTPFolder/Teachered/UFH/naturalscience.umthamo2-whats-happening-here.pdf

Saide: Course design and development.

ROCS: Course implementation coordination.

Roger Federer Foundation: Lead and funding of development and implementation

Contents

Module 3:
Questioning Skills

Learning outcomes

By the end of this module you will have:

1. Worked to achieve a balance in your learning activities between teacher talk and questions and learner talk and questions;
2. Explored a range of ways to plan and prepare a safe environment in your classroom for learner participation;
3. Asked a range of different kinds of questions in your classroom which link with learners' own knowledge and experience, open up communication in the classroom and stimulate critical thinking;
4. Created opportunities for learners to construct and ask questions;
5. Developed ways of encouraging and responding to learners' questions and contributions.

Week 1: Getting the balance – teacher talk and learner talk

Activity 1: Think about your own teaching: Who is doing the talking?

45 mins

Purpose

- To find out the ratio between teacher talk and learner talk in your classroom.

Word Power

***Ratio**: n. relationship between two amounts, showing how much bigger one is than the other*

What you will need

- Pen or pencil for filling in the checklist
- Check list for classroom observation, page 182 below.
- An observer to fill in the check list for your classroom.
- A colleague or friend to take a video i of the lesson.

What you will do

- Teach your class in the way you normally do.
- Have an observer fill in a checklist to show who talks the most and who asks the questions in your classroom.
- Watch the video.
- Find out what the ratio is between teacher talk and learner talk and teacher and learner questioning in your class.
- At the next study group meeting you will discuss your findings.

1. In your study group, decide on which teacher should teach the lesson that will be videoed. It can be any lesson of their choice, and should be implemented in the way that they usually teach.

   A friend or colleague should be tasked with making the video**.**

   Use the tablet to video the first 15 minutes of the lesson.

2. The rest of the teachers in the group should work in pairs. One teacher should teach a lesson of their own choice in the style that they usually use in class while the other teacher observes and fills in the checklist which you can see below and which is also available in your printed Study Guide.

3. Each teacher must take a turn to teach and also have a turn to observe. So, do one lesson first and then swap roles and do another lesson. The teacher who did the observing will now teach and the other teacher will use the checklist to observe.

4. **Guidelines for observation**: Use the check list in your printed Study Guide to fill in your observations.
    - Observe the lesson for the first 15 minutes
    - Make a mark (/) for every sentence spoken by a teacher in the TEACHER TALK block in the checklist.
    - Make a mark (/) for every sentence spoken by a learner in the LEARNER TALK block in the checklist.
    - Do the same for every question asked by a teacher or a learner.
    - It will be difficult to do this accurately. However, the observer should try their best to be as accurate as possible.
    - Stop after 15 minutes and add up the marks for teacher talk, learner talk, teacher questions and learner questions.
    - The results will give some idea of how much you and your learners are talking and asking questions.

Checklist for teacher talk and questioning / Learner talk and questioning **Instructions**: Observe and fill in for 15 minutes of the teacher's class			
TEACHER TALK **Instructions**: Each time a <u>teacher</u> speaks a sentence, make a mark (***I***) in the block below.	**Total**	**LEARNER TALK** **Instructions**: Each time a <u>learner</u> speaks a sentence, make a mark (***I***) in the block below.	**Total**
TEACHER QUESTIONS **Instructions**: Each time a <u>teacher</u> asks a question, make a mark **(*I***) in the block below.	**Total**	**LEARNER QUESTIONS** **Instructions**: Each time a <u>learner</u> asks a question, make a mark (***I***) in the block below.	**Total**

Activity 2: Think about the ratio of teacher and learner talk in your lessons

 30 mins

Purpose

- Discuss and reflect on the ratio between teacher talk and learner talk in your classroom.

What you will need

- Pen or pencil for making notes
- The check list for classroom observation that you filled in
- The video that was made of the selected teacher.

What you will do

- Watch the video of the selected study group teacher
- Look at the information you recorded on your checklist
- Calculate the ration of teacher talk as compared with learner talk.
- Discuss how much teacher talk and how much learner talk there is in the video and in the lessons that you have each observed?

1. In your study group, watch the video.

2. For the teacher, that you observed work out the ratio of teacher talk: learner talk. E.g. If the teacher talk total is 210 and the learner talk total is 51, the ratio of teacher talk: learner talk is 210:51.

3. As 51 divides into 210 about four times, this means that you talk 4 times as much as your learners do.

4. Work out the ratio of teacher questions: learner questions in the same way.

5. Now compare your checklists and see whether your ratios are similar or different.

Stop and think

Who did most of the talking and questioning? The teacher or the learners? Or was there a balance? Individually, write your thoughts and discuss them in your group.

 ……

……

Activity 3: Making the shift from traditional to interactive teaching

 1 hour

Purpose

- To watch the video clips that show a teacher (Billy) teaching the same topic using two different approaches.
- To focus on how much learner talk and questioning there is in each of the two lessons.

What you will need

- Videos 24,25 and 26
- Pen or pencil for making notes;

What you will do

- First, watch **Video 24 a traditional approach to teaching** a Grade 5 Social Science lesson. Topic: Our District
- Answer the questions in 3.
- Then watch Videos 25 and 26 **an interactive teaching approach** using questions to teach a Grade 5 Social Science lesson: Our District
- Answer the questions in 6.
- Think about and discuss the two different ways in which Billy taught the same topic.
- Discuss whether there was any differences between the amount of teacher talk, learner talk and learner engagement in the two versions of the same lesson?

1. Before you watch Video 24, read the questions in 3 below, in your group.

2. In your group, watch Video 24, and think about the questions while you do so.

3. Now discuss and answer all the questions a - h. Write down the key points that you have observed and discussed in the space provided:

    a. How many questions did Billy ask during the lesson?

 ……

    b. Apart from asking questions, what other teaching methods did he use?

✍ ……

……..

c. How many times did learners talk?

✍ ……

d. How many times did learners ask questions?

✍ ……..

e. What do you think is the ratio between teacher talk and learner talk in the lesson?

✍ ……

f. What did Billy ask learners to do during the lesson?

✍ ……

g. Were the learners engaged in learning?

Word Power

Engaged*: adj. involved, occupied or participating*

✍ ……

h. What makes you say so? Explain

✍ ……

4. Before you watch video 25 and 26 read the questions in 6 in your group.

5. In your group, watch Videos 25 and 26, and think about the questions while you do so.

6. Now discuss and answer all the questions a - f.

   Write down the key points that you have observed and discussed in the space provided:

   a. In this video, did Billy ask more or less questions than he did in the previous video?

   ✍ ……

   b. What other differences did you notice between this lesson and the last?

   ✍ ……

   c. How many times did learners talk in this lesson? How many times did learners ask questions?

   ✍ ……

   d. What do you think is the ratio between teacher talk and learner talk in this lesson?

   ✍ ……

   e. What did the teacher ask learners to do during and after the lesson?

   ✍ ……

f. Do you think learners were more engaged or less engaged than they were in the previous lesson? What makes you say so?

✍ …….

……

…….

Stop and Think

Who did most of the talking in the Video 24 lesson?
What effect do you think this kind of teaching has on young learners?

✍ ……

……..

Who did the talking in the Video 25 and 26 lesson?
What effect do you think this kind of teaching has on young learners?

✍ …….

……..

Activity 4: Asking questions: Building on learners' own knowledge

 45 mins

Purpose

- To study the Activity Plan for both versions of the Grade 5 Social Science Lesson: Our District, taught by Billy.
- To think back about videos 24 and 25 & 26
- To think about t how to build on learners' prior knowledge and experience by asking questions and getting learners to ask questions.

What you will need

- A pen or pencil for making notes
- The Grade 5 Social Science Tradtional Lesson Activity Plan: Our District on page 190 below and
- The Grade 5 Social Science Interactive Lesson Activity Plan: Our District on page 192 below.

What you will do

- Read and compare the two 'Our District' Activity Plans.
- Think back about Videos 24, 25 and 26 and how learning happened in each lesson.
- Think about how the teacher (Billy) activated and built on the learners' prior knowledge and experience by asking questions and getting learners to ask questions.

Word Power

Prior knowledge*: n. knowledge which they had before the lesson*

1. Study the Grade 5 Social Science**Tradtional Lesson Activity Plan** (page 190 below) and the **Interactive Lesson Activity Plan** (page 192 below). If you like, you can look at these two Lesson Activity Plans in your printed Study Guide and compare them.

   Discuss the points below in your study group and make brief notes about the differences related to:

   a. The 'Purpose' and the 'Skills/ Knowledge/Values' reflected in each of the Activity Plans.

✍ ……

……

……

b. What is different about the ‘Preparation and Resources Needed’ in each of the activity plans?

✍ ……

……

……

c. Discuss what is different about the ‘Introduction’ in each of the activity plans?

✍ ……

……

……

d. Discuss what is different about the kind of “Activities” that are described in each of the plans?

✍ ……

……

……

e. Is there any difference in the way each of the lesson activities end? If so, describe the difference.

✍ ……

……..

1. Tradtional Approach Activity Plan: Topic = Our District

Name of School:	**Date and/or Time:**
Grade/s: 5	
Time allocation: One 45 minute lesson	
Subject Focus: Social studies: Our District: Living together in the community	

Purpose of activity:
To convey to learners information about their district, found on a map and in a textbook
Specific outcomes
5.1.1.1 Locate on the map of Zambia the position of the district
5.1.1.2 Identify the main physical features on a map of the district
5.1.1.3 Describe social, economic, cultural, political structures of the district in the past
5.1.1.4 Mention the cultural composition of the people in the district
	Skills / knowledge / attitudes learners should develop:
	• The skill of map reading;
	• Knowledge of the district's
	  ○ physical features,
	  ○ past social, economic, cultural, political structures,
	  ○ population groups,

PREPARATION AND RESOURCES NEEDED

1. Textbook, containing the above information (e.g. Grade 5 *Let's do Social Studies*, by Mary Chilele and Jungu Mkandawire, pages 1 – 22). Oxford. Or any other approved Zambian Grade 5 Social Studies text book.
2. Map of Zambia, with provincial divisions, main towns. (Big one, that can be seen by whole class)
3. Map of Zambia, with main physical features (mountains and rivers). (Big one, that can be seen by whole class)

INTRODUCTION

How you introduce the activity, (get the learners' attention)

- Show the learners the political map of Zambia (in their text book and/or on the wall).

Point out:

- The ten provinces in Zambia;
- The position of their province and district on the map. Let the learners write a heading 'My province and district' in their books.

- The districts in their province. Learners should write down the names of the districts in their province, under the sub-heading ‘Districts in my province’.
- The main towns in the province and district. They should write down the names of the towns in the province and in the district under the sub-heading ‘Towns’.

DO THE ACTIVITY **Teacher Tasks** (What will you do to support the activity?)	**Learners Tasks** (What will the learners do in the activity?)
1. Discuss the physical features which are shown on a map, mountains/highlands; plateau; escarpment, watershed, rivers and river valleys, waterfalls, swamps and lakes.	• Learners are quiet, paying attention to what is being taught. • They answer key questions about features on the map when asked.
2. Tell learners, and write notes on the board, about the social, economic, cultural and political structures of the district, using the outline in the textbook and making sure that learners are listening by asking key questions and checking at intervals that they have heard and understood.	• They copy down the notes.
3. Write key questions on the board which check understanding of what has been taught.	• Learners copy down and write answers to certain key questions.
ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?) 1. Go through the answers to the questions. 2. Summarize what has been taught	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?) • Learners mark their work.

2. Interactive Approach Activity Plan: Topic = Our District

Name of School:	**Date and/or Time:**
Grade/s: 5	
Time allocation: This plan will be implemented over two lessons of 45 minutes each	
Subject Focus: Social studies: Our District: Living together in the community	

Purpose of activity:

1. To develop in learners an awareness of and curiosity about their district.
2. To use questioning bring together the learner's prior knowledge as a basis on which to build new knowledge.

Specific outcomes

5.1.1.1 Locate on the map of Zambia the position of the district
5.1.1.2 Identify the main physical features on a map of the district
5.1.1.3 Describe social, economic, cultural, political structures of the district in the past
5.1.1.4 Mention the cultural composition of the people in the district
5.1.1.5 Describe the economic activities in the district
5.1.1.6 List names of historical and cultural sites in the district
5.1.1.7 State the significance of each historical/cultural site.

Skills / knowledge / attitudes learners should develop:

- Map-reading skills;
- Knowledge of the district's
  - physical features,
  - past social, economic, cultural, political structures,
  - population groups,
  - economic activities and
  - historical and cultural sites of the district, as well as their significance;
- An attitude of confidence in own knowledge;
- An inquiring mind, eager to know more about one's surroundings.

PREPARATION AND RESOURCES NEEDED

1. **Draw a large map of Zambia on chart paper – large enough for all learners to see.**
   - Show district divisions, main towns and, if possible, main physical features (mountains and rivers).

2. **Write the following questions beforehand on the board, or on a piece of chart paper.**

What do you know about your district?

- *What different ethnic groups live here?*
- *What do you know about each ethnic group's history or culture?*

- *What different languages are spoken here?*
- *What kinds of plants and animals are found here?*
- *What different kinds of work do people do?*
- *Are there any famous people who came from here?*
- *Did important things happen here long ago? Or recently?*
- *Are there any places which commemorate those historic or cultural events?*
- *Is there something tourists would like to see in your district?*

3. **Reference sources or textbook**, containing maps to copy and information about Zambia and its districts, in particular the district in which the school is located (e.g. Grade 5 *Let's do Social Studies*, by Mary Chilele and Jungu Mkandawire, pages 1 – 22). Oxford.

INTRODUCTION
How you introduce the activity, (get the learners' attention)

The teacher shows the learners the map of Zambia with provincial and district demarcations and asks the learners questions to draw out their existing knowledge of the topic.

- How many provinces do we have in Zambia?
- What are the names of the provinces?
- What is the name of our province?

The teacher invites one or two of the learners to come to the front of the class and to point out the provinces, on the map so that everyone can see where each province is located.

The teacher then asks some further questions:

- Why the provinces are named as they are?
- What do we call the smaller areas that the provinces are divided into? (Districts)
- How many districts is our province divided into? (The example in the video is the Lusaka province which is divided 3 districts)
- The teacher asks the learners to name the 3 districts
- Who can tell us the name of the district that we are in? (Kafue)

The teacher invites one of the learners to come to the front of the class and to point out the Kafue District on the map so that everyone see where it is.

Another learner is invited to try and pin point the learner's school on the map (in the video it is Chilambila Community School).

Then the teacher shows the learners the map of Zambia with natural/ physical features and continues to ask the learners questions to build on their existing knowledge of maps and how to read them.

- Why do we have maps?
- What are maps used for?

The teacher points to the map and asks:

- What do all these symbols on the map represent?
- Why do we call this list of symbols the key?

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

1. Group search for places

Let learners sit in groups.

Write the following questions (on the board or on papers per group) to answer in their groups: *What can you see on the map of our province?*

- *Towns*
- *Rivers*
- *Dams*
- *Lakes*
- *Escarpment*
- *Anything else (depending on your province, there may be other features?)*

Move round the class making sure the groups are on task.

Ask groups to report back on their answers, and write them on the board.

Learners Tasks

(What will the learners do in the activity?)

Group search for places

In groups, learners discuss and write answers to the questions: (Group roles and rules should be in place.)

What can you see on the map of the province?

- *Towns:*
- *Rivers:*
- *Dams*
- *Lakes*
- *Escarpment*
- *Anything else:*

Group reporters give their answers, which are written on the board.

2. Whole class discussion Teacher: Say to the learners: We have looked at the important geographic features of our Province, now I would like us to move closer to home. We will now look at our own district, (in the video it is the Kafue district) and try and find out as much information as we can about our district. • Ask questions such as the following, encouraging answers, delving deeper into their knowledge and adding to it. • Ask learners whether the answers provided are correct? See if all learners agree or not? Write down correct answers. o *What different ethnic groups live here?* o *What do you know about each ethnic group's history or culture? (Move away from this question after 5 or 8 minutes. It could begin to dominate the whole lesson.)* o *What different languages are spoken here?* o *What kinds of plants and animals are found here?* o *What different kinds of work do people do?* o *Are there any famous people who came from here?* o *Did important things happen here long ago? Or recently?* o *Are there any places which commemorate those historic or cultural events?* o *Is there something tourists would like to see in your district?* Comment that between us all, we know quite a lot about our district. What do we still need to know?	**Whole class discussion** Learners respond to questions as a whole class and discuss answers to reach agreement as to whether the information is correct or not? *What do you know about your district?* • *What different ethnic groups live here?* • *What do you know about each ethnic group's history or culture?* • *What different languages are spoken here?* • *What kinds of plants and animals are found here?* • *What different kinds of work do people do?* • *Are there any famous people who came from here?* • *Did important things happen here long ago? Or recently?* • *Are there any places which commemorate those historic or cultural events?* • *Is there something tourists would like to see in your district?*

3. Think, pair, share Ask learners: • On their own, to come up with one or more questions which they have about the district. After they have had a minute to do this, ask them: • To work with a partner to combine their questions and think of more. **4. Report back and discussion on finding answers** Now ask learners to report back on their questions. Write the learners questions down on the board. Discuss with the whole class how they can find out the answers to these questions for homework (Possible answers: ask a teacher? ask an elder? person with specialist knowledge? read the text-book?) Ask specific pairs of learners to find out the answers to specific questions. **5. Homework** In pairs, learners are tasked with finding out the answers to the questions that have been allocated to each pair. This will prepare the way for the next lesson, when answers will be given and information about the district consolidated.	**Think, pair, share** ○ On their own, learners should write down a question (or more) which they have about the district. ○ Join a partner to combine their questions and think of more. **Report back and discussion on finding answers** Learners report back and their questions which are listed on the board by the teacher. Participate in a discussion on how they can find out answers to their questions. **Homework** As homework, specific pairs of learners have to find out answers to some of their questions in preparation for the next lesson.
ENDING THE ACTIVITY (Teacher) (What does the teacher do to end the activity?) Ask the learners what they have learned today: • What have they learned about maps? • What have they learned about their district? • What have they learned about learning / finding things out? Listen carefully to answers given and affirm learners, drawing out more from them.	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?) Learners respond with their ideas.

Test yourself

- Before moving onto Week 2 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. The relationship between two amounts, (like the amount of teacher talk, and the amount of learner talk) is called:

    a. Prior knowledge ☐

    b. A ratio. ☐

    c. A balance. ☐

    d. An equation. ☐

2. Learners are more engaged in a lesson if:

    a. The teacher does all of the talking ☐

    b. The learners do all of the talking ☐

    c. The teacher write notes and the learners copy them ☐

    d. There is a balance between teacher talk and learner talk. ☐

3. Learners can absorb new information better if:

    a. It is written on the board. ☐

    b. They can link it to something they already know. ☐

    c. They have their own textbooks. ☐

    d. They are challenged with new knowledge ☐

4. Teaching based on the learner's prior knowledge - moving from the known to the unknown is a way of:

    a. Valuing learners own knowledge and experience ☐

    b. Getting the learners to talk in class ☐

    c. Assessing what learners know ☐

    d. Assessing what learners don't know ☐

5. One important difference between Billy's traditional lesson and the second lesson he taught is that:

    a. He used different maps in the two lessons. ☐
    b. The second lesson took more time than the first. ☐
    c. Learners created their own questions in the second lesson. ☐
    d. He gave them written work in the first lesson. ☐

Week 2: Plan, prepare and implement teacher and learner questioning activities

Activity 1: Thinking about learner participation and questioning in your classes

 30 mins

Purpose

- To think about and discuss the reasons for learners' participation / lack of participation and questioning in your class.

What you will need

Pencil or pen to make notes.

What you will do

- Discuss reasons for your learners' participation / non-participation and questioning in class.
- Write down your ideas in the space provided.

In your study group

1. Discuss your own experiences of learners taking part (or not taking part) in class. Write down your thoughts on the lines below.

   a. Do the learners in your class participate freely in your lessons/activities?
      - Do they ask questions?
      - Provide reasons for why you think they feel free to participate and to ask questions?

 ……

……

…… ……

……

b. If learners are reluctant to participate or to ask questions, what do you think the reasons for this are?

- Provide reasons for why you think they may not feel free to participate and to ask questions?

> ***Word power***
>
> ***Reluctant****: adj.*
>
> *Unwilling or hesitant*

……

……

……

……

……

……

> ***Word power***
>
> ***Norms****: n. ways of doing things which are seen as normal and acceptable*

c. Discuss whether the norms of school and home encourage learner participation and questioning.

- Do the rules and norms of the school encourage learners to participate and ask questions of their teachers?

……

……

……

……

d. Do the rules and norms of the home encourage learners to ask questions of their parents and other elders?

……

……

……

……

e. This Interactive Learning Course presents a view of learning which is different from the traditional one which we were used to when we were young? What do you feel about these changes?

✍ Changes and your response to them ……

……

……

……

If the current norm or custom is not to actively encourage children to ask too many questions, what can you do as teachers to change this practice in your classrooms?

An interactive approach to learning encourages learner participation and learner questions. Why do many education experts believe that it is a good thing for learners to ask questions and find answers for themselves?

Think about these questions when you do the next activity!

Activity 2: Learners constructing their own questions and finding out the answers

 15 mins

Purpose

- To stop and think about the value of getting learners to formulate their own questions and to find out the answers for themselves.

What you will need

- A pen or pencil for making notes

What you will do

- Discuss why it is important for learners to be able to:
  - Formulate their own questions about a topic related to their own immediate environment.
  - Find the answers on their own by asking people in their own community
- Answer the questions in section 2 below and write your responses in the space provided.

1. In your group, discuss your thoughts about the importance of building the learners' confidence and ability to think of relevant questions about a specific topic.

   Also discuss why it is important (what skills will learner's acquire?) by going out and finding the answers to their questions by talking to various people in their own community.

   Write your key points in the space provided:

   ✍ ……

   ……

   ……

   ……

2. Now discuss the following questions in your study group and write your response in the space provided.

   a. Is the following statement TRUE or FALSE? Give reasons for your answers.

Learners are likely to be more engaged in a lesson if they ask some of the questions.

✍ ……..…..…….

……

……

b. Is the following statement TRUE or FALSE? Give reasons for your answers.

If learners are tasked with finding out information for themselves by asking people in their community to answer questions about specific topics, they will learn more than if the teacher provides this information in the classroom.

✍ ……..…..…….

……

……

Activity 3: Plan and prepare a Social Studies lesson – Using teacher and learner questioning activities

 45 mins

Purpose

- To plan and prepare a Grade 5 Social Studies lesson on the topic: "My District"
    - Use questions in class to build your lesson on the learner's own knowledge and experience of this topic
    - Encourage the learners to expand their own knowledge of this topic by formulating their own additional questions.
    - Task your learners with going out into the community to find the answers to their questions.

What you will need

- The filled in Interactive Approach Activity Plan: Topic Our District, page 192 above.
- The blank Activity Plan Template on page 207.
- Refer to Videos 25 and 26.
- Pencil or pen for writing your plan

What you will do

- Work with a colleague to plan and prepare a Social Studies lesson which uses a similar approach to that which you watched in Videos 25 and 26 on the topic: *My District*
- Choose a Social Studies topic that is in the Syllabus and which is appropriate to the grade and level of your learners.

The lesson will:

- Aim to maximise learner engagement and participation
- Aim to achieve a balance between teacher talk and learner talk;
- Make use of teacher and learner questions
- Include a homework task in which learners are require to formulate a question about their district and find the answers for themselves.

Work with a colleague (in pairs) to fill in your Activity Plan on page 207.

Use the points below as a guideline to help you fill in the Activity Plan.

1. Carefully read through the filled in Interactive Approach Activity Plan: Topic - *Our District* (page 192 above) which Billy used as the basis of the lesson which we saw in the videos of the Interactive Lesson.

2. If you want to refresh your memory, watch Videos 25 and 26 – Becoming an Interactive Teacher (Part 1 and Part 2) again.

3. Think about how you will teach a Social Studies Lesson that is similar to Billy's lesson.

4. Choose a Social Studies topic that is in the 2013 Syllabus and which is appropriate to the grade and level of the learners that you and your colleague both teach. For example:
    - Grades 1 and 2 you may want to plan a lesson on the topic of transport and communication
    - Grades 3 and 4 - Transport and communication
    - Grades 5 and 6 - Living together in the Community: My District / My Province
    - Grade 7- The World – Continents or Physical Features

5. Start filling in the blank Activity Plan Template on page 207 of your printed Study Guide.
    - Think your activity topic and purpose
    - Plan and prepare the resources you will need for the activities. For example:
        - A map of Zambia
        - A map of the world
        - Key questions written up on a chart.
        - Other resources…?

    - How will you organise your class for this learning activity – whole class questioning or will you prepare different questions for various groups?

        - Look carefully at the 'Our District' Activity Plan. Think about:
        - The way the teacher introduced the lesson.
        - The way Billy mixed group work with whole class teaching.
        - The resources he used.
        - The way he drew out the learners' prior knowledge.
        - The way he used questioning.
        - The way he stimulated learners to create their own questions.
        - The way the learners were going to find answers to their questions.

    - Think about and plan the questions that you will ask your learners.

    - Think about how you will help your learners to think of additional questions related to the topic.

    - Plan the homework activity:
        - Will the learners do this task on their own or in pairs?
        - How will you ensure that each learner/pair has a good question to research?
        - How will you help your learners to know who they can speak to in the community to answer their question?
        - When and how will the learners need to report back to the class on the answers to their questions?

In your Study Group:

6. Once you have planned your lesson and thought about all the necessary preparations, agree on:
    - Which teacher in your group will have their lesson activities videoed
    - When the lesson will be implemented
    - Who will make the video using the tablet
    - When the Study Group will meet again to watch and discuss the videoed lesson activities.

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / values learners should develop:**
PLANNING AND PREPARATION **RESOURCES NEEDED**	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

Activity 4: Implement a Social Studies lesson: Using teacher and learner questioning activities

 45 minutes

Purpose

- To implement a Social Studies lesson in which the teacher uses questioning, establishes prior knowledge, and gives learners opportunities to ask their own questions.

What you will need

- Your prepared activity plan
- Any resources that you need for implementing the planned lesson activities
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement this activity according to the plan with their own class.
- But only one teacher in the group will have their activity videoed.
- A colleague or friend will use the tablet to take the video.
- Later the whole group will watch and discuss the video (see Activity 5).

1. Follow the instructions under “What you will do” above.

Activity 5: Reflect on the Social Studies lesson: Using teacher and learner questioning activities

45 mins

Purpose

- To reflect on what worked well in the activity.
- To consolidate what you learnt from watching another teacher's activity.
- To identify what could be done differently the next time you implement this kind of plan.

What you need

- The video of the teacher's activity on the tablet.
- The Activity Plan for the teacher's lesson.
- A pen or pencil to make notes.

What you will do

- Watch the video that was taken.
- Reflect on the video activities and on your own activities.
- To make notes.

2. Before you watch the video, read the questions in section 3 (below) and keep them in your mind.

3. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

Study group teacher's video

4. Discuss these questions in your group. Write some notes about what you learned during the discussion:

a. What did you learn from watching the video of this practice lesson?
   - What was the purpose(s) of the activities? (See Activity Plan)
   - Were the purposes achieved? Yes/ No?
   - Explain.

……

……

……

……..

b. Which activity/ies were particularly successful? Explain what was successful about them.

✍ ……

……

……

……

c. Which aspects of the lesson surprised you? Explain.

✍ ……

……

……

……

d. Did the teacher experience difficulties with managing:
   - any activities?
   - any aspects of her plan?
   - any groups of learners?

   Do you think the lesson was too ambitious (tried to do too much)?

   Give details about all of these.

✍ ……

……

……

……

e. Can you think of ways you / she could improve her plan, or manage a similar lesson better in future?

✍ ……

……

Test yourself

- Before moving onto Week 3 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Learners will NOT be encouraged to participate and ask questions in class if the teacher:

   a. Creates interactive tasks for them to carry out in groups. ☐

   b. Punishes learners for making noise and being disrespectful. ☐

   c. Gives encouraging responses to all learner answers and contributions. ☐

   d. Asks open-ended questions which open up discussion. ☐

2. Select the ONE statement that does NOT describe an action that creates a safe environment for participation in the classroom.

   a. Let the learners in the younger grades (Grades 1-3) sit close to the teacher in class and make eye contact with them. ☐

   b. Let the Grade 4's work in pairs to think of questions about the lesson topic. ☐

   c. Let Grade 5 - 7 learners think of questions and find own answers by asking people in the community ☐

   d. Asked learners to quietly copy down the notes from the board. ☐

3. Which norm or custom of good behaviour, taught in the home, could discourage learners from asking questions in class?

   a. A young person should not question what an older person is doing. ☐

   b. Good children must share in the household chores. ☐

   c. Children should keep themselves busy outside when adults are talking. ☐

   d. All adults are a child's parents and can discipline the child. ☐

4. Which of the following teacher roles will make learners feel SAFEST to participate and ask questions in a classroom situation?

   a. Information-giver. ☐
   b. Facilitator. ☐
   c. Judge. ☐
   d. Advisor. ☐

5. Which of the following classroom arrangements will be encouraging to MOST learners to participate in classroom discussion and problem-solving?

   a. Groups of eight or 10 learners. ☐
   b. Chairs in a circle. ☐
   c. Groups of four or six learners. ☐
   d. Desks in rows facing the front of the classroom. ☐

Week 3: Asking different kinds of questions, encouraging and responding to learner contributions

Activity 1: Kinds of questions and how you use them

 30 mins

Purpose

- To think about the ways in which you use questions in your classroom.
- To think about the kinds of questions you use in your classroom.

What you will need

- A pen or pencil to fill in tables and make notes.

What you will do

- Discuss questioning in your classroom.
- Make notes

.

1. On your own, think about these questions and choose one option:

a. When do you use questions in your classroom and for what purposes? Make an **x** in the relevant column to mark your response.

Do you use questions:	**Often**	**Sometimes**	**Never**
At the beginning of a lesson, to establish prior knowledge, or to remind learners of previous work?			
To stimulate learners to think about the topic?			
To encourage learners to participate?			
To make learners think critically (Whether something is true or right, and why / why not?)			

b. What kinds of questions do you use?

Kind of questions (add others below)	Often	Sometimes	Never
Questions which have one right or wrong answer?			
Questions asking learners to remember and repeat something they had learned?			
Questions asking learners what they know and have experienced?			
Questions asking learners to say what they think or feel?			
Questions asking learners to give reasons for something?			
Questions asking learners whether something is true / good or false / bad, and why?			

c. What kinds of questions do your learners ask?

Kind of questions (add others below)	Often	Sometimes	Never
Do they ask you to clarify something?			
Do they ask you to explain something again?			
Do they ask about something they don't know and want to know about?			
Do they ask you to give reasons for something?			

2. In your study group, share your answers and write down 3 conclusions you have reached about questioning in your classrooms:

✍ ……..

…….

…….

Activity 2: The teacher's role in creating a safe environment for learner participation

 1 hour

Purpose

- To read Case Study: Tillie's Grade 4 English Lesson in order to identify factors which make learners feel safe and free to participate
- To discuss the teacher's role in creating a safe environment for learner participation

What you will need

- The traditional story: The river swept that swept away liars (below)
- Case Study: Tillie's Grade 4 English Lesson on page 220 below.
- Pencil or pen to make notes

What you will do

- In your Study Group, read the Case Study: Tillie's Lesson.
- Think about and discuss factors which make learners feel safe and free to participate in activities.
- Discuss how the teacher can create a safe environment for learner participation and questioning.
- Write your responses to the questions in Section 4 in the space provided

1. First read the traditional story that the teacher, Tillie, uses as the bases for her Grade 4 English Lesson in the Case Study Below.

A Traditional African Story: The river that swept away liars

An old man was on a journey with his friend. It was a long journey on horse-back. As they were travelling across the country, the old man saw a jackal crossing their path.

The old man remarked, "*This jackal is quite big*."
The friend replied, "*Oh, this is nothing compared to the one I saw yesterday*."
"*Is that so*?" responded the old man.
"*Oh yes. It was very, very big. In fact, it was as big as an ox!"*
"*As big as an ox?"* questioned the old man.
"*Yes, as big as an ox,"* answered the friend.
The old man asked again, "*You say 'as big as an ox'*?"
"*Yes, really, as big as an ox,"* said the friend.

The old man did not utter a word and they continued on their way, without talking to each other, for about an hour.

The friend noticed that the old man was not happy and he didn't know what was worrying him. So he asked the old man what the matter was. The old man told him that they would have to cross four rivers before they reached their destination. The last river was the biggest and the most dangerous of all the rivers. This river was allergic to liars, and no liar

could escape its wrath. It swept liars there and then down to the deep blue sea. It never missed a liar, even if the liar was to use a special magic potion which brings luck, and to give them power to conquer evil spirits.

When the friend heard this, he was quite shocked because he knew how powerful the magic potion was. If this river would not yield to the magic potion, then he knew it was a VERY powerful river. As they travelled, he became more and more uneasy. The old man also became sadder and sadder the further they rode. And as the old man grew sadder, the friend grew more and more panic-stricken.

As they neared each river, the size of the jackal changed. When they reached the first river the friend said to the old man,*"the jackal was not exactly as big as an ox. It was a bit smaller than an ox.*" The old man did not remark.

When they reached the second river, the friend said, "*The jackal was not even nearly the size of an ox. It was as big as a calf.*" But again, the old man did not remark. When they had crossed this second river, the old man just explained his concerns about the last dangerous river, and said no more.

As they were between the second river and the last river, the friend said, "*The jackal was not even as big as a calf. It was as big as a goat*." Just before they reached the last river, the jackal was the same size as other jackals, which are common everywhere.

That is why there is an idiom which says, "*Don't try to be important among your friends"*. *Everybody has something to share*". You don't need to exaggerate things in order to be important.

2. In preparation for reading the Case Study, read the questions in 3 below and keep them in mind while reading the Case Study:

3. Now read the Case Study.

Case Study: Tillie's Grade 4 English Lesson

Tillie had written down a traditional story which she had heard from an elderly friend.

She read through the story carefully and decided how far she would read into the story with her Grade 4 class. She was only going to read the first part of the story, because she wanted them to ask questions about it, in order to make guesses as to how the story would end.

She decided to read them the first three paragraphs, and wrote them out on the chalkboard the day before the lesson.

In the classroom the next day, Tillie told the learners how she had got the story from an elderly man in their community.

She told them that what was written on the board was just the beginning of the story. She read the beginning of the story aloud for the learners, and then asked

them to read it on their own, silently. Some of the learners whispered the story to themselves; others could read on their own completely silently.

When Tillie thought most of them had finished reading, she stopped them and asked them to work in pairs. They were to write down very quickly all the questions they could think of from what they had read. She didn't want questions to *test* what they had read. She wanted *real questions* about what was *not* in the passage they had read: things that had happened *before* the beginning of the story, and things that might happen at the *end* of the story. She moved around the classroom, making sure that they were writing down the right kinds of questions (not testing questions).

After about 5 minutes, when she could see that most learner pairs had written down a number of questions, Tillie stopped them. She asked each pair to join up with another pair and share their questions in their new group. After they had read each other's questions, they were to think of and talk about possible answers to some of the questions. She moved around the classroom, making sure that the groups understood what they were to do.

After about 10 minutes, she asked each group to read out one of their questions, and wrote it on the board. She then asked whether they had thought of possible answers to the question. Once they had given their ideas, she asked other groups whether they could think of possible answers to the question. She asked them to support their suggestions (said something like, 'Why do you think this is the answer? What does the story say that makes you think so?')

She tried to make sure that *each* group gave a question and some answers, and also asked shy learners to participate. Her aim was to involve all the learners in the discussion.

Now she asked learners to go back into the pairs they had worked in at first. They should discuss with their partner a continuation and an ending the story. They should write a proper story in their books, not just a few sentences. She gave them about half an hour to write their story. By the time they had finished, the period was over.

The next day, she gave the learners a chance to swap the stories they had written with other pairs. They were to make positive suggestions about one another's stories, making a comment on *what they had enjoyed most*, and *what they would like to know more about*.

She then read the original version of the rest of the story to them. She asked which endings they had read which they thought were better – or just as good. She gave some learners a chance to read their version of their ending to the class.

She took the learners' stories in and made constructive comments on them herself. She told them *what she had enjoyed most*, and *what she would like to know more about*. Later, they made some of the stories into reading books for their class library.

4. Read and discuss the following questions and write your responses in the space provided:

   a. What do you think encourages learners in this Case Study to participate in the lesson and ask questions?

   ✍ ……

   ……

   …… ……

   b. What role does the teacher play in creating conditions in which learners feel free to participate and to ask questions?

   - Does the teacher play a specific role? (e.g. Information-giver; facilitator; mediator; parent; friend; judge; advisor; pastor). How would you describe Tilly's role?

     ✍ ……

     ……

     ……

   - What is the teacher's relationship and attitude to the learners? Explain.

     ✍ ……

     ……

   - Does the teacher set up certain kinds of activities?

     ✍ ……

     ……

> ***Word power***
>
> ***Facilitator****: n. someone who helps people discuss and makes processes happen more smoothly*

> ***Word power***
>
> ***Mediator****: n. someone who helps the learners to understand the new content knowledge through discussion and reflection.*

- Does she make certain kinds of resources available?

✍ …….

……

- How does she manage learners' questions and answers?

✍ ……..

……

- Do you think that the way the learners are grouped and the classroom is arranged plays a role in how much or how little they participate? How were the learners grouped in the Case Study lesson? Explain your answer.

✍ ……..

……

……

- Do you think that the teacher's confidence and familiarity with the topic that she was teaching played a role in promoting learner participation and questioning? Explain your answer.

✍ ……

……

Activity 3: Encouraging and responding to learner contributions

 30 mins

Purpose

- To think about and discuss ways that a teacher can encourage learners to speak.
- To think about and discuss responses which encourage learning.

What you will need

- Four ways of responding to leaner answers, see page 225 below.
- Pencil or pen to write notes.

What you will do

- Individually, complete the table on "teacher behaviour" below.
- In your study group, think about and discuss the ways in which a teacher can encourage and respond to learner contributions
- Read: Four ways of responding to leaner answers below
- Answer the question in Section 4 related to the readings.

On your own

1. The following sentences describe ways a teacher can behave during a lesson involving questioning.

   Read each sentence and decide whether the teacher's behaviour will encourage learners to participate and learn, or not.

   Put an **X** in the column under **YES** or **NO**.

Teacher behaviour	**Will it encourage learning and participation?**	
	YES	**NO**
1. The teacher waits 3 to 6 seconds after asking the question, giving learners a chance to answer.		
2. When a learner answers incorrectly, the teacher says, 'That's wrong', or 'You're stupid'.		
3. The teacher always asks the same kinds of questions.		
4. The teacher ignores some learners' answers.		
5. When learners give wrong answers the teacher makes them stand in a corner, or beats them.		

6. The teacher asks a lot of questions one after another.		
7. The teacher listens very carefully to the learner's answer so that she can give the right response which will take the learning further.		
8. The teacher asks a question and then answers it herself.		
9. The teacher puts her questions in the right order, from easy to difficult, to lead the learners to think about the topic.		
10. The teacher does not correct wrong answers.		

In your Study Group

2. Discuss your YES/NO answers to the statements above.
   Reach agreement among yourselves on which statements should have a 'YES' response.

3. Read the four examples. Then answer the questions that follow in Section 4.

Four ways of responding to leaner answers

1. Teacher: *What causes rain?*

Learner: *It's when people pray in the church.*

Teacher: *It certainly helps when we go to God with our needs, but I was hoping you'd talk about what happens in the sky and the rivers and other parts of nature, that make it rain. Think about that and try again.*

The learner gives an answer which is not what the teacher was hoping for. She looks for an aspect of the answer that is right, gives them direction and suggest that they try again.

2. Teacher: *What causes rain?*

Learner: *The clouds. The sun sucks the water.*

Teacher: *Ye-es. So what can you tell me about how those two things fit together to make rain fall?*

The learner's answer is incomplete and not quite clear. The teacher *probes,* to find out more, and to help the learner put her answer together more clearly.

Word power

Probe *v. To query, to inquire or investigate further*

3. Teacher: *What causes rain?*

Learner: *The wind.*

Teacher: *Well, yes, the wind does play a part. What does the wind bring which makes it rain?*

When a learner's answer is only partly right, the teacher *prompts* them, adding hints, or asking further questions to help them develop their answer and improve it.

Word power

Prompt *v. To encourage or motivate*

4. Teacher: *What causes rain?*

Learner: *The sun sucks up the water and it makes clouds. When the clouds get high up into cold air, they change to rain.*

Teacher: *Well done. So how does this link to what we learned last week about the way the rain falls on the mountains?*

When a learner's answer is correct, the teacher tries to *refocus,* linking what the learner has said with knowledge learned before. This broadens their understanding.

Word power

Refocus *v. To re direct, help to clarify.*

4. Briefly summarise the strategies or methods that the teacher in the above example used to provide responses to learners which are encouraging and are not negative or belittling.

✍ ……

……

……

……

Activity 4: Plan and prepare an English language activity that promotes learner questioning

 1 hour

Purpose

- To plan and prepare your English language activity based on a traditional story.

What you need

- To refer to the Case Study: Tillie's Grade 4 English Lesson (See Activity 2 on page 220 above).
- A story to use for the activity – either the one used by Tillie in the Case Study on page 220 above, or one from the African Story Book series.
- The blank Activity Plan template on page 229207 below.
- Pencil or pen to write your plan

What you will do

In your study group:

- Read through and discuss this activity so that everyone is sure of what to do.
- You will all implement the planned activity-based lesson next week, but as usual, only one teacher's lesson will be videoed.
- Agree on which teacher's activity-based lesson will be videoed.
- Agree on the date and time of the video lesson
- Agree when you will meet again next week as a group to discuss the videoed activities.

Individually:

- Each teacher individually will plan and prepare a lesson based on a traditional story, which uses a similar approach to that used by Tillie in Case Study.
- If you are teaching grade 2, you will need to adapt the activity to focus on oral, responses from the learners, rather than written ones. The lesson will:
  - Aim to maximise learner engagement and participation.
  - Aim to achieve a balance between teacher talk and learner talk.
  - Involve teacher and learner questions.

1. Fill in the blank Activity Plan on page 229 below. Plan each aspect of the language activity systematically.

2. Think carefully about the story you are going to use. Do you already have one in mind, or do you still need to find an appropriate story? If so, you need to plan how you will get the story and write it down. You could use one of the traditional stories in the African Story Book series or you could use the same story that Tillie used - see page 220 Activity 2, above.

3. You will also need to decide whether you need to write the beginning of the story out:
    - on the chalkboard,
    - on a piece of chart paper,
4. When you have thought carefully about the purpose of the lesson, fill in the section on PURPOSE as well as the skills, knowledge, attitudes and values you wish your learners to gain from the activities.

5. Think about the way Tillie introduced the lesson. How you can get your learners to feel excited about and interested in it? Fill in introductory section.

6. Think about the body of the lesson. Fill in the 'Do the Activity' section, putting all the parts of the lesson in the right order.

    - What will you do in each part?
    - How will you move from one part of the lesson to the next?
    - Think about the way Tillie mixed group and pair work (in the Grade 4 lesson) with whole class teaching.
    - The way she drew out the learners' ideas, based on their prior knowledge.
    - The way she used questioning.
    - The way she stimulated learners to create their own questions.
    - The way the learners explored answers to their questions.

7. Fill in the 'Ending the Activity' section. In this part of the lesson:
    - Learners should get a chance to show or tell what they have done or learned;
    - It's a time to consolidate learning.

8. Once your activity plan has been fully written up, use your plan to write a list of the resources that you need to prepare so that you are ready to implement the activity with your class next week.

9. Once everyone in the group has completed their planning and thought about the necessary preparation, you will need to agree on which teacher in the group will have their lesson videoed next week. Also decide on who will make the video.
    - Agree on the day and date that the lesson will be implemented and videoed.
    - Agree on when the study group will meet again next week to reflect on the videoed lesson.

10. Everyone in the group will implement this lesson the planned lesson with their classes (but as usual, only one will be videoed for discussion).

Activity Plan

Name of School:	Date and/or Time:
Grade/s:	
Subject Focus:	
Purpose of activity:	Skills / knowledge / attitudes learners should develop:
PLANNING AND PREPARATION RESOURCES NEEDED	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

Test yourself

- Before moving onto Week 4 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

The questions below will help you to apply your understanding of different types of questing methods.

Read this short passage and answer the questions below, which are based on it.

Transport – long ago

A long time ago people had to walk from one place to another. They had to carry their luggage on their heads, in their hands and on their backs. These journeys were usually slow and tiresome. Then, people began to use tame animals such as cattle and horses to help them carry goods and travel from place to place.

Thousands of years before Christ was born (between BC 8000 and BC 3500) people invented the wheel. This allowed them to make carts. In sandy places, like the Kalahari, wheels did not work well. In these places, old canoes were pulled by cattle. Canoes, barges and sail boats were invented to help people travel over rivers, lakes and seas.

(Adapted from Chilele & Mkandawire, 2015, p. 89.)

Select the correct answer.

1. Which of the following questions about the passage is OPEN, encouraging further discussion?

   a. What did people invent thousands of years before Christ was born? ☐
   b. Did people use cattle to carry their goods, long ago? ☐
   c. Why was the wheel such an important thing to invent? Give some examples to show the importance of the wheel. ☐
   d. What did they use long ago in the Kalahari to transport goods? ☐

2. Which of the following questions about the passage draws out prior knowledge and experience?

   a. What did people invent to help them travel down rivers and across the sea? ☐
   b. What do you use to help you carry heavy packages? ☐
   c. Why was the wheel such an important thing to invent? Give some examples to show the importance of the wheel. ☐
   d. What did they use long ago in the Kalahari to transport goods? ☐

3. Which of the following questions on the passage promotes **critical thinking**?

   a. What did people invent to help them travel down rivers and across the sea? ☐
   b. Why did wheels not work well in the Kalahari? ☐
   c. What was made possible by the invention of the wheel? ☐
   d. Which was more important: the wheel or the sail? Give reasons for your answer. ☐

4. The teacher asks a learner 'Why did wheels not work well in the Kalahari?' and a learner answers, 'It was sandy there'. What response from the teacher would help **open up the topic for further thought and discussion**?

   a. Very good. ☐
   b. Yes, and why did that make it difficult to ride with wheels? ☐
   c. Mm. Any other answers? ☐
   d. Right. Next question? ☐

5. The teacher asks a learner 'How do members of your family travel, when you have to go to hospital, for instance?' and a learner answers, 'We go on foot, and when we reach the road, we take a taxi'. What response from the teacher would **help other learners feel comfortable to share their experiences**?

   a. Going on foot is difficult when someone is ill, isn't it? ☐
   b. Yes. Next? ☐
   c. Mm. Any other answers? ☐
   d. You go on foot all the time!? ☐

Week 4: Creating opportunities for learners' questions

Activity 1: Implement an English language activity-based lesson: Encouraging learner questioning

 45 mins

Purpose

- To continue from the previous week.
- To implement an English language activity-based lesson in which the teacher encourages learner questioning.

What you will need

- Your prepared activity plan
- Any resources that you need for implementing the planned lesson activities (e.g. a copy of the story that you have selected and prepared questions).
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement this activity according to the plan with their own class.
- But only one teacher in the group will have their activity videoed. You will need to agree ahead of time who that teacher will be.
- A colleague or friend will use the tablet to take the video.

Activity 2: Reflect on the implementation of the English language activity-based lesson

30 mins

Purpose

- To reflect on what worked well in the activity.
- To consolidate what you learnt from watching another teacher's activity.
- To identify what could be done differently the next time you implement this kind of plan.

What you need

- The video of the teacher's activity on the tablet.
- The Activity Plan for the teacher's lesson.
- A pen or pencil to make notes.

What you will do

- Watch the video that was taken.
- Discuss and reflect on the video activities and on your own activities.

1. Before you watch the video, read the questions in 3 (below) and keep them in your mind.

2. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

   Study group teacher's video

3. 3. Discuss these questions in your group. Write some notes about what you learned during the discussion:

   a. What did you learn from watching the video of this practice lesson?
      - What was the purpose(s) of the activities? (See Activity Plan)
      - Were the purposes achieved? Yes/ No? Explain.

……

……

……

……..

b. Which activity/ies were particularly successful? Explain what was successful about them?

……

……

……

……

c. Which aspects of the lesson surprised you? Explain.

……

……

……

……

d. Did the teacher experience difficulties with managing:
   - any activities,
   - any aspects of her plan,
   - any groups of learners?
   - Do you think the lesson was too ambitious (tried to do too much)?

Give details about all of these.

……

……

……

e. Can you think of ways you / she could improve her plan, or manage a similar lesson better in future?

……

……..

Activity 3: Using different kinds of questions to introduce a new topic

 1 hour

Purpose

- To identify and discuss the type and the purpose of the questions used by the teacher in a video clip of an introductory lesson on the topic of seeds.

What you will need

- Video 36
- Pen or pencil to write notes

What you will do

- Read the short piece: Kinds of questions on page 239 below.
- Watch Video 36 - observe and discuss the ways the teacher (Billy) uses questions.
- Discuss the kinds of questions Billy asks.
- Answer the questions in the two tables below.
- Write summary notes in the space provided.

In your study group:

1. Before you watch the video, read the questions in Tables 1 and 2 below. Also read the section entitled 'Kinds of Questions'.

2. Watch Video 36 – which is the introductory part of a lesson on seeds. Keep the questions below in mind while you are watching the Video.

3. Observe and discuss the kinds of questions Billy uses and for what purpose.

4. Fill in Tables 1 and 2. Put an **X** in the relevant column.

Table 1: Purpose of Questions

For what purposes did Billy use questions?	**Often**	**Sometimes**	**Never**
a. For testing at the end of the lesson?			
b. At the beginning of the lesson, to establish prior knowledge, or remind learners of previous work?			
c. To stimulate learners to think about the topic?			
d. To encourage learners to participate?			
e. To make learners think critically (Whether something is true or right, and why / why not?)			
f. Other?			

Kinds of Questions

*Questions like those in a) and b) are often called **'closed questions',** because they don't open up any further discussion. These questions are also 'lower order questions'. This means that you can answer them without doing any complex thinking.*

*Questions like those in c) and d) need you to do some thinking of your own and can have many different 'right' answers. They are therefore called **'open questions'**. Such questions link classroom learning with learners' own knowledge and experience, and open up communication in the classroom.*

*Questions like those in e) and f) are also open questions, and require '**higher order thinking'**. In other words, they need you to use parts of your brain which do complex thinking. Such questions stimulate what is called critical thinking.*

*It is important to include **different kinds of questions** in your lessons, and to include more 'higher order questions' as the learners get older.*

Table 2: Kinds of Questions

Kinds of questions did Billy use?	**Often**	**Sometimes**	**Never**
a. Questions which have one right or wrong answer			
b. Questions asking learners to remember and repeat something they had learned?			
c. Questions asking learners what they know and have experienced?			
d. Questions asking learners to say what they think or feel?			
e. Questions asking learners to give reasons for something?			
f. Questions asking learners whether something is true / good or false / bad, and why?			
g. Questions that help learners to understand the topic or new information better			
h. Questions that help to focus the learner's attention on something that is important to note			
i. Other?			

5. Discuss the question below in your study group. You may want to look at the video carefully again. Then write down your observations about the way Billy used questions in the introduction to the lesson on seeds. Give reasons for your views.

- Did the Billy try to build on the learners' own knowledge and experience? Explain.

✍……..……..

……

……

- Did Billy use questions to try and focus his learners to observe things more carefully? Explain.

✍……..……..

……

……

- Did Billy use questions to try and clarify information about the topic?

✍……..……..

……

……

- Did Billy try and encourage a range of views and answers to his questions or did he only accept one right answer? Explain.

✍……..……..

……

……

- How many different kinds of questions did Billy use in this video?

Activity 4: A learner asking questions and finding answers

30 mins

Purpose

- To study the example of a learner asking questions and finding answers
- To think about the value of learners formulating their own questions and finding out the answers for themselves

What you will need

- To read: The background to Daniel's Interview, below.
- Video 27
- A pen or pencil for making notes

What you will do (in your study group)

- Read about the task that Billy set his Grade 5 Social Science class (Background to Daniel's Interview).
- Watch the video (27) in which Daniel, asks a member of his community questions which help him to find out more about the economic activities of his district.
- Answer the questions in section 3 below and write your responses in the space provided.
- In the following week you will implement a questioning and research activity like this one with your learners.

1. Read the short piece about how Daniel came to be doing an interview.

In Week 1, of this Module, we watched the videos of the Grade 5 Social Studies Lesson in which the teacher (Billy) had been discussing the economic activities of their local district.

Billy has decided, that instead of just writing notes about this topic on the board for the learners to copy into their exercise books, the learners would learn more if they prepared their own questions and found out the information for themselves.

In Video 26 - the end of the map work lesson *"My District"* the learners were asked to think of their own questions about their district. For homework, they were then tasked with going out into the community and talking to various people to try and get answers to their questions. In the following lesson, Billy planned to ask the learners to report what they had been able to find out about the economic activities in their district.

Like in many parts of Zambia, agriculture is one of the key economic activities in the Kafue district where Billy teachers.

Daniel, one of the grade 5 learners, knows that when the maize has been harvested in his community, the people bring it to the school. This is the place where the maize bags are weighted, closed up and then transported to the nearest town to be milled.

He has therefore decided that is it a good idea to ask Joseph, the young man who he has seen weighing the bags, some questions about crops in his district.

2. In your study group, watch Video 27 – Daniel asking Joseph questions about the crops in Kafue district.

3. Discuss and answer these questions in the space provided.

    a. What did Daniel do before he started asking Joseph the questions?

✍……

    b. What did Daniel do after he had asked Joseph the questions?

✍……

    c. Apart from getting answers to his questions about crops in the district, what other skills and knowledge do you think Daniel learnt from preparing and asking Joseph these questions?

✍……

……..

……

Test yourself

- Before moving onto Week 5 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Which of the following is **NOT** a way to encourage learners to ask questions?

   a. Creating a safe environment for learner participation. ☐

   b. Writing up questions on the board for learners to write down and answer. ☐

   c. An attitude that believes that learners have valuable things to say. ☐

   d. Asking them to think of questions about things they would like to know about a topic or a story. ☐

2. Which of the following is **NOT** a way to create a safe environment for learner participation and questioning?

   a. Making sure that your classroom is always quiet. ☐

   b. Responding in a positive way to learners' contributions. ☐

   c. Listening carefully to learner contributions. ☐

   d. Giving learners time to think about and respond to your questions. ☐

3. Which of the following will be the **MOST** helpful in getting **all learners** to come up with their questions about a topic or story?

   a. Think – pair - share. ☐

   b. Asking the whole class to come up with questions ☐

   c. Asking each learner to write down his questions and then ask for volunteers to read them out to the class. ☐

   d. Ask them to generate questions in groups. ☐

4. Choose one of the following which is **NOT** good for interactive learning.

   a. Balancing teacher talk and learner talk ☐

   b. Drawing out learners' prior knowledge ☐

   c. Asking questions which open up communication in the classroom. ☐

   d. Writing notes on the board for learners to copy down ☐

5. Here are some rules you could give to learners who are writing down as many questions as they can about a topic or story. Which is **NOT** a good rule?

   a. Make sure that your spelling and punctuation are correct. ☐

   b. Ask as many questions as you like. ☐

   c. Don't stop to discuss, judge or answer any question. ☐

   d. Write down the exact words of every question. ☐

Week 5: Putting questioning skills into practice

Activity 1: Plan and prepare a lesson on transport: Applying teacher and learner questioning skills

 1 hour

Purpose

- To plan and prepare a Social Studies Activity on transport which uses a similar approach to that used by Billy in the Interactive Lesson: “My District”, but this time on the topic of transport.
- To plan a range of questions which you can get your leaners to research in their community as part of the Social Studies syllabus.

What you need

- One or more Social Studies text books to refer to.
- To refer to the Activity plan used by Billy in the Interactive Lesson: “My District” [See Week 1: Activity 4 page 192].
- The Extract: Zambian Social Studies Syllabus on page 246 below.
- The blank Activity Plan template on page 248.
- Pencil or pen for writing your plan.

What you will do

In pairs:

- Plan and prepare a lesson on the development of transport in your district which uses a similar approach to that which you watched in video 25 and 26 – Billy’s interactive lesson – “My District”.
- Use questions to obtain as much information as possible about the topic based on the learners own knowledge and experience.

In your study group:

- Discuss and plan a range of questions (related to the topic of transport) which you can get your leaners to investigate in their community, just like Daniel does in the video (27) in Week 4: Activity 4.

The lesson will:

- Aim to maximise learner engagement and participation by making use of teacher and learner questions.
- Create an opportunity for learners to construct their own questions and to do their own investigations, interviewing members in their community to find out answers for themselves.

- Plan the logistics of implementing the lesson and the learner interviews with the rest of the study group:

- Agree on when the planned lessons will be implemented
- How much time will be allocated for the learners to conduct their interviews
- Agree on which teacher in the group will have their lesson videoed and who will take the video.
- The teacher whose lesson will be videoed, will then ALSO use the tablet to video a few of their learners conducting interviews. NOTE: Select a teacher and learners in one of the higher classes – grade 5 upwards.
- The teacher and learner videos will be shared at the next study group meeting.

- Agree on a date and time for the study group meeting.

In pairs:

1. Fill in the Activity Plan: Refer to the Social Studies curriculum/Syllabus. Transport (and Communication) is a topic that cuts across all seven grades.

2. The extract below follows on well from the Grade 5 lesson "My District" which we studied in Week 1: Activity 4.

Extract: Zambian Social Studies Syllabus

Topic: Transport and Communication

- Grade 1-3: The syllabus focus is on types of transport, signs and signals and on a range of safety issues, including risky behaviour on the road.
- Grade 4: The focus is on challenges such as non -availability of transport, accidents and pollution
- Grade 5: Transport and Communication in the District (Transport: from walking to scotch-carts to cycling to riding motor vehicles).
- Grade 6: Has a strong focus on road safety.
- Grade 7: Explores national and regional transport networks and the benefits that these bring.

3. If you do not teach grade 5, adapt the content knowledge to the grade and level of learners that you do teach.

4. Think carefully about the topic – transport. Study any text-books or other books which you may have.

5. Look carefully at the Interactive Activity Plan 'Our District' [Used in Week 1 Activity 4, page 192] it will help you to structure your activities on transport. Think about the way:

    - The teacher introduced the lesson.
    - Resources were used.

- The teacher drew out the learners' prior knowledge.
- He used questioning.
- He stimulated learners to create their own questions.
- The learners were going to find answers to their questions by interviewing people in their community to find the answers for themselves.

In your study group:

6. Plan a few questions which you can get your leaners to research in their community.

    - Discuss and prepare a list of questions related to the content knowledge of this topic and that are appropriate for the grade and level of the learners in you class.

    - These questions are intended as examples which will help learners to think of more questions themselves.

    - Write down your questions in the space provided. When you implement the lesson you will write these on a chart or on the board for the learners to see.

✍……

……..

……

……..

……

7. Remember to set a time and date for your next study group meeting at which you will watch and discuss the video of the lesson implementation as well as the learner's interview videos.

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / attitudes learners should develop:**
PLANNING AND PREPARATION **RESOURCES NEEDED**	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

Activity 2: Implement an activity-based lesson on transport: Applying teacher and learner questioning skills

 80 mins (double lesson)

Purpose

- To implement an activity-based Social Studies lesson on “Transport” in which the teacher uses:
    - questioning to establishes prior knowledge
    - creates opportunities for learners to construct their own questions and to investigate their answers by conducting interviews with community members

What you will need

- Your prepared activity plan;
- Any resources that you need for implementing the planned activities;
- The tablet for taking a video of the lesson implementation and a few of your learners conducting interviews with people in the community.

What you will do

- All the teachers in your study group will implement this activity according to the plan with their own class.
- Only one will have their lesson videoed. That teacher will also use the tablet to video s few of their learners conducting their interviews.
- You will need to ensure that each learner or pair of learners have prepared a relevant question which they will collect information on by interviewing someone in the community.
- Provide support to your learners by helping them think about who they can interview.
- Task your learners with writing down their questions and the answers that they get.
- Make the necessary arrangements with the learners to video a few of the interviews.
- At a follow up lesson the video of learner interviews can be shared with class mates
- Later the whole study group will watch and discuss the video of the lesson implementation as well as the videos of the learners conducting interviews with members of the community.

Implementing this activity- based lesson:

1. Introduce the lesson, asking questions of the learners to draw out their own knowledge and experience of the topic.

2. Present and discuss your planned content of lesson topic – transport.

3. Then discuss the questions you have formulated with your learners and encourage them to think of more of their own questions.

4. Explain to your learners that after the lesson (for homework) they will need to find out the answers to their questions. They will do this by identifying people in the community who they think have the knowledge to help them to answer these questions.

5. Explain to your learners that they should write down their questions and the answers they get.

6. Also explain that you will video a few of them while they do their interviews so that you can later share the videos with their friends in their class.

7. Agree on a date by when the learners need to have completed this task.

8. Explain that you will use the next Social Studies lesson as an opportunity for all the learners to present their research to the rest of the class. The learners will also be able to watch each other's interview on the tablet.

Activity 3: Reflect on the transport lesson activities: Applying questioning skills

40 mins

Purpose

- To reflect on what worked well in this activity-based lesson.
- To consolidate what you learnt from watching the video of another teacher applying questioning skills and supporting learners to do the same.
- To watch the videos that the teacher took of the learners conducting interviews with community members.
- To identify what could be done differently the next time you implement these kinds of activities.

What you need

- The video of the teacher applying questioning skills.
- The videos of the learners applying questioning skills
- The Activity Plan for the teacher's lesson.
- A pen or pencil to make notes.

What you will do

- Watch the video that was taken of the teacher as well as the videos of a few learners conducting interviews.
- Reflect on the video activities and on your own activities.

1. In your study group, watch the study group teacher's video and the learner interview videos on the tablet. Read the questions in Section 2 below and keep these in mind while you watch the videos.

   Study group teacher's video and learner's interview videos

2. Read, discuss and answer these questions in your study group. Write your answers in the space provided.

   - What was the purpose(s) of the activities? (See Activity Plan)
     - Were the purposes achieved? Yes/No?
     - Explain

……

……

……

- Which activity/ies were particularly successful? Explain what was successful about them?

✍ ……..

……

……

……

- Which aspects of the lesson surprised you? Explain.

✍ ……

……

……

……

- Did the teacher experience difficulties with managing:
  - any activities,
  - any aspects of her plan,
  - any groups of learners?

  Give details about all of these.

✍ ……

……

……

……

- Can you think of ways you/the teacher could improve their plan, or manage a similar lesson better in future?

✍……

……

……

……

……

- What did you learn from watching the video of this practice lesson?

✍……..

……

……

……

Test yourself

- This has been a difficult module, involving skills which many teachers struggle to master.
- Before moving onto Module 4 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer

1. Most of the following are important attitudes for a teacher. Which is the most important if you wish to promote learner participation and engagement in the lesson?

   a. A belief in discipline and hard work. ☐
   b. Respect for the wishes of the parents. ☐
   c. The belief that learners have valuable things to say. ☐
   d. An insistence on neatness, in the classroom, in learners' dress and in their work books. ☐

2. Choose the **BEST** answer. It is important to build new knowledge on the prior knowledge and experience of the learners because:

   a. New knowledge is more interesting and absorbed more easily if it can be linked with something a person already knows. ☐
   b. Knowledge is stored in our brains in structures like mind-maps. ☐
   c. We must move from the known to the unknown. ☐
   d. Learners are not empty vessels. ☐

3. Open questions are questions which:

   c. Draw on learners' prior knowledge. ☐
   a. Open up discussion and stimulate learner participation. ☐
   b. Have one correct answer. ☐
   d. Learners know the answer to. ☐

4. These sentences describe ways of responding to learner contributions. Which will **NOT** encourage more learning?

   a. Incorrect. Can someone give him the right answer? ☐

   b. Well done. So how does this link to what we learned last week? ☐

   c. Yes, you are partly right. But let's look at the question again to get the rest of the answer. ☐

   d. Let me listen to your answer again. (Repeats.) OK. Now listen to the question and try again. ☐

5. Why should we encourage learners to ask questions? Choose the **BEST** answer from the four below.

   a. It means they are engaged in the lesson. ☐

   b. You are more likely to learn something if it answers your own question. ☐

   c. It helps to balance teacher talk and learner talk. ☐

   d. We usually see learners as empty vessels needing to be filled with information we can give them. ☐

Module 4:
Doing Investigations

Learning outcomes

By the end of this module you will have:

1. Begun to value more highly the learners' ability to learn through their own investigation and enquiry;

2. Planned and facilitated activities involving learning and problem-solving through observation, investigation and discussion.

Week 1: Solving problems: Learner enquiry

Activity 1: Creating opportunities for learners to find things out for themselves

 30 mins

Purpose
To discuss activities that you have done with in your classroom in which learners have found things out for themselves.

What you will need
Pen or pencil to make notes

What you will do

- Discuss questions about activities which have taken place in your classroom in which learners had to find out information on their own.
- Write down some thoughts about things which have helped learners find things out for themselves.

On your own

Think about activities which have taken place recently (and earlier) in your class.

1. What did learners find out for themselves? In which activities did this happen?

2. What helped them find things out for themselves?
   - A safe environment for learner participation
   - The way I behaved towards them (My role / relationship with learners)
   - The way I organised the class (e.g. groups, pairs, whole class)
   - The kinds of questions I asked
   - Learner questions
   - The balance of teacher talk & learner talk
   - The kinds of resources used in the activity
   - The kind of task I set

Write down some of your thoughts:

 ……..

……..

……

……..

……

……..…

……..

In your study group

Share the ideas which you have written down and reach some agreement on things which can help learners find out things for themselves. Write down 3 important points:

✍ ……

……..

……

Activity 2: Solving Maths problems in different ways

 45 mins

Purpose

- To read the story of Mrs Phiri's maths class shows us that there are different ways of solving maths problems.
- To observe how bottle tops can be sued as a teaching aid to solve word problems or story sums.

What you will need

A pen or pencil to make notes

What you will do

- Read the Case Study of Mrs Phiri's maths class below.
- Discuss the questions in your study group and answer the questions
- Watch the video of Chintu (21) doing story sums with a group of learners
- Answer the questions related to the video.

In your study group

1. Read the Case Study: Mrs Phiri's Maths Class.

Case Study: Mrs Phiri's maths class: Different ways of solving problems

Mrs Phiri reminded her pupils that, when they go home from school, there isn't only one way to get home: there are many possible ways. Some are shorter, some longer, some safer, some more interesting. She told them it was the same with mathematics problems – there is often more than one way to get to the right answer, and looking at the different ways might be interesting.

Mrs Phiri put the following questions on the board.

1. Chanda has 24 bottle tops. He gives 8 bottle tops to a friend. How many bottle tops does he have left?
2. Kakanda eats 7 sweets every day. She has 42 sweets. For how many days does she have sweets?
3. The teacher buys 5 packets of crayons. There are 12 crayons in each pack. How many crayons does she have?

Next she asked the pupils to solve the problems using any method they liked. She asked them to work individually, and gave them 10 minutes to work on their answers.

She then split the class into groups of four or five and asked learners in the groups:

- To compare their answers to the problem;
- To explain carefully to each other how they had worked out their answers, and
- Count how many different ways were used to work out a correct answer.

After 10 more minutes, she asked them to stop working in groups. She asked each group to report back to the class. They had to answer the following questions about each problem:

- Did you all have the same answer?
- Did you all work it out in the same way?
- How many different ways did your group find to work out a correct answer for the problem? Describe the different ways.

She checked the answers and made a list on the board of the different ways of solving them.

Mrs Phiri then asked her to say which methods were most popular.

In closing the lesson, Mrs Phiri reminded her pupils about the different routes to school and explained that the same was true in maths, there were different ways of solving maths problems. She told her learners, to remember that if one method does not work, they should always try another!

2. In your group, discuss and answer these questions. Write in the space provided.

    a. What was Mrs Phiri's purpose in giving her class this activity?
        i. What did she want her learners to learn?

✍ ……

……

        ii. Why was it important for them to learn this?

✍ ……

……

        iii. Why do you think she let learners work on the problems on their own before coming together in groups?

✍ ……

3. Watch Video 21 where Chintu uses the bottle top counters she has collected as resources, for her learners to work out similar problems (story sums).

4. Discuss what is the same and different about Mrs Phiri's class and Chintu's class. Did they have the same purpose or different purposes?

5. Discuss which approach will be more appropriate for your class. Write down some of your ideas.

✍ ……

……

……

……..

……

……..

Activity 3: Plan and implement a Maths problem-solving activity

 60 mins

Purpose

- To plan and prepare a Maths activity similar to Mrs Phiri's, or similar to Chintu's.
- To implement the activity.

What you will need

- The blank Activity Plan template on page 268 below.
- A pen or pencil to write your plan
- Your tablet, a colleague or friend to take the video
- To find the resources needed for the activity (bottle tops or small stones)

What you will do

- You will plan and prepare an activity similar to Mrs Phiri's and/or Chintu's maths activity.
- All teachers will implement the planned maths activity in their class.
- One teacher in the group will be selected to be videoed while they implement the activity with their learners.

Work in pairs to fill in the Activity template. Use the template provided on page 268 below.

1. Fill in in the copy of the Activity Template that is in your printed Study Guide.
    - The first sections of the Activity Plan: School name; Date and Time; Grade(s); Time allocation, Subject focus.
    - The section on PURPOSE, according to your discussion in the previous activity.

2. Look carefully at Mrs Phiri's story and think again about the maths video of Chintu doing story sums with her group of learners. Think about and discuss with your partner:

    - Think about ways you can adapt the lesson for your grade level.
        - Are the problems appropriate for your grade?
        - Are your learners old enough to work on their own and in groups in the way Mrs Phiri's learners worked? Or is Chintu's lesson more appropriate?
    - Can you use the same introduction for the lesson?
    - Are any resources necessary? You may have resources in your STORE boxes which can help the learners as they work out solutions to the problems (e.g. bottle tops for counting may help younger learners like in Chintu's lesson).

3. Now carefully fill in all the other sections of the Activity Plan.

4. In your study group agree on whose lesson is going to be videoed and by whom and decide when you will come together again to watch and to discuss the video.

Individual teachers

5. With all the planning and preparation done, you will all now implement the maths activity with your learners.

6. A colleague or friend will take a video of the selected teacher implementing this maths activity with their class.

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / attitudes learners should develop:**
RESOURCES AND PREPARATION NEEDED	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

  ……

Activity 4: Reflect on the implemented Maths activity

30 mins

Purpose

- To reflect on the implementation of the maths activity – both by the videoed teacher and your own implementation.

What you will need

- The Activity Plan used by the teacher that was videoed
- A pen or pencil to write your plan
- The video of the activity on the tablet

What you will do

- You will watch the video and reflect on the activity assessing what went well and what could be done differently next time.

In your study group

1. Before you watch the video, read the questions in section 3 below and keep them in mind as you watch the video.

2. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

   Study group teacher's video

3. Now discuss the following questions in your group. Write some notes about what you learned during the discussion:

   a. What was the purpose(s) of the activities? (See Activity Plan)
      - Were the purposes achieved? Yes/ No?
      - Explain

……

……

……

b. Which aspects of the activity were particularly successful? Explain what was successful about them?

……..

……

c. Which aspects of the activity surprised you? Explain.

……

……..

d. Did the teacher experience difficulties with managing:
   - any aspects of her plan,
   - any groups of learners?
   - give details.

……..

……

e. Can you think of ways you / they could improve her plan, or manage a similar lesson better in future?

……..

……

f. What did you learn from watching the video of this lesson?

……..

……

Activity 5: Making simple resources

 30 mins

Purpose

- Read how the teacher (Francis) made simple maths resources to create opportunities for his learners to get more practice in doing certain maths problems.
- Think about how you can apply the same idea with your own class.

What you will need

- The Case Study: Making simple maths resources (below).
- A pen or pencil to make notes

What you will do

- You will read the case study of how Francis made simple resources for his learners so that they could to get more practice in solving maths problems.
- Make a set of cards to use with your learners in your next maths lesson.

1. Read this Case Study and then answer the questions in 2.

Case Study: Making simple maths resources

Francis was teaching in a small Community School. He only had one Maths text book for each class.

He found that for certain sections of the maths syllabus, there just were not enough examples in the textbook to give the learners the practice they needed.

Realising that it is so important for the learners to get lots of practice in solving problems, he decided to make sets of work cards, on which he wrote extra examples. Some he got from a friend of his that had a different Maths textbook, and some he just made up himself.

He made eight copies of each work card and an answer card to go with each set.

Once he had taught the learners a specific section, and they had done the examples from the text book, he would have a lesson in which they worked on their own on the work cards.

He would divide the class into groups of 8. (They all knew which group they belonged to; He had divided them according to their maths ability). The group leader would fetch a set of work cards and hand them out to the learners in that group. Once the members of the group had finished the work card, the leader would go and fetch an answer card. The group leader would read out the answers to the group and each group member would mark their own work. They would then move on to another set of cards, swopping sets with the other groups.

While the groups were busy, Francis would take the opportunity to go round from one learner to another, concentrating particularly on those who seemed to be finding the problems difficult.

2. Discuss and answer these questions in your study group.
    a. What problem did Francis have?

✍ …… ……

……

    b. How did he solve this problem?

✍ ……

……

    c. Do you have similar problem? Can you use this idea with your maths classes?

✍ ……

    d. Can you apply this idea to any other subject? If yes which subject?

✍ ……

Test yourself

- Before moving onto Week 2 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Choose the **BEST** answer. Learners are more likely to find out things for themselves if:

   a. They are given a problem to solve. ☐
   b. A safe environment for participation is created. ☐
   c. There is more teacher talk than learner talk. ☐
   d. The teacher adopts the role of a judge. ☐

2. Which statement is **NOT TRUE**? A problem is best solved if:

   a. You sit quietly and behave yourself. ☐
   b. You feel free to try many methods. ☐
   c. You have the right method to solve it. ☐
   d. You can find the essence of the problem. ☐

3. Which statement is **NOT TRUE?** Learners are more likely to find out things for themselves if:

   a. The teacher is playing a facilitative and supporting role. ☐
   b. They can work together with a partner or in a group. ☐
   c. The teacher is dictating notes for them to write down. ☐
   d. They feel free to ask questions. ☐

4. Which statement is **NOT TRUE**? A useful step or strategy for solving everyday problems is:

   a. To get different points of view on the problem and how to solve it. ☐
   b. To find out as much as you can about what is going on. ☐
   c. To leave it to the experts. ☐
   d. To brainstorm different ways to solve it. ☐

5. Choose the **BEST** answer. If learners can get to the essence of a problem:

   a. They will understand how Maths works. ☐
   b. They will not get confused by the details of a ‘story sum’. ☐
   c. They will have the right method to solve it. ☐
   d. They will get good marks. ☐

Week 2: Experiential learning: Whole class and group work

Activity 1: Learning through own experience in an Integrated Science lesson

Word Power

***Experiential**: adj. Learning through own experience or hands-on learning*

1 hour

Purpose

- To watch and discuss the video clips that show how the teacher (Charity) organises her multi-grade class (grades 1 and 2) to create opportunities for her learners to experience and investigate the properties of various materials in the Integrated Science lessons.

What you will need

- A pen or pencil
- Videos 28, 29, 30 and 31 on the tablet

What you will do

- Watch all four video clips: 28, 29, 30 and 31
- Think about and discuss the questions related to how the teacher (Charity) organised her multi-grade class and created opportunities for her learners to observe, experience and investigate the properties of various materials in the Integrated Science lessons.
- Answer the questions in the space provided.

1. In your study group watch each of the video clips. Discuss and answer the questions related to that clip before moving onto the next one.

Video 28: Planning and preparation – properties of different materials

a. How did Charity plan this activity?

……

……

……

b. Which skills, knowledge and attitudes did she aim to develop in the learners?

✍ ……

……

……

Video 29: Whole class activity -describing the properties of different materials

c. Why was it important that Charity carry out her own investigation of objects around the school before the lesson?

✍ ……

……

……

d. Did questioning play a part in this first part of the activity? What kinds of questions did Charity ask?

✍ ……

……

……

e. How were the learners' different senses used in this activity? Why was this important?

✍ ……

……

Video 30: Dividing the learners into homework groups – learner look for various objects

f. Explain what you think the purpose was of giving the learners the homework task of looking for objects with specific properties (smooth/ rough etc.)

……

……

……

g. Charity divided her class into groups and within the larger group she tasked her learners to work in pairs when they went out to look for various object. Why do you think she organised her learners in this way?

……

……

……

h. How did Charity manage the collection of different kinds of objects by the children? How did this work? Was it successful? Would you do it differently?

……

……

……

Video 31: Group work – learners apply what they have learnt about different materials and their properties

i. How did the teacher support learners as they investigated the properties of the materials in their groups?

……

……

……

j. How did Charity draw together the learner's findings so that they could consolidate what they had learned?

✍ ……

……

……

k. To conclude this activity, discuss what you think worked well in these lessons and what could be done differently?

✍ ……

……

……

……

……

Activity 2: Plan and prepare experiential activities for Integrated Science lesson

 45 mins

Purpose

- To plan and prepare activities similar to those that you watched Charity implement with her classes in the videos in the previous Activity. .
- The activities should involve the investigation of the properties of materials, in groups that work at different workstations.

What you will need

- The extract of the Integrated Science Syllabus (Grades 1-7) on page 285 below
- Charity's filled in Activity Plan, see page 286.
- A blank Activity Plan template – use the one in your printed Study Guide on page 268.
- A pen or pencil to write your plan
- Relevant sample materials and other necessary equipment (e.g. bowl of water, an egg).

What you will do

- You will plan and prepare activities similar to those you watched Charity implement in the previous Activity. Feel free to refer back to the videos again if you like.
- Remember, if you teach older learners, you will need to adapt the content to suit their level and grade.
- Refer to the Integrated Science Syllabus (Grades 1-7).
- Use Charity's Activity Plan for reference and guidance as you fill in your own plan.

The lesson aim:

- To create an opportunity for learners to learn through investigating the properties of real materials in their environment.

Working on your own or with a partner to fill in your Activity Plan on page 268.

1. Think carefully about the grade/s you are teaching. If you are not teaching Grades 1 & 2, you may wish to teach a lesson where learners investigate some other property or aspect of materials.

2. Refer to the extracts from the Integrated Science syllabus (page 285 below) for parts of the syllabus which deal with types, states and properties of materials at

various grade levels. Select a topic or sub topic that is suitable for your class. If you teach the lower grades Grade 1-3) you will be able to use the same topic as Charity and you will be able to follow her plan.

3. Use Charity's Activity Plan on page 286 as Guide for preparing your own.

4. Think about the activity or discuss with your partner:
    - What the purpose of the lesson would be?
    - How you could implement similar activities adapted to your learner's grade?
    - How many periods you will spend on it (2 if you follow the video model)?
    - What kinds of material/resources you would ask the learners to investigate and find in the school environment? When and from where will the learners collect the relevant materials?
    - Will you use revolving group work?
    - How will you manage the class and support the learners once every learner has brought their objects?
    - How will learners consolidate what they have learned?

In your study group

5. Agree on which teacher's lesson will be videoed and who will take the video.

    - Confirm the date and time of the lesson that will be videoed.
    - Agree on the date and time of the next study group meeting at which you will review your colleague's videoed lesson.

Integrated Science Syllabus: Types, states and properties of materials

Integrated Science Syllabus Grades 1-4, 7 (First number in first row indicates grade)				
SUBTOPIC	**SPECIFIC OUTCOMES**	**KNOWLEDGE**	**SKILLS**	**VALUES**
1.5.1 Types and properties of materials	1.5.1.2 Describe properties of materials	Properties of materials (Rough/smooth; hard/soft; flexible/rigid; strong/fragile; sinking/floating)	Comparing materials according to type, properties and uses Classifying materials according to properties	Co-operating in group activities Listening to others with respect Appreciating different uses of materials
2.5.1 Soluble and insoluble materials	2.5.1.2 Demonstrate that some materials are soluble and others are insoluble	Dissolving and non-dissolving substances (e.g. sugar, salt, chalk, dust, sand)	Investigating the solubility of different solids in cold and hot water	Appreciating the solubility of substances Asking questions for more understanding Participating in class activities actively
3.5.1 Three states of matter	3.5.1.1 Demonstrate the effect of heating and cooling on matter	Effects of heating and cooling on matter: change of state into solid, liquid and gas	Investigating the effect of heating and cooling on matter Communicating the process of melting, evaporation and condensation	Cooperating in group activities Appreciating change of state of matter Applying safety rules during demonstration on heating/cooling
	3.5.1.2 Demonstrate the process of melting, evaporation and freezing	Process of: melting, evaporation, freezing and condensation		
4.5.3 Magnets	4.5.3.3 Identify magnetic and non-magnetic materials	Magnetic materials e.g. iron and steel and non-magnetic materials, e.g. copper aluminium, plastic	Classifying materials into magnetic and non-magnetic	Appreciating magnets Asking questions for more understanding Cooperating in group activities
7.5.6 Metals and non-metals	7.5.6.1 Identify types of metals and non-metals	Types of metal (aluminium, copper, iron, zinc); non-metals (carbon, hydrogen, oxygen and carbon-dioxide) Conduction and non-conduction of electricity	Comparing metals and non-metals Experimenting with types of materials using and electric current	Awareness of non-metals and metals Participating actively in group discussion

Charity's Activity Plan: Properties of materials

Name of School:	**Date and/or Time:**
Grade/s: 1 and 2 (Multi-grade) For this lesson, the two classes will be taught together.	
Time allocation: This plan will be implemented over two lessons of 45 minutes each	
Subject Focus: Integrated Science: Materials and energy: Describe the properties of materials	

Purpose of activity:

- To give learners an opportunity to investigate the properties of materials and describe them in terms of whether they are rough / smooth; hard / soft; flexible / rigid; strong / fragile; sinking / floating.

General outcomes:

- Develop and demonstrate investigative skills about the immediate environment / about materials and energy

Specific outcomes:

- Describe properties of materials: rough / smooth; hard / soft; flexible / rigid; strong / fragile; sinking / floating.

Skills / knowledge /values learners should develop:

- Skills of observing and investigating
- Knowledge about the following properties of materials: rough / smooth; hard / soft; flexible / rigid; strong / fragile; sinking / floating.
- An attitude of curiosity and enquiry about the world around them.

General outcomes:

- Develop and demonstrate investigative skills about the immediate environment / about materials and energy

Specific outcomes:

Describe properties of materials: rough / smooth; hard / soft; flexible / rigid; strong / fragile; sinking / floating

RESOURCES AND PREPARATION:

- I will check my facts with the textbooks we have in our school (e.g. Hikaula, S. and Lungu, M. (2015). *Let's do Integrated Science, Grade 1*. Oxford, pp. 55-59.)
- Before the lesson, I will carry out my own investigation of objects in the immediate environment of the school which are rough / smooth; hard / soft; flexible / rigid; strong / fragile; sink / float, and which children could easily find and pick up. I might decide to also let learners select objects from our BRING and STORE boxes.
- While children are selecting their objects (see below), I will arrange the classroom so that there are 5 tables or work stations. On each of them I will place two labels (see below), one on each side of the table, in English and the local language.

RESOURCES

- Some examples of my own, for demonstration, of objects which are rough / smooth; hard / soft; flexible / rigid; strong / fragile; sink / float.
- Large labels: **rough, smooth, hard, soft, flexible, rigid, strong, fragile, sink, float** (in Home Language).
- A fairly large bowl of water.

Figure 1 Rough and smooth

Figure 2 Hard and soft

Figure 3 Flexible and rigid

Figure 4 Strong and fragile

Figure 5 Sink and float

PERIOD 1

INTRODUCTION

How you introduce the activity, (get the learners' attention)

I will show the children that I have a number of objects with me today. I'll ask them to name the objects as I hold them up. I will write the names of the objects on the board, in home language.
I will tell them that today they are going to talk about what these objects are like. They are going to learn words to describe them. Later they are going to do another interesting activity with different objects.

DO THE ACTIVITY **Teacher Tasks** (What will you do to support the activity?) **Whole class observation, investigation and discussion**	**Learners Tasks** (What will the learners do in the activity?)
1. Show the children two objects (one rough, one smooth) and send them round the classroom for them to feel. (I will have more than one of each to keep more learners busy at a time.) • Demonstrate how they must feel the objects (Stroke them). • Pass the objects round and let children feel them. • Ask them to think of two words to describe how the objects feel. • Take their suggestions (write them on the board, perhaps). • Focus in on the two words 'rough' and 'smooth' in the home language. Introduce the English words for the Grade 2's. Show them the two labels: **rough** and **smooth.** Let learners say the words together**.** 2. Show the children two (or more) objects (one hard, one soft) and ask them to feel them as they go round the classroom.	• Learners pass the objects round the class, feeling them. • Learners suggest words to describe the way the objects feel. • Learners say the words 'rough' and 'smooth' together. • Learners pass the objects round the classroom, feeling them. • Learners suggest words which describe the difference between the objects. • Learners say the words 'hard' and 'soft' together.

• Demonstrate how they must feel the objects (Squeeze them; push fingers into them). • Pass the objects round and let children feel them. • Ask them to think of two words to describe the difference between the two objects. • Take their suggestions (write them on the board, perhaps). • Focus in on the two words 'hard' and 'soft' in the home language. Introduce English words for Grade 2's. Show them two labels: **hard** and **soft.** Let learners say the words together.	• Learners pass the objects round the classroom, trying to bend them. • Learners suggest words which describe the differences between the objects.
3. Follow a similar procedure with two objects, one flexible (can bend) and one rigid (stiff). Now the children must try to bend the objects. Focus in on the two words 'flexible' and 'rigid' in the home language. Introduce English words for Grade 2's. Show them the two labels: **flexible (can bend)** and **rigid (stiff).** Let learners say the words together.	• Learners say the words 'flexible' (can bend) and 'rigid' (stiff) together.
4. Show the children two objects, one **strong** and the other **fragile** (**can break**) (e.g. a rock and an egg, or a glass). Ask them what will happen if you drop these two objects. What will be the difference between what happens? Focus in on the two words 'strong and 'fragile' ('can break') in the home language. Introduce English words for Grade 2's. Show them your two labels: **strong** and **fragile (can break).** Let learners say the words together.	• Learners say what could happen if the objects are dropped. • Learners suggest words which describe the differences between the objects. • Learners say the words 'strong' and 'fragile' (can break') together.
5. Now take any of the objects you have already used, and ask the children what will happen if you drop it into the water. Will it sink or will it float? Show them your two labels: **sink** and **float.** Ask the learners for their predictions, and then drop the items into the water. See whether the children were right or wrong.	• Learners say whether the objects will sink or float. • Learners watch to see whether they were right or wrong.

Group and Pair work: Exploration 6. Divide the class into 5 groups. 7. Tell the learners you want them to go outside. Each one must find one object. • The learners in Group 1 must work in pairs. One must find a rough thing; the other must find a smooth thing. • The learners in Group 2 must work in pairs. One must find a hard thing; the other must find a soft thing. • The learners in Group 3 must work in pairs. One must find something that can bend; the other must find a stiff thing. • The learners in Group 4 must work in pairs. One must find a strong thing; the other must find something that can break easily. • The learners in Group 5 must work in pairs. One must find a thing that will sink; the other must find a thing that will float.	Learners search for objects.

PERIOD 2

PREPARATION AND RESOURCES

1. Objects selected by learners.
2. Blackboard and chalk
3. Exercise books and pencils

INTRODUCTION

How you introduce the activity, (get the learners' attention)

Bring learners back together in the classroom.
Ask Group 1 learners to stand next to the 'rough / smooth' table and put their objects on it. They must mix them up, not divide them into rough and smooth.

Ask Group 2 learners to stand next to the ‘hard / soft’ table and put their objects on it.
=> They must mix them up, not dividing them into hard and soft.
Ask Group 3 learners to stand next to the ‘flexible / rigid’ table and put their objects on it.
=> They must mix them up, not divide them into flexible and rigid.
Ask Group 4 learners to stand next to the ‘strong / fragile’ table and put their objects on it.
=> They must mix them up, not divide them into strong and fragile.
Ask Group 5 learners to stand next to the ‘sink / float’ table and put their objects on it.
=> They must mix them up, not divide them into sinking and floating items.

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Group experiential learning, rotating work stations

1. Tell the learners that they must divide the objects on their table into two piles, next to the labels:
   - At table 1, they put the **rough** objects on one side and the **smooth** objects on the other.
   - At table 2, they put the **hard** objects on one side and the **soft** objects on the other.
   - At table 3, they put the objects **that can bend** on one side and the **stiff** objects on the other.
   - At table 4, they put the **strong** objects on one side and the **things that can break easily** on the other.
   - At table 5, they must put each object in the water to see whether it sinks or floats, and then put **sinking** objects on one side and **floating** objects on the other.
2. Go from table to table giving support. When all groups have done their task, they mix up the objects again and move to the next table to do that task. This continues until all learners have sorted the items at each table.

Learners Tasks

(What will the learners do in the activity?)

a. Learners sort objects on their table according to categories, then mix them up again and move on to the next table.
   - At table 1, they put the **rough** objects on one side and the **smooth** objects on the other.
   - At table 2, they put the **hard** objects on one side and the **soft** objects on the other.
   - At table 3, they put the objects **that can bend** on one side and the **stiff** objects on the other.
   - At table 4, they put the **strong** objects on one side and the **things that can break easily** on the other.
   - At table 5, they must put each object in the water to see whether it sinks or floats, and then put **sinking** objects on one side and **floating** objects on the other.

This continues until all learners have sorted the items at each table.

2. ENDING THE ACTIVITY

Teacher Activities

(What does the teacher do to end the activity?)

Tidying up the classroom

1. Teacher asks learners to help put desks back in their usual places so that learners can sit down as a whole class.
2. Objects are arranged on one side of the classroom, (on the floor?), in categories, together with their labels.

Whole class discussion and demonstration

3. Ask for a volunteer to take one rough and one smooth item from the piles, and show the class what rough and smooth mean. Write a sentence on the board in local language, about each item, e.g.
    a. A tin is smooth.
    b. Tree bark is rough.

Learner Activities

(What do the learners do to show that they have done the activity with understanding?)

1. Learners tidy the classroom, and put the objects with their labels at the side of the room.
2. They sit in their usual places, as a whole class group.

3. A volunteer learner shows the class a rough and a smooth item and tells the class what rough and smooth mean.

4. Ask for a volunteer to take one hard and one soft item from the piles, and show the class what hard and soft mean. Write two sentences on the board.	4. A volunteer learner shows the class a hard and a soft item and tells the class what hard and soft mean.
5. Ask for a volunteer to take one bendy and one stiff item from the piles, and show the class what bendy and stiff mean. Write two sentences on the board.	5. A volunteer learner shows the class a bendy and a stiff item and tells the class what bendy and stiff mean.
6. Ask for a volunteer to take one strong and one breakable item from the piles, and show the class what strong and fragile mean. Write two sentences on the board.	6. A volunteer learner shows the class a strong and a breakable item and tells the class what strong and breakable mean.
7. Teacher asks Group 5 whether they were right about the objects they thought would sink and float. Listen to their experiences and let them show which items sank and which floated. Write two sentences on the board.	7. Group 5 learners tell about their experiences with the objects they thought would sink and those they thought would float, and whether they were right or wrong in their predictions. They show which items sank and which floated.
8. Ask learners to copy the sentences in their books, or write their own. (This may need to be done in the next period.)	8. Learners copy the sentences or write their own. (This may need to be done in the next period.)

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / attitudes learners should develop:**
RESOURCES **PREPARATION**	
INTRODUCTION **How you introduce the activity, (get the learners' attention)**	

DO THE ACTIVITY **Teacher Tasks** (What will you do to support the activity?)	**Learners Tasks** (What will the learners do in the activity?)
ENDING THE ACTIVITY **Teacher Activities**	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

(What does the teacher do to end the activity?)	

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……..
- What was unexpected?……
  ……..
- What difficulties did you have? ……..
  ……..
- Did all learners play an active part in the activity?.....
  ……..

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

  ……

Activity 3: Implement experiential learning activities: Integrated Science lesson

 45 mins

Purpose

- To implement the planned activities applying an experiential approach to learning about the properties of various materials (types/states).

What you will need

- Your prepared activity plan;
- The resources that you need for implementing the planned activities;
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement these activities according to their plan with their own class.
- But only one teacher in the group will have their activity videoed. As this activity is likely to take place over more than one period, it may be wise to decide on a portion of the activity to video.
- A colleague or friend will use the tablet to take the video.
- At the next study group meeting, the whole group will watch and discuss the video.

Activity 4: Reflect on the implementation of experiential activities

30 mins

Purpose

- To reflect on the implementation of the Integrated Science activities using an experiential approach to investigate properties of various materials

What you will need

- The Activity Plan used by the teacher that was videoed
- A pen or pencil to write your plan
- The video of the activity on the tablet

What you will do

- You will watch the video and reflect on the implementation of the activities assessing what went well and what could be done differently next time.

In your study group

1. Before you watch the video, read the questions in section 3 below and keep them in mind as you watch the video.

2. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

   Study group teacher's video

3. Now discuss the following questions in your group. Write some notes about what you learned during the discussion:

   b. What was the purpose(s) of the activities? (See Activity Plan)
      - Were the purposes achieved? Yes/ No?
      - Explain

……

……

……

g. Which aspects of the activities were particularly successful? Explain what was successful about them?

……..

……

h. Which aspects of the activities surprised you? Explain.

……

……..

i. Did the teacher experience difficulties with managing:
   - any aspects of her plan,
   - any groups of learners?
   - give details.

……..

……

j. Can you think of ways you / they could improve her plan, or manage a similar lesson better in future?

……..

……

k. What did you learn from watching the video of this lesson?

……..

……

Test yourself

- Before moving onto Week 3 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Which statement is **NOT TRUE**? A reason for letting groups take turns in using resources is:

   a. Resources are scarce, and there are not enough for every learner, or every group. ☐

   b. It saves time and money; the class does not need many of the same resource. ☐

   c. Learners can have hands-on experience of a number of different resources in one lesson. ☐

   d. To give the learners physical exercise. ☐

2. Which suggestion is given in this module? If your learners don't have enough Maths examples for practice, you can:

   a. Buy more text-books. ☐

   b. Make sets of Maths work-cards that can be used in turns by groups. ☐

   c. Write examples on the board. ☐

   d. Apply to the Department of Education for help. ☐

3. Which of the learners' senses did Charity use in her lesson?

   a. Touch. ☐

   b. Taste. ☐

   c. Smell. ☐

   d. Hearing. ☐

4. Which statement is **NOT TRUE**? Before the lesson, Charity had to:

   a. Explore the properties of materials in the environment for herself. ☐
   b. Collect a few examples of objects which had the different properties. ☐
   c. Think carefully about the structure and purpose of her lesson. ☐
   d. Collect enough materials for every learner in her class to experience the different properties. ☐

5. Which statement is **NOT TRUE**? Preparing for a hands-on investigation lesson includes:

   a. Making sure that learners have enough background knowledge to be able to carry out the investigation. ☐
   b. Giving each child a text-book ☐
   c. Making sure the classroom is suitably arranged for the investigation. ☐
   d. Doing the investigation yourself before-hand. ☐

Week 3: Learning by observing and investigating

Activity 1: Observation and investigation: Integrated Science activities

 1 hour

Purpose

- To watch and discuss the video clips that show how the teacher (Chintu) has created opportunities for learners to investigate and participate in a number of Science experiments using real materials that are found locally.
- To familiarise yourself with the "work station" approach to managing group work experiments in a context of limited resources.

What you will need

- The description of how set up and use work stations below.
- Videos 32,33 and 34 on the tablet
- A pen or pencil

What you will do

- Read about work stations and how they can be used.
- Watch the three video clips (32, 33 and 34) which provide examples of how Chintu created opportunities for her learners to investigate and participate in a number of Science experiments using real materials that are found locally.
- Think about and discuss how Chintu used Science work stations, setting up different experiments on each one, allowing learners to move from one to another.
- Answer the questions in the space provided.

Individually

a. Read the description of how work stations can be used as a strategy in schools where resources are limited and classes are large.

Setting up work stations for Science experiments

In these three Science video clips, Chintu has set up a number of Science experiments which will help her learners to develop their observation and investigative skills.

She is working with a group of learners from various grades.

Her focus is "Materials and Energy", these are topics from the Integrate Science Syllabus.

She uses found materials for the experiments which do not cost any money and which can be easily found in the local environment.

The idea of the work stations is a simple but effective one:

- The teacher puts two or three school desks together to organise them into "work stations"
- She sets up a number of different experiments – one on each work station.
- Once the experiments are set up, the teacher can facilitate "revolving group work". For example:
    - If you have 40 learners in a class, you could set up five work stations, one experiment at each work station.
    - Divide the class into five groups of eight.
    - Each group starts off at a work station with clear guidelines on how to do the experiment and what to focus on.
    - Once the group has completed the experiment at Work Station 1, they move to Workstation 2. The learners at Work Station 2 move to Work Station 3 and so on, until all 5 groups have worked their way around each of the 5 Work Stations.
- In this way, all the learners get to participate in all of the experiments.
- This is a useful strategy in schools where resources are limited and classes are large.

In your study group

b. Watch each of the video clips. Discuss and answer the questions related to that clip before moving onto the next one.

Video 32: How do solids become liquids? And, how do liquids become gasses?

a. What did Chintu want her learners to learn from observing this experiment?

 ……

……

……

b. Refer to the Integrated Science Syllabus extract on page 285 above Topic: Materials and Energy, Sub Topic: Three states of matter. Now identify the grade in which this sub – topic should be discussed.

✍ ……

Video 33: How does air displace water? And how does water displace air?

c. What kinds of questions did Chintu ask?

✍ ……

……

……

d. Describe how Chintu used the work station method in this video clip:

✍ ……

……

……

Video 34: Understanding the terms “Soluble” and “Insoluble”

e. What did Chintu do in this activity to help her learners to understand the difference between the meaning of the two concepts *Soluble* and *Insoluble?*

✍ ……

……

f. Which one of the learners’ senses was used in this activity?

✍ ……

Activity 2: Plan and prepare Science investigation activities using the revolving group work approach

 45 mins

Purpose

- To plan and prepare activities similar to those that you watched Chintu implement with a group of learners in the videos in Activity 1 (above).
- The activities should involve experiments which will help your learners to develop their observation and investigative skills and which will create the opportunity for the learners to make their own findings.
- To practice revolving group work using the Work Station approach.

What you will need

- The extract of the Integrated Science Syllabus (Grades 1-7). See Week 2: Activity, page 285 (above).
- The blank Activity Plan template on page 310 below.
- A pen or pencil to write your plan.
- Relevant found materials and objects to conduct the experiments.

What you will do

- You will plan and prepare activities similar to those you watched Chintu implement in Activity 1 (above). Feel free to refer back to the videos again if you like.
- You will implement your Science activities/experiments using revolving group work and work stations.
- Remember, if you teach older learners, you will need to adapt the content to suit their level and grade.
- Refer to the Integrated Science Syllabus (Grades 1-7).

The lesson aim:

- To create an opportunity for learners to learn through observing and participating in experiments to make own findings.

1. Working on your own or with a partner to plan a set of activities or experiments using work stations to implement a revolving group work approach.

2. Use the guidelines provided below to fill in your Activity Plan on page 310.

    - Think carefully about the grade/s you are teaching. If you are not teaching the lower grades, you may wish develop activities where learners investigate some other materials for example, magnets in grade 4 or metals and non-metals in grade 7.

- Refer to the extracts from the Integrated Science curriculum page 285 above for parts of the curriculum which deal with types, states and properties of materials at various grade levels.

- Think about the activity or discuss with your partner:
  - What the purpose of the lesson would be.
  - What will your learners do?
    - Will you implement similar activities/experiments to the ones that Chintu did or do you need to adapted or plan new activities to suit your learner's grade and level?
  - How many periods you will spend on it?
  - What kinds of material/ resources you would ask the learners to investigate?
  - When and from where will you obtain the necessary materials? Will you ask your learners to help you to collect the materials before the lesson?
  - How you will use revolving group work.
    - How will you divide your groups?
    - How many groups will you have?
    - How many work stations will you have?
  - How will you ensure that each group knows what to do?
    - Will you explain to each group?
    - Will you prepare basic written instructions and leave them at each work station for the groups of learners to follow?
  - How will you manage the class and support the learners at the different work stations.
  - How will learners consolidate what they have learned?

In your study group

3. Agree on which teacher's lesson will be videoed and who will take the video.
   - Confirm the date and time of the lesson that will be videoed.
   - Agree on the date and time of the next study group meeting at which you will review your colleague's videoed lesson.

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / attitudes learners should develop:**
RESOURCES AND PREPARATION:	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

  ……

Activity 3: Implement Science investigation activities using the revolving group work approach

 45 mins

Purpose

- Set up and facilitate Science experiment activities using work stations and the revolving group approach.

What you will need

- Your prepared activity plan;
- The resources that you need for implementing the planned experiments;
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement these Science experiments according to their plan with their own class.
- But only one teacher in the group will have their activity videoed. As this activity is likely to take place over more than one period, it may be wise to decide on a portion of the activity to video.
- A colleague or friend will use the tablet to take the video.
- At the next study group meeting, the whole group will watch and discuss the video.

Activity 4: Reflect on the implementation of Science experiments and the revolving group work approach

30 mins

Purpose

- To reflect on the implementation of Science experiment activities using work stations and the revolving group approach.

What you will need

- The Activity Plan used by the teacher that was videoed
- A pen or pencil to write your plan
- The video of the activity on the tablet

What you will do

- You will watch the video and reflect on the implementation of the activities assessing what went well and what could be done differently next time.

In your study group

1. Before you watch the video, read the questions in section 3 below and keep them in mind as you watch the video.

2. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

   Study group teacher's video

3. Now discuss the following questions in your group. Write some notes about what you learned during the discussion:

   a. What was the purpose(s) of the activities? (See Activity Plan)
      - Were the purposes achieved? Yes/ No?
      - Explain

……

……

……

b. Which aspects of the activities were particularly successful? Explain what was successful about them?

✍ ……..

……

c. Which aspects of the activities surprised you? Explain.

✍ ……

……..

d. Did the teacher experience difficulties with managing:
   - any aspects of her plan,
   - any groups of learners?
   - give details.

✍ ……..

……

e. Can you think of ways you / they could improve her plan, or manage a similar lesson better in future?

✍ ……..

……

f. What did you learn from watching the video of this lesson?

✍ ……..

……

Test yourself

- Before moving onto Week 4 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Which statement is **NOT TRUE**? If you are worried that you don't have a thorough understanding of the topic you have to teach:

   a. You are unlikely to encourage learners to ask questions. ☐
   b. You will probably rely heavily on the text-book. ☐
   c. You will invite your learners to ask questions. ☐
   d. You will feel inadequate and won't enjoy your teaching. ☐

2. Which statement is **NOT TRUE**? Being a 'model learner' means:

   a. Showing enthusiasm about finding out new things and exploring the answers to questions. ☐
   b. Showing learners how you go about looking for answers to questions. ☐
   c. Showing that saying 'I don't know' is the beginning to finding out something new. ☐
   d. Always having the answer to every question which arises in class. ☐

3. Which answer is the best? Chintu's purpose in setting up work stations for Science experiments was to:

   a. Give the learners an opportunity to move around the class room. ☐
   b. Give the learners an opportunity to observe and participate in the experiments and find answers for themselves. ☐
   c. Demonstrate various experiments. ☐
   d. To teach them how to behave safely around a hot brazier. ☐

4. Chintu used the revolving group approach because:

   a. It is a good way to manage a large group of learners in a class with few resources. ☐
   b. The learners are ales likely to get bored if they are moving around. ☐
   c. Group work frees the teacher up to do their marking. ☐
   d. Learners love group work. ☐

5. Chintu didn't tell the learners what happens when you put a tissue into a jar and you put the jar into a bucket of water because:

   a. She didn't know. ☐
   b. The learners had already found out the answer. ☐
   c. She wanted the learners to continue thinking about the questions and looking for answers. ☐
   d. She needed to research it in a book at home. ☐

Week 4: Learning through observing and describing

Activity 1: Learning through observing and describing: Seeds

 1 hour

Purpose

- To watch the video clips which show a teacher (Billy) teaching an activity-based Integrated Science lesson which focuses on learners observing and investigating different kinds of seeds and how they are dispersed.

What you will need

- A pen or pencil
- Videos 35, 36, 37, 38 and 39

What you will do

- Watch the five video clips: 35, 36, 37, 38 and 39 of the Billy's interactive lesson.
- Think about and discuss questions about Billy's activities on seeds and their dispersal.

In this activity, you will be watch five parts of a video showing an interactive lesson on the topic: Fruits and Seeds.

In your study group

1. Watch each of the video clips. Discuss and answer the questions related to that clip before moving onto the next one.

 **Video 35:** Planning and preparation for the learning activities on seeds and how they are dispersed.

a. How did Billy prepare himself for the observation activity? What resources did he need to prepare?

 ……

……

……

b. How did Billy plan to introduce his lesson?

……

……

……

Video 36: Getting started by asking questions and introducing the topic.

c. How did Billy use questions to prepare the learners for the study of the fruits and seeds?

……

……

……

d. How did he respond to and use the answers which the learners gave?

……

……

……

e. How did Billy support learners in their observation of the flower?

……

……

……

Video 37: Looking and learninging - you are now going to see the main body of the lesson, in which Billy lets learners study fruits

f. Where were the fruits and seeds obtained for this observation lesson? Would you (and your learners) be able to obtain similar examples to observe?

……

……

……

g. How did Billy support learners in their observation of the fruits and the seeds?

……

……

……

h. What kinds of questions did Billy ask? Were they **'closed questions',** which have one right answer or were they **'open questions',** opening up communication in the classroom.

……

……..

Video 38: Investigating outside - the learners go out into the school yard tolook for different kinds of seeds. Back in the classroom, the learners sort the seeds according to type.

i. Can you think of other questions which you could ask the learners about the fruits, or about the seeds they have found? Are your questions open or closed questions?

✍ ……

……..

……..

j. What part did group work play in the activity? In which parts of the lesson were the learners most active and involved? In which parts did they interact the most?

✍ ……

……..

……..

Video 39: Consolidating the learning activity and ending the lesson.

k. How did Billy draw together their findings so that learners could consolidate what they had learned?

✍ ……

……..

……..

l. How do you think Billy should follow up on this lesson, in his next Integrated Science class?

✍ ……

Activity 2: Planning and preparing an activity-based lesson: Focusing on observation and investigation

 45 mins

Purpose

- To plan and prepare an activity-based Integrated Science lesson which focuses on learners observing and investigating different kinds of seeds OR flowers.
- To create an opportunity for learners to learn through observing real fruit, seeds and plants, from their own environment.

What you will need

- The Integrated Science Curriculum Extract: Plants on page 326, below.
- A blank Activity Plan template – use the one on page 328, below.
- Billy's filled in Activity Plan for the lesson on seeds on page 192 below. OR
- A filled in Activity Plan for a lesson on the flower on page 332, below
- A pen or pencil to write your plan
- Fruits (or seeds or flowers)
- Sufficient knives for cutting the fruit (OR some blades, if you do the flower lesson)

What you will do

- You will plan and prepare some activities similar to Billy's activity OR similar to that in the Activity Plan for the observation of a flower
- You will use Billy's Activity Plan (or the one on the flower) for reference and guidance as you fill in your plan.
- The lesson will aim to create an opportunity for learners to learn through observing and describing real objects from the plant world (e.g. seeds, or a flower).

NOTE: You can choose flowers or seeds!

The Grade 7 curriculum requires you to teach flowers and seeds. The lesson on flowers should come before the one on seeds. It may be better or easier for you (because of the season) to focus your observation lesson on flowers instead of seeds. You will find a detailed Activity Plan on the observation of a flower just below the Activity Plan on Seeds.

Working on your own or with a partner to fill in the Activity Plan on Page 328.

1. Decide whether you will plan an activity-based lesson on Seeds or on Flowers.

2. Study the Integrated Science Curriculum on Plants below on page 326 below. If you do not teach grade 7, select a sub-topic that is suited to the grade you teach. Even in the lower grades there are topics which require observation activities.

3. Read through Billy's Activity Plan for the lesson on Seeds on page 192, below. OR The Activity Plan on Flowers, below on page 332.

4. Use either of these plans as a guide. This will help you to get a clear idea of all the important steps in the planning process. You may be able to implement this plan as is, or you may need to adapt it a bit to suit your situation.

5. Fill in the Activity Plan systematically. Give careful thought to the following:

    a. The main purpose of these activities is to create opportunities for learners to learn **through observing real plants**, or parts of plants, from their own environment.

    b. How many periods you will spend on it (2 if you follow the video model). You may not have time for this, so you may need to shorten the activity, or restructure it.

    c. How you would need to prepare yourself for such an activity, and which fruits, seeds or plants you will use in your observation activities.

    d. Will you take your learners out doors to collect seeds/ plants or to observe the growing plants?

    e. Go back in your mind to the video lesson. Or, you can look at the videos again (35, 36, 37 38 and 39). Think about or discuss with your partner:
        - What preparation Billy did before the lesson. Do you have a text book which you can use a reference for this lesson? It will help you to make sure that you have covered the basic content and knowledge required for this topic.
        - How did Billy organise the different parts of the lesson:
            - Whole class work, structured around questions and discussion;
            - Group or pair work for learners, when they observe, describe and report back;
            - Individual work, where learners write down what they have learned, and the conclusions of the observation.
        - How Billy prepared the learners for the observation activity.
        - The resources Billy brought to the classroom.
        - The way he introduced the lesson.
        - The way he used questions.

- The way he prepared the learners for observing and collecting the seeds in and around the school.
- The way he set up the observation activity.
- The way he supported the learners while they were working in groups.
- How did Billy consolidate learning at the end of the lessons?

In your study group

6. Agree on which teacher's lesson will be videoed and who will take the video.
    - Confirm the date and time of the lesson that will be videoed.
    - Agree on the date and time of the next study group meeting at which you will review your colleague's videoed lesson.

Integrated Science Syllabus: Plants

Integrated Science Grades 1-7 (First number in first row indicates grade)				
SUBTOPIC	**SPECIFIC OUTCOMES**	**KNOWLEDGE**	**SKILLS**	**VALUES**
1.4.1 Local plants	1.4.1.1 Identify plants in the local environment.	Local plants, e.g. plants, weeds, decorative plant	Comparing plants in the local environment Observing stages of plant growth	Appreciating plants in local environment Asking questions for more understanding
	1.4.1.2 Observe the early stages of plant growth.	Plant growth stages (seed, root and shoot)		
2.4.1 Parts of plants	2.4.1.1 Identify the main parts of a plant	Plant parts (root, stem, leaf, flower, and fruits)	Observing the main parts of a plant Comparing the life cycle of plants	Appreciating wild plants Caring for vital plants
	2.4.1.2 Describe the life cycle of a plant	Seed – seedling – adult plant with flowers – adult plant with fruits – adult plant dies		
3.4.1 Plant classification	3.4.1.1 Classify plants into flowering and non-flowering	Flowering plants (e.g. maize, beans, rose flower) and non-flowering plants (e.g. ferns, moss, pine)	Classifying plants into flowering and non-flowering	Appreciating classes of plants
4.4.1 Flowering plants	4.4.1.1 Describe the functions of parts of the flowering plant	Function of: roots for anchorage, stem for absorption, leaf for food making, flower for reproduction	Communicating the main parts of a plant	Participating actively in class activities
5.4.1 Non-flowering plants	5.4.1.1 Identify different types of non-flowering plants	Types of non-flowering plants: Algae, ferns, moss, fungi (e.g. mushroom) Ferns: Ornamental plants; fungi; baking; beer brewing; food; medicine (e.g. penicillin)	Comparing the differences among non-flowering plants Communicating the use of ferns and fungi	Cooperating in group activities Applying the use of ferns and fungi in everyday life.
	5.4.1.2 Identify use of ferns and fungi			
6.4.1 Photosynthesis	6.4.1.1 Investigate how water and mineral salts reach the leaves	How water/mineral salts reach the leaves: transpiration (root -> stem -> leaves)	Investigating the movement of mineral salts and water to leaves in plants Communicating information on how plants make food Observing the presence of starch in a leaf	Appreciating how plants make food Asking questions for more understanding Cooperating in group work
	6.4.1.2 Describe the process by which plants make food.	Process by which plants make food: carbon dioxide combines with water to make starch in presence of light and chlorophyll.		
	6.4.1.3 Test for the presence of starch in a leaf	Testing for starch in a leaf: use of iodine solution to obtain blue/black colour		

7.4.1 The flower	7.4.1.1 Identify the parts of a flower	Parts of a flower: anthers, filament, petals, ovary, stigma, style, sepal, stalk	Observing parts of flowers Recording information on observations	Appreciate the organisation of floral parts Cooperating in group activities Respecting other people's opinions
	7.4.1.2 Explain the functions of the parts of the flower	Functions of anthers, filament, petals, ovary, stigma, style, sepal stalk		
7.4.2 Pollination and fertilization in flowering plants	7.4.2.1 Describe pollination	Pollination: transfer of pollen grains from anthers to stigma	Communicating agents of pollination Comparing pollination and fertilisation in plants	Appreciate the role of insects and wind in pollination Cooperating in group activities
	7.4.2.2 Identify the agents of pollination	Agents of pollination: wind, water, animals (birds, insects and mammals)		
	7.4.2.3 Describe fertilization in flowering plants	Fertilisation in plants: joining of ovule and pollen grains		
7.4.3 Fruits and seeds	7.4.3.1 Explain why plants produce seeds	Why plants produce seeds: for plant propagation	Comparing varieties of fruits and seeds	Actively participating in class discussions Questioning new ideas for more understanding
	7.4.3.2 Explain the importance of improving seed varieties	Importance of improving seed varieties: more yields and resistance to diseases and drought		
7.4.4 Seed dispersal	7.4.4.1 Describe what seed dispersal is	Seed dispersal as a method of spreading seeds in the environment	Communication agents of seed dispersal	Awareness of the importance of seed dispersal
	7.4.4.2 Describe ways in which seeds are dispersed.	Ways of seed dispersal: wind, animals, water, explosive method		
	7.4.4.3 Explain the importance of seed dispersal	Importance of seed dispersal: for survival of plant species		
7.4.5 Propagation	7.4.5.1 Explain what plant propagation is.	Plant propagation: means by which plants continue their existence	Communicating methods of plant propagation	Applying knowledge of plant propagation in everyday life
	7.4.5.2 State methods of plant propagation.	Methods of plant propagation: seed and vegetative propagation.		
	7.4.5.3 Demonstrate how some plants are propagated in the local area	Plant propagation: row planting e.g. maize, beans; planting by broadcasting e.g. millet, sorghum		

Activity Plan

Name of School:	**Date and/or Time:**
Grade/s:	
Subject Focus:	
Purpose of activity:	**Skills / knowledge / values learners should develop:**
RESOURCES AND PREPARATION NEEDED:	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

  ……

Select EITHER this Activity Plan: Seeds OR The Activity Plan on Flowers (Below).

ACTIVITY PLAN: SEEDS	
Name of School:	**Date and/or Time: (double period)**
Grade/s: 7	
Time allocation: This plan will be implemented over a double period (2 x 45 mins) or two lessons on different days	
Subject Focus: Integrated Science: Seeds and their dispersal	
Purpose of the lesson activities: • To stimulate interest in and curiosity about seeds in the learners' environment and their dispersal. • To facilitate the acquisition of knowledge about seeds and different methods of seed dispersal. • To give learners experience of learning through observation and analysis of plants (fruits and seeds). **General outcomes:** Develop investigative skills about plants and animals **Specific outcomes:** 7.4.3.1 Explain why plants produce seeds. 7.4.4 Describe what seed dispersal is. 7.4.4.2 Describe ways in which seeds are dispersed. 7.4.4.3 Explain the importance of seed dispersal 7.4.5.1 Explain what plant propagation is	**Skills / knowledge / attitudes learners should develop over the 2 lessons:** • Interest in and curiosity about the seeds in their environment; • The skill of observation and analysis of a plant (fruits and seeds). • Knowledge about seeds and different methods of seed dispersal; **General outcomes:** Develop investigative skills about plants and animals **Specific outcomes:** 7.4.3.1 Explain why plants produce seeds. 7.4.4 Describe what seed dispersal is. 7.4.4.2 Describe ways in which seeds are dispersed. 7.4.4.3 Explain the importance of seed dispersal 7.4.5.1 Explain what plant propagation is

LESSON 1

CLASSROOM ORGANIZATION FOR INTERACTIVE LEARNING: Whole class questions and answers and information-building.

RESOURCES AND PREPARATION

1. Before Lesson 1, I will prepare myself for presenting fruits and seeds and their dispersal by carefully studying the Science text book (Malambo, P. and Mubita, M. (2015). *Let's do Integrated Science, Grade 7*. Oxford.), as well as any other books or resources at my disposal.
2. I made a large labelled diagram of a cross-section of a flower for a previous lesson on flowering plants and will refer to this again in this lesson.

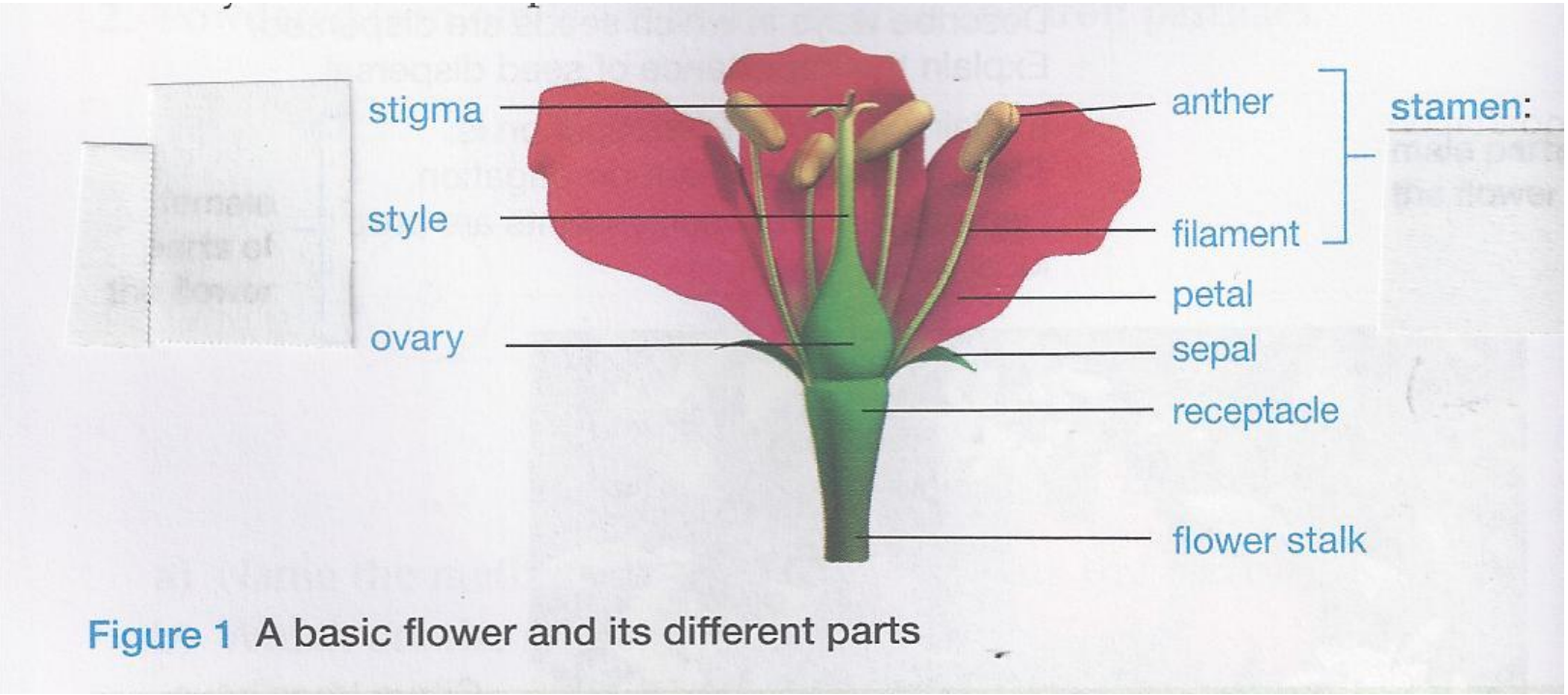

Figure 1 A basic flower and its different parts

Malambo and Mubita, Integrated Science OUP 2015 p. 50

3. I will try to find 3 or 4 flowers for learners to study.
4. I will bring some fruits from home and from the market for learners to cut open and study (paw-paw, avocado, orange, tomato).

INTRODUCTION:

How you introduce the activity, (get the learners' attention)

Tell them:

- Today's lesson is about different kinds of seeds and how they are dispersed or spread.
- Before we look at fruits and seeds we need to remind ourselves about our previous lesson on the parts of a flower and their functions.

Refer them to the diagram, asking them questions:

- Which are the male parts of the flower?
- Which are the female parts of the flower?
- Which part of the flower becomes a fruit, with seeds?

Give each of the 4 groups in my class a flower and show them how to pull the petals off and look at the ovary, where seeds are developing.

Tell them: Today we will look at the fruits and the seeds which develop from the flower.

DO THE ACTIVITY **Teacher Tasks** (What will you do to support the activity?)	**Learners Tasks** (What will the learners do in the activity?)
Whole class question and information-building session 1. Ask questions. Encourage, respond to and work with the answers, providing explanations and new information where necessary, and writing new words (e.g. dispersed) on the board: • What season are we in now? (Dry season) • What do we do in this season? (E.g. We harvest the maize.) • What is happening on the trees and plants? (E.g. Seeds are dry and falling off the trees.) • What are seeds?	1. Offer answers. Engage in discussion about the questions.

• Where do we find them? • Why do plants produce seeds? • Why is it important for plants to produce seeds? • What do we mean when we say seeds are dispersed or spread? • Why is it important for seeds to be spread? 2. Share out the fruit to the 4 groups. Each group gets a tomato and an orange. The paw-paw and avocado have to be cut in half and shared with another group. 3. Give each group a knife, warning them to use it carefully. 4. Ask them to cut open the fruit. Ask them: • In which direction shall we cut (the paw-paw)? (same with other fruits) 5. Ask them to observe the seeds inside each one of the different fruits carefully. 6. Lead a discussion on what they have observed, trying to draw them out and think more deeply about the topic. 7. Prompt them with questions where necessary, e.g. • Do all the seeds look the same? Are the paw-paw seeds the same as the tomato seeds? • What do the various seeds look like? • Do all the fruits have the same number of seeds? • Is the colour of all the seeds the same? • Where are the seeds situated in the fruit? • Why do you think they are in that place? 8. Now that we have looked at the seeds in these fruits, let's think about where else we can find seeds. In which places can you find seeds? 9. Ask learners to go outside and collect as many different types of seeds as they can find in and around the school	2. Cut open the fruit and look carefully at the seeds. 3. Describe what they have observed. 4. Respond to the questions and engage in discussion. 5. Learners respond with their ideas. 6. Learners go outside to look for and collect seeds, for about 10 minutes. 7. Put all their seeds together on the group table. 8. Sort the seeds into different types. 9. Respond to and discuss questions.

yard, and bring them back to the classroom. Remind them that they should look in the trees and on the ground. 10. Stand outside the classroom watching the learners and being available to them. **Group activity after collection of seeds (± 10 minutes)** 11. Ask each group of learners to: • Put all their seeds together on the group table. • Sort the seeds into different types. 12. Once they have sorted the seeds, discuss the following questions with each group: • How many different types did your group find? • What do the different seeds look like? • Are they are similar or different to the seeds in the fruits? • Where on the plant or tree did you find the seeds? • Why are the fruit seeds located <u>inside</u> the fruits, whereas the seeds in the bush are located <u>at the tips of</u> the branches, or <u>the end of</u> the grass or plant? 13. Make sure I listen to answers, and build on them, probing for more information, and adding ideas in appropriate places. **Discussion and input on seed dispersal** 14. Building on the answers to the last two questions above, introduce new content from the textbook on different kinds of dispersal: wind, water, animals, birds, humans, explosion. 15. Discuss the following questions: • How do animals/ birds disperse seeds?	10. Listen and interact with teacher. 11. Respond to and discuss questions. 12. Learners give their views and offer reasons for what they say. 13. Learners sort seeds into 5 groups according to type of dispersal.

- How does the wind disperse seeds?
- How do seeds get dispersed in water?
- How do people disperse seeds?
- Have you seen any seeds which are dispersed by explosion?

16. Ask the learners how they think the fruits and the kinds of seeds they have collected are dispersed. Ask what makes them think this.
17. Ask learners to sort the seeds again, into 5 groups:
    - Dispersed by animals / birds
    - Dispersed by wind
    - Dispersed by water
    - Dispersed by people
    - Dispersed by explosion
18. Go round from group to group, discussing what they have done and encouraging and assisting.

1. ENDING THE ACTIVITY

Teacher Activities

(What does the teacher do to end the activity?)

19. Ask each learner to select one type of fruit / plant seed, look at it carefully and draw it as big as possible on the large shared sheet of paper on their desks. If they know what the plant is called, in the local language, or in English, they should write the name next to the seed.
20. Go round the class, encouraging learners and advising where necessary.
21. Sum up what has been learned by saying:

Let us try to sum up the things we have learned today:

- Where are various types of seeds produced?
- Why are seeds so important?

Learner Activities

(What do the learners do to show that they have done the activity with understanding?)

Learners each draw a large diagram of one seed, writing down its name if they know it, in the local language, or in English.

• What are the different ways in which seeds are dispersed? After the discussion, conclude by saying: Very good. We have all learned a lot today!	Learners contribute their ideas on what they have learned.

NOTE

Depending on the time of the year, if there are flowers around, you may prefer to implement the lesson on flowers OR if it is the hot, dry season, it may be easier to focus on seeds as these will be plentiful.

If you would like to, you can ofcourse do both as the lesson on flowers, comes before the lesson on seeds in the syllabus!

Select EITHER this Activity Plan on Seeds to implement.

OR

The Activity Plan on Flowers (See below).

ACTIVITY PLAN: FLOWERS

Name of School:	**Date and/or Time: (2 lessons, on two following days)**
Grade/s: 7	
Time allocation: This plan will be implemented over two lessons on two days, each lesson lasting 45 minutes. (**If both lessons are to take place on the same day, instructions regarding the collection and observation of the flowers need to be given on the previous day, or time needs to be made for observation and flower collection in-between the two lessons.)**	
Subject Focus: Integrated Science: The parts of a flower	
Purpose of the 2-day activity: • To stimulate interest in and curiosity about the reproduction of the flowering plants in their environment. • To facilitate the acquisition of knowledge about the parts of a flower and different methods of pollination. • To give learners experience of learning through observation and analysis of plants.	**Skills / knowledge / attitudes learners should develop over the 2 days:** • Interest in and curiosity about the flowering plants in their environment; • The skill of observation and analysis of a plant. • Knowledge about the different parts of a flower, and their functions w.r.t. reproduction; • Knowledge about different methods of pollination.
General outcomes: Develop investigative skills about plants and animals	**General outcomes:** Develop investigative skills about plants and animals
Specific outcomes: 7.4.1 The flower 7.4.1.1 Identify the parts of a flower. 7.4.1.2 Explain the functions of the parts of the flower 7.4.2 Pollination and fertilization in flowering plants 7.4.2.1 Describe pollination 7.4.2.2 Identify the agents of pollination 7.4.3.2 Describe fertilization in flowering plants	**Specific outcomes:** 7.4.1 The flower 7.4.1.1 Identify the parts of a flower. 7.4.1.2 Explain the functions of the parts of the flower 7.4.2 Pollination and fertilization in flowering plants 7.4.2.1 Describe pollination 7.4.2.2 Identify the agents of pollination 7.4.3.2 Describe fertilization in flowering plants

LESSON 1	
CLASSROOM ORGANIZATION FOR INTERACTIVE LEARNING: Whole class questions and answers and information-building.	
RESOURCES AND PREPARATION 1. Before Lesson 1, prepare yourself for presenting the reproduction of flowering plants by carefully studying the Science text book (which learners should also have, if possible) (e.g. Malambo, P. and Mubita, M. (2015). *Let's do Integrated Science, Grade 7*. Oxford.), or other reference information. 2. Prepare a large diagram of a cross-section of a flower, labelled. This could be drawn on the board, but should preferably be on a piece of chart paper, so that it can be used again.	

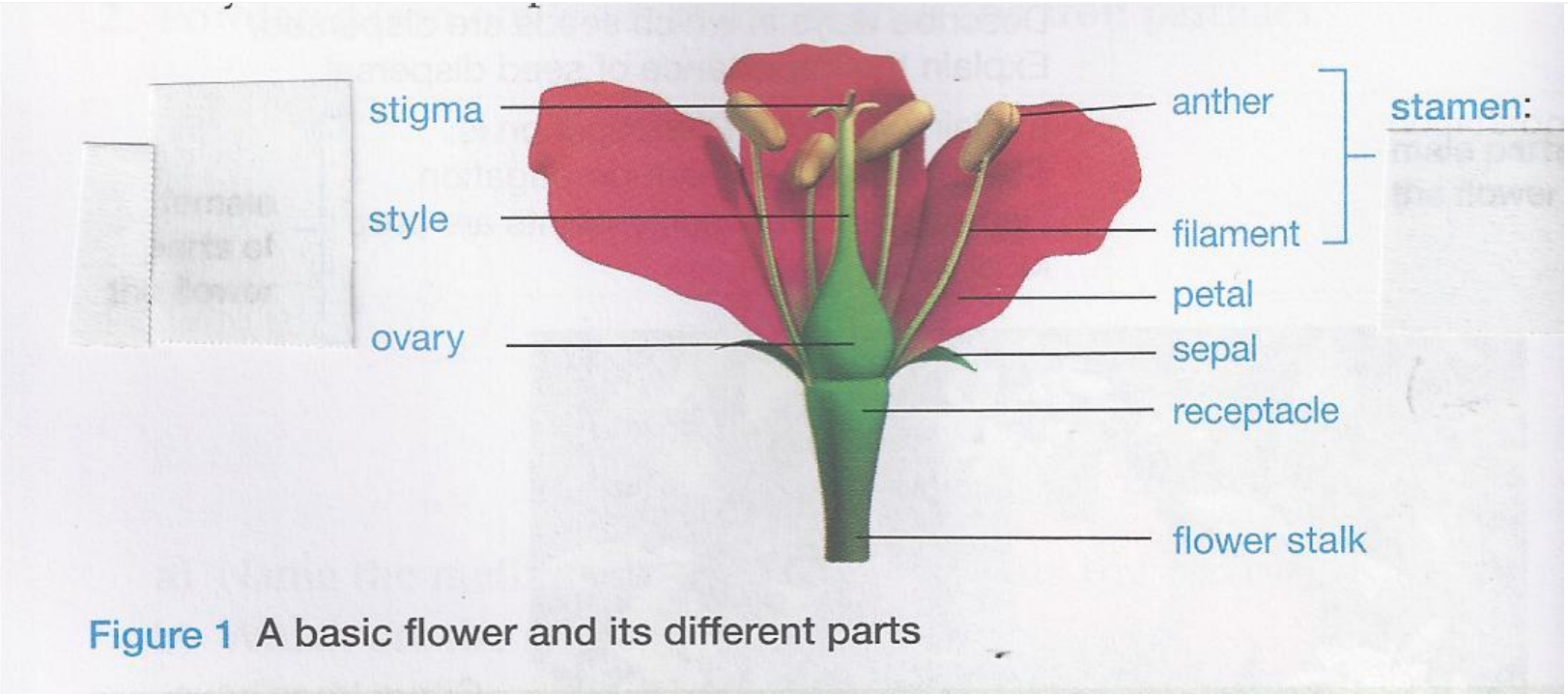

Figure 1 A basic flower and its different parts

(Malambo and Mubita, p. 50)

3. Also write the following incomplete sentences on the board or on the chart paper:
   - The petals are the parts that are often _____ coloured. They surround the reproductive parts.
   - The sepals are the green parts which are like leaves. They _____ the flower before it opens.
   - The stamen is the ___ ____ ____. It is made up of the ____ and the ____
   - The carpel is the ____ ____ ____. It is made up of the ____, the ____ and the ____.
   - Pollen grains are ____ _____ ____. They are found in the ____.
   - Ovules are ____ ____ ____. They are found in the _____.
   - The ovules are fertilized when a ____ ____ gets onto the ____.
   - The ___ ____ grows a tube which travels down the ____ to the _____.
   - The pollen grains can be transported from another plant by ____, ____, ____ or _____.
   - This is called _____-pollination. Some plants are ____-pollinating.

INTRODUCTION: LESSON 1

How you introduce the activity, (get the learners' attention)

Teacher says:

'Today we are going to start looking at how flowering plants reproduce.

When you were in Grade 5, you learned about the differences between men and women which enable them to reproduce, or have babies.

Q1: Is it the same with plants? Do you find male and female plants, with different parts? How is a baby plant made?' (Takes answers and suggestions, encouraging and drawing out learners' prior knowledge.)

Q2: Where are the male and female parts in plants?' (Take answers and suggestions, moving towards the answer: In most plants, the male and female parts are both in the same plant – in the flower. Learners may know more than this. If so, affirm and encourage their contributions.)

DO THE ACTIVITY LESSON 1 **Teacher Tasks** (What will you do to support the activity?)	**Learners Tasks** (What will the learners do in the activity?)
Whole class question and information-building session 2. Tell the learners that, for the next lesson, they will each bring a flower which they have found, so that they can see how these things work in reality, but for today they are going to look at a diagram of a simple flower. 3. Put up the diagram of the flower. Refer them to their textbooks if possible, where there is a similar diagram (p. 50). 4. Ask the following questions and take and work with answers. Point to the labels and write each term on the board as the correct answer is given. • Does anyone know which are the male parts of this flower? Would anyone like to guess? (**stamens** – **anthers** and **filaments**.)	1. Watch as diagram is put up on board or turn to the diagram in the textbook, if they have one. 2. Offer answers to the questions (whole class).

• Which are the female parts of this flower? Would anyone like to guess? (**carpel** - **stigma**, **style** and **ovary**) How did you guess? (In humans, women also have ovaries) • In animals and humans, male sex cells are called sperm. Do you know what they are called in plants? (**Pollen grains**) • In animals and humans, the female sex cell is called an ovum or egg. Do you know what it is called in plants? (**Ovule**, also meaning egg) 5. Go through the labels of each part of the flower. Ask the learners to complete the first 6 incomplete sentences about the labelled parts of the flower. Tell them write the sentences in their note-books (or exercise books), under the heading 'Reproduction of flowering plants'. (Answers: brightly; protect; male sexual part; anthers; filament; female sexual part; stigma, style, ovary, male sex cells; anthers; female sex cells, ovary). • The petals are the parts that are often _____ coloured. They surround the reproductive parts. • The sepals are the green parts which are like leaves. They _____ the flower before it opens. • The stamen is the ___ ____ ____. It is made up of the ____ and the ____ • The carpel is the ____ ____ ____. It is made up of the ____, the ____ and the ____. • Pollen grains are ____ _____ ____. They are found in the ____. • Ovules are ____ ____ ____. They are found in the _____. 6. Ask learners to read out their sentences (one learner per sentence). Affirm or work with answers. Write on board. Let learners mark their work.	3. Work in pairs to complete the sentences about each of the labelled parts of the flower. They should discuss in pairs and then write these sentences in their note-books (exercise books?), under the heading 'Reproduction of flowering plants'. 4. Volunteer and then read out answers to their completed sentences.

7. Now talk and ask questions about the difference between animals and plants: • When male and female animals want to get together to make babies, they move around looking for a mate. Plants are stuck in one place, so what do they do? • How does the male pollen grain get to the ovule in the ovary of the plant? • Does the pollen have to come from another plant, or can the flower be fertilized with its own pollen? • Does every plant have a flower with colourful petals? • Why do some plants have colourful petals and sweet nectar? 8. As you discuss the above questions with the class, make sure that they move towards the following answers. Also tell them about the many different kinds of plants and flowers. (Show some examples, or some pictures of examples.) Write only the **bold** words, below, on the board. • When a pollen grain lands on the stigma, it grows a tube, which lets the male sex cell travel down the style to the ovary. This process is called **pollination**, and causes the ovule to be **fertilized**. • Most flowers need pollen from another flower (**cross-pollination**), though a few are **self-pollinating**. • Some flowers have bright attractive flowers and sweet nectar, attracting **insects** and **birds** so that they visit the flower and take the pollen to the next flower. • Others, not so attractive, have anthers which dangle outside the flower so that the **wind** can easily blow the pollen away. The stigma is also exposed, so that it can catch the pollen blowing on the wind. • Some plants grow near the ground and rely on passing **animals** to transport the pollen on their legs from one flower to another.	5. Offer answers to questions. Engage in the discussion.

9. Ask the learners to complete the rest of the incomplete sentences about the flower: • The ovules are fertilized when a ____ ____ gets onto the ____. • The ___ ____ grows a tube and travels down the ____ to the _____. • The pollen grains can be transported from another plant or flower by ____, ____, ____ or _____. • This is called _____-pollination. A few plants are ____-pollinating.	
ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?) 1. Teacher takes answers to the completed sentences, allowing learners to mark and correct their own work. (Answers: pollen grain, stigma, pollen grain, style, ovary, wind, insects, birds, animals, cross, self) 2. Teacher asks the class: 3. What have you learned today about the reproduction of flowering plants, i.e. how plants make more plants? 4. Teacher listens to, probes, affirms, draws out further the learners' answers in order to summarize the processes of pollination and fertilization. 5. Teacher explains and asks the learners to write down the homework task which s/he writes on the board. The homework must be done before the next lesson (lesson 2).	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?) 1. Learners give their answers and mark their work. 2. Learners respond to questioning. 3. Learners write down homework.

Homework

1. Find a flower
2. Before you pick it, observe the plant. Write answers in your exercise book:
   - Do bees, flies, ants, etc. or birds visit the flowers?
   - Does the pollen hang outside the flower or is it inside the flower?
   - Is the plant in a windy place?
   - Does the plant have seeds? Draw one.
   - How many flowers on one stem?
   - What colour is the flower?
   - How many petals in one flower?
   - Draw the shape of a petal.
   - Draw the shape of a leaf.
3. Pick the flower (and seeds, if it has them) just before school and bring them to the next science class.

Explain that they are going to dissect (cut up or take apart) their flower and draw a diagram of it.

Homework

1. Find a flower
2. Before you pick it, observe the plant. Write answers in your exercise book:
   - Do bees, flies, ants, etc. or birds visit the flowers?
   - Does the pollen hang outside the flower or is it inside the flower?
   - Is the plant in a windy place?
   - Does the plant have seeds? Draw one.
   - How many flowers on one stem?
   - What colour is the flower?
   - How many petals in one flower?
   - Draw the shape of a petal.
   - Draw the shape of a leaf.
3. Pick the flower (and seeds, if it has them) just before school and bring them to the next science class.

LESSON 2

CLASSROOM ORGANIZATION FOR INTERACTIVE LEARNING: Whole class questions and answers and collaborative group work (observation and description).

RESOURCES AND PREPARATION

Before the lesson, make your own collection of local flowers, and cut through them with a sharp knife or blade, in order to make a cross-section.
(My collection of flowers, below, was damaged by wind and frost. It may be best to conduct this lesson in spring or summer!)

Single, flowers, like those in last lesson’s diagram, and the picture below, are the easiest to dissect.

However, many African flowers are composite, i.e. like many daisies, they are made up of hundreds of florets – small flowers – in the middle of the flower, which has some big petals round the edge. To examine the structure of a floret, you will need a magnifying glass.
Some may also be arranged in spikes. In other words, there are a number of flowers growing up the stem, with the lower ones opening first.

You will find out these differences when you cut the flowers open, and must be prepared to help the learners with them.

RESOURCES FOR THE LESSON

1. Flowers of all kinds, brought by learners. Each should have brought a flower.
2. Bring some extra flowers yourself, in case certain learners have forgotten, and to ensure that there are enough simple single flowers to make the dissection and observation easier.
3. Two or three sharp knives or blades, to cut the flower through the middle.
4. (A magnifying glass, if you can get one.)
5. Science text book or reference information for yourself (and for learners, if available).
6. Paper or exercise book per learner, for them to draw and write in or on, and a pen / pencil each.
7. Labelled diagram of flower from yesterday.
8. The following incomplete description, written on the board or on chart paper, for learners to complete:
    - This flower is about (number) centimetres in diameter.
    - It is (colour).
    - It has (number) petals.
    - (Number) flower(s) grow(s) on one stem.
    - The anthers and stigma are (outside / inside) the flower.
    - The plant (does / does not) grow in a windy place.
    - (Bees / flies / ants / birds) (do/do not) visit the plant.

INTRODUCTION LESSON 2

How you introduce the activity (get the learners' attention)

Ask learners to hold up their flowers so that the class can see the diversity of flowers. Make sure that each pair of learners has a flower.

Whole class discussion and feedback based on question and answer related to fieldwork observations:

Ask learners about their experiences finding flowers.

Where did you get them?

What did you find out through observing?

- Do bees, flies, ants, etc. or birds visit the flowers?
- Does the pollen hang outside the flower or is it inside the flower?
- Is the plant in a windy place?
- Does the plant have seeds? Draw one.

- How many flowers on one stem?
- What colour is the flower?
- How many petals in one flower?
- Draw the shape of a petal.
- Draw the shape of a leaf.

Listen to the experiences of one or two learners, and what they wrote in response to the homework questions above.

DO THE ACTIVITY Lesson 2	
Teacher Tasks (What will you do to support the activity?)	**Learners Tasks** (What will the learners do in the activity?)
Group work **Ask the learners to sit in groups of 4 (2 pairs).**	
1. Go round to the groups helping them to cut their flowers in half. Let 2 other learners help you, with the other knives you have brought, once they have seen what you are doing. (Make sure no-one gets cut.)	1. Learners have their flowers cut open and try to identify the parts discussed in the previous lesson.
2. Go round from group to group, inviting questions and discussing with groups or with the class as a whole the differences between the flowers they are seeing, i.e. simple single flowers, composite flowers and flowers arranged in spikes. There may be other kinds of flowers which have been collected. If you don't have answers about them, admit it and plan to do some research to find out about this new type of flower. All these flowers have the same basic structure, but in some these structures may be easier to see with the naked eye than others.	2. They ask questions about what they see.
3. Assist groups as they look at their flowers in cross section, and choose the one where it is easiest to see the parts they learned about in yesterday's lesson. Make sure each group has a flower where the parts are visible.	3. They choose the flower where it is easiest to see the parts they learned about in yesterday's lesson.
4. Tell them that each group member must draw a diagram of what they see, and label it. Many will have to enlarge what	

they see. (Put the diagram up on the board again to assist them.) 5. Support them if they struggle to find the parts of the flower, to see them and to draw them, and to identify and label the parts they discussed the day before. 6. Write the following sentences on the board for learners to copy and complete below their diagram, describing their flower. • This flower is about (number) centimetres in diameter. • It is (colour). • It has (number) petals. • (Number) flower(s) grow(s) on one stem. • The anthers and stigma are (outside / inside) the flower. • The plant (does / does not) grow in a windy place. • (Bees / flies / ants / birds) visit the plant. 7. Ask group members to select one of their number to present their findings to the class.	4. Each group member draws what he/she sees, and labels the parts discussed the day before. 5. They also write sentences about the flower, based on homework which was done. Sentences will follow the pattern below. (They will need help from the person who picked the flower. This may mean they need to ask the teacher, if they are using the teacher's flower.) • This flower is about (number) centimetres in diameter. • It is (colour). • It has (number) petals. • (Number) flower(s) grow(s) on one stem. • The anthers and stigma are (outside / inside) the flower. • The plant (does / does not) grow in a windy place. • (Bees / flies / ants / birds) visit the plant. 6. Groups select a member with a good drawing to present their findings to the class.
ENDING THE ACTIVITY LESSON 2 **Teacher Activities** (What does the teacher do to end the activity?) 1. Teacher asks the selected group members to come to the front with their flower and diagram. She asks them to show the flower and the diagram, pointing to the parts. They read their sentences and tell whether they think the plant is insect, bird, animal or wind pollinated and why. 2. Teacher asks the whole class the question: What have you learned today through observation? 3. Teacher draws learner remarks together, again summarizing what has been learned about the pollination and fertilization of flowering plants. Refer learners to an additional set of notes, or a section in the text-book, e.g. Malambo & Mubita, pp. 50 – 58)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?) 1. Group representatives show their flower and the diagram of it, pointing to the parts. They read their sentences and tell whether they think the plant is insect, bird, animal or wind pollinated and why. **2.** Learners respond, saying what they learned through their observation of flowers.

Activity 3: Implementing your Integrated Science observation activity on seeds / flowers / plants

 45 mins x 2 = 90 mins

Purpose

- To implement the planned activities involving observation and description of seeds / flowers / plants.
- To video (parts of) the lesson for later reflection.

What you will need

- Your prepared activity plan;
- The resources that you need for implementing the planned activities;
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement this activity according to their plan with their own class.
- But only one teacher in the group will have their activity videoed. As this activity is likely to take place over more than one period, it may be wise to decide on a portion of the activity to video.
- A colleague or friend will use the tablet to take the video.
- Later the whole group will watch and discuss the video (see Activity 4).

Activity 4: Reflect on the Integrated Science observation activities on seeds / flowers / plants

30 mins

Purpose

- To reflect on what worked well in the activity-based lesson
- To consolidate what you learnt from watching another teacher's activity.
- To identify what could be done differently the next time you implement this kind of plan.

What you need

- The video of (part of) the teacher's activity on the tablet.
- The Activity Plan for the teacher's lesson.
- A pen or pencil to make notes.

What you will do

- Watch the video that was taken.
- Reflect on the video activities and on your own activities.

1. Before you watch the video, read the following questions so that you have them in your mind:

a. What was the purpose(s) of the activity? (See Activity Plan)
   - Were the purposes achieved? Yes/ No?
   - Explain

b. Which aspects of the activity were particularly successful? Explain what was successful about them?

c. Which aspects of the lesson surprised you? Explain.

d. Did the teacher experience difficulties with managing:
   - any aspects of her plan,
   - any learner / groups of learners
   - Do you think the lesson was too ambitious (tried to do too much)?

   Give details about all of these.

e. Can you think of ways you / she could improve her plan, or manage a similar lesson better in future?

f. What did you learn from watching the video of this activity?

2. In your study group, watch the study group teacher's video on the tablet, thinking about the questions. You can watch it more than once if you need to.

Study group teacher's video

3. Now discuss the above questions in your group. Write some notes about what you learned during the discussion:

✍ Purposes and their achievement ……..

…….

…….

Successful aspects ……..

…….

…….

…….

Surprising aspects ……

…….

…….

Difficult aspects ……

…….

…….

Possible changes and improvements …….

…….

…….

…….

Other lessons learned ……

…….

…….

ENRICHMENT ACTIVITY – Optional!

If you implemented the Flower Lesson, you can now implement the Seeds Lesson or *visa versa.*

Test yourself

- Before moving onto Week 5 each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Which statement is **NOT TRUE**? It is good for learners to learn through observation and description because:

   a. Learners find out for themselves, so they will not forget what they learn. ☐

   b. It links school with everyday life in their environment. ☐

   c. They are working with real objects instead of theory on paper. ☐

   d. It saves the teacher work because the learners are doing it themselves. ☐

2. Which statement is **NOT TRUE**? Preparing for an observation lesson includes:

   a. Sitting in your classroom while learners do the preparation. ☐

   b. Making sure learners have suitable examples to observe. ☐

   c. Doing the observation activity yourself. ☐

   d. Making sure you have any tools that are needed with you in the classroom. ☐

3. Which statement is **NOT TRUE**? Billy started his lesson by going back to the previous one, on flowers, because:

   a. He wanted to move from the known to the unknown. ☐

   b. They didn't understand the last lesson. ☐

   c. The ovary of the flower produces the seeds. ☐

   d. He wanted to take the lesson on seeds right back to the place where seeds begin. ☐

4. Which sentence is **NOT TRUE**? When learners arrange the seeds in groups they have to use:

   a. The skill of categorizing. ☐

   b. Thinking skills, wondering what the reason is for the different shapes and kinds of seeds. ☐

   c. That seeds come in many shapes and forms. ☐

   d. The senses of sight and touch. ☐

5. The position of the seeds on the plant (e.g. inside the fruit; at the end of the grass stem) has something to do with:

   a. The ovary. ☐

   b. The kind of flower they come from. ☐

   c. The way they will be dispersed. ☐

   d. The shape of the seed. ☐

Week 5: Solving problems

Activity 1: Problem-solving: A Case Study about waste in the environment

 45 mins

Purpose

- To read and discuss Case Study: Solving local waste problems
- To help you plan and implement a similar series of lessons

What you will need

- Case Study: Solving local waste problems, below
- Pencil or pen to make notes

What you will do

- Read Case Study: Solving local waste problems
- Discuss certain questions about the Case Study
- Think about ways you could implement a similar lesson
- Write down your ideas.

In your study group

1. Read the Case Study and individually and then discuss the question in Section 2 below and answer them in the space provided.

Case Study: Solving local waste problems

Collins Lungu was teaching Social Studies to both Grade 6 and Grade 7. In both classes, he was dealing with aspects of pollution. He had taught lessons on different kinds of waste, waste disposal and recycling, as well as the causes of pollution. Now he felt it was time to become practical. The curriculum seemed to require that the learners get out into the community and identify the problems caused by pollution and waste, as well as ways of dealing with them.

He was chatting about this to Mary Khondowe in the staff room, and found that even at Grade 2 level, she was teaching the learners about waste and dangerous substances in the environment. They decided to take their learners on a joint outing, to look for places where waste was lying around.

Identifying the problem

Before they went, they held "brainstorm" lessons with their classes. They asked the learners to name as many waste products as they could think of.

Anything that gets thrown away at home, at school and in the market place. They must think of waste products which come from our own bodies and the bodies of animals. They must think of waste products which go into the air, when we make fires or drive cars. They must think of any kind of waste product.

Word Power
***Brainstorm**: n.* Spontaneous group discussion to produce ideas and ways of solving problems.

Collins wrote down all the learners' ideas on the chalk board. Then he asked the learners to make a two-column table in their exercise books, and write down all the ideas from the board in the first column. He started it off for them on the board…

Waste	Where we saw them
Plastic bags	On fences in town; in the river
Cardboard boxes	
Orange peels	
Plastic bottles	
Cow dung	
Smoke	

The next day, Tuesday, the three classes set off on their walk through the village and down by the river. The Grade 6's and 7's were told to take the lists of waste products that they had started in class, with them and to add more items as they went along.

Mary had made her own plans with the Grade 2's for recording what they saw. They kept close to her while they walked around town.

The Grade 6's and 7's were given a bit more freedom, but were told to be back in class by 10h30 for their next lesson.

On Wednesday, in their Social Studies class, Collins organised his learners in groups. Each group had to make a new table, this time with three columns, listing ALL the waste items they saw on their walk in the village, where they saw these items and the bad effect that the waste was having on the community>

Waste	Where we saw it	The bad effect on the community and environment
Plastic bags	On fences in town; in the river	Polluting the drinking water
Cardboard boxes		
Orange peels		

Plastic bottles		The goats try to eat them and get sick
Cow dung		Makes a mess on the ground – it's not nice when you step into it!
Smoke		

After about 15 minutes, each group reported back to the class, and Collin made a master list on the board, of waste products, key locations, and negative impacts.

They had an open discussion on which was the most serious aspect of waste which needed to be addressed in their community. They also talked about which aspect they as a class could do something about.

In their next period, the problem-solving began. He asked the learners to go back into their groups and develop some plans for tackling the problem of waste disposal and pollution in their area. Their aim was to think of a project which their class could undertake to recycle certain kinds of waste and use them for useful purposes. They could also think of people in the community who could help them.

Each group was given an opportunity to present their plan. At the end of the lesson, they voted on the plan which the class felt was the best.

Grade 6's chosen plan involved building a giant compost heap to use in the school vegetable garden. They had learned about making compost the year before, in Integrated Science, and had got to know a local farmer who could advise them various aspects of compost making, if they needed help.

- They planned that every week each learner in the class would bring a bag of organic waste – any waste from cooking like vegetable peels, or garden waste-like dried maize leaves, or fruit peels lying around in the street or near the market.
- Certain learners would pick up manure from the cattle, sheep and goats that wandered around town, making sure they didn't touch it with bare hands.
- All of this organic waste would be thrown together on one big heap at the back of eh school yard.
- Once a month, certain learners would turn or mix the compost, and when the organic waste materials were broken down, they would spread it on the garden, and dig it in to feed the soil make the vegetables grow better.

The Grade 7 plan involved collecting and washing plastic bags.

- Some mothers had already developed a way of crocheting bags, mats and caps out of strips of plastic bags of various colours. They planned to ask these mothers to teach some of the learners in the class to do this as well.
- They also hoped that the products they made could be sold, to raise funds for more learning materials for their class.

- Some learners would collect, wash and prepare the bags, some would cut them into strips, some would do the crochet work and others would manage the business side of things.
- Plastic bags which were too dirty to be useful would be collected in bags and sent to the refuse dump.

2. Discuss the questions listed under and make notes of your answers:

    a. How did Collins draw and value learners' prior knowledge?

✍ …… ……

……

    b. How this activity make use of local resources? If so, explain how?

✍ ……

……

……

    c. How did Collins set things up so that his learners could get engaged in problem-solving? What were the stages leading up to the problem-solving activity?

✍ ……..

……

Activity 2: Planning and preparing an activity to address environmental problems in the community

 45 mins

Purpose
To plan and prepare an activity similar to Collins' activity.

What you will need
- Extract from Integrated Science/Social Studies and Home Economics syllabuses: Waste and Pollution on the next page.
- A blank Activity Plan template - use the activity plan template that follows .
- A pen or pencil to write your plan.

What you will do
- Plan and prepare an activity similar to Collins' activity.
- The lesson will aim to create an opportunity for learners to solve real problems through their own effort and enquiry.

Work on your own or with a partner to fill in your Activity Plan that follows

1. Refer to the extracts from Integrated Science, Social Studies and Home Economics syllabuses all of which deal with some aspect of waste or pollution in one grade or the other.

2. Look carefully at the Case Study. Think about or discuss with your partner:
    - What the class knew about waste and pollution before Collins started this activity.
    - The way Collins introduced the lesson and prepared the learners for their outing.
    - The way the problem-solving activity was set up.
    - The process that led the class to selected their project.
    - Participation of all learners in the project.
    - How you will consolidate and end the learning activity

3. Think about the activity and discuss with your partner:
    - What the purpose of the lesson would be.
    - How Collins' activity can be adapted to suit your grade level.
    - How many periods you will spend on it. You may not have time for this. If so, make a decision on which sections of the activity you could adapt, shorten or leave out.
    - How you and the learners could manage an on-going project which might come out of this activity.

4. Fill in and prepare the Activity Plan that follows the syllabus chart.

Syllabus: Waste and Pollution

Integrated Science Grade 2 and 5 (First number in first row indicates grade)				
SUBTOPIC	**SPECIFIC OUTCOMES**	**KNOWLEDGE**	**SKILLS**	**VALUES**
2.3.1 Our Environment	2.3.1.1 List things that are harmful to human beings and the environment	Harmful things (waste dumps, toxic fumes from factories, automobiles and fires)	Communicating information on clean and dirty environment Observing things harmful in the environment	Appreciating the environment Cooperating in group activities Participating in voluntary activities on keeping the environment clean Applying know-ledge of keeping homes and schools clean
2.3.1 Our Environment	2.3.1.2 Explain why wastes should be deposited in the right places	Depositing waste in the right places to avoid contamination of the environment		
2.3.1 Our Environment	2.3.1.4 Explain the importance of keeping our homes and schools clean.	Keeping homes and schools clean to avoid land and water pollution		
5.3.2 Fertilizers	5.3.2.2 Demonstrate how to prepare compost manure	Way of preparing compost manure: pile of layers under the shade	Demonstrate how to make composite manure	Appreciating role of fertilizers in Agriculture Asking questions for more under-standing Cooperating in group work
	5.3.2.3 Importance of maintaining a supply of composted materials	Importance of maintaining a supply of composted materials: continuous supply of manure to plants		
Social Studies Grade 6 and 7				
6.4.1 Protection of the Environment	6.4.1.1 Identify ways of disposing of waste 6.4.1.2 Identify communal places that need protection from waste 6.4.1.3 Describe the role of the community in environmental protection and waste management	Recycling, burying Markets, schools, clinics Churches, bus stations, drainages Community participation, sensitisation and advocacy		Protection of the environment

7.3.5 Pollution	7.3.5.1 Explain causes of pollution 7.3.5.2 Outline effects of pollution on the environment 7.3.5.3 State possible solutions to pollution	Mining, solid waste disposal, chemical processing, forest fires, combustion Acid rain, land degradation, contamination of water sources, environmental education		
Home Economics Grade 5 (Health Education)				
5.2.3 Sanitation	5.2.3.1 Dispose different wastes	Importance of good sanitation: good health / prevention of diseases. Disposal of wet refuse: burying (compost heap) and dry refuse: burning Cleaning a kitchen bin	Disposing wet and dry refuse Cleaning a kitchen bin	Appreciating good sanitation

Activity Plan

Name of School:	Date and/or Time:
Grade/s:	
Subject Focus:	
Purpose of activity:	Skills / knowledge / values learners should develop:
RESOURCES AND PRREPARATION NEEDED:	

INTRODUCTION

How you introduce the activity, (get the learners' attention)

DO THE ACTIVITY

Teacher Tasks

(What will you do to support the activity?)

Learners Tasks

(What will the learners do in the activity?)

ENDING THE ACTIVITY **Teacher Activities** (What does the teacher do to end the activity?)	**Learner Activities** (What do the learners do to show that they have done the activity with understanding?)

REFLECTION (Complete this after you have done the activity. Use the following questions as a guide.)

- What was the purpose of the activity? ……..
  ……..
- Did you and the learners achieve the purpose? How do you know? ……..
  ……..
- What parts of the activity went well? ……
  ……
- What was unexpected?……
  ……
- What difficulties did you have? ……
  ……
- Did all learners play an active part in the activity?.....
  ……

- What do you think they learned? ……

  ……

  ……
- What did you learn? ……

  ……

Activity 3: Implementing your problem-solving activity on waste and pollution in the community

1 hour (if you implement the whole series of activities described in the Case Study, you will need more time)

Purpose

- To implement the activities involving problem-solving about waste and pollution
- To video (parts of) the lesson for later reflection.

What you will need

- Your prepared activity plan;
- Any resources that you need for implementing the planned activities;
- Tablet for taking video (plus friend or colleague to take video).

What you will do

- All the teachers in your study group will implement this activity according to their plan with their own class.
- But only one teacher in the group will have their activity videoed. As this activity is likely to take place over more than one period, it may be wise to decide on a portion of the activity to video.
- A colleague or friend will use the tablet to take the video.
- Later the whole group will watch and discuss the video (see Activity 4).

Activity 4: Reflect on the activity involving problem-solving around waste and pollution in the local community

30 mins

Purpose

- To reflect on what worked well in the activity.
- To consolidate what you learnt from watching another teacher's activity.
- To identify what could be done differently the next time you implement this kind of plan.

What you need

- The video of (part of) the teacher's activity on the tablet.
- The Activity Plan for the teacher's lesson.
- A pen or pencil to make notes.

What you will do

- Watch the video that was taken.
- Reflect on the video activities and on your own activities.

1. In your study group, watch the study group teacher's video on the tablet, thinking about the questions in Section 2.

Study group teacher's video

2. Discuss the questions in your group. Write some notes about what you learned during the discussion:

a. What was the purpose(s) of the activity? (See Activity Plan)
   - Were the purposes achieved? Yes/ No?
   - Explain

……

……

……

b. Which aspects of the activity were particularly successful? Explain what was successful about them?

✍ …….

……

……

c. Which aspects of the lesson surprised you? Explain.

✍ …….

……

d. Did the teacher experience difficulties with managing:
   - any aspects of her plan?
   - any learner / groups of learners?
   - Do you think the lesson was too ambitious (tried to do too much)?

   Give details about all of these.

✍ ……..

……

……

e. Can you think of ways you / the teacher could improve her plan, or manage a similar lesson better in future?

✍ ……..

……

f. What did you learn from watching the video of this activity?

✍ ……

……..

Test yourself

- Before completing this module, each teacher needs to complete this multiple choice assessment individually.
- You can do the test as many times as you like.
- Once you are satisfied with your result, tap save.
- A code number will pop up, sms the code to the course administrator
- This is how your progress through the course will be tracked.
- For your own record, note the code you sent: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Select the correct answer.

1. Collins prepared his learners for a problem-solving activity by:

   a. Combining three different classes in the outing. ☐
   b. Bringing them face-to-face with the problem. ☐
   c. Talking to Mary in the staff room. ☐
   d. Brainstorming the problem with the class. ☐

2. How did Collins make sure that the learners tried many ways to solve the problem? Choose the **BEST** answer.

   a. Going on an outing. ☐
   b. Letting them work in groups. ☐
   c. Letting each group think up a solution. ☐
   d. Writing down all the possible waste products they might find. ☐

3. How did Collins make sure that the learners focused on the task when they went on the outing?

   a. He told them to be back in class by 10h30. ☐
   b. They had a table to complete in which they recorded their findings. ☐
   c. He let the Grade 6's and 7's roam fairly freely. ☐
   d. The Grade 2's stayed close to their teacher. ☐

4. In the first lesson after their outing, they started by working in groups:

   a. To combine the information they had gathered. ☐
   b. To discuss the negative impacts of the waste they had seen. ☐
   c. To combine their information and discuss the negative impacts of the waste they had seen. ☐
   d. To write a master table on the board. ☐

5. In the second session of group work:

   a. They worked on a school compost heap. ☐
   b. They developed a plan for a school garden. ☐
   c. Every group had to design a plan to recycle waste. ☐
   d. They planned how they could collect and dispose of the waste. ☐

Congratulations

You have completed the Interactive Learning and Teaching Course.

We hope this has inspired you to become an interactive teacher.

Good luck!