

Name of lesson: The biosphere and the germination of seeds

Grade 7: Term 1

Subject: Natural Sciences

Curriculum Standards: (CAPS) Grade 7 Natural Sciences Term 1

CAPS requirements	Knowledge	Skills
<p>Life and Living: The biosphere</p> <p>The concept of a biosphere.</p> <p>Requirements for sustaining life.</p>	<p>The biosphere</p> <p>Germination</p> <p>Germination questions:</p> <ol style="list-style-type: none"> Is water essential for germination? How much is too much or too little? Is soil necessary for seed germination? How does temperature affect germination? Is light or darkness essential for seeds to germinate? Do seeds need air to germinate? Does the type of soil in which the seed is planted affect seed germination? 	<p>Create a visual representation of the information about the biosphere.</p> <p>Carry out a germination experiment.</p> <p>Turn questions into a testable hypothesis.</p> <p>Design an experiment that will answer the question.</p> <p>Carry out an experiment over a week. Keep detailed written observations and drawings of your seeds progress.</p> <p>Draw a conclusion from the experiment.</p>

Resources

Dictionary, worksheet, each group needs (depending on the question chosen) a variety of seeds, measuring devices and containers, paper towels, sand, soil, gravel, trays, water, egg cartons, plastic soda bottles, yoghurt containers, newspapers, paper towels, sunny window area, other germinating spots, pencil/pen, paper for recording, a selection of YouTube videos:

Germination of a seed: <http://www.youtube.com/watch?v=rDN0yAFcQok>

Amazing video germination of seeds: <http://www.youtube.com/watch?v=eelwEB4Z1GA>

Germination of Seeds - Theory and Experiment – Science: <http://www.youtube.com/watch?v=T94hwhYCFsY>

Biosphere animation: <http://spot.pcc.edu/~jvolpe/b/bi101h/Ch41/movies/biosphere.swf>

Objectives

Learners will:

- Create a visual representation about the biosphere and how it is made up
- Carry out a germination experiment choosing one of the questions provided

Background

This lesson introduces the learners to the term 'biosphere', and the spheres in the biosphere such as lithosphere, atmosphere and the hydrosphere. The biosphere includes all living organisms and dead organic matter. All living things can carry out all the seven life processes: nutrition (feeding), growth, reproduction, respiration (energy production), excretion, sensitivity (to the environment), and movement. To sustain living, things need energy, gases, water, soil and favourable temperatures. The learners will conduct an experiment to find out more about the seven life processes.

Vocabulary

biosphere, spheres, lithosphere, atmosphere, hydrosphere, organisms, organic matter, life processes, nutrition, growth, reproduction, respiration, excretion, sensitivity, movement, energy, gases, water, soil, temperatures

Teacher preparation before starting

Before starting to teach this activity, ensure that you are familiar with the definitions and the concepts and that you have worked through the activities the learners will be asked to work through

Teaching the Activity

Begin by finding out what the learners know about the biosphere. Introduce the concept of the biosphere more fully by means of a short online animated image to set the scene: <http://spot.pcc.edu/~jvolpe/b/bi101h/Ch41/movies/biosphere.swf>

Use the content of the image to explain the meanings of the different vocabulary words for this lesson. Establish the fact of the spheres such as lithosphere, atmosphere and the hydrosphere, and the seven life processes.

Main Activity

Discuss the various vocabulary terms listed under 'vocabulary' that will be used in this lesson and reinforce the vocabulary that the learners are unfamiliar with.

Once the students have grasped the concept of the biosphere, let them read the introduction on the worksheet and create a visual representation of what they understand about it. This can be in the form of a mind map or a different kind of drawing. They explain their drawing to a partner.

For the next part of this lesson, show the learners one of the YouTube videos about seed germination. This will lead up to the experiment the learners will be conducting.

Place the learners in groups to experiment with seeds to see if they can grow in different conditions.

Let each group choose one of six provided questions to examine. They then re-word their question so that it becomes a testable question.

The learners design an experiment that will answer the question and carry out the experiment over a week.

Learners keep detailed written observations and drawings of their seeds progress and draw a conclusion from the experiment.

Let the learners relate their findings to the seven processes of living things.

Encourage each group to report back to the class about their experiment.

Worksheet link

The instruction part of this lesson is the worksheet entitled 'The biosphere and the germination of seeds'.

Assessment Criteria

Did the learner create a visual representation about the biosphere and how it is made up?

Did the learner carry out a germination experiment choosing one of the questions provided?

Informal Assessment

Record each learner's progress on your specified recording sheet.

Assessment rubric

Rating code	Description of competence
7	Outstanding achievement
6	Meritorious achievement
5	Substantial achievement
4	Adequate achievement
3	Moderate achievement
2	Elementary achievement
1	Not achieved