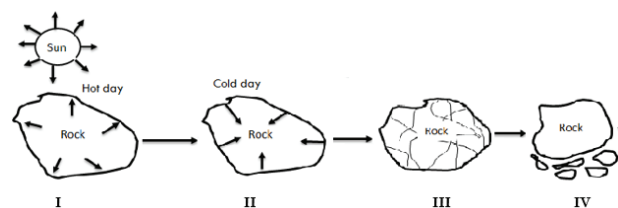


BIOLOGY

Revision Activity 1

Weathering is the process of soil formation by the breaking down of rocks into small particles. Weathering can be a biological process involving living organisms or a chemical process involving chemicals substances like acids or a physical process involving physical factors of the environment. Weathering is a slow and continuous process.



Study the figure above.

- What is happening to the rock at Stage I? Why is it happening?
- What is happening to the rock at Stage II? Why is it happening?
- What is happening to the rock at Stage III? Why is it happening?
- What is happening to the rock at Stage IV?
- Do you think this is a physical or chemical or biological process?

Revision activity 2

Soil is grouped basing on the size and nature of the soil particles. Have you ever asked yourself why different types of soils are used for different purposes? In this lesson you will learn how to distinguish clay from loam and sand soil.

Materials you will need:

Soil Sample A, Soil Sample B, Soil Sample C, Water

Activity set up

- Collect two cups full of soil from the following sites
 - Soil from the top layer of a well mulched garden/soil near a rubbish pit/soil under leaves in a forest/soil by the roadside where grass is growing (Labelled **Soil Sample A**)
 - Soil from a place where pots or charcoal stoves are made/ from a big anthill (Labelled **Soil**

Sample B)

- Soil from sand pits or mines/ soil that remains by the roadside when slow moving water has drained. (Labelled **Soil Sample C**)
- Place the soils on separate sheets of paper to dry
 - Remove any non-soil material from your samples
 - Keep the soils in separate containers for use in other activities

Caution: wash your hands with soap and water after this activity

Procedure:

Step 1: Take a pinch of soil sample A between your thumb and your forefinger. Press and rub gently. Describe the size of the soil particles. Are they small/ fine (powder-like)/big? Record your description in the table below.

Step 2: Repeat the procedure in step 1 using soil sample B and soil sample C.

Step 3: Take a pinch of soil sample A between your thumb and your forefinger. Pour ONE or TWO drops of water onto the soil between your fingers. Press and rub gently. Describe how the soil feels (texture). Is it smooth/rough/slippery/ gritty? Record your description in the table below.

Step 4: Repeat the procedure in step 3 using soil sample B and soil sample C.

Step 5: Take a handful of soil sample A, add a little water at a time and mix it with the soil. Try and mould the soil into a ball. Throw the ball into the air about 50cm and then catch it. Describe what happens to the ball. Does it remain intact/ it falls apart? Record your observation in the table below.

Step 6 Repeat the procedure in step 5 using soil sample B and soil sample C.

	Soil Sample A	Soil Sample B	Soil Sample C
Size of the soil particles			
Feel (texture) of soil			
Behavior of soil when thrown in air			

Read the characteristics below and use them to identify soil samples A, B and C.

Sand soil; feels gritty when wet, has relatively big particles that do not easily clamp together when wet.

Clay soil; feels smooth and slippery when wet, has very fine particles that strongly clamp together when wet.

Loam soil; feels like an intermediate between gritty and smooth, has small particles that readily clamp together when wet.

Soil Sample A is

Soil Sample B is

Soil Sample C is

Follow-up activity:

Soil in Uganda is used for various economic activities or in making different products. Think about your community and identify the economic activities that use soil or products made from soil. For each activity/product identified, mention the type of soil used and give reasons why that soil type is preferred.

Revision activity 3

Soil drainage is the soil's natural ability to let water pass through it while water retention refers to the amount of water soil can hold. Why do you think it is important to understand these two properties of soil? In this lesson you will compare drainage in two types of soil.

Materials you will need:

4 empty clear plastic bottles (500/600mls) as receivers, cotton wool, dry sand and clay, clock/watch, water, 4 funnels (If you cannot find a ready-made funnel, then use a cutter (knife/razor blade) to cut ½ of upper portion of the empty clear plastic bottles and use them as funnels and the lower portions as receivers/containers. In this case, you will need a cutter (knife/razor blade)).

Caution: Wash your hands with soap and water after this activity.

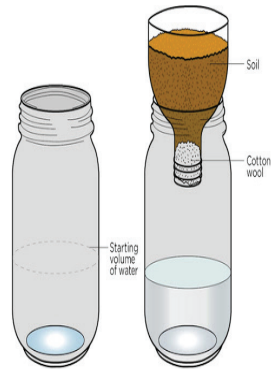
Procedure:

Step 1: Measure an equal volume of each soil sample, for example 30cm³

Use a piece of cotton wool to plug each funnel

Step 2: Put clay in one funnel and the sand in the other funnel

Step 3: Place the funnels with their contents over the receivers.



Step 4: Pour (at the same time) an equal volume (50cm^3) of water on each of the soil samples. Look at your clock or watch and let the experiment run for 20 minutes

Step 5: Observe and take note of the following:

- i. The soil from which water started dripping first.
- ii. The volume of water collected after the experiment.

Step 6: Record your findings in a table of your choice.

What explained conclusions can you draw about:

- i. Drainage in:
 - Clay soil
 - Sandy soil

- ii. Water retention:
 - Clay soil
 - Sandy soil

Follow-up activity

Comment on how the knowledge of drainage and water retention of clay and sand is used in the following areas:

- i. Agriculture
- ii. Building construction
- iii. Craft making

MATHEMATICS

Class: SENIOR TWO

Mathematics

Topic: Numerical Concepts

Lesson 1

Learning outcome

By the end of this lesson, you should be able to know the Rational, Irrational and Real Numbers. You will work out problems involving these numbers and apply them in real life situations.

Materials: You will need grid papers. The grid papers will be used when dealing with Square numbers and Square roots.

Introduction

You have already learnt about some types of numbers like Natural numbers, Whole numbers, Fractions, Decimals, Integers and many others. All these numbers can be expressed in different bases.

In term one of Senior one, you learnt *Bases* where you carried mathematical operations, converted numbers from one base to another and vice versa.

Remember that Integers have positions on a number line.

Activity 1

Represent the following numbers on the same number line

- (a) -3, -1, 1, 2, 5, 10
- (b) 0.1, 0.4, 0.5, 0.8
- (c) $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{1}{7}$

Rational Numbers

Remember, Integers and decimal numbers can easily be represented on a number line.

In the previous activity, you might have converted fractions to decimals in order to present them on a number line.

When fractions are converted into decimals, **they** are terminating, recurring and others are neither terminating nor recurring.

Note. Terminating and recurring decimals can be expressed in form of $\frac{a}{b}$ where **a** and **b** are integers. This means that all integers can be written in form of $\frac{a}{b}$

Activity 2.

Express the following numbers in form of $\frac{a}{b}$

- (a) 2, 7, 9, 11, 15, -3, -5

- (b) $1\frac{1}{3}$, $1\frac{1}{3}$, $3\frac{11}{55}$, 2.2, 4.8, 1.02

You have seen that integers, terminating and recurring decimals can be written in form of $\frac{a}{b}$ where **a** and **b** are integers.

Numbers which can be expressed in form of $\frac{a}{b}$ are called Rational numbers.

Activity 3.

Are all Decimal Numbers Rational numbers? With examples, justify your answer.

Irrational Numbers

Activity 4: Using a Calculator, find the square roots of the following numbers

- (a) 1 (b) 4 (c) 9 (d) 3 (e) 2 (f) 13

Write the answers for (a).....(f) in form of $\frac{a}{b}$ where **a** and **b** are integers

Have you been able to write your answers for (a)(f) in form of $\frac{a}{b}$?

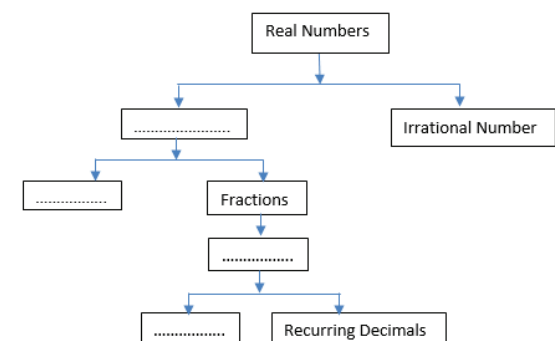
Note: All numbers which cannot be written in form of $\frac{a}{b}$ are called irrational numbers

All Irrational numbers have corresponding positions on the Number line

Real Numbers

Remember Rational and Irrational numbers have positions on the Number line

Activity 5: Complete the following chart of Real numbers



Converting Recurring Decimals into Fractions