MINISTRY OF EDUCATION

SECONDARY ENGAGEMENT PROGRAM

GRADE 8

INTEGRATED SCIENCE

Week 1 **Lesson 1**

Topic: The Microscope

Objectives:

- Given an unlabelled picture of a microscope students will label at least 10 parts correctly.
- Given a table of the parts of a microscope and functions of the parts, students will match each part with its respective function correctly.
- With the aid of a handout on how to use the microscope, students will rearrange all the steps to show the sequential order for using the microscope.
- With the use of appropriate examples, students will calculate the magnification of objects correctly.
- After looking at a video, students will identify at least three ways to care for the microscope.

Content

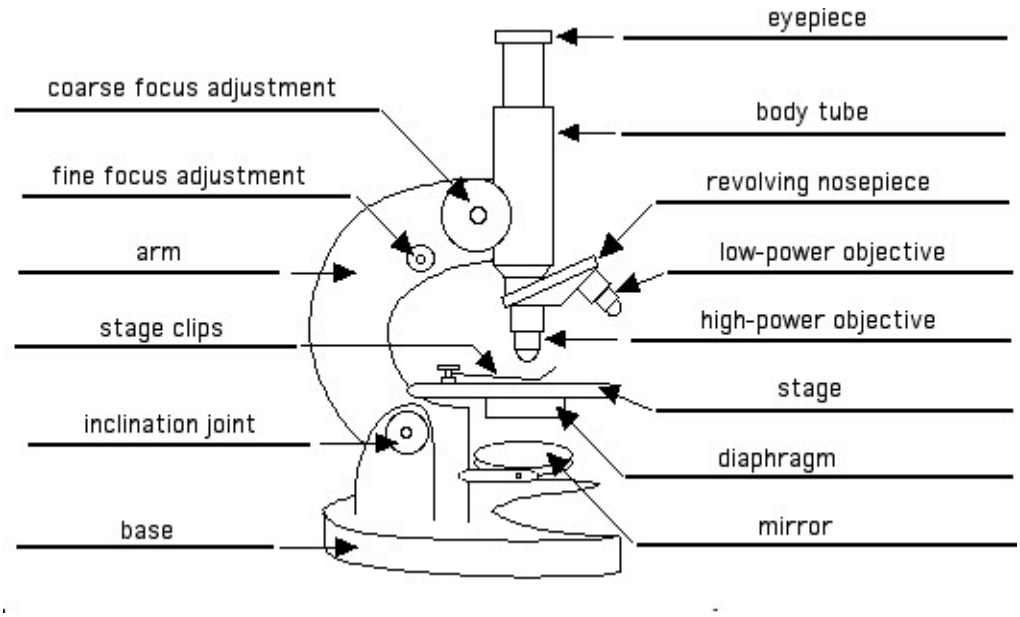
- The microscope is an instrument that magnifies objects that are too small to be seen with the naked eyes.
- The compound or light microscope consists of two convex lenses; the eyepiece and objective lens.
- The eyepiece of a light microscope usually produces magnifications 10 times (10x) the original specimen.
- The objective lens can produce magnifications within the ranges of 4, 10 and 40 times (4x, 10x or 40x) the original specimen.
- The total magnification of the light microscope = magnification of the eyepiece x magnification of the objective lens.
- For example, if the magnification of the eyepiece is 10x and magnification of the objective lens is 4x, then the total magnification is 40x.

Now let's have a look at how to use the microscope. Follow the link below:

Video link: https://www.youtube.com/watch?v=F5yildOr4i4

Fact Sheet

Parts of a Microscope



Functions of the Parts of a Microscope

- Eyepiece - is the lens present at the top of the microscope and is used to see the objects under study
- Body tube - connects the eyepiece to the objective lenses
- Objective lens- provides magnification that allows for microscopic specimens to be seen.
- Stage- the flat platform where the slides are placed
- Diaphragm- has different sized holes and is used to vary the intensity and size of the cone of light that is projected upward into the slide
- Mirror - it is used to reflect light from an external light source up through the bottom of the stage
- Base – bottom of the microscope that is used for support
- Arm - Supports the tube and connects it to the base of the microscope
- Coarse adjustment - The coarse adjustment knob located on the arm of the microscope moves the stage up and down to bring the specimen into focus.
- Fine adjustment - this knob is inside the coarse adjustment knob and is used to bring the specimen into sharp focus under low power and is used for all focusing when using high power lenses
- Nose piece- this is the part of the microscope that holds two or more objective lenses and can be rotated to easily change power

- Stage clip - clips that are attached to the stage and are responsible for holding the slides in place

How to use the microscope

1. To carry the microscope, hold the microscopes' arm with one hand and your other hand under the base.

2. Place the microscope on a table with the arm towards you.

3. Turn the coarse adjustment knob to raise the body tube.

4. Revolve the nosepiece until the low-power objective lens clicks into place.

5. Adjust the diaphragm. While looking through the eyepiece, also adjust the mirror until you see a bright white circle of light.

6. Place a slide on the stage and centre the specimen over the opening on the stage. Use the stage clips to hold the slide in place.

7. Look at the stage from the side. Carefully turn the coarse adjustment knob to lower the body tube until the low power objective almost touches the slide.

8. Looking through the eyepiece, very slowly, turn the coarse adjustment knob until the specimen comes into focus.

9. To switch to the high-power objective lens, look at the microscope from the side. Carefully, revolve the nosepiece until the high-power objective lens clicks into place. Make sure the lens does not hit the slide.

10. Looking through the eyepiece, turn the fine adjustment knob until the specimen comes into focus.

Caring the Microscope

The microscope is an expensive instrument and should be handled with great care to maintain its precision. Here are some hints to follow:

1. Always use both hands to carry the instrument. Hold the limb with one hand and place the other hand under the base.
2. When placing the microscope on a bench or a table, place it down carefully so that the delicate mechanism is not jarred.
3. Clean the lenses by wiping them with lens paper or soft tissue. Never touch the lens with the finger or coarse cloth. Never wet the lens.
4. Keep the stage of the microscope dry and clean. Wipe it immediately if it becomes wet.
5. Do not tilt the microscope when using wet preparations on the slide.

6. Always cover the object with a coverslip to protect the objective lens.
7. Always move the lens upwards when focusing to avoid breaking the slide. (Follow link)

Homework

There are different types of microscopes. Name the types of microscopes and state their differences.

References

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