Science 8

Cell Theory I

Name:
Date:
Block:

1. **Living Things**
2. **Microscope**

Living Things

Identify the 7 characteristics of living things from the pictures provided (on the PowerPoint). For each living thing, write why you think it is living.

Picture:	Living or Non-living?	Why do you think it is living? (what characteristic is it exhibiting?)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

Living Things

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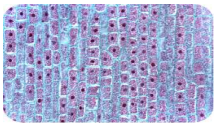
Characteristic of Living Things

1. **Living things…_____.**



- _____ are the basic unit of life
- Ex: _____ - organisms made up of _____ cell.
    -
- Ex: _____ - organisms made up of _____ one cell.
    -

2. **Living things…_____.**

- Anything that causes a _____ _____ to _____ is called a _____.
- Ex:
- Ex:

3. **Living things…_____.**

- To _____ to the environment, living things require _____.
- Living things have _____ _____ of getting energy.
- Ex:

4. **Living things…_____.**

- All living things _____ in some way.
- This may be obvious (_____) or less obvious (_____).
- A _____ may be needed to observe movement at a _____ level.

5. **Living things…_____.**

- _____ is a result of _____ in your body increasing in number.
- _____ are continually being _____.

6. **Living things…_____.**

- A way for living things to _____ _____ _____ that die.

7. **Living things…_____.**

- What living things consume are not always used by the body and therefore creates _____.
- Animals produce waste such as _____, _____ and _____.

While watching the video, find examples of how each characteristic is demonstrated.

Characteristic	**Example:**

Characteristics of Living Things Questions

1. All living things are made up of cells and can be unicellular or multicellular. What does "uni" and "multi" mean?
   - Uni =
   - Multi =

2. Define stimulus. Describe **your own example** of an animal responding to stimulus.
   - Definition:
   - Example:

3. What are three types of wastes produced by animals?
   1. 2. 3.

4. Many non-living things have some of the same characteristics as living things. For example, a non-living thing might move, use energy, and grow in size. For each of the following, identify and describe the characteristics that it shares with living things. Then explain why scientists **do not** consider it to be living.
   i. A campfire

   ii. An icicle

   iii. A printer

   iv. A fossil

5. Imagine you live in a future where robots take in nutrients, use energy and produce waste. They also respond to stimuli. Each robot is made of artificial cells that can increase in number, allowing the robot to grow. Finally, the robots are able to reproduce by building new robots. Explain why you would or would not consider the robots to be living things.

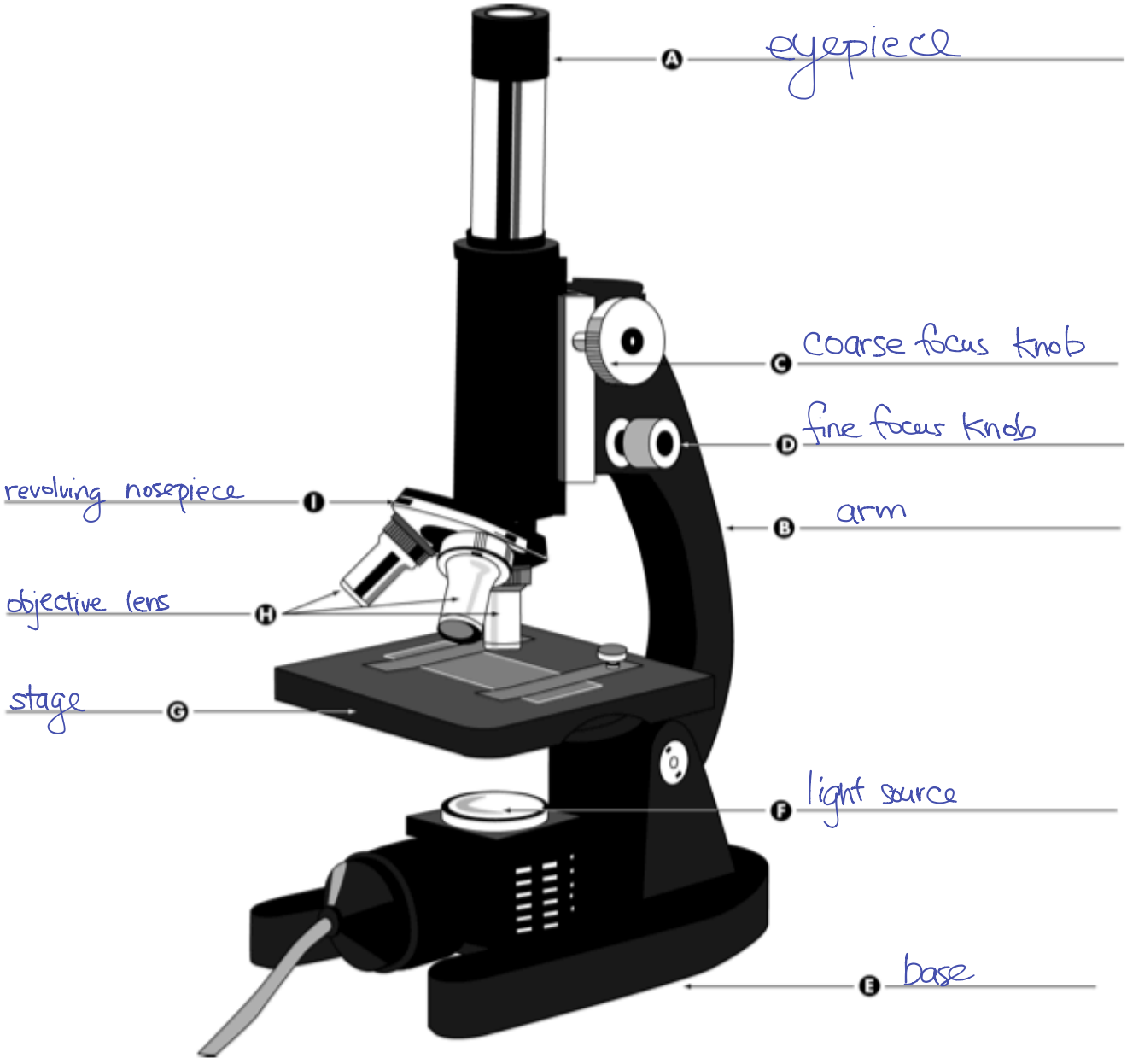
Microscopes

Early Microscopes:

- Built in the late 1600's and early 1700's
- One of the first people to build a microscope was named Anton van Leeuwenhoek

THE COMPOUND LIGHT MICROSCOPE:

- Usually used in science classes and medical laboratories.
- **Using your textbook, label the parts of the microscope!**



Parts of the Microscope

Part	**Function**
Eyepiece	Used for viewing and contains a lens that magnifies
Arm	Supports the eyepiece.
Coarse focus knob	brings an object into focus at low or medium power
Fine focus knob	Brings an object into focus at high power.
Objective lenses	Magnifies the image
Revolving nosepiece	Holds the three objective lenses.
Stage	Supports the slide
Light Source	Supplies the light needed to view the slide.
Base	Supports the entire microscope

Magnification:

- Contains two sets of lenses
- Eyepiece lens 10x
- Objective lenses:
  - Low-power objective lens 4x
  - Medium-power objective lens 10x
  - High-power objective lens 40x

Eyepiece lens x Objective lens = Total magnification of microscope

Example:
Total magnification of medium-power lens =

eyepiece x medium

= 10 x 10 = 100x

An eyepiece on a microscope has a magnification of 10×. The objective lenses on the microscope have magnifications of 4× at low power, 10× at medium power, and 40× at high power.

(a) Using the information how would you combine lenses on a microscope if you wanted to magnify an object 40×?

eyepiece × low power = 40×

(b) How would you combine lenses if you wanted to magnify an object 100×?

eyepiece × medium power

(c) How would you combine lenses if you wanted to magnify an object 400×?

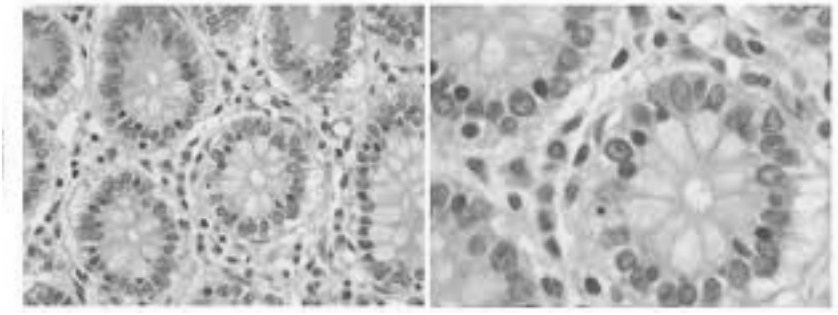
eyepiece × high power

If a compound microscope has an eyepiece of 15× magnification and you select an objective lens with a power of 40×, what is the total magnification of the object?

15 × 40 = 600×

Field of View (FOV):

- Describes how much of the specimen you will be able to see under the microscope.
- As the magnification gets greater, the FOV gets smaller.
- You are "zooming in" to the specimen.
- You will be able to see less of the specimen, but the image you see will be in greater detail.



Microscope Questions:

1. Match the microscope part to the correct function.

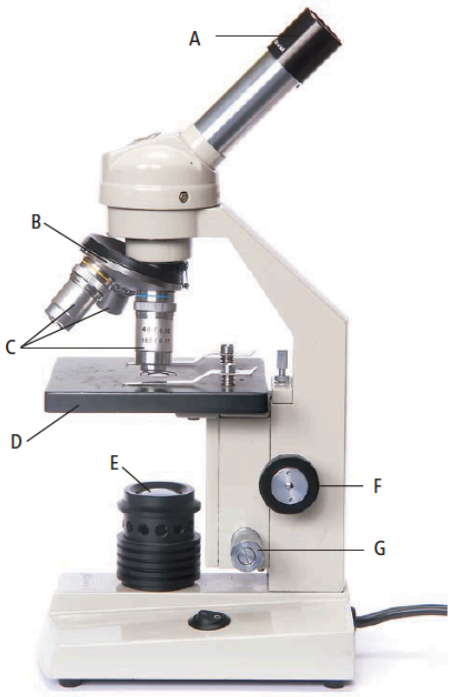
Function	Microscope part
_____ 1. holds the slide in place	(a) objective lens
_____ 2. lens closest to the eye	(b) eyepiece
_____ 3. supplies the light needed to view the object	(c) revolving nosepiece
_____ 4. allows you to switch magnifications	(d) course focus knob
_____ 5. magnifies the object	(e) stage clips
_____ 6. supports the microscope slides	(f) fine focus knob
_____ 7. used for focusing at low power	(g) light source
_____ 8. used for focusing at high power	(h) stage

2. Name three parts of a compound light microscope that have names similar to the names of human body parts.

a) b) c)

3. What is the proper way to carry a microscope?

4. Name each part identified with a letter in the photograph of the compound light microscope below.



A:

B:

C:

D:

E:

F:

G:

5. Why do you start with the low-power objective lens when focusing an image?

6. If an objective lens of a compound light microscope has a magnification power of 40x, why is the image magnified 400x?

7. You are exploring a remote region in the interior of British Columbia. You unexpectedly discover what may be a new microscope life form in a sample of pond water. How could you determine if this sample is living or non-living?