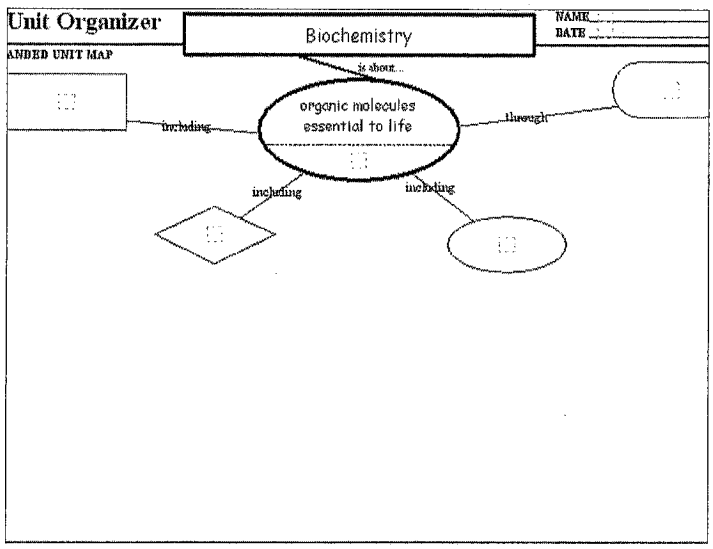
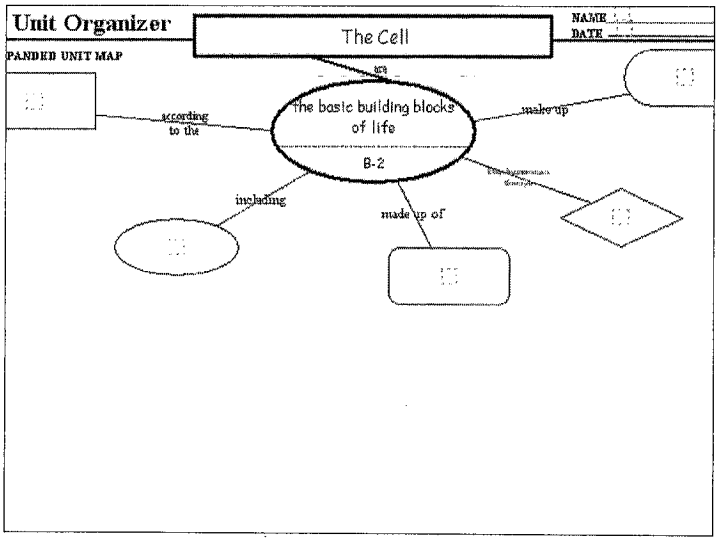
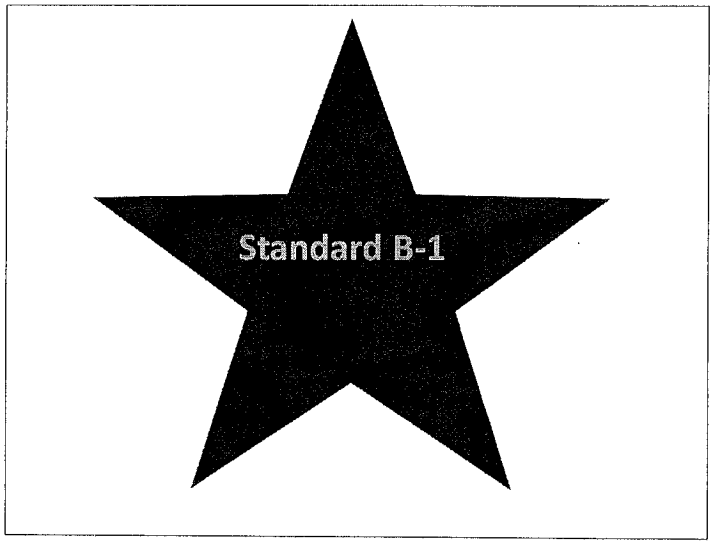
Benchmark I Review







1. What are the steps of Scientific Method?

Experiment, Data Collection/Analysis, Conclusion, Rete

2. What is a hypothesis?

A suggested solution to the problem must be testable and specific

3. What is an independent variable?

Variable that is changed

4. What is a dependent variable?

Variable that is measured

5. What is a control variable?

Variable that is kept the same

6. Identify the requested parts of the scientific method in the following experiment abstracts.

Sammy was trying to decide what kinds of faucets to install in his new house. In order to the best water pressure, he takes five different faucets and installs them in the same type of shower in the same house. He measures the amount of water flowing per minute from the faucet to determine the best water faucet. He determined type a, b, and d had the same rates, type c was small, and type e was the best.

Independent Variable-

Type of faucet installed

Dependent Variable-

Amount of water flowing per minute

7. What is precision?

How closely measurements taken in the same wa agree to one another

8. What is accuracy?

The degree to which the experimental value agrees with the true or accepted value

9. What is the SI base unit for measuring length?

Meter

Volume?

Liter

Mass?

Gram

10. How many mL are in 15L?

15,000 mL

11. How many L are in 15mL?

0.015 L

12. How many variables should be tested at one time?

Just one at a time!

Which of the following is the correct order of the scientific method?

1. Problem, experiment, hypthesis, variables, prediction, and conclusion
2. Observation, hypothesis, experiment, analysis, and conclusion
3. Prediction, experiment, analysis, experiment, observation, and conclusion
4. Experiment, hypothesis, analysis, conclusion, problem, and theory

Identify the *independent variable* in the following statement: More peaches will be produced if the soil is fertilized more.

1. Number of peaches produced
2. Amount of fertilizer
3. Amount of sunlight
4. Amount of water

How many mL are in 0.147 L?

1. 1,470 mL
2. 1.470 mL
3. 14.7 mL
4. 147 mL

The base unit for volume is the _____.

1. gram
2. meter
3. liter
4. ounce

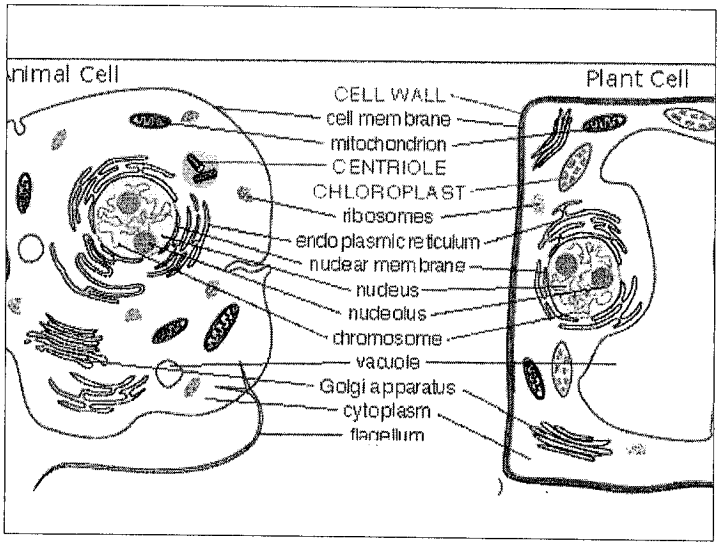
When viewing a specimen under high power, a student noticed that the specimen was out of focus. Which part of the microscope should he use to obtain a clearer image?

1. diaphram
2. eyepiece
3. coarse adjustment knob
4. fine adjustment knob

13. What are the three parts of the Cell Theory?

- **The Cell is the most basic unit of life.**
- **All living things are made of one or more cells.**
- **All new cells come from pre-existing cells.**

Organelle	Function
Nucleus	Control Center
Mitochondria	Produces Energy
Chloroplasts	Photosynthesis
Lysosome	Digests Waste
Vacuole	Storage Center
Ribosomes	Makes Proteins
Endoplasmic Reticulum (ER)	Transport in Cell
Golgi apparatus	Packaging Center
Cilia	Cell Movement (Hair)
Flagella	Cell Movement (Tail)
Cell membrane (Plasma membrane)	In/Out of the Cell
Nuclear membrane (Nuclear envelope)	In/Out of the Nucleu
Cell wall	Structure/Protection
Cytoplasm	Jelly-like, holds organelles



28. Describe the characteristics of a prokaryotic cell.

No nucleus, no membrane-bound organelles
Has DNA in nucleoid region, cell membrane, ribosome
Typically unicellular organisms

29. Describe the characteristics of a eukaryotic cell.

Has membrane-bound organelles
DNA is in the nucleus
Typically multicellular organisms

30. What is the organization of organisms from smallest (cell) to largest (organism)?

Cell, Tissue, Organs, Organ Systems, Organism

31. Describe the term "homeostasis".

Maintaining a balanced internal environment; equilil

31. Which organelle helps maintain the cell's homeostasis?

Cell Membrane (aka Plasma Membrane)

33. What is passive transport?

Transport from an area of high to low concentration that requires no energy

a. What is diffusion?

Movement of a solute from high solute concentration to low solute concentration

b. What is facilitated diffusion?

Movement of a solute from high solute concentration to low solute concentration through a transport or carrier protein

c. What is osmosis?

Movement of water from high water concentration to low water concentration

Osmosis-- Movement of water

a. What happens to a cell placed in a hypotonic environment?

Water moves into the cell
The cell swells

b. What happens to a cell placed in a hypertonic environment?

Water moves out of the cell
The cell shrinks

c. What happens to a cell placed in an isotonic environment?

Water moves in and out of the cell
No net water movements
The cell stays the same

34. What is active transport?

Transport of molecules in and out of the cell from an area of low concentration to high concentration
Requires energy

a. Describe endocytosis.

Formation of a vesicle to move large molecules into a cell

b. Describe exocytosis.

Fusing of a vesicle with the cell membrane to release large molecules out of the cell

35. What does pH measure?

The acidity of a substance

36. What is an acid?

pH less than 7

37. What is a base?

pH greater than 7

38. What 3 things affect the rate of biochemical reactions?

Temperature, pH, catalysts

39. Explain the role of buffers.

Buffers help regulate pH

40. What is an enzyme?

Biological catalyst

41. How do catalysts work?

Lowering the activation energy required for a reaction to take place

Which of the following is NOT a macromolecule of life?

1. acids
2. carbohydrates
3. proteins
4. lipids

All organic compounds contain the element

1. Carbon
2. Nitrogen
3. Calcium
4. Sodium

Amino acids are the monomers of

1. carbohydrates
2. proteins
3. fats
4. lipids

Which phrase best describes the effect of a catalyst on a chemical reaction?

1. Increase the temperature
2. Increase the volume of the reactants
3. Decrease the reaction rate
4. Decreases the activation energy

Homeostasis means

1. a change over long periods of time.
2. keeping factors like pH and temperature the same.
3. rapid change in temperature.
4. the same thing as inquiry.

42. What are the 4 organic macromolecules of life?

Carbohydrate, Lipid, Protein, Nucleic Acid

43. What makes a molecule organic?

Made of carbon

	Macromolecule	Function
44.	Protein	**Builds muscles, enzymes (catalysts)**
45.	Carbohydrate	**Short Term Energy**
46.	Lipid	**Long Term Energy**

Macromolecule	Monomer
47. Protein	**Amino Acids**
48. Carbohydrate	**Saccharides**
49. Lipid	**Fatty Acids**

50. Which macromolecule is the main source of energy for the cell?

Carbohydrates

51. What type of microscope do we use in our labs?

Compound light microscope

52. How do you find total magnification?

Eyepiece magnification * objective lens magnifica

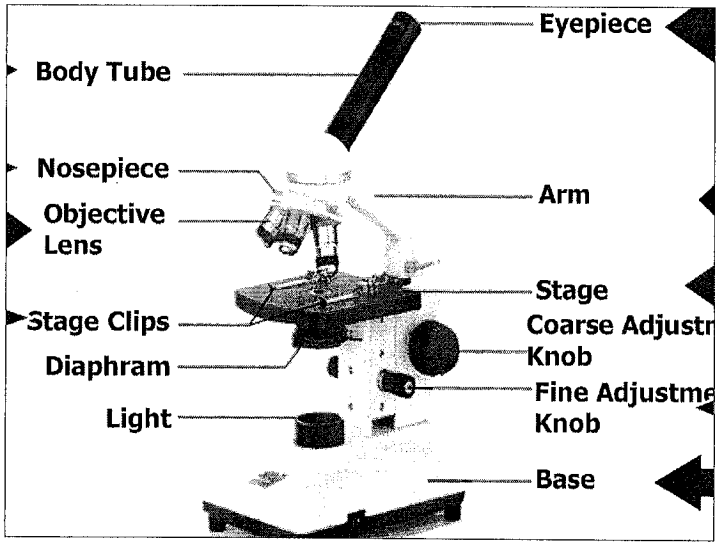
53. What is the purpose of the course adjustment?

Large adjustments by raising the stage to bring the specimen into view

54. What is the purpose of the fine adjustment?

Small adjustments in focus

55. What safety procedures are used during microscope use? **Carry with two hands, fine adjustment only with high pow**



A particularly active cell might contain large numbers of

1. chromosomes
2. vacuoles
3. mitochondria
4. walls

Jeremy looks through his microscope and sees a cell with the following: cell wall, chloroplasts, and a large vacuole. What type of cell is he viewing?

1. animal
2. plant
3. bacteria
4. prokaryotic

One difference between prokaryotes and eukaryotes is that

1. nucleic acids are found only in prokaryotes.
2. mitochondria are found in larger quantities in eukaryotes.
3. the Golgi apparatus is found only in prokaryotes.
4. prokaryotes have no nuclear membrane.

Which of the following does *not* expend energy?

1. diffusion
2. endocytosis
3. active transport
4. a sodium-potassium pump

What is a major difference between facilitated diffusion and active transport?

1. Active transport moves substances against the concentration gradient.
2. Active transport uses proteins in the process.
3. Facilitated diffusion moves molecules through the plasma membrane.
4. Facilitated diffusion requires large amounts of energy.