

Unit 1 - Process of Science

Identify:

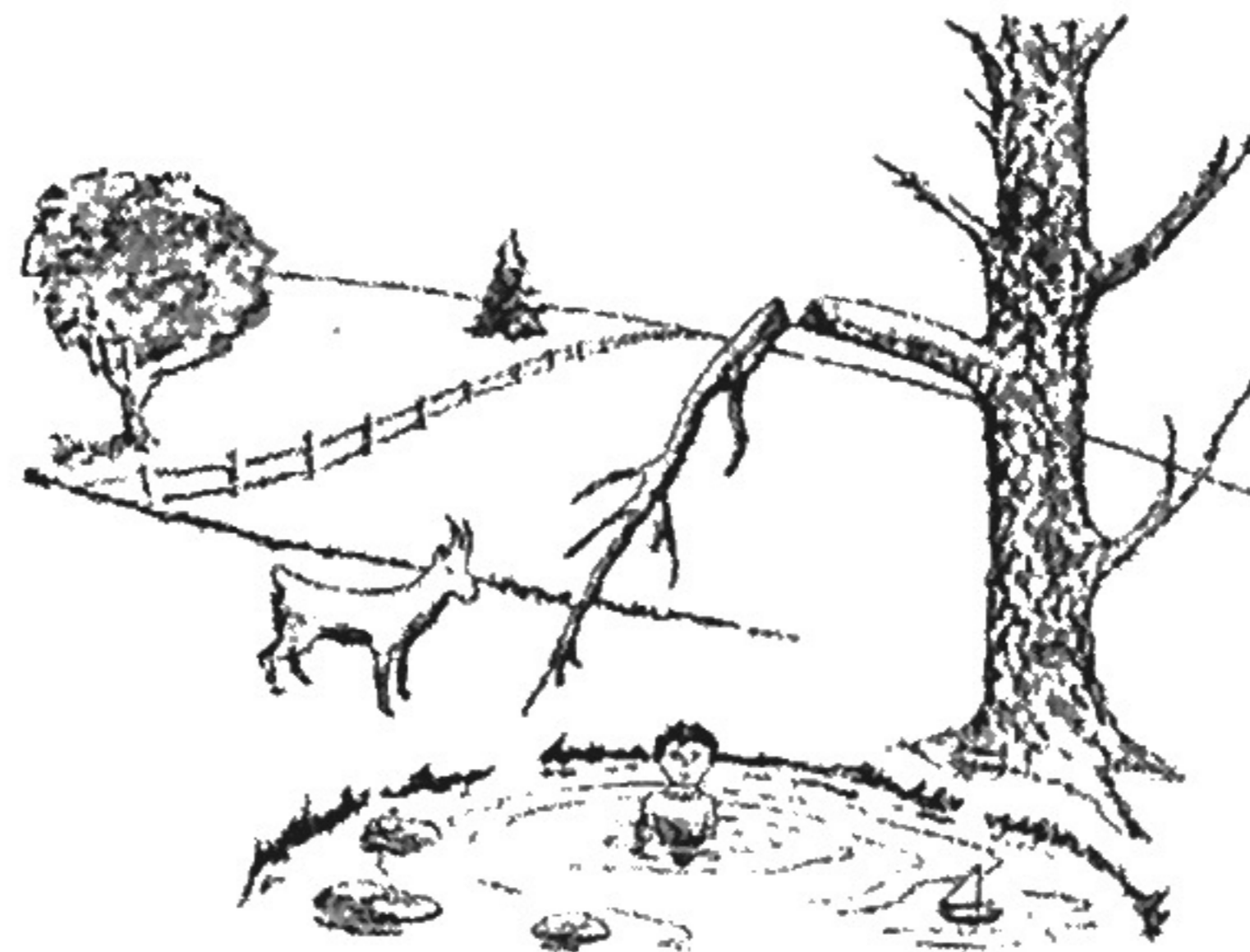
1. Independent variable: manipulated (changed by experimenter)
2. Dependent variable: result of experiment, data collected

Situation: I want to see if decreasing the amount of homework will assist students in getting better grades. The independent variable is amount of h/w.
The dependent variable is grade.

Based on the image to the right:

List 3 observations:

- goat
- tree
- person



List 2 inferences:

- boy is sad
- it is hot out

Chemistry

Identify:

Matter: has mass & takes up space.

3 parts of an atom: protons, electrons, neutrons

1. **Draw** a water molecule (2H, 1O) and label the positive and negative atoms.



2. **Covalent** bonds share electrons, while **ionic** bonds transfer electrons.

3. **Water:** Cohesion is when two water molecules are held together by hydrogen bonds. (this is why we observe surface tension. Think of the penny.)

4. **You must know what it means when I say water is a polar molecule.**
What does that mean?

• partially positive & negative parts of molecule allow to bond to other H₂O molecules!

Unit 1: Macromolecules

1. What are the four Organic Compounds (MACROMOLECULES)? Identify the polymers (larger molecules) with its monomers (those that make up the larger molecules).

Polymer	Monomer	Function	Notes
Carbohydrate	monosaccharide	<ul style="list-style-type: none"> • short term energy storage • structure 	Fructose and glucose are examples <ul style="list-style-type: none"> • cellulose
Nucleic Acids	nucleotide <ul style="list-style-type: none"> • 5C sugar • Phosphate • Nitrogen 	<ul style="list-style-type: none"> • instructions to make proteins • genetic info. 	DNA and RNA
Lipids	triglyceride <ul style="list-style-type: none"> • Glycerol + 3 fatty acids 	STORE large amounts of energy for the body. (Long-term storage) Insulation	<ul style="list-style-type: none"> • carbohydrates fats • carbohydrates waxes • Steroids • oil
Protein	amino acid	<ul style="list-style-type: none"> • transport O_2 • enzymes • receptors • structural support 	<ul style="list-style-type: none"> • hemoglobin • catalase

2. What are enzymes and what factors affect the function of enzymes?

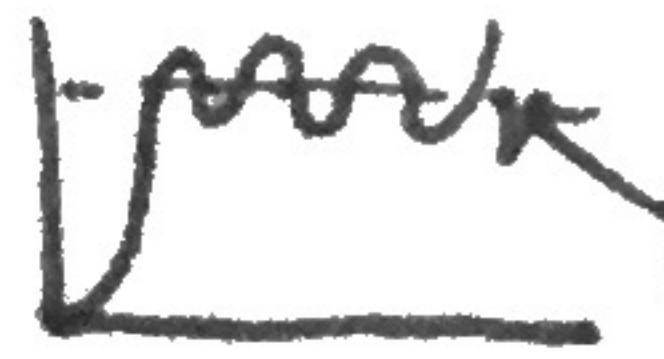
temperature, pH, low substrate, function: speeds up rxns
lower activation energy

Unit 2 - Ecology

1. What are biotic and abiotic factors?

living non-living

2. What is carrying capacity?



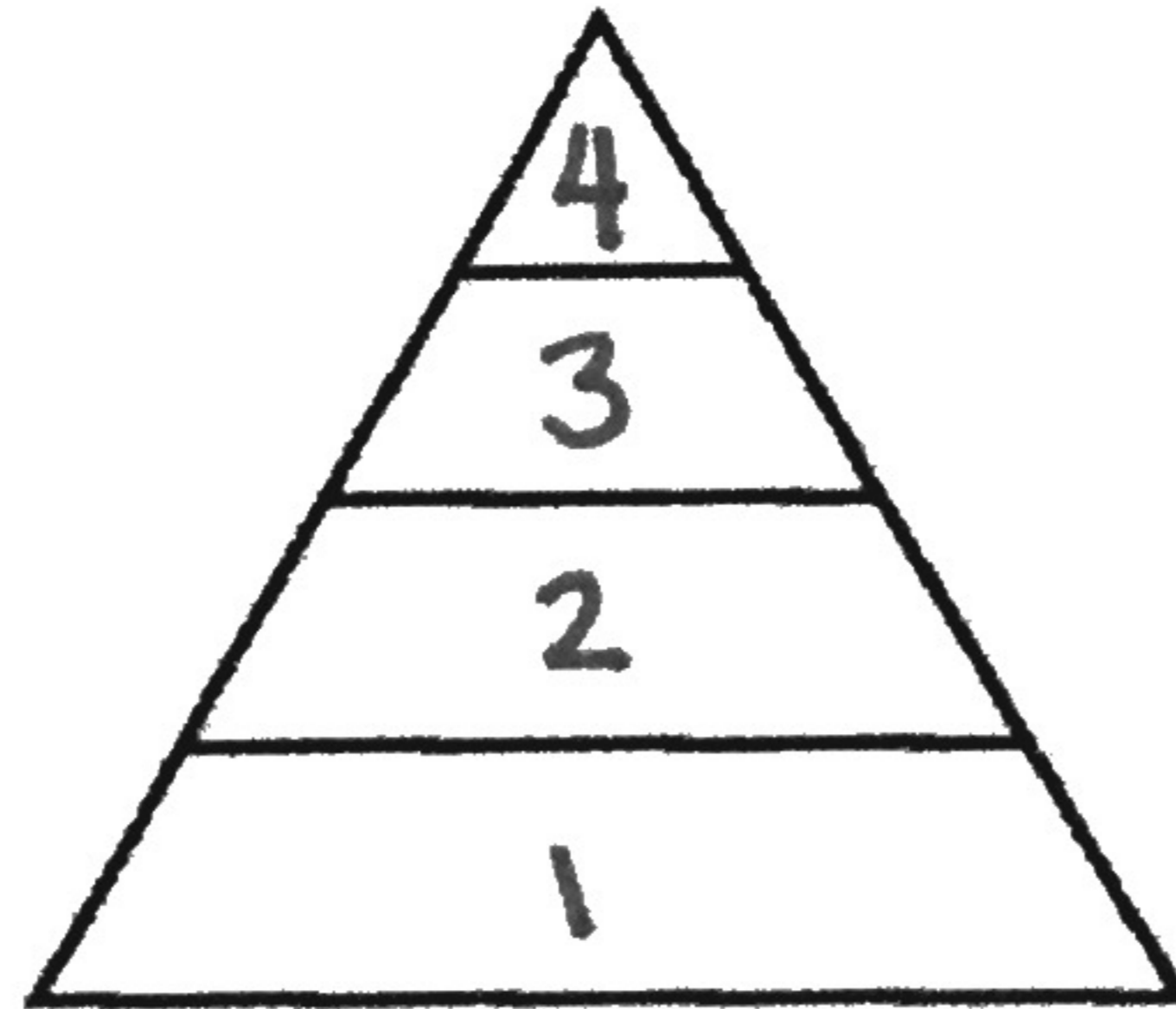
highest amount of individuals in a living system that carrying capacity can be supported

3. What are the differences between a food chain and food web?

Food chain (short, for one line) web (multiple chains linked)

4. Label the following terms in this ecological pyramid. Provide an example organism for each level.

1. Producer
2. Primary Consumer
3. Secondary Consumer
3. Tertiary Consumer



What is a heterotroph?

• consumes for energy

What is an autotroph?

• makes own energy

5. Only about 10% (number) of the energy available within one trophic level is transferred to organisms at the next trophic level.

6. Energy flows in ONE DIRECTION in an ecosystem. How does matter move through an ecosystem? ** Think carbon and water cycle

Cycles!

Unit 3 - Cells

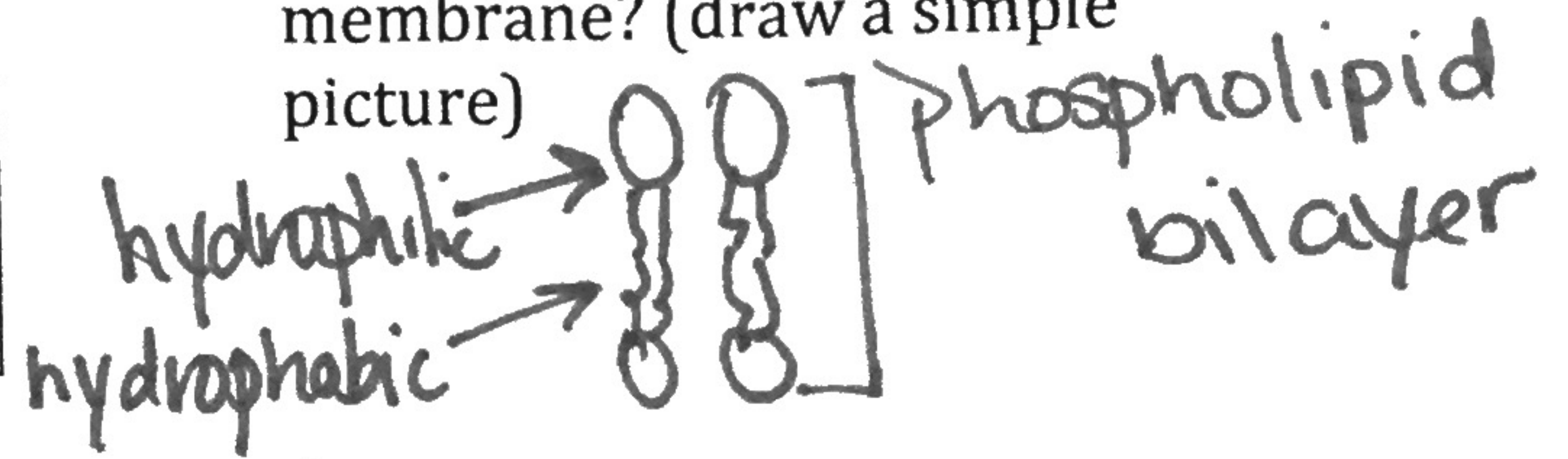
Identify where you would find these organelles. Place an X in a the appropriate spots. You will need to know what the function of each organelle is!

Structure	Eukaryotic Cells	
	Animal	Plant
Cell Membrane	X	X
Cell Wall		X
Nucleus	X	X
Ribosomes	X	X
Endoplasmic Reticulum	X	X
Golgi Apparatus	X	X
Lysosomes	X	
Vacuoles		X
Mitochondria	X	X
Chloroplasts		X
Cytoskeleton	X	

1. What are the 3 parts of the cell theory?

- ① All living things come from pre-existing cells
- ② All living things composed of 1 or more cells
- ③ Cells: basic unit of life

2. What is the structure and function of the cell membrane? (draw a simple picture)

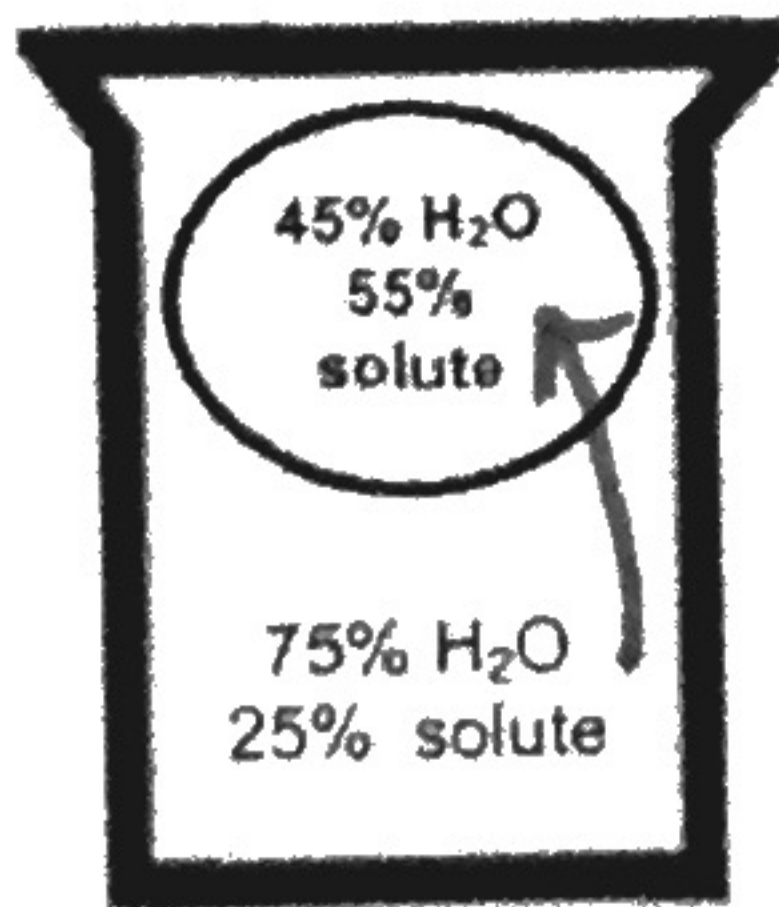


3. Particles move from high concentration to low concentration.

4. What is the difference between simple diffusion and osmosis?

osmosis is ~~the~~ specific to only H₂O movement.

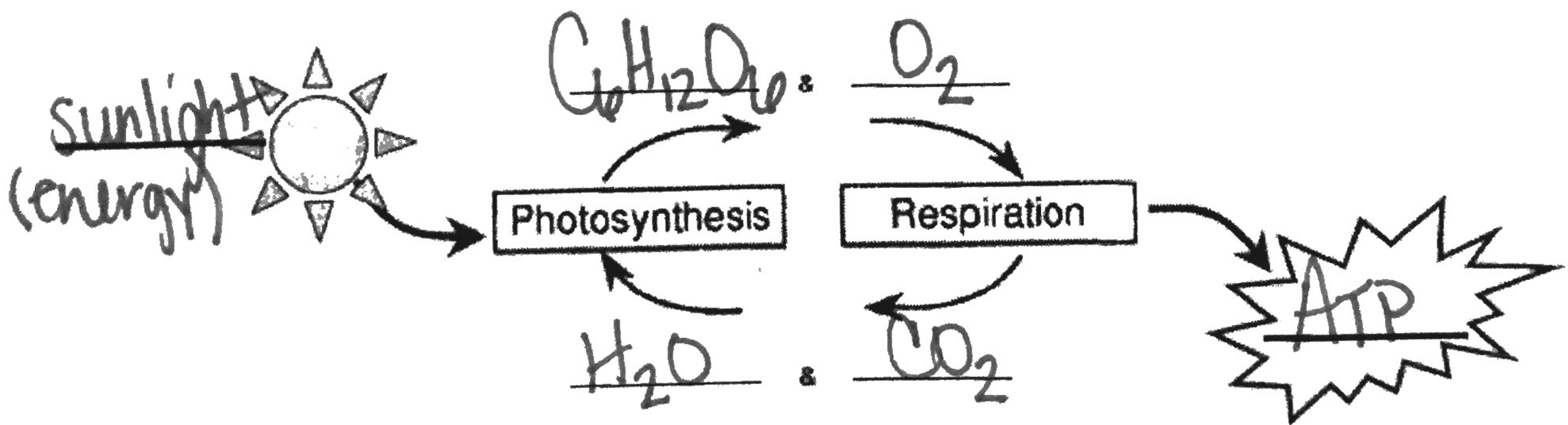
5.



Explain how water will move in the following solution in the image to the left.

- move into cell, high to low
- hypotonic solution
- less solute in solution + more H₂O

Identify: Fill in the blanks to the process of photosynthesis and cellular respiration. I would know both the word and molecular equations.



Bikini Bottom Genetics

Name _____

Scientists at Bikini Bottoms have been investigating the genetic makeup of the organisms in this community. Use the information provided and your knowledge of genetics to answer each question.

1. For each genotype below, indicate whether it is a heterozygous (He) OR homozygous (Ho).

TT Ho Bb He DD Ho Ff He tt Ho dd Ho
 Dd He ff Ho Tt He bb Ho BB Ho FF Ho

Which of the genotypes in #1 would be considered purebred? TT, DD, BB, FF, ff, dd, bb, tt

Which of the genotypes in #1 would be hybrids? Dd, Bb, Ff, Tt

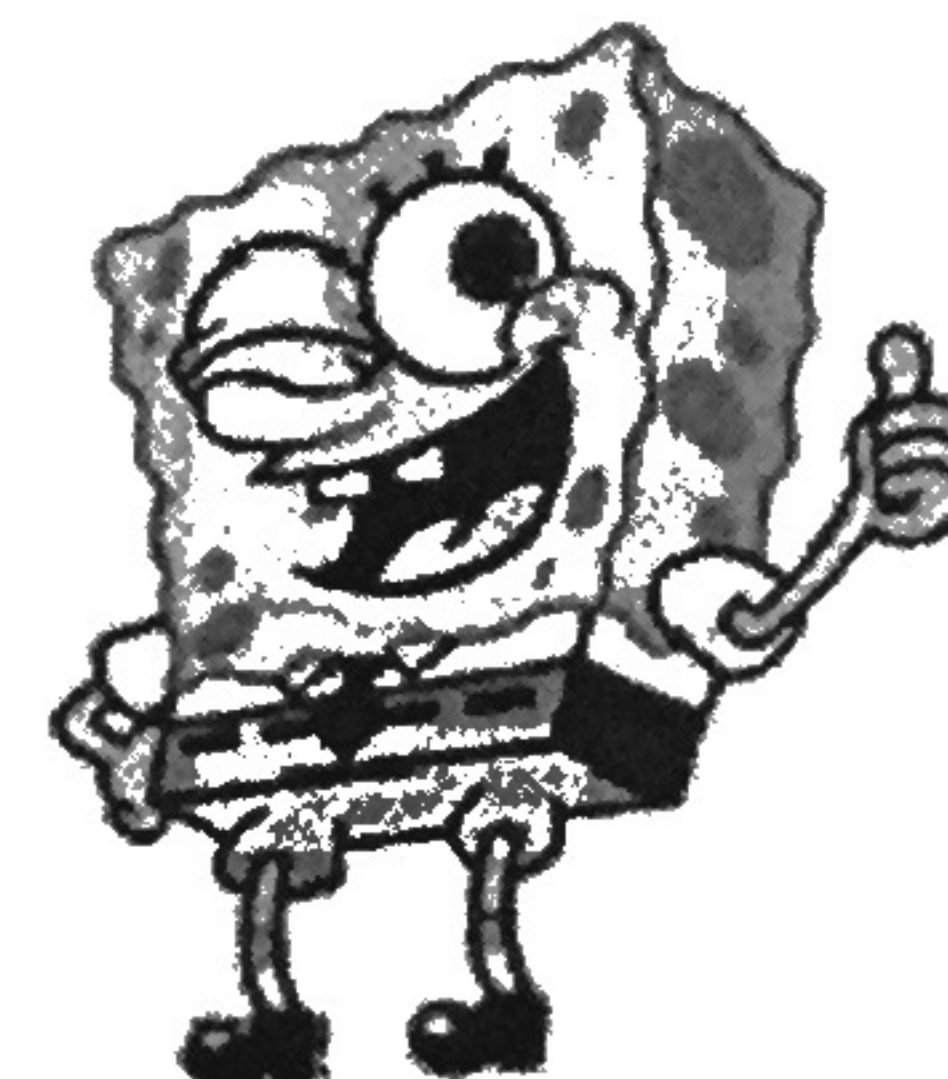
2. Determine the phenotype for each genotype using the information provided about SpongeBob.

Yellow body color is dominant to blue.

YY yellow Yy yellow yy blue

Square shape is dominant to round.

SS square Ss square ss round



3. For each phenotype, give the genotypes that are possible for Patrick.



A tall head (T) is dominant to short (t).

Tall = TT or Tt Short = tt

Pink body color (P) is dominant to yellow (p).

Pink body = PP or Pp Yellow body = pp

4. SpongeBob SquarePants recently met SpongeSusie Roundpants at a dance. SpongeBob is heterozygous for his square shape, but SpongeSusie is round. Create a Punnett square to show the possibilities that would result if SpongeBob and SpongeSusie had children. HINT: Read question #2!

	S	s
S	Ss	Ss
s	ss	ss

A. List the possible genotypes and phenotypes for their children.

SS-square, Ss-square, ss-round

B. What are the chances of a child with a square shape? 2 out of 4 or 50%

C. What are the chances of a child with a round shape? 2 out of 4 or 50%

5. Patrick met Patti at the dance. Both of them are heterozygous for their pink body color, which is dominant over a yellow body color. Create a Punnett square to show the possibilities that would result if Patrick and Patti had children. HINT: Read question #3!

	P	p
P	PP	Pp
p	Pp	pp

A. List the possible genotypes and phenotypes for their children.

PP-pink, Pp-pink, pp-yellow

B. What are the chances of a child with a pink body? 3 out of 4 or 75%

C. What are the chances of a child with a yellow body? 1 out of 4 or 25%