

HW #5
Packet

The Scientific Method

Scientists study problems and conduct experiments in a variety of ways. However, all use the scientific method. The **scientific method** is an organized way to find answers to a problem. Match each phrase in the word box to an activity that describes it. Then number the descriptions to show the correct sequence for the scientific method.

interpret data
identify the problem

observe and record
arrive at a conclusion

make a hypothesis
test the hypothesis

A

A group of students discuss what they believe will be the outcome of an experiment they are about to conduct. Each student records a statement that will either be proven or disproven by the experiment.

B

Each member of the group carefully watches as the experiment proceeds. One group member writes down the comments of the group as they call out what they see.

C

After the experiment is complete, the group discusses their observations. They review their notes and create a graph that shows the results of the experiment. The group discusses what these findings might mean.

D

Now that the group has decided on a hypothesis, they are ready to proceed with the experiment. As they work, the group is cautious to test only one variable at a time and to follow all directions carefully.

E

The group reviews their notes and the data they have collected. After a short discussion, they decide whether or not the original hypothesis is correct.

F

A science group begins a discussion related to what they have been studying in class. They take turns posing questions they still have about the topic. Together, they decide on an experiment they would like to conduct. They hope the experiment will answer some of the questions they still have.

Chapter

6 The Chemistry of Life**Chapter Assessment****Reviewing Vocabulary**

Match the definition in Column A with the term in Column B.

Column A**Column B**

- | | |
|---|-------------------|
| _____ 1. Center of an atom | a. diffusion |
| _____ 2. Mixture in which one or more substances are distributed evenly in another substance | b. enzyme |
| _____ 3. All of the chemical reactions that occur within an organism | c. metabolism |
| _____ 4. Bond formed between amino acids | d. nucleus |
| _____ 5. Protein that changes the rate of a chemical reaction | e. peptide bond |
| _____ 6. Molecule with unequal distribution of charge | f. polar molecule |
| _____ 7. Large molecule formed when many smaller molecules bond together | g. polymer |
| _____ 8. Net movement of particles from an area of higher concentration to an area of lower concentration | h. solution |

In the space at the left, write the term in parentheses that makes each statement correct.

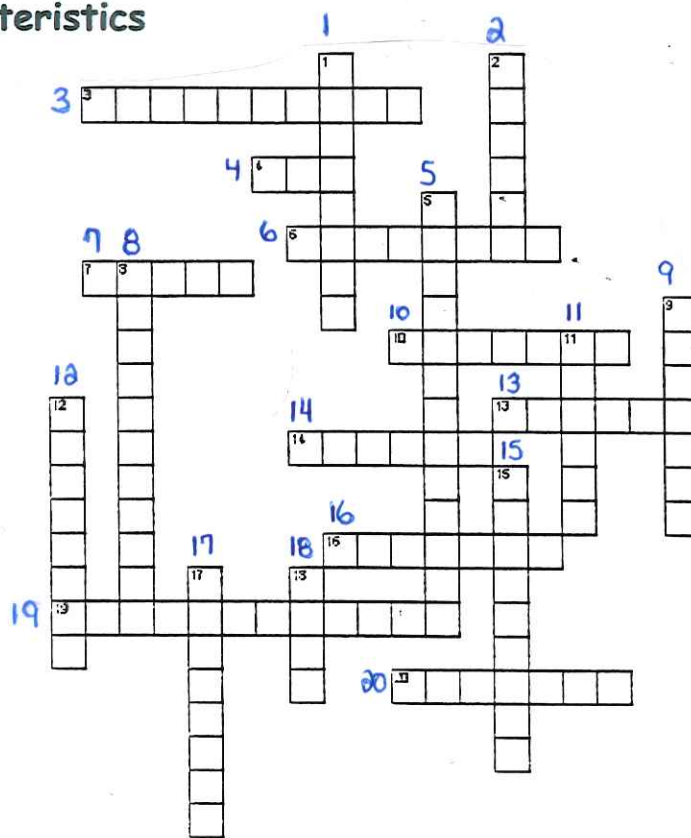
- _____ 9. Atoms of the same element with different numbers of neutrons are (*isotopes, isomers*).
- _____ 10. Atoms of two or more elements chemically combined are (*mixtures, compounds*).
- _____ 11. Two atoms that share electrons are held together by (*ionic, covalent*) bonds.
- _____ 12. Any substance that forms hydrogen ions in water is a(n) (*acid, base*).
- _____ 13. The smaller subunits that make up nucleic acids are (*amino acids, nucleotides*).
- _____ 14. Some substances move into cells by (*hydrogen bonding, diffusion*).

Macromolecules Characteristics

Review

Word Bank:

amino acid	lipids
carbohydrates	monomer
covalent	nucleic acids
diseases	nucleotide
DNA	polymer
energy	protein
enzyme	sequence
fats	three
glucose	twenty
hydrophobic	vitamins



Across:

- 3.) monomer of nucleic acids
- 4.) the abbreviation of deoxyribonucleic acid
- 6.) many genetic _____ are due to defective proteins in our bodies
- 7.) _____-dimensional shape is very important for the function of that protein
- 10.) genetic term for any building block molecule of any class
- 13.) there are _____ kinds of amino acids in our cells
- 14.) cholesterol is in the _____ class of macromolecules
- 16.) a macromolecule made of amino acid monomers
- 19.) macromolecules made of nucleotides (2 words)
- 20.) a monomer of carbohydrates

Down:

- 1.) micronutrients (named A, B, C, D, E, and K) essential for our body
- 2.) humans do not have the _____ to digest plant cellulose
- 5.) class of macromolecules made of sugar monomers
- 8.) describes any molecules that are repelled by water molecules
- 9.) generic term for any macromolecule of any class
- 11.) main function of triglycerides is _____ storage
- 12.) type of bond that connects atoms together to form molecules
- 15.) monomers of proteins
- 17.) the order or _____ of the amino acid determines the shape of the protein
- 18.) type of triglycerides found mainly in animal cells

Homework - Osmosis

1.) You have been clam digging all day in the Chesapeake Bay and finally caught a jumbo clam. You take your jumbo clam and place it into a bucket of freshwater. Explain what will happen to the cells inside the jumbo clam's body as it remains in the bucket of freshwater over time.

2.) What type of osmosis has occurred in question #1?

Isotonic, Hypotonic, or Hypertonic

3.) You see a water snake slithering around outside in your backyard. Suddenly, the snake squirms into a large pan of salt water sitting on the grass. Explain what will happen to the cells inside the snake's body as it remains in the pan for a period of time.

4.) What type of osmosis has occurred in question #3?

Isotonic, Hypotonic, or Hypertonic

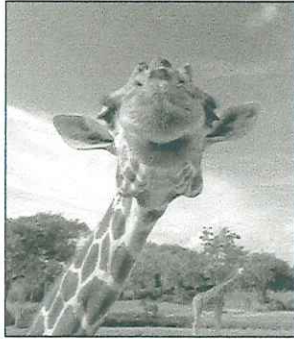
5.) Draw a picture to represent the following types of osmosis. Use the letter "X" to represent the solutes and "H" to represent the solvent.

• isotonic

• hypotonic

• hypertonic

Discover Magazine September 2012
Tomorrow's Zoo: Clones Dodos and Cyborg Giraffes?
by Jennifer Abbasi



Resurrecting long-dead species, bioengineering friendlier animals, and creating robot creatures made of artificial tissue: These are some of the concepts proposed by prominent zoo directors, animal behaviorists, conservationists, and architects at a first-ever symposium about the future of zoos, held in Buffalo, New York, this winter.

Some presenters touched on familiar themes of introducing more open terrain where large animals could roam freely. Others explored vertical zoos—high-rise exhibits that would have a small footprint in crowded cities. But the conference also plunged into more controversial territory. Within decades, advances in sequencing genes from ancient tissue could allow scientists to clone extinct dodo birds, saber-toothed cats, and woolly mammoths, says Jeffrey Yule, an evolutionary ecologist at Louisiana Tech University. Researchers in Asia and Europe are working to piece together DNA from mammoth tissue preserved in Siberian permafrost. Someday they might be able to insert it into an elephant egg to produce an embryo that a surrogate elephant would carry. It could fall to zoos to look after these animals.

Animals might also be bioengineered to better suit captivity, says John Fraser, former director of the Wildlife Conservation Society. Altering big cats, for example, to produce more endorphins might make them less aggressive. "We've spent a lot of time creating what look like barrier-less exhibits, but they still have barriers," Fraser explains. "Animals could have more freedom without putting others at risk." Fraser also predicts robotics and lab-grown tissue will converge to create animal cyborgs with machine brains and living flesh, allowing visitors to interact with more species at petting zoos.

Some exhibits, like Detroit's re-creation of the Arctic tundra, are already advancing, says Michael Noonan, a biologist at Canisius College, which hosted the event. "The evolution is under way."

Science Journal Article Questions - Discover Magazine September 2012
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- 1.) Name some of the goals that prominent zoo directors, animal behaviorists, conservationists, and architects would like to see in tomorrow's zoos.

- 2.) Describe the mechanism that could allow researchers to clone extinct species such as dodo birds or woolly mammoths taking place at Louisiana

- 3.) Discuss some of the predictions mentioned by John Fraser, former director of the Wildlife Conservation Society, regarding tomorrow's zoos.

- 4.) The article's last sentence reads, "The evolution is under way". Based on your scientific knowledge of evolution, does this really seem like "evolution"?

- 5.) How comfortable would you be to have this type of "tomorrow's zoos" living within your town/city?