Name _____ Due Date : _____

SECTION 7B

Analysis Skill

HW#3 Packet

Using a Scientific Method

Scientists are interested in the world around them. This curiosity leads them to investigate things and events. Scientists use their senses to observe as they investigate. They use many methods of scientific problem solving. One scientific problem-solving technique has six steps:

1. State the problem.
2. Gather information about the problem.
3. Form a hypothesis.
4. Test the hypothesis.
5. Accept or reject the hypothesis.
6. Do something with the results.

Read the information in the paragraph and answer the following questions, applying the scientific method outlined in the box.

Scientists observed that white mice that were fed seeds appeared to grow more than mice given leafy green and yellow vegetables. The scientists hypothesized that the protein in the seeds was responsible for the growth. They designed an experiment to test this hypothesis. They divided 200 mice of the same age, size, health, and sex into two groups of 100 mice each. The mice were kept under identical conditions for 14 days. One group was given a diet low in protein. The other group was given a normal protein diet. The mass of each mouse was recorded daily for 14 days.

1. Which group of mice served as a control?

_____

2. What was the variable?

_____

3. What effect of the protein diet was tested?

_____

_____

4. What other effects of a protein diet could have been tested?

_____

_____

5. Why were larger numbers of mice used in this experiment?

_____

_____

6. If the results of the experiment did not show a marked change between the two groups, what should the scientists do next?

_____

7. What are the parts of an experiment?

_____

_____

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MICROSOPE

Word Bank

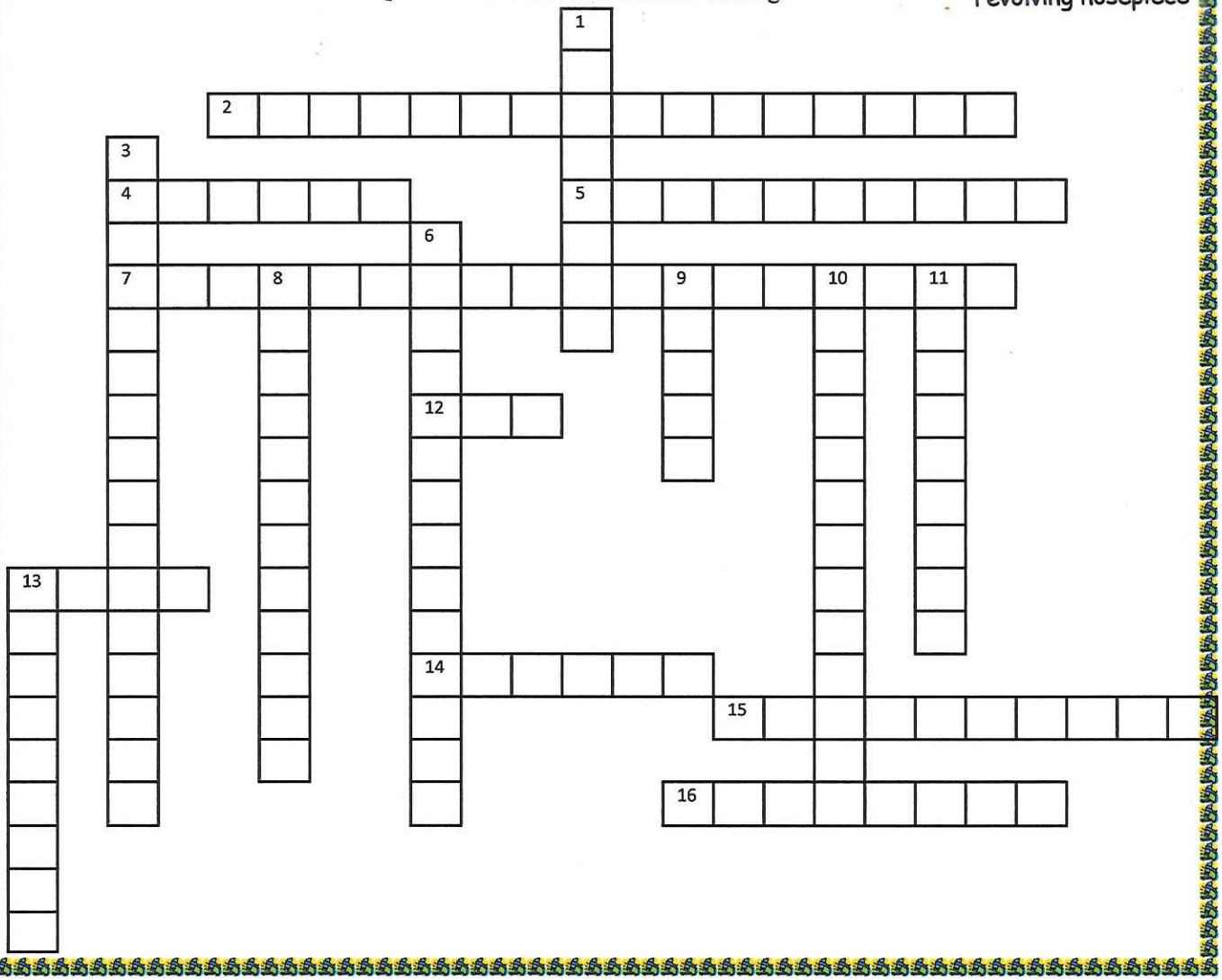
dry mount
ocular
arm
binocular
stage
objectives
mirror
wet mount
oil immersion
cover slip
stage clips
inclination joint
iris diaphragm
coarse adjustment
base
fine adjustment
revolving nosepiece

ACROSS:

2. Allows some microscopes to be tilted for more comfortable viewing (2 words).
4. Another name for the eyepiece.
5. These lenses come in various powers.
7. Used to change from one objective to another (2 words).
12. One of two parts of the microscope that should be grasped when carrying it.
13. One of two parts of the microscope that should be grasped when carrying it.
14. Reflects light up into the microscope.
15. These hold the glass slide in place (2 words).
16. Another name for a smear slide that has no liquid or cover slip (2 words).

DOWN:

1. Type of slide containing a drop of water and a cover slip (2 words).
3. Used for focusing on low power; should never be used on high power (2 words)
6. Used for focusing on high power (2 words).
8. Type of microscope used for very high magnifications (2 words).
9. Place where the glass slide is supported for viewing.
10. Adjusts the amount of light entering the microscope (2 words).
11. Placed over a drop of liquid on a microscope slide (2 words).
13. Name of microscope that allows three dimensional viewing.



Name Date Class

Chapter 1 **Biology: The Study of Life**

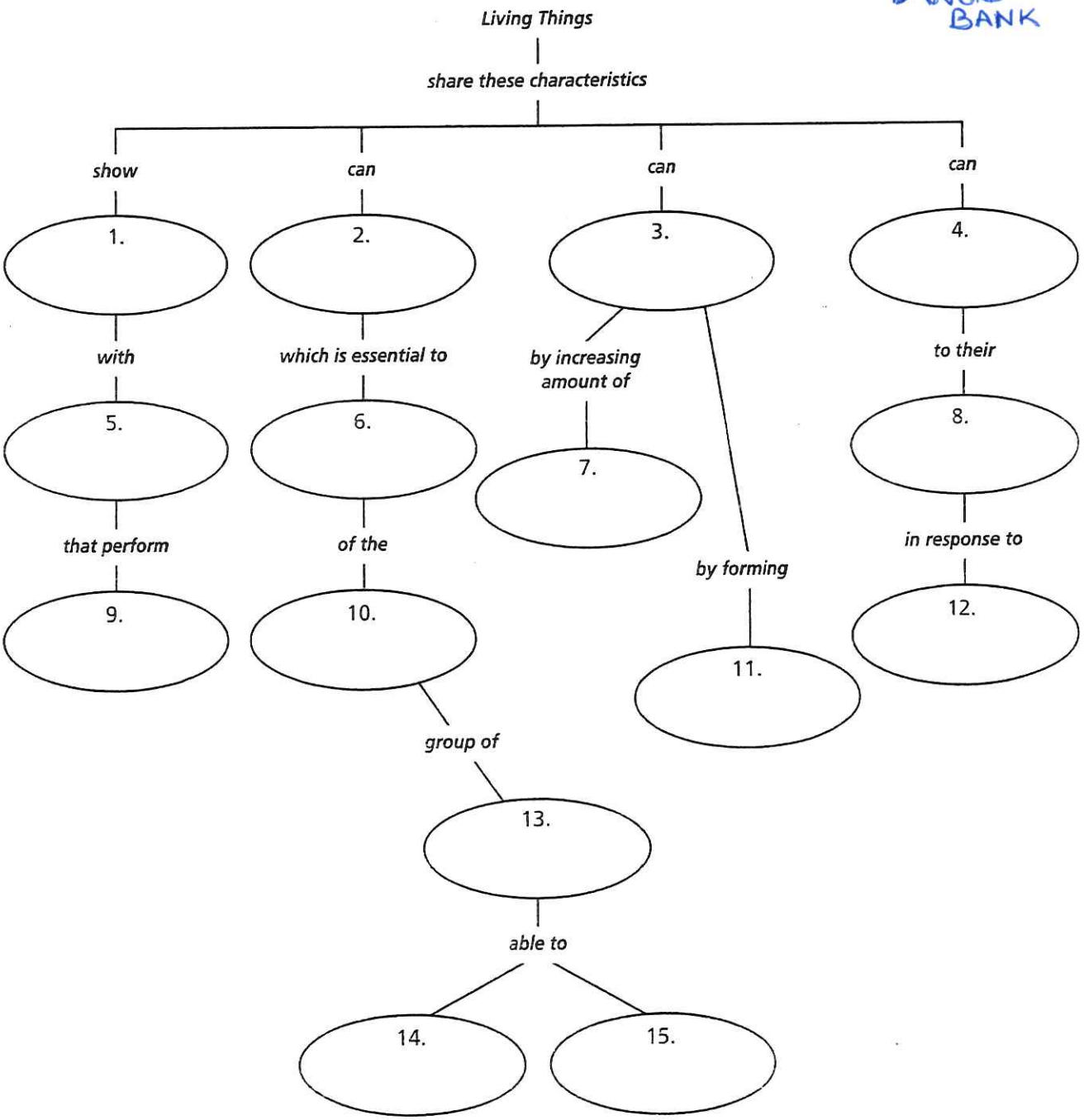
Concept Mapping

Use with Chapter 1, Section 1.1

Characteristics of Living Things

Complete the concept map on the characteristics of living things. Use these words or phrases once: *particular functions, grow, stimuli, specialized parts, environment, species, new structures, produce fertile offspring, adjust, continuation, similar organisms, living matter, interbreed, organization, reproduce.*

WORD BANK



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ScienceNews—Electronic Skin

by Stephen Ornes January 18th, 2012

James Bond and his enemies would be interested in the goings-on at the laboratory of John Rogers. So would Batman, the Spy Kids, Darth Vader and their enemies. That's because Rogers, a materials scientist at the University of Illinois at Urbana-Champaign, mixes electronics with the human body to create new devices not found even in science fiction.

Make room, Lord Vader. There's a new kind of cyborg in town.

Rogers and his collaborators have built an electronic device that's smaller than a postage stamp and sticks to the skin like a temporary tattoo. The device's possible users — patients, athletes, doctors, secret agents, you — are limited only by their imaginations.

Placed on a forehead, the device can record brainwaves; on the wrist, blood flow and muscle movement. On the skin of sick patients, it can track vital signs and watch for problems, replacing the bulky equipment usually found in hospitals. And stuck to the throat, it can function as a secret cell phone, activated by the movements of a person's voice box.

The scientists designed the device, about half as thick as an ordinary sheet of paper, with skin in mind. Like skin, the electronic material can be stretched and squashed in many ways but keep on working.

Scientists who design devices for the body have to study how it functions, down to a tiny, cellular level. The body and the machine have to speak the same language. "We wanted to build devices that interact with the body," Rogers says.

Last fall, Rogers and his colleagues demonstrated how their new device measures the body in different ways. The invention can record temperature, muscle motion or the electrical activity on a person's skin. It may be outfitted with lights and a tiny power source, which means it can wirelessly transmit data to a nearby computer. This device may even change the way we think about medical tools and how doctors help their patients, inside and out.

Tattoos you can use

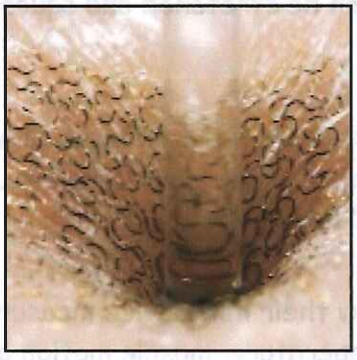
Rogers doesn't have any permanent tattoos. But he says he's been wearing "more and more" of the temporary kind to hide the stuck-on electronic circuits. (He even concealed one device behind a blue pirate tattoo.) Temporary tattoos use a simple and inexpensive way to adhere, or stick, to skin: a good sticky backing that stretches and flexes with skin's natural motion.

Rogers and his colleagues have been experimenting with their new devices in the lab, taking various measurements of and from different parts of the body.

More than skin deep

The scientists have found a way to extend the technology deeper than the body's surface. In 2010, they introduced an electrical plastic wrap that can be attached to a person's heart during open-heart surgery. Electronic circuits and instruments record blood flow and electric current, which means the material can alert doctors to hidden problems with a patient's ticker. The team has already shown that a device attached to the surface of the brain can capture the electrical signals of an epileptic seizure. Rogers, who says he's always been drawn to science, regularly participated in science fairs as a kid. But as he got older, he realized that scientists' work can create positive changes in the world.

"Making devices that have real benefits to society has been a real focus of our team, especially in recent years," he says. "We are aiming to create devices that bring new ways to address health problems and other grand challenges in society."



Device can withstand poking, stretching, and squeezing like the properties of skin.

Stick like temporary tattoos. When attached to the head devices pick up electrical signals from the brain.

Science Journal Article Questions
ScienceNews—Electronic Skin by Stephen Ornes

1.) Describe **some** of the **benefits** regarding **electronic skin devices.**

2.) **Who** may **benefit** from using the electronic skin devices?

3.) **How** does the electronic skin devices **attach** onto various locations of the body?

4.) Describe the **meaning associated** with the phrase, "**more than skin deep**".

5.) In what ways could this type of research have a **negative impact** in our society?