

## Section 2. II DOCUMENTATION

Science Pilot Study Demographic Survey

Science Pilot Study Assessment Items

(Administered December 18, 2002)

UNH Science Pilot Study



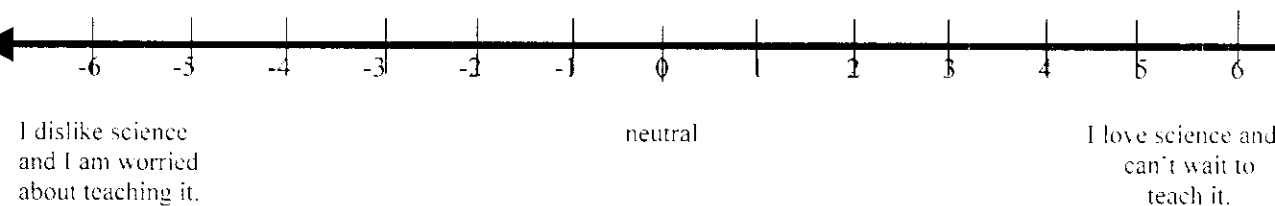
Name \_\_\_\_\_

Date: \_\_\_\_\_

Thank you for participating in the science assessment pilot study. These assessment results will assist us in enhancing our program. Again, we wish to remind you that your score on this assessment will not become your record. We will share the results with you for your information only.

Please answer these questions before taking the science assessment:

Where would you place yourself on this continuum? Mark an X.



1. Which of the following science courses did you take in high school?

- Earth Science
- Physical Science
- Biology
- Chemistry
- Physics
- AP science courses (please specify): \_\_\_\_\_
- Other: \_\_\_\_\_

2. How many science courses have you taken in college? \_\_\_\_\_

Please list:

3. Which statement best describes your view of teaching science at the elementary level?

- Science is a technical and complex subject area that should be taught by science content specialists.
- Science is a subject area that should be taught through the presentation of scientific facts.
- Science is a way of knowing and should be taught so that students learn scientific concepts similar to the way in which scientists come to know scientific principles.
- Science is typically a challenging subject and only the simplest content should be introduced at the elementary level.

4. Reflect on your own experiences as an elementary school student. Which statement best describes the science methods used when you were taught science?

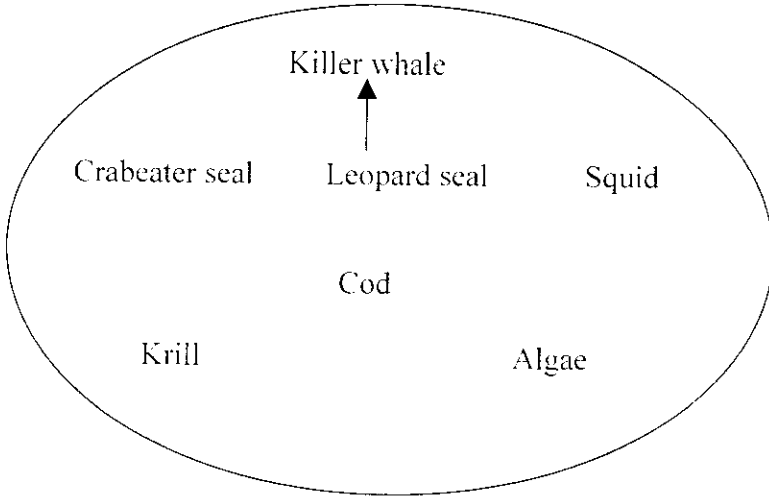
- Science was viewed as a technical and complex subject area and was typically taught by science content specialists.
- Science was primarily taught through the presentation of scientific facts.
- Science was viewed as a way of knowing and taught so that students learned scientific concepts similar to the way in which scientists come to know scientific principles.
- Science was viewed as a challenging subject and only the simplest content was introduced at the elementary level.
- Science was not taught at the elementary level.

Name \_\_\_\_\_

Date \_\_\_\_\_

UNH Science Assessment Pilot Study

1. The diagram below depicts a food web. Draw arrows from each creature to the things that eat it.



2. The human body is made up of systems (e.g., circulatory, respiratory, digestive, reproductive). How would you explain to your science students what a system is? Use examples from one of the human body's systems.

A system is

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For example,

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3. Some people living at high elevations have more red blood cells than do people living at lower elevations. Propose a hypothesis to account for this observation.

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4. Water freezes at  $32^{\circ}\text{F}/0^{\circ}\text{C}$ . If alcohol is added to water, what will happen to the freezing point? Explain why.

The freezing point will (Please check the correct answer and then explain why.)

- (A) be lowered  
 (B) be raised  
 (C) remain the same

because . . .

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5. You observe Mrs. Jones' students conducting an experiment. They are taking their pulse during and after various activities. Here are their data:

<u>Activity</u>	<u>Pulse Rate</u>
Sitting	65
After sit ups	75
After walking	70
Reclining in chair	62

What is the scientific question they are trying to investigate?

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Write at least one valid conclusion they can draw from these data.

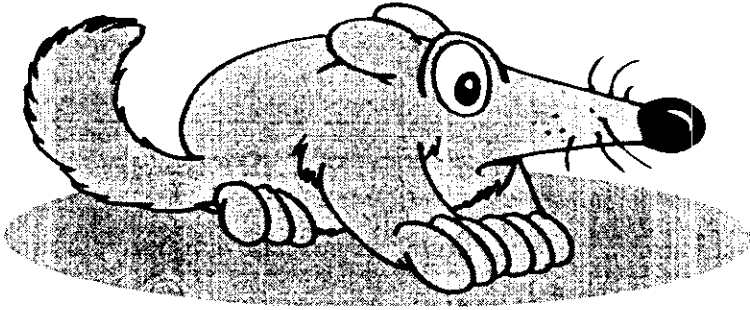
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6. Below is a picture of an animal about 10 inches long and 6 inches high. It weighs about 8 pounds.



Where would this animal most likely live and why?

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What may this creature eat and why?

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7. A nail gets rusty. An ice cube melts. Both the nail and the ice cube have changed. Explain the difference between these two changes.

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8. On a warm summer day, someone is holding two cups, each containing a different liquid. One cup is wet on the outside, although there are no holes in the cup. Make an inference about what kind of liquid is in each cup and explain why you think so.

The cup that is not wet on the outside contains \_\_\_\_\_.

The cup that is wet on the outside contains \_\_\_\_\_  
because . . .

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9. Your students section off two large squares in a field, one in a grassy area and the other in a wooded area on the periphery of the field. Students check these locations every day.

Identify two organisms they may only find in one of the squares and describe the relationship of these two organisms within the ecosystem.

Two organisms in the grassy area: \_\_\_\_\_

OR

Two organisms in the wooded area: \_\_\_\_\_

Relationship: \_\_\_\_\_

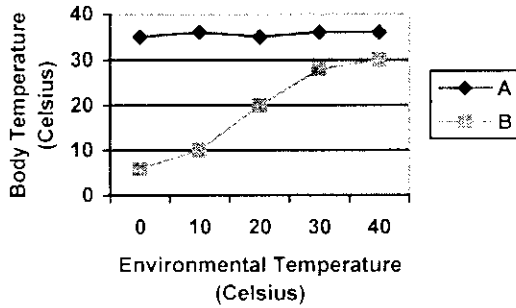
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10. The graph below shows the relationship between body temperature and environmental temperature for two animals (humans and snakes). Which line (A or B) best represents the humans? Explain your answer.



Line \_\_\_\_\_ represents the humans because . . .

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11. Electrical wires are typically encased in materials such as vinyl or rubber. Explain why such materials are particularly safe choices.

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12. Beethoven was deaf. Yet, he claimed he was able to “hear” the music. What was Beethoven actually “hearing”?

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13. Almost everyone has used a magnet at one time or another and has observed how magnets work. Magnets have north and south poles. When the north and south poles of magnets are placed near one another, they are attracted. What happens when two similar poles are placed near each other?

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14. Explain why dogs can hear certain sounds that humans cannot hear, such as "dog whistles."

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15. Your local TV weatherperson reports that the interior portions of the state can expect a freeze while the coastal areas will have above freezing temperatures. Why does this occur?

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16. Imagine watching a drawbridge operate. Imagine watching a sailor pull up an anchor with a rope wheel. Elevators, conveyer belts, rope wheels, and drawbridges all operate on the same physical principle. What is this simple machine and how does it operate?

The simple machine is a \_\_\_\_\_ and (explain how it works):

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17. How would you explain to a student why an astronaut appears to "float" in the space shuttle?

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18. Suppose that an airplane takes the same route between New York and Los Angeles every day. It typically takes the plane longer to fly from New York to Los Angeles than from Los Angeles to New York. Explain why this happens.

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19. Explain why some regions of the earth experience extremely long nights and very short days at some times of the year. Draw a diagram to support your explanation and show the region of the earth that you are describing.

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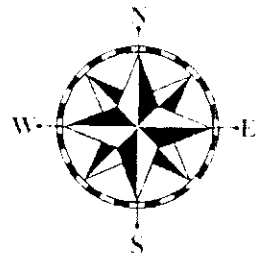
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20. Imagine standing outside at night. As you look at the sky, you notice that the stars appear to be moving from east to west. How would you explain this phenomenon? Include, along with your explanation, a diagram showing the stars and the earth.



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21. Explain why fossils are likely to be found in sedimentary rock.

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22. A student thinks that a mirror image of an object is exactly the same as the object. What could you do to demonstrate how objects actually appear in a mirror?

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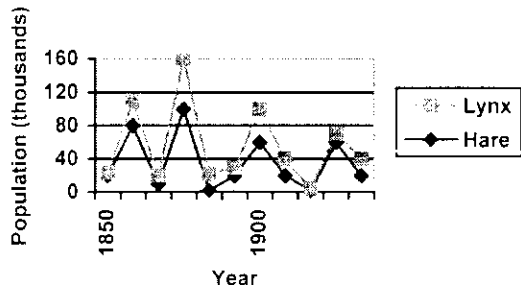
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23. The graph below shows the population cycles of the snowshoe hare and one of its predators, the lynx. How does this graph show the relationship of the lynx and the hare as part of an ecosystem?



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