Week 1

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Grade 6 Science Task

Name_____ **Date**_____ **Hour**_____

Science as Inquiry

Read the following scenario comparing two students' experiments testing the effect of light on plant growth. You will use the information from the experiment to answer five questions. The first four are multiple choice questions. The last question requires you to write an extended response.

Scientific Investigations

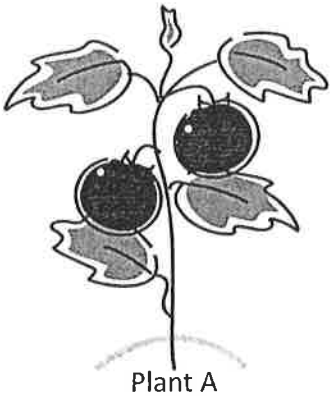
Ms. Kendal wanted her students to learn about the effects of light on the growth of plants. She presented this question to the students: How does the amount of light affect a plant's growth? After much class debate the students produced the following hypothesis: The amount of light available will affect the growth of a plant; the more light available, the better the plant will grow. Then she gave each student the same materials and allowed them to each design their own experiment to test their hypothesis. Each week the students graphed the plants' progress. The following is the results of the experiment.

Materials List:

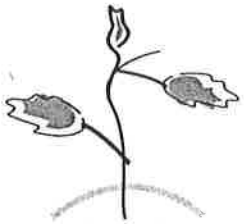
- 2 - potted tomato seedlings
- 2 - windows with sunlight access
- 1 - medium sized cardboard box
- 1 - roll of packing tape

Haley's Experiment

Haley's first step was figuring out how to block the sun. She took her cardboard box and disassembled it making it one large sheet of cardboard. She then taped the cardboard over one of her windows blocking out all of the sunlight coming through. She then took her plants and placed plant A on the window sill in front of the window with full sunlight access. She placed plant B on the window sill that had the sunlight blocked by the cardboard box. Every other day for two weeks she watered the plants and once a week she documented the plants' growth. At the end of the second week she took photos of both plants. This is what her plants looked like.



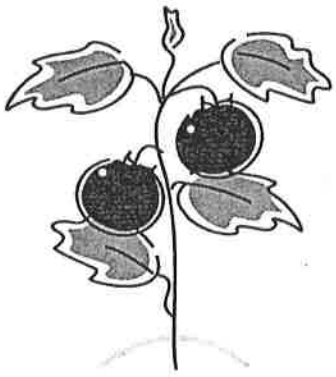
Plant A



Plant B

Dawson's Experiment

Dawson chose a different method to change the amount of sunlight the plants received. He placed plant A on the window sill with sunlight access. He placed plant B in the cardboard box. He then used the tape to seal the box. Every other day for two weeks he watered plant A and observed and documented the plant's growth. At the end of the second week he unsealed the box, took out plant B and took photos of both plants. This is what his plants looked like.



Plant A

Plant B

Use the information from the two experiments to answer the following questions.

1. Which of these correctly identify the independent and dependent variables in the experiment?

    a. Independent: amount of sunlight, Dependent: growth of plants
    b. Independent: growth of plants, Dependent: amount of sunlight
    c. Independent: amount of sunlight, Dependent: amount of water
    d. Independent: amount of water, Dependent: growth of plant

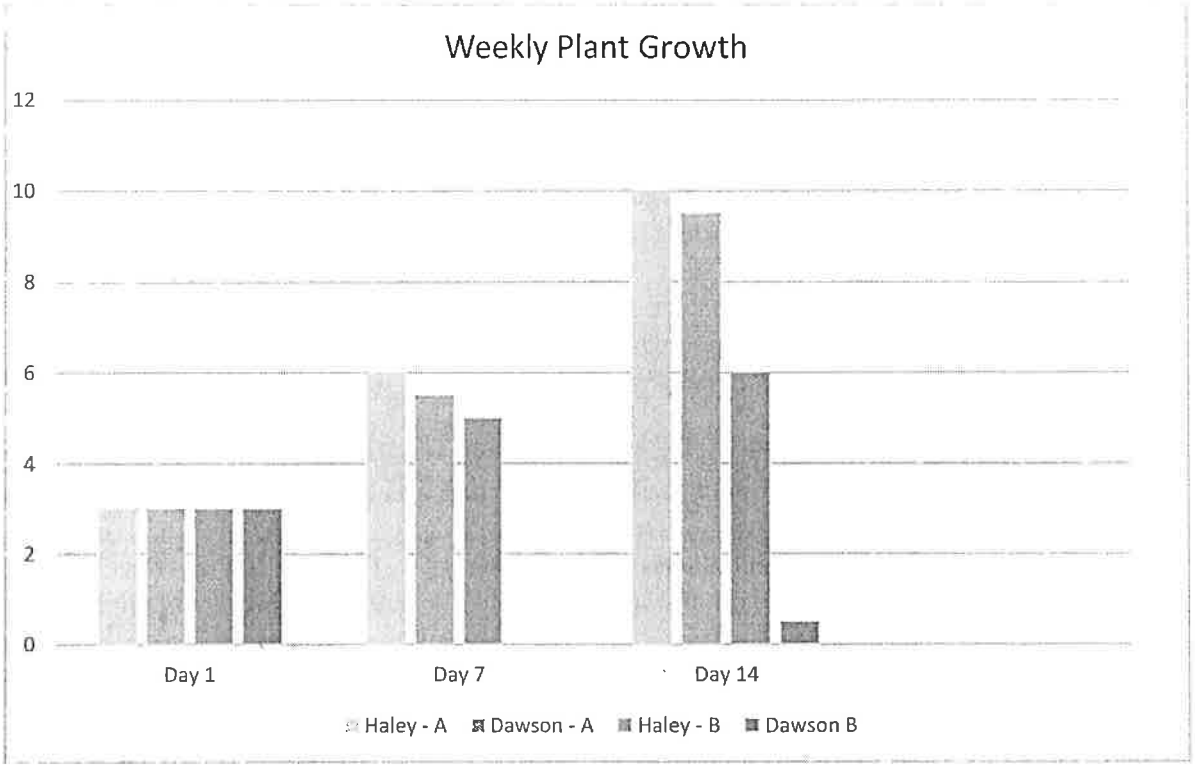
2. Why do you think Ms. Kendal had the students grow the plants in pots inside the classroom? Why couldn't the plants have been planted in a garden outside?

    a. The school did not have enough space for all of those plants.
    b. Ms. Kendal bought the pots on sale and was trying to find something to use them for.
    c. The sun doesn't always shine outside.
    d. Planting them outside left too many other variables that could not be controlled.

3. **Instead of** changing the amount of sunlight the plants received, what is another variable Ms. Kendal could have had the students change to have gotten results similar to Haley's?

    a. She could have had the students not water either plant.
    b. She could have made plant B be a bell pepper plant.
    c. She could have had the students fertilize plant A but not plant B.
    d. She could have had the students repeat the experiment 3 more times.

Below you will find a graph documenting the plants' growth for both Haley and Dawson's plants. Use the graph to answer question 4.



4. Why do you think there was no data recorded for the growth of Dawson's plant B on day 7?
    a. Plant B had no growth during the first week.
    b. Plant B was sealed in the box.
    c. Plant B's growth was the same as Plant A's growth.
    d. It was not important to record the Day 7 information. The students just needed to know the end results.

The following question requires you to write an extended response that combines information from the source with your knowledge of science.

To earn full credit you should:

- Read the question and then refer to the data from the students' experiment.
- Answer **all** parts of the question **and** support your ideas with examples, data, facts, or details.
- Write a response that is long enough to fully address the topic. You may need more than one paragraph. Responses with fewer than 25 words will not be scored.

Constructed Response

5. Although Haley and Dawson had the same materials available they chose to take different approaches to designing their experiment. Haley's experiment showed a definite difference in the plants' growth based on the amount of sunlight the plants received. Dawson's experiment also showed a difference in the plant's growth. However, the results of Dawson's experiment showed a much more dramatic difference in the plants' growth. Why do you think Dawson's experiment had such a dramatic difference in the plants' growth? What was the major design flaw in Dawson's experiment?

Support your answer using your knowledge of the scientific method and the results of the students' experiments.

Week 2

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Grade 6 Science Task
Science and the Environment

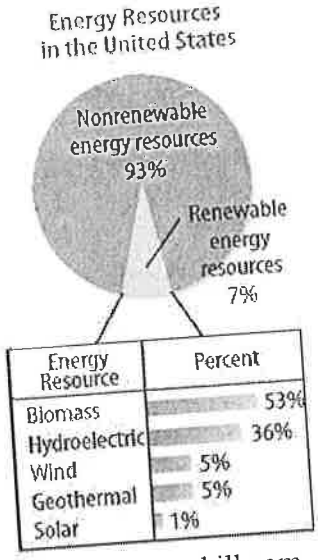
Name_____ Date_____ Hour_____

Study the following information on resources. Use the stimulus items to answer the following questions. The first 4 questions are multiple choice and the last question is extended constructed response.

Stimulus Item #1 (Source: mcgraw-hill.com)

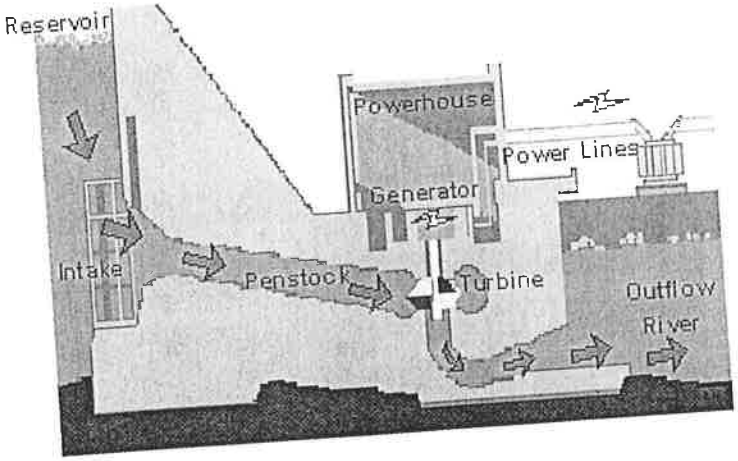
Renewable Resource	Advantages	Disadvantages
Solar energy	• nonpolluting • available in the United States	• less energy produced on cloudy days • no energy produced at night • high cost of solar cells • requires a large surface area to collect and produce energy on a large scale
Wind energy	• nonpolluting • relatively inexpensive • available in the United States	• large-scale use limited to areas with strong, steady winds • best sites for wind farms are far from urban areas and transmission lines • potential impact on bird populations
Water energy	• nonpolluting • available in the United States	• large-scale use limited to areas with fast-flowing rivers or great tidal differences • negative impact on aquatic ecosystems • production of electricity affected by long periods of little or no rainfall
Geothermal energy	• produces little pollution • available in the United States	• large-scale use limited to tectonically active areas • habitat disruption from drilling to build a power plant
Biomass energy	• reduces amount of organic material discarded in landfills • available in the United States	• air pollution results from burning some forms of biomass • less energy efficient than fossil fuels, costly to transport

Stimulus Item #2



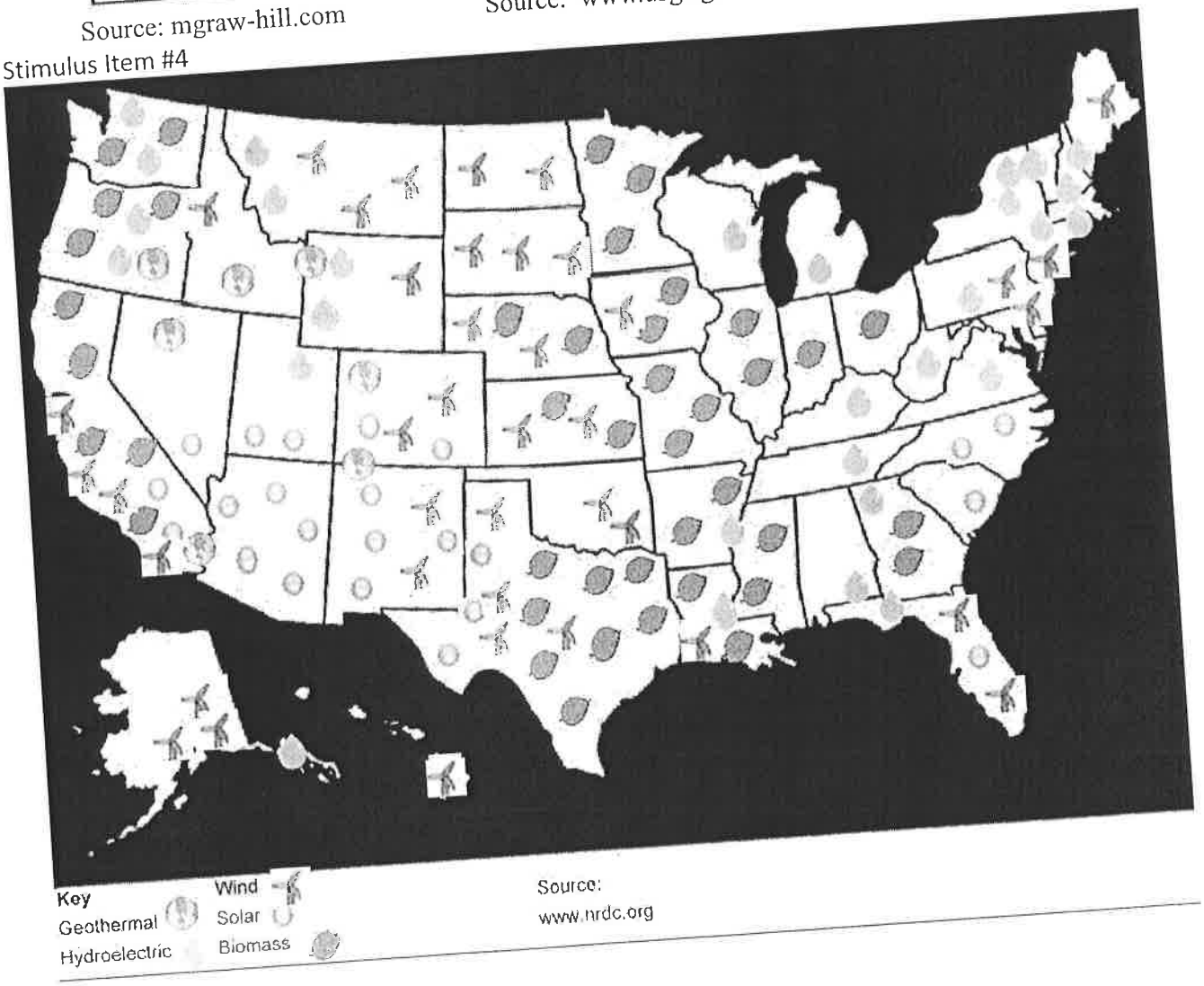
Source: mgraw-hill.com

Stimulus Item #3



Source: www.usgs.gov

Stimulus Item #4



Multiple Choice: Choose the best answer.

1. Biomass, wind, geothermal, solar, and hydroelectric (water) power are all considered what type of energy?

A. nonrenewable
B. renewable
C. inexhaustible
D. non-polluting

2. Using the information provided in the stimulus items, Stimulus Item #3 is most likely a diagram showing which resource type?

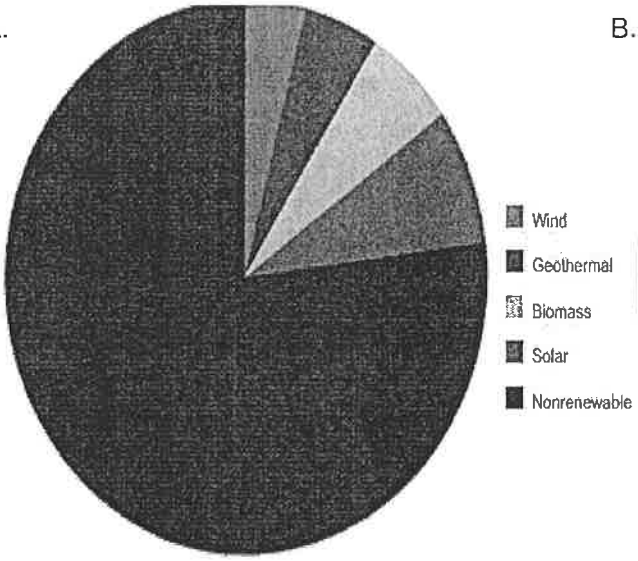
A. geothermal
B. hydroelectric
C. solar
D. biomass

3. Using the map and the chart, which available resource would the population of Louisiana most likely use if they wanted a resource that would reduce the amount of fossil fuels, would not cause pollution, would not affect fish populations, and would be inexpensive?

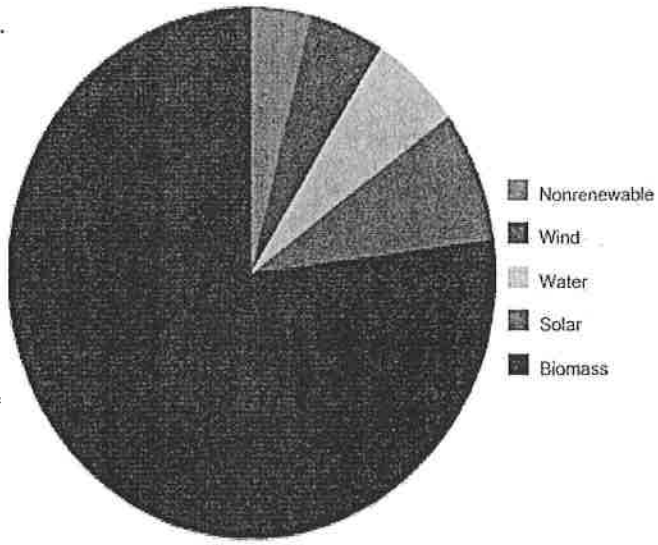
A. wind
B. hydroelectric
C. solar
D. geothermal

4. Using the stimulus materials provided, which circle graph most likely represents Louisiana's energy use?

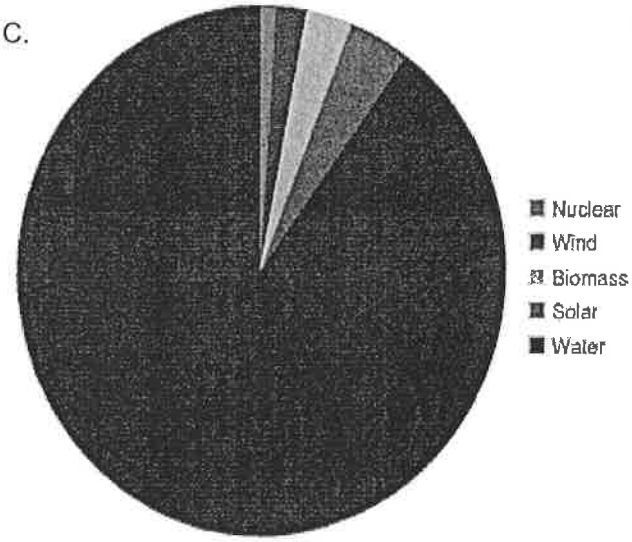
A.



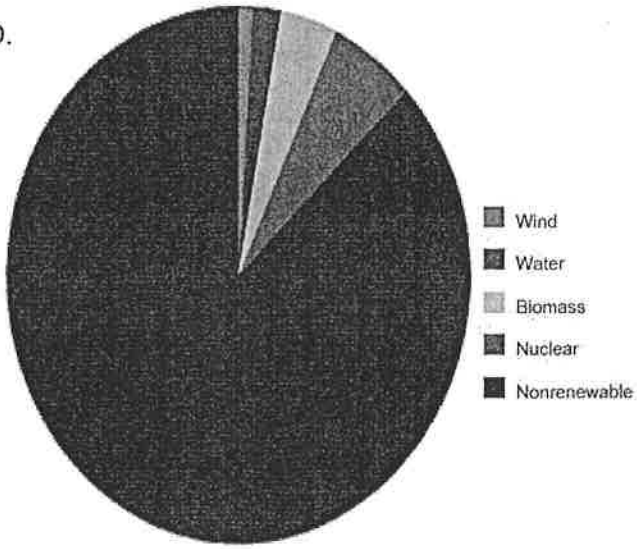
B.



C.



D.



Constructed Response

Write a letter to the principal of your school persuading him/her to consider bringing in an alternative energy source to use for electricity. Use evidence from the stimulus items provided and your prior knowledge to:

*Choose one of the alternative energy sources shown on the map for YOUR state.

*Include and explain at least 2 advantages of this alternative energy and 1 disadvantage.

*Include the types of technology or equipment that would be necessary to use this energy.

*Write a response that is long enough to fully address the topic. You may need more than one paragraph. Write at least 25 words.