Science students should be able to distinguish scientific questions from social, teleological, and ethical questions.

1. Identify the question below that best exemplifies a scientific question, one that can be addressed through evidence and amended due to new experimental data.

    A. Is it acceptable to date my best friend's ex-boyfriend?
    B. How many ATP are generated from the complete oxidation of glucose?
    C. Why do animals eat?
    D. Should soda machines be banned from a ll schools?
    E. Is cheating wrong if you can not be caught?
    F. What country has the highest rate of obesity?
    G. Can abortion be a form of birth control?
    H. Is legal drinking age of 21 to old?

2. Now that you have identified the scientific question label the others as either social, teleological or ethical questions. You can leave the scientific question blank.

    A. _____

    B. _____

    C. _____

    D. _____

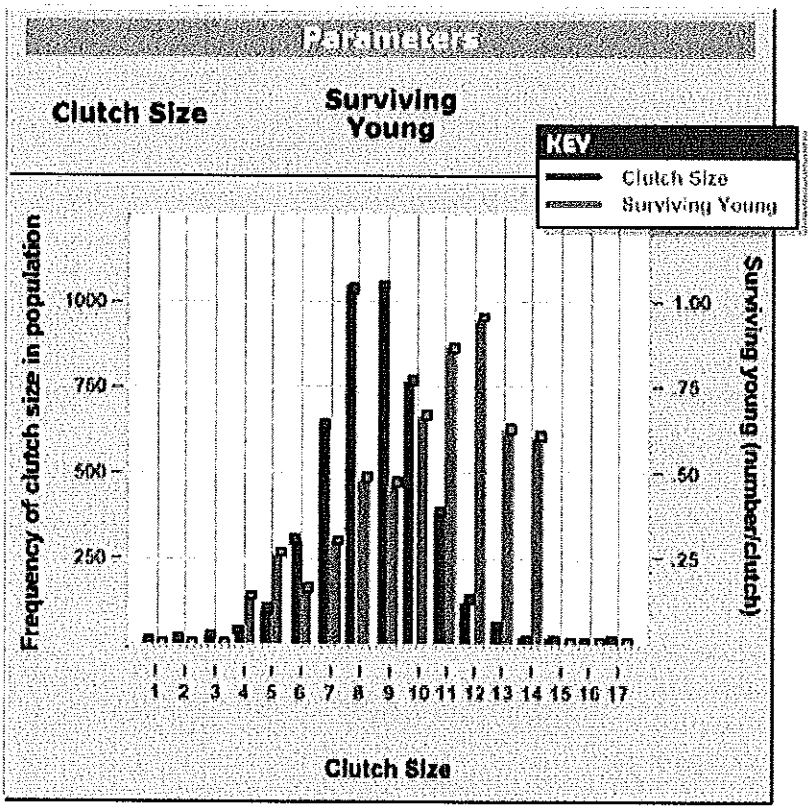
    E. _____

    F. _____

    G. _____

    H. _____

3. Examine the graph below. Based upon the data collected, what question do you think the investigator is asking?



4. Using the observations provided below, develop the most reasonable question that one might ask given these specific observations.

1. Some large insects, including honeybees, closely regulate thoracic body temperature within a relatively narrow range regardless of the air temperature. These insects are called endotherms.

2. Scientists believe that honeybees maintain a relatively constant thoracic temperature by varying evaporative heat loss from the thorax.

3. Some endothermic insects, such as the bumblebee, thermoregulate the thorax by transferring heat from the thorax to the abdomen.

4. Thermoregulation during flight by varying heat production is not considered possible for endothermic insects because as the insect warms up its thoracic muscles to allow for flight, metabolic rates also increase. Flight muscles must continue to contract in order to keep the insect in the air which continues to add heat to the thorax.

5. Using the observations provided below, develop the most reasonable question that one might ask given these specific observations.

1. Many lizards are able to climb up vertical and overhanging surfaces, geckos being the most able climbers, climbing on inverted surfaces (i.e., a ceiling).

2. These lizards also have subdigital (palm-side of the digits) pads on their feet that are believed to aid in climbing.

3. The structure of the pad area is different in different species. For example, the pads of geckos and anoles are covered with small hairlike structures called setae, while skinks have long "folds" or "ridges" covering the pads.

4. In general, geckos have larger foot pads in relation to body size compared to anoles and skinks.

6. Evaluate the questions below and rank them in order from the weakest (worst) scientific question to the strongest (best). Include a brief explanation why you ranked them in that order.

   A. What affect(s) do fevers have on humans?

   B. Why do infections cause fever?

   C. What affect do fevers have on the reproductive rate of *e-coli* bacteria in humans?

7. Think of an observation that you made in the past and create your own valid scientific question.

Science Process 3.3 Formative 1

KEY

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G. Can abortion be a form of birth control?
H. Is legal drinking age of 21 to old?

2. Now that you have identified the scientific question label the others as either social, teleological or ethical questions. You can leave the scientific question blank.

A. SOCIAL
B. SCIENTIFIC
C. TELEOLOGICAL
D. TELEOLOGICAL
E. ETHICAL
F. SCIENTIFIC
G. ETHICAL
H. SOCIAL

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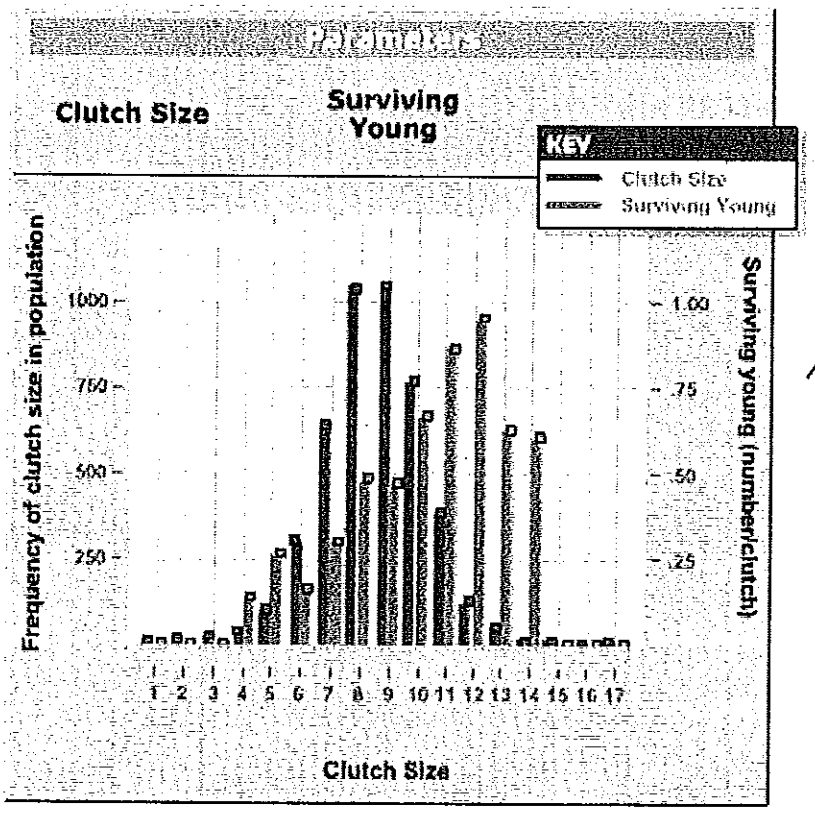

How Does Clutch Size Affect The Survival of The Offspring?

Answers May Vary.

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4. Thermoregulation during flight by varying heat production is not considered possible for endothermic insects because as the insect warms up its thoracic muscles to allow for flight, metabolic rates also increase. Flight muscles must continue to contract in order to keep the insect in the air which continues to add heat to the thorax.

How Do These Insects Regulate Body Temp During Flight?

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HOW DOES FOOT PAD SIZE AFFECT CLIMBING ABILITY?

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WEAKEST B. Why do infections cause fever?

BEST C. What affect do fevers have on the reproductive rate of *e-coli* bacteria in humans?

7. Think of an observation that you made in the past and create your own valid scientific question.

ANSWERS WILL VARY