Is it alive?

Living organisms have specific characteristics. Is a rock a living organism? Is a dog? What characteristics describe something that is living?

Procedure

1. Read and complete a lab safety form.
2. Place three pieces of pasta in the bottom of a clear plastic cup.
3. Add carbonated water to the cup until it is 2/3 full.
4. Observe the contents of the cup for 5 minutes. Record your observations in the Data and Observations section below.

Data and Observations

Think About This

1. Think about living things. How do you know they are alive?

2. Which characteristics of life do you think you are observing in the cup?

3. Key Concept Is the pasta alive? How do you know?
Characteristics of Life

Directions: Unscramble each word. Then write the correct term next to its definition on the lines provided.

1. clel ______________________
2. samigon ______________________
3. rainullclue ______________________
4. steamhissoo ______________________
5. cruelmalltiul ______________________
6. made of one cell
7. the ability to maintain steady internal conditions when outside conditions change
8. the smallest unit of life
9. made of more than one cell
10. a thing that has all the characteristics of life
Characteristics of Life

A. Characteristics of Life
   1. All __________________________ things are organized, grow and develop, reproduce, respond, maintain certain internal conditions, and use energy.
   2. Things that have all the characteristics of life are called ________________.

B. Organization
   1. Whether an organism is made of only one __________________________—the smallest unit of life—or many cells, all living things have structures that have specific functions.
   2. Living things that are made of only one cell are called __________________________ organisms.
   3. Living things that are made of two or more cells are called ________________ organisms.
   4. Living things with more than one cell have a greater level of ________________ because groups of cells function together.

C. Growth and Development
   1. Living things grow by increasing ______________________ or increasing cell number.
   2. The changes that occur in an organism during its lifetime are called ________________.

D. Reproduction
   1. ________________ is the process by which one organism makes one or more new organisms.
   2. Some organisms must have a(n) __________________________ to reproduce, but others can reproduce without one.

E. Responses to Stimuli
   1. All living things can __________________________ to changes in the environment. These changes are called ________________ and can be internal or external.
   2. Hunger and thirst are examples of __________________________ stimuli.
   3. Some examples of __________________________ stimuli are light and temperature.
Lesson Outline continued

F. Homeostasis

1. An organism’s ability to maintain steady internal conditions when outside conditions change is called _________________. Maintaining these conditions ensures that cells can _________________.

2. When your outside environment becomes too hot or too cold, your body responds by sweating, shivering, or changing the flow of ________________ to maintain a body temperature of 37°C.

G. Energy

1. Cells continuously use ________________ to transport substances, make new cells, and perform chemical reactions.

2. For most organisms, the energy they use originally came to Earth from the _________________.

Name ___________________________ Date __________________ Class ________
Characteristics of Life

Directions: On the line before each definition, write the letter of the term that correctly matches it. Each term is used only once.

1. a tadpole changing into a frog  
   - A. growth and development
2. a bacterium dividing and becoming two bacteria  
   - B. homeostasis
3. eating because you feel hungry  
   - C. organization
4. your body temperature staying the same  
   - D. reproduction
5. what you need for doing all activities  
   - E. response to stimuli
6. groups of cells working together  
   - F. energy

Directions: Circle the term in parentheses that correctly completes each sentence.

7. Something that has only four of the six characteristics of life is (a nonliving thing/an organism).
8. A living thing that is made of only one cell is a (multicellular/unicellular) organism.
9. Cells in a (multicellular/unicellular) organism usually are organized into groups that have different jobs.
10. Light and temperature are two examples of (external/internal) stimuli.
11. The smallest unit of life is a (cell/tadpole).
12. (Growth/Homeostasis) allows living things to keep a steady internal environment.
Characteristics of Life

Directions: Use your textbook to respond to each statement.

1. Research each organism listed in the table. Then give an example of how each organism exhibits the characteristic of life listed next to it.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Characteristic of Life</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunflower</td>
<td>organization</td>
<td>a.</td>
</tr>
<tr>
<td>Tadpole</td>
<td>growth and development</td>
<td>b.</td>
</tr>
<tr>
<td>Snake</td>
<td>response to stimuli</td>
<td>c.</td>
</tr>
<tr>
<td>Oak tree</td>
<td>use of energy</td>
<td>d.</td>
</tr>
</tbody>
</table>

2. The ability to maintain a stable internal environment, or homeostasis, is another characteristic of life. Give three examples that illustrate how your body maintained homeostasis today.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Characteristics of Life

Key Concept What characteristics do all living things share?

Directions: Living things have all the characteristics of life. Unscramble the letters to find a characteristic of living things. Write the characteristic in the blank.

1. THOWGR DAN VELDEMEOPNT
   Hint: You have changed since you were born.

2. MEOHOSTSISA
   Hint: You sweat when you are hot.

3. IOGANORATNIZ
   Hint: You have different body parts that have different jobs.

4. PRORETIONDUC
   Hint: Baby birds are in a nest with their mother.

5. NSEPORES OT MULISTI
   Hint: You are hungry and go to the kitchen.

6. SUE FO ERGYEN
   Hint: You have been playing soccer for an hour.

Directions: Write your own hint for each of the six characteristics of living things on the lines provided.

7. Hint:

8. Hint:

9. Hint:

10. Hint:

11. Hint:

12. Hint:
Characteristics of Life

Key Concept What characteristics do all living things share?

All living things consist of cells. Some organisms are made of one cell. Other organisms are made of organized groups of cells.

Directions: Read each sentence and decide which type of organism it describes. On the line before each item, write U for unicellular, M for multicellular, or B for both unicellular and multicellular.

1. These organisms are made of two or more cells.
2. Some of these organisms lay eggs.
3. These organisms grow as the number of cells increases.
4. These organisms use energy for everything they do.
5. During development, the cells in these organisms become specialized.
6. These organisms are made of only one cell.
7. These organisms respond to internal and external stimuli.
8. These organisms have specialized cells for reproduction.
9. This organism grows only as the cell increases in size.
10. Homeostasis is necessary for these organisms to survive.
11. These organisms reproduce by dividing and becoming two cells.

Directions: Answer the question on the line provided.

12. What process is considered to be growth when it occurs in a multicellular organism and reproduction when it occurs in a unicellular organism?
**Homeostasis**

Imagine you are a medical doctor who wants to study the ability of the human body to maintain homeostasis. You want to observe what happens to a person’s heart rate following exercise.

**Design an Investigation**

Design an investigation to find the answer to your question. You can use a volunteer to help you gather data. You also will need a stopwatch to find the volunteer’s pulse rate in three different situations—while resting, following exercise, and 5 minutes after exercise.

Make a hypothesis about how the person’s heart rate will change during the experiment.

Write each step of your experiment. How will you find the volunteer’s pulse? What exercise will the volunteer do? How many trials should you run? What safety measures should you take? How will you record your data?

Afterward, create a line graph showing changes in the volunteer’s pulse rate. Include a brief explanation of why the pulse rate changed. Be sure to include the term *homeostasis* in your explanation.