Characteristics of Living Things

Name: _____ **Class:** **Date:** _____

Read and Learn

Living organisms carry out life processes. **MRS GREN** helps us remember seven important processes:

Letter	Life process	Meaning
M	Movement	Changing position or moving parts of the organism.
R	Respiration	Chemical reactions in cells that release usable energy from nutrients.
S	Sensitivity	Detecting and responding to changes in the environment.
G	Growth	A permanent increase in size or dry mass.
R	Reproduction	Producing new organisms of the same species.
E	Excretion	Removing waste products of metabolism and substances present in excess.
N	Nutrition	Obtaining or making nutrients needed for energy, growth, and repair.

Respiration is not the same as breathing. Plants, animals, and microorganisms all respire.

All living organisms consist of one or more **cells**. Cells are the basic structural and functional units of life: they form organisms and are the smallest units capable of carrying out the processes of life.

- **Living:** Alive now, including dormant organisms such as viable seeds.
- **Dead:** Was once alive but no longer carries out life processes.
- **Non-living:** Has never been alive, such as a rock or water.

One characteristic alone is not enough to identify life. A car moves, but it is not alive. Also, an individual organism does not need to reproduce to be living.

Match the Life Process

Write the correct **life process** beside each example.

Example	Life process
A sunflower turns its growing shoot toward light.	_____
A bacterium divides to form two bacteria.	_____
A rabbit eats grass.	_____
A seedling becomes taller and gains dry mass.	_____
A fish swims across a pond.	_____
Cells release usable energy from glucose.	_____
A person removes urea in urine.	_____

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Complete the Sentences

Word bank: cells • respiration • sensitivity • reproduction

1. The basic units of life are _____.
2. The release of usable energy through chemical reactions in cells is called _____.
3. Detecting and responding to environmental changes is called _____.
4. Producing new organisms of the same species is called _____.

Living, Dead, or Non-living?

Classify each example. Use **non-living** to mean *never alive*.

Example	Living, dead, or non-living?
A healthy tree	_____
A whole beetle that has died	_____
A glass marble	_____
A dry bean seed that can still germinate	_____
Water in a pond	_____
A bacterium	_____

True or False?

Write **T** or **F**. Correct each false statement.

1. Plants do not move because they cannot walk. _____

2. Every living organism consists of one or more cells. _____

3. An animal that cannot reproduce must be non-living. _____

4. Respiration occurs in both plant and animal cells. _____

Apply Your Understanding

1. A car moves, uses fuel, and releases waste gases. Explain why these observations do not prove that it is alive.

2. A dry seed shows no obvious movement or growth. What could you do to investigate whether it is alive?

3. Explain why cells are called the basic units of life. Include an example of a single-celled organism.

4. Challenge: Fire grows, spreads, and uses oxygen. Give two scientific reasons why fire is not a living organism.

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Characteristics of Living Things — Answer Key

Match the Life Process

Example	Life process
A sunflower turns its growing shoot toward light.	**Sensitivity** — responding to light; also involves growth and movement.
A bacterium divides to form two bacteria.	**Reproduction**
A rabbit eats grass.	**Nutrition**
A seedling becomes taller and gains dry mass.	**Growth**
A fish swims across a pond.	**Movement**
Cells release usable energy from glucose.	**Respiration**
A person removes urea in urine.	**Excretion**

Complete the Sentences

1. **cells**
2. **respiration**
3. **sensitivity**
4. **reproduction**

Living, Dead, or Non-living?

Example	Classification
A healthy tree	**Living**
A whole beetle that has died	**Dead**
A glass marble	**Non-living**
A dry bean seed that can still germinate	**Living — dormant**
Water in a pond	**Non-living**
A bacterium	**Living**

True or False?

1. **False.** Plants move parts of their bodies, such as shoots growing toward light, even though they do not walk.
2. **True.**
3. **False.** An individual organism can be alive without being able to reproduce. It still consists of cells and carries out other life processes.
4. **True.**

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Apply Your Understanding

Accept scientifically correct answers in students' own words.

1. Why do the car's characteristics not prove it is alive?

Some non-living things share individual characteristics with organisms. A car is not made of cells and does not carry out the coordinated biological life processes of an organism. Burning fuel in an engine is not cellular respiration.

2. How could you investigate whether a dry seed is alive?

Provide suitable conditions for germination, including water, oxygen, and an appropriate temperature. Observe it over several days for root and shoot growth. Germination provides evidence that it is alive; failure to germinate immediately does not necessarily prove it is dead.

3. Why are cells the basic units of life?

Cells form the structure of organisms and perform the functions needed for life. A single cell is the smallest unit capable of carrying out life processes. **A bacterium, amoeba, or yeast** is an example of a single-celled organism.

4. Why is fire not a living organism?

- Fire is **not made of cells**.
- Fire is a **combustion reaction**, rather than an organism carrying out coordinated cellular processes such as nutrition, respiration, and biological reproduction. Its spreading is not reproduction.

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