MAKE-A-SLIDE

What are some examples of living things?

- Human, geese, yeast, ducks, trees, plants, flowers, insects, crocodiles, kangaroo, Melissa, flamingo, octopus, coral, succulents, kiwi, mold

How can you tell if something is alive?

- Does it eat food?
- Is it breathing?
- Does it ingest oxygen?
- Does it grow?
- Does it have a soul?
- Does it have health/heart?
- Is it moving?
- Is it sentient (aware of its surroundings)?

1.1: CHARACTERISTICS OF LIVING THINGS

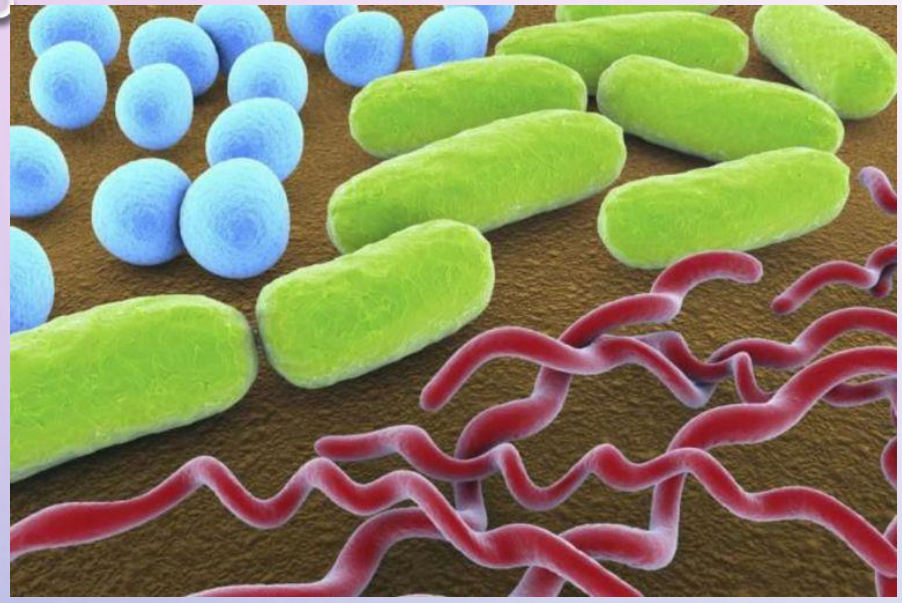
Science 8

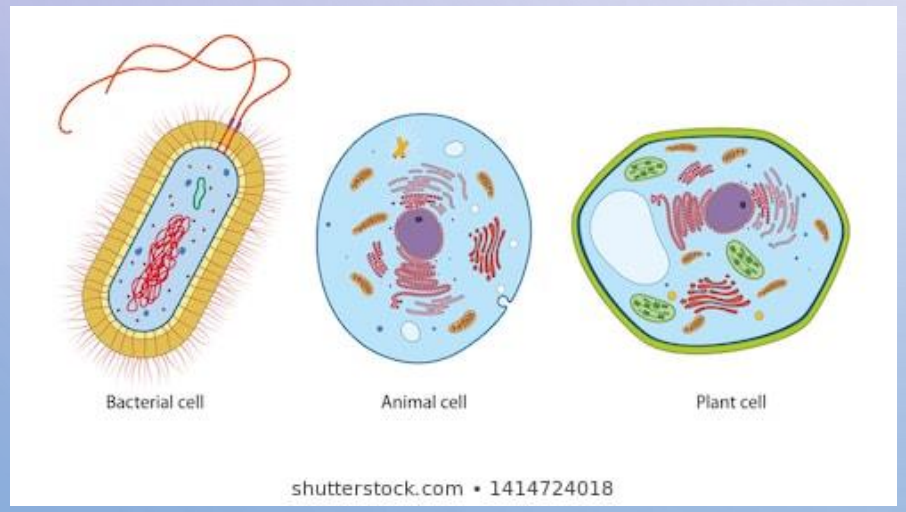
1) LIVING THINGS ARE MADE OF CELLS

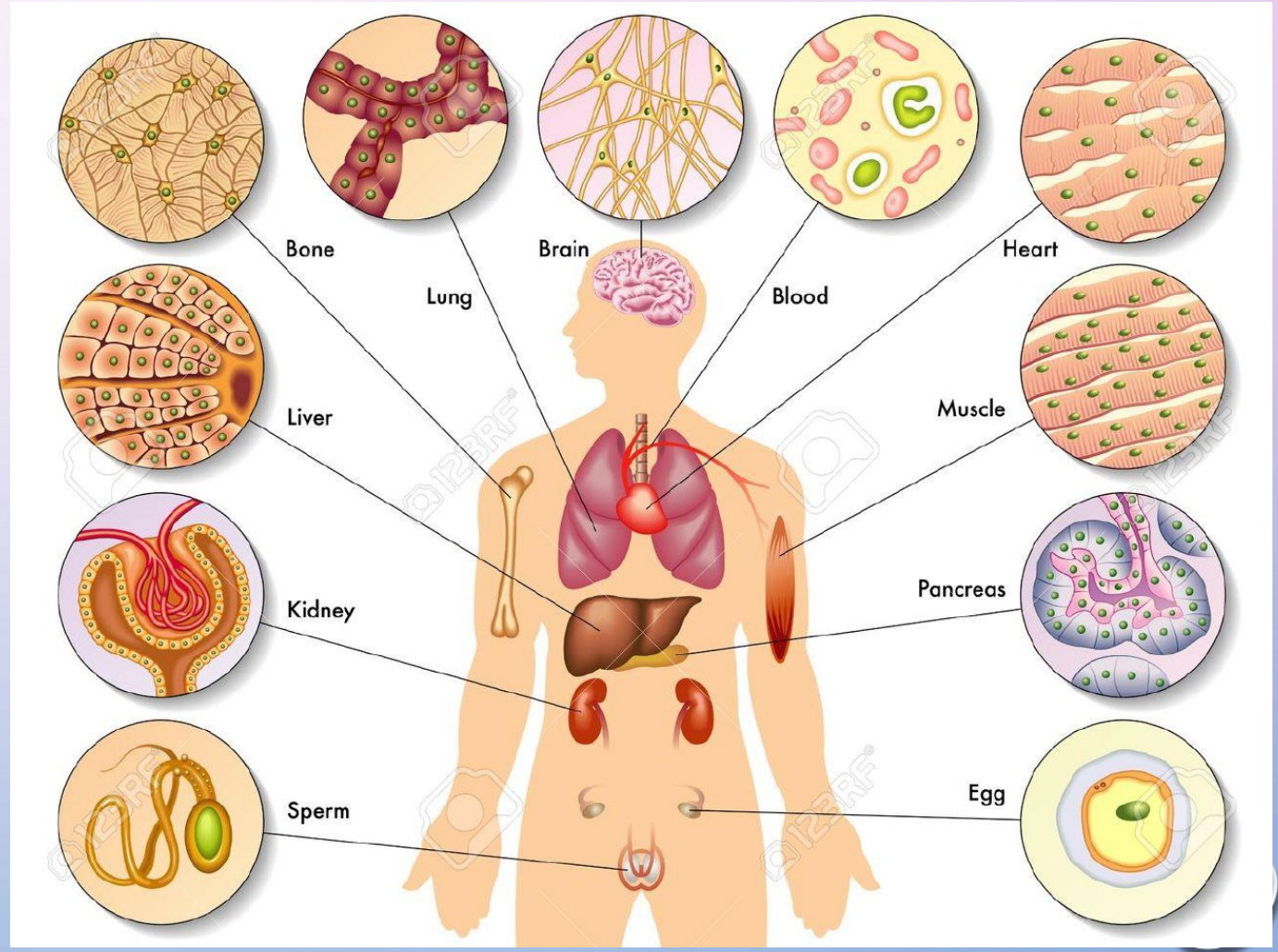
https://www.youtube.com/watch?v=gFuEo2ccTPA&ab_channel=FrankGregorio

https://www.youtube.com/watch?v=M1wdIdCOk-Y&ab_channel=FuseSchool-GlobalEducation

1) LIVING THINGS ARE MADE OF CELLS







Images from thoughtco.com, shutterstock.com

1) LIVING THINGS ARE MADE OF CELLS

How big are cells?

https://htwins.net/scale2/

1) LIVING THINGS ARE MADE OF CELLS

- Cells are the smallest unit ("building blocks") of all living things
- Cells are very small (could fit 10-10,000 cells in 1 mm)
- A cell is like a 'bag' filled with water and other structures

1) LIVING THINGS ARE MADE OF CELLS

Unicellular organisms are made of a single cell only

(Examples: bacteria, yeast, algae)

Multicellular organisms are made of multiple cells

(Examples: shrimp, human, tree)

2) LIVING THINGS TAKE IN NUTRIENTS

- **Nutrients**: substances that living things need but cannot make for themselves
- Examples:
  - Vitamins, minerals
  - Fiber
  - Water

Nutrition Facts

Serving Size 2/3 cup (55g)
Servings Per Container About 8

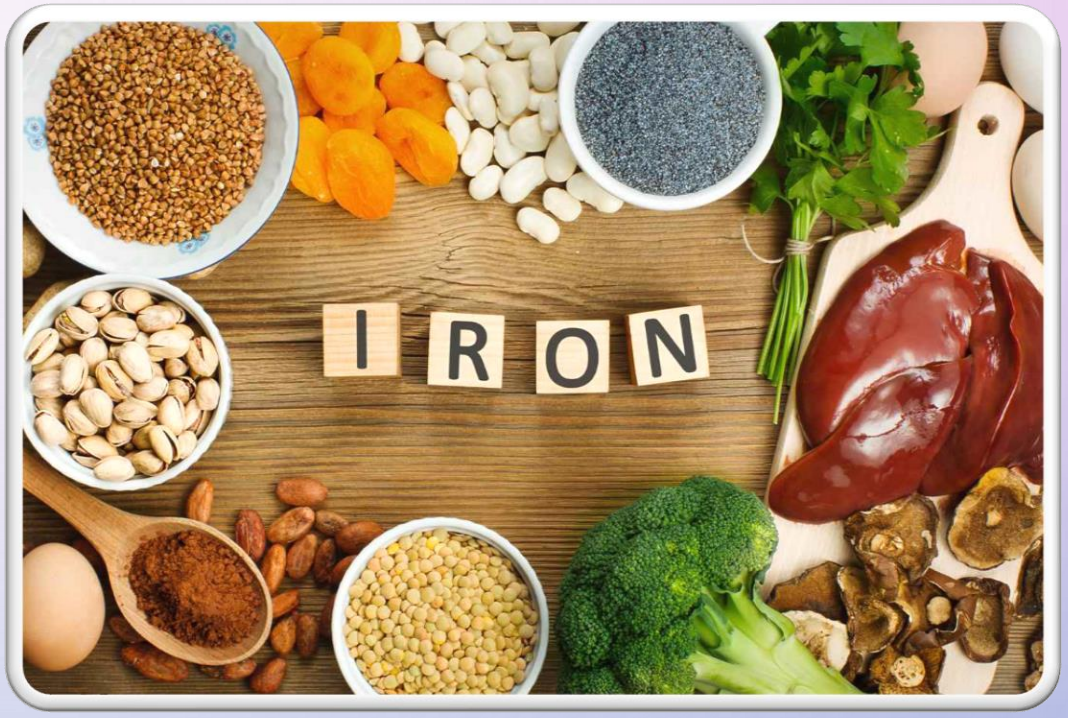
Amount Per Serving

Calories 230	Calories from Fat 40
	% Daily Value*
Total Fat 8g	**12%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
Total Carbohydrate 37g	**12%**
Dietary Fiber 4g	**16%**
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g

Note: a nutrient for one species may not be a nutrient for another! (e.g. oxygen is a nutrient for humans; carbon dioxide is a nutrient for plants.)



2) LIVING THINGS TAKE IN NUTRIENTS

2) LIVING THINGS TAKE IN NUTRIENTS

- **Consumers**: get their nutrients and energy by eating food (e.g. hamster, human)
- **Producers**: can make their own food using the Sun's energy and nutrients from their surroundings (e.g. plants)

3) LIVING THINGS USE ENERGY

- Living things need energy (from nutrients) to power their daily activities.
- Examples:
  - Physical activity
  - Thinking/learning
  - Manipulating our environments
  - Talking
  - Sleeping
  - Making a TikTok video

4) LIVING THINGS PRODUCE WASTE

- **Waste**: substances that living things produce and need to get rid of
- Examples:
  - Excretions (urine, feces)
  - Exhaled gases
  - Materials that are shed or left behind (e.g. trash, shed skin, food remnants)

Fun fact: Squirrels make “middens”, piles of discarded cones after their seeds/nuts have been eaten.

They can get territorial over their favourite snack spots!

PRACTICE (TB PG. 9)

1. How are multicellular and unicellular organisms the same or different?
2. Why do living things need energy, and where do they get it?

5) LIVING THINGS RESPOND TO STIMULI

Stimulus (pl. stimuli): anything that causes a living thing to respond in a certain way

- Internal stimulus: information about your body (e.g. hunger, tiredness, pain)
- External stimulus: information about your environment (e.g. smell, taste, touch, vision)

5) LIVING THINGS RESPOND TO STIMULI

Practice: internal or external stimulus?

- Colour
- Sound of the bell ringing
- Feeling sleepy
- Being angry
- Feeling the wind on your face
- Feeling jetlagged
- Tickling
- Seeing a red stop sign
- Feeling the urge to cough or sneeze
- Being thirsty
- Getting poked on the finger
- Feeling the warmth from a hot cup of chocolate
- Leg falling asleep

What other stimulus examples can you think of? Are they internal or external?

BRAIN BREAK!

Activity:

- One hand raised in air; other index finger touching nose. Then try to touch tip of thumb.
- Alternate hands after each touch.
- Now try while wiggling the fingers of your raised hand.

PROPRIOCEPTION

- Sense of body position

Activity: Try writing the word "proprioception" on your sheet of paper. Then write it again, but with your eyes closed. What do you notice?

Is proprioception an internal or external stimulus?

6) LIVING THINGS GROW AND DEVELOP

- Increase in size and/or number of cells
- Heal (repair wounds)
- Become more complex over time (includes learning)

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7) LIVING THINGS REPRODUCE

Reproduce: produce more copies of themselves (e.g. trees make seedlings, humans make babies, bacteria split to make two bacteria)

Many different reproduction strategies exist.

Question: How are growth and reproduction similar? Different?

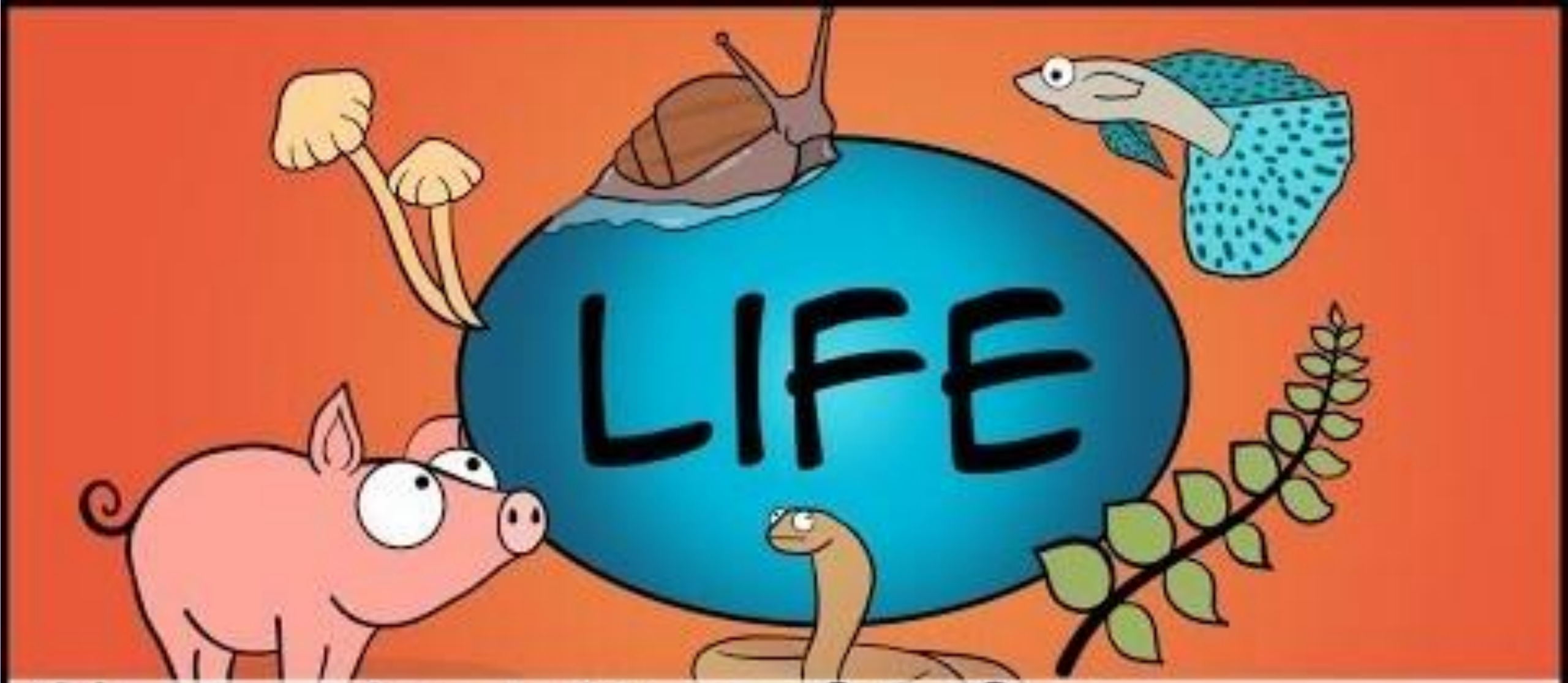
PRACTICE

	Made of Cells	Take in Nutrients	Use Energy	Produce Waste	Respond to Stimuli	Grow	Repro-duce	Living? (Y/N)
Wood	x			x				
Rock								
Frog								
…								

wood, rock, frog, leaf, worm, safety pin, cactus, door, paper, grass, tree, jail, T-shirt, tennis shoe, bicycle, car, human, book, water

MORE PRACTICE!

- Workbook pg. 4, 5



Characteristics of Life

with the Amoeba Sisters

https://www.youtube.com/watch?v=cQPVXrV0GNA&vl=en

"IS WOOD ALIVE? EXPLAIN"

Sample Answer	Mark + Reason
No, wood is not alive, because although it is made of cells and produces wastes, it does not take in nutrients, use energy, respond to stimuli, grow or reproduce.	Developing. • Correct: wood is not alive. • Does not explain any of the words used…student could have an inaccurate understanding of concepts and it would be hard to tell • Vocabulary used [mostly] correctly. • If examples are given, some of them may be incorrect.

"IS WOOD ALIVE? EXPLAIN"

Sample Answer	Mark + Reason
Yes, wood is alive, because it has cells and uses energy. It grows and reproduces.	Emerging. • Incorrect: wood is not alive • Does not explain any of the words used…student could have an inaccurate understanding of concepts • Vocabulary used incorrectly: wood does not use energy, grow, or reproduce.

"IS WOOD ALIVE? EXPLAIN"

Sample Answer	Mark + Reason
No, wood is not alive, because although it is made of cells (which you can see under a microscope), produces wastes (such as pieces of wood that fall off and are not needed anymore), and reproduces (because other plants grow from it), it does not use energy, take in nutrients, or grow.	Proficient • Correct: wood is not alive. • Explains some, but not all, of the words used. • Vocabulary used correctly overall...maybe one or two minor mistakes. Student mostly has a good understanding. • "Reproduces" was explained incorrectly, but the student recognizes that new living things are formed during reproduction.

"IS WOOD ALIVE? EXPLAIN."

Sample Answer	Mark + Reason
No, wood is not alive. It is made of cells (as shown in Robert Hooke's microscope slides), and it produces waste (because as it breaks down, pieces of bark and wood fall off and are used as nutrients for other animals). But it does not have all 7 characteristics of living things. It does not take in any nutrients, it does not use energy, it does not respond to stimuli (if you 'cut the wood', the wound will not heal). It also does not grow in size or in cell number (in contrast, wood will only deteriorate over time), and does not reproduce (because wood cannot make new copies of itself.) Therefore, wood is not a living thing.	Extending. • Correct: wood is not alive. • Explains all the words used. Gives examples and counterexamples to show a sophisticated understanding. • Uses all vocabulary accurately. • Goes above and beyond (e.g. recognizes that the "waste" of the wood can be used as nutrients for other living things")