

MAKE-A-SLIDE (Q2 SCI8)

How can you tell if something is alive?

- All grow (get bigger)
- All have cells
- All breathe
- All reproduce (to make more of the same living thing)
- All living organisms
- All die
- Have conscience

MAKE-A-SLIDE (Q1 SCI8)

How can you tell if something is alive?

- Plants, Sebastian, animals, fish, human, monkey, dog, ape, cat, frog, wolf living.
- Chair, rock, car, clock, building non-living
- Takes nutrients (something that keeps you alive)
- Have cells
- Breathe
- Produce wastes
- Has a pulse, a circulatory system
- Reproduce
- Moves

MAKE-A-SLIDE (1-2)

How can you tell if something is alive?

- If they need something (e.g. plants need sun)
- See if it can move on its own
- If it has a heartbeat
- Breathing x2
- Small changes (e.g. trees lose leaves, leaves change colour)

MAKE-A-SLIDE (2-1)

How can you tell if something is alive?

- If it's breathing
- Shows a reaction
- Moving
- Heartbeat/pulse
- Get food/can eat
- When it does anything
- If it can answer a test question
- Colour/looks relatively healthy
- Not decomposing
- When a plant has water and sunlight
- When there's oxygen

MAKE-A-SLIDE (2-3)

How can you tell if something is alive?

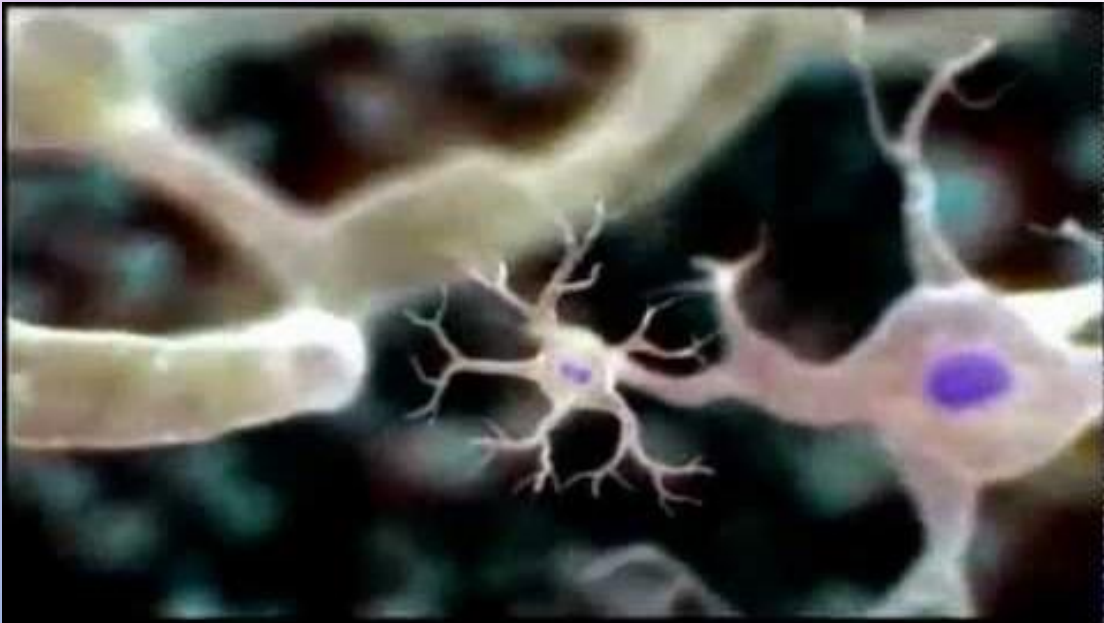
- Heartbeat/pulse
- Moving
- Breathing
- If it bites you
- Growing
- Needs oxygen
- Colour looks healthy
- Plant: stands tall
- If it's changing

The background features a gradient from light purple at the top to light blue at the bottom. Scattered throughout are several realistic water droplets of various sizes, some with highlights and shadows. In the center, there is a faint, large circular graphic with a dashed border and a central dot, resembling a cell or a molecule.

1.1: CHARACTERISTICS OF LIVING THINGS

Science 8

1) LIVING THINGS ARE MADE OF CELLS

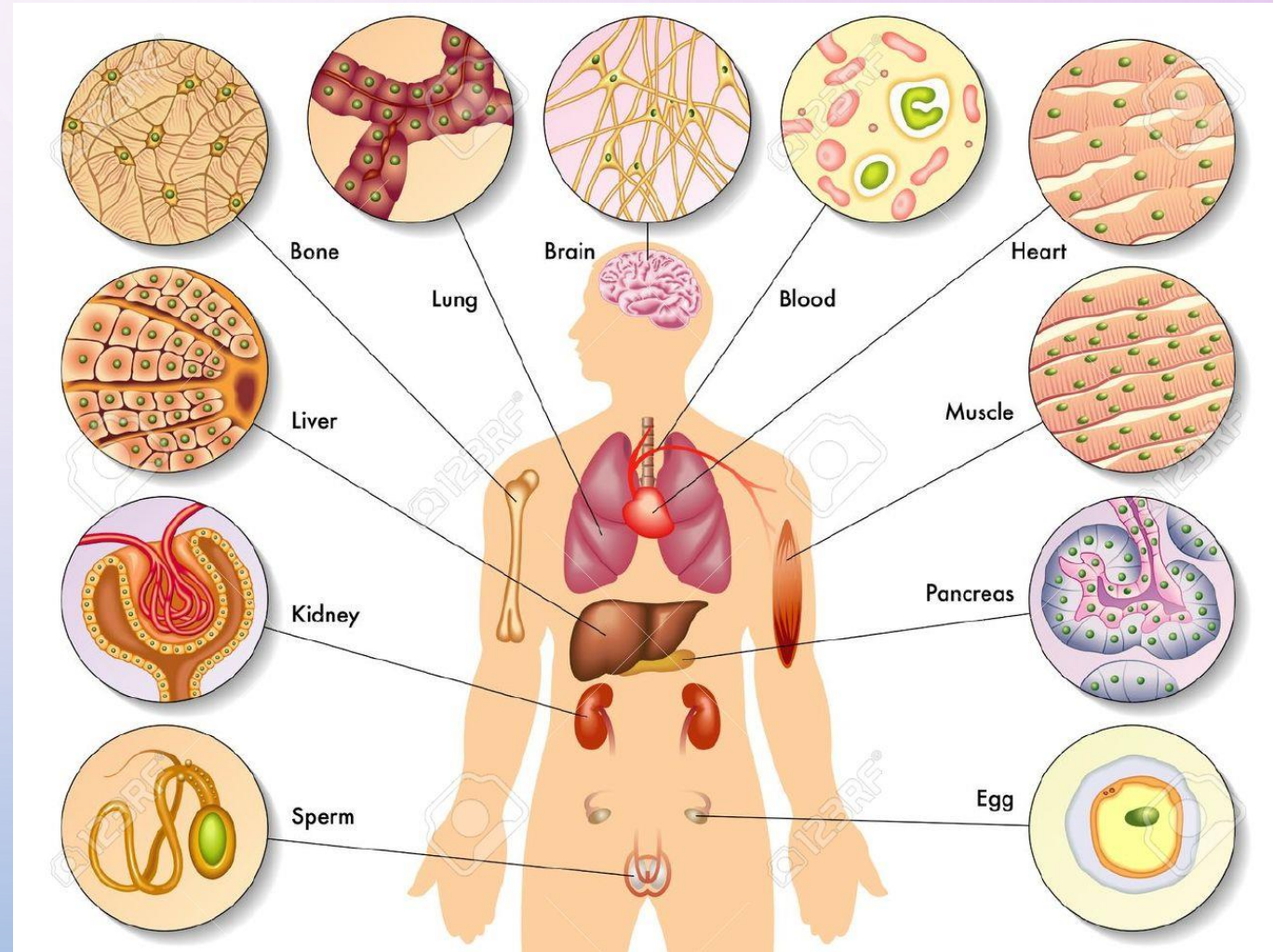
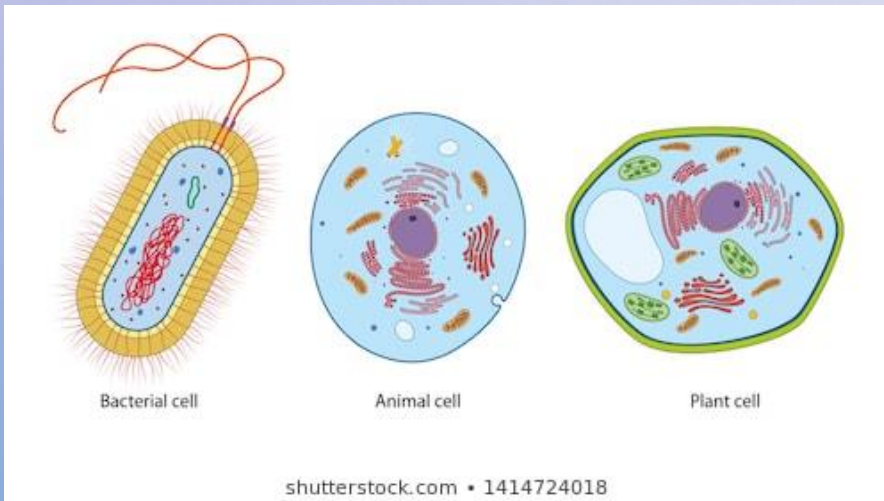
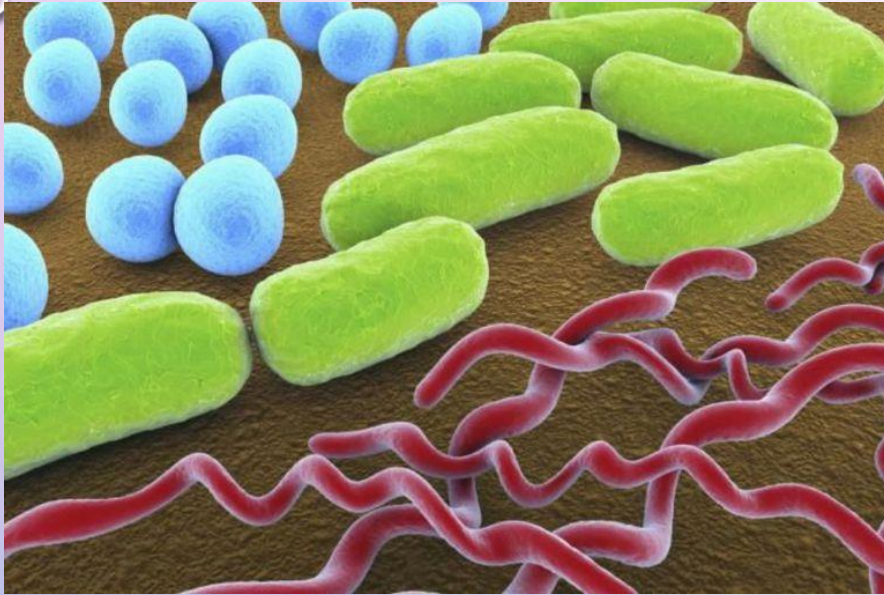


https://www.youtube.com/watch?v=gFuEo2ccTPA&ab_channel=FrankGregorio

https://www.youtube.com/watch?v=M1wdldCOk-Y&ab_channel=FuseSchool-GlobalEducation



1) LIVING THINGS ARE MADE OF CELLS



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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
- Different kinds we will learn:
 - Prokaryotic cell
 - Eukaryotic cell
 - Plant cell
 - Animal cell



1) LIVING THINGS ARE MADE OF CELLS

Unicellular (single-celled)
organisms



Multicellular organisms
(made of multiple cells)



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%
<i>Trans Fat</i> 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

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- **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

- Basically everything we do uses energy!
- Examples:
 - Physical activity
 - Thinking/learning
 - Manipulating our environments
 - Talking
 - Sleeping
 - Making a TikTok video





4) LIVING THINGS PRODUCE WASTE

- Excretions (urine, feces)
- Exhaled gases
 - CO_2 for humans
 - O_2 for plants
- 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
- Feeling too cold (need a jacket)

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

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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?



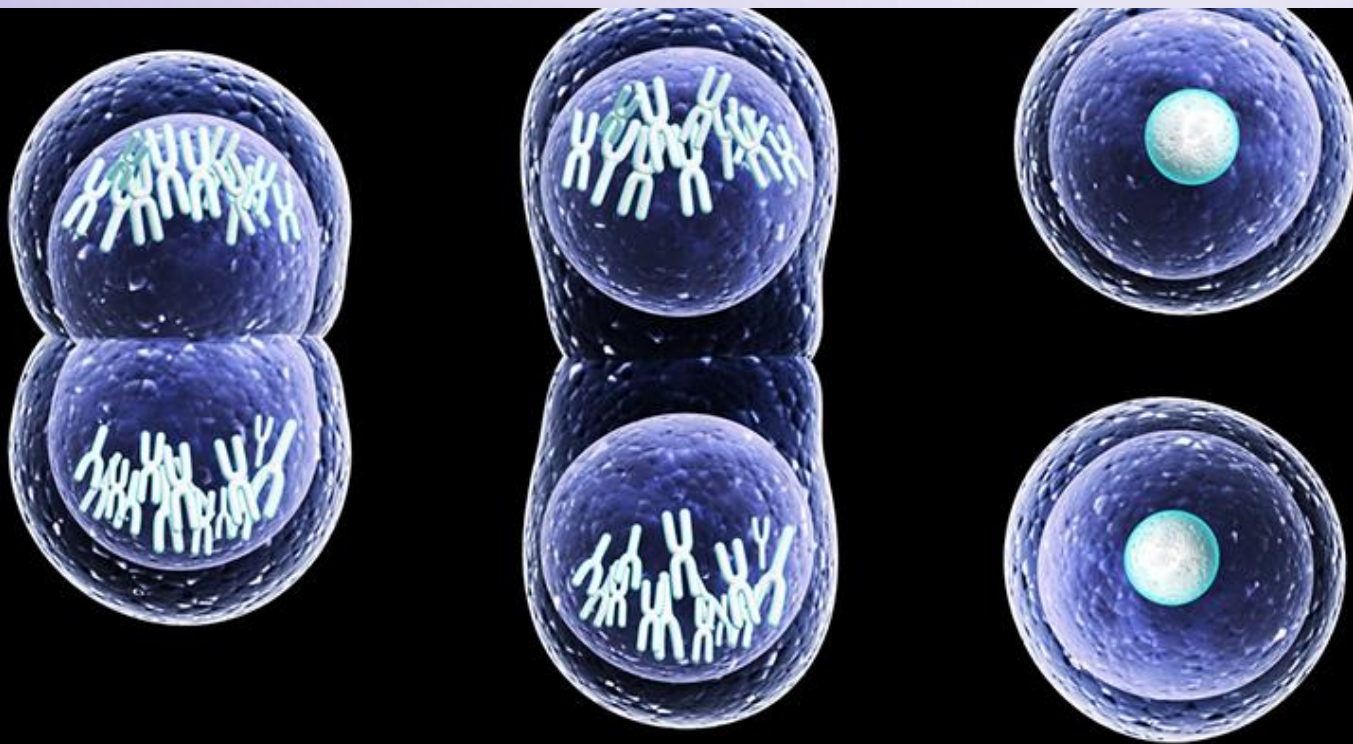
6) LIVING THINGS GROW

- Increase in size and/or number of cells



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- Increase in size and/or number of cells



7) LIVING THINGS REPRODUCE

- Produce more of their own species
- Many different reproduction strategies
 - With or without a mate?

Question: What is the difference between growth and reproduction?



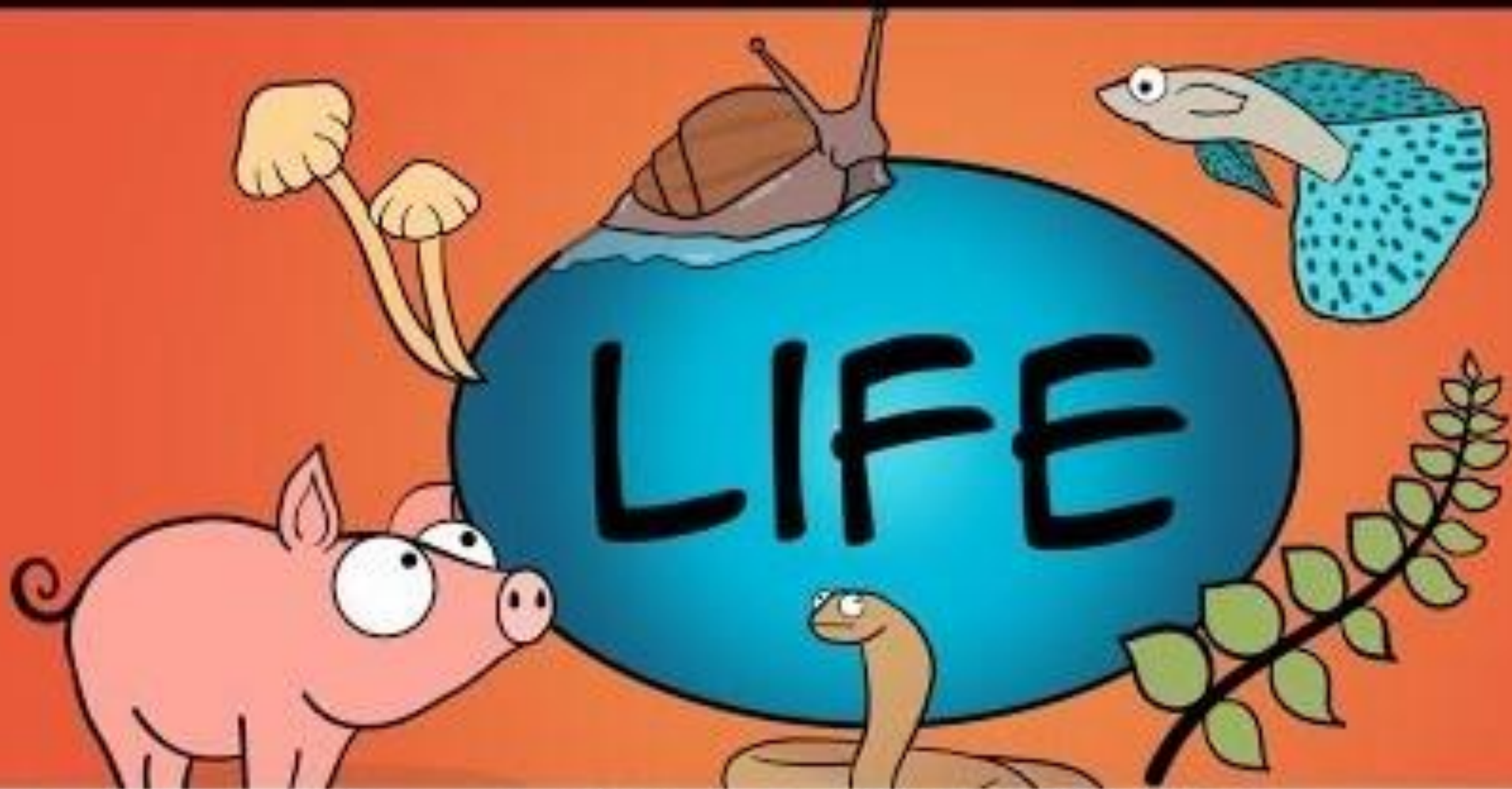
PRACTICE

	Made of Cells	Take in Nutrients	Use Energy	Produce Waste	Respond to Stimuli	Grow	Reproduce	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

“IS WOOD ALIVE? EXPLAIN”

Sample Answer

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.

Mark + Reason

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
<p>Yes, wood is alive, because it has cells and uses energy. It grows and reproduces.</p>	<p>Emerging.</p> <ul style="list-style-type: none">• 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

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.

Mark + Reason

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

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.

Mark + Reason

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”)