Science Virtual Learning

LEP Science

Response to Stimuli

April 21, 2020

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Lesson: April 21, 2020

Objective/Learning Target: I can explain what a stimulus is and how organisms respond to different stimuli.

Let's get started

Think back to your lesson on Homeostasis:

What is homeostasis (write your definition of homeostasis on a sheet of paper)

If you touch something hot with your hand, what is your reaction? (to leave your hand there, or to pull your hand away?)
Why did you pull your hand away? What "stimulated" your response?

Let's get started

Think back to your lesson on Homeostasis:

What is homeostasis (write your definition of homeostasis on a sheet of paper) You should have written something like: the way an organism maintains a balance inside.

If you touch something hot with your hand, what is your reaction? (to leave your hand there, or to pull your hand away?) Generally, people pull their hands away from something hot.
Why did you pull your hand away? What "stimulated" your response? The heat is what stimulated your pulling your hand away.

Lesson and Activity

Copy this down in your notebook or on a piece of paper

Recognizing Stimuli And Responses

To understand learning, you have to be clear on what **stimuli** and **responses** are.

- **Stimuli are inputs.**
- **Responses are outputs.**

Copy the highlighted parts into your notes.

Stimuli (usually) activate one or more of the senses. Stimuli can be internal as well as external. External stimuli are received by the body from the outside. Some examples of external stimuli: visual stimuli, like the screen in front of you; click of the keys; touch stimuli, like the feel of the keys under your fingertips. Internal stimuli signal the state of the body. Some examples of internal stimuli: the feeling you describe as hunger, the churning sensation you experience when anxious or afraid.

Copy the highlighted parts into your notes.

Responses are actions of the body: muscle contractions, gland secretions, or brain actions. Examples of responses include: muscle movements, like pressing a key with a finger; the product of muscle movements, like speaking; glands secreting, like salivation or perspiration or increased adrenaline flow inside the body; brain reactions, like changes in the EEG ("brain waves").

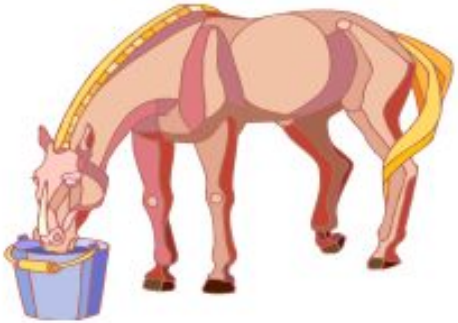
Now, using your notes, see if you can identify the stimulus and the response.

1)

Stimulus: _____

Response: _____

2)



Stimulus: _____

Response: _____

Now, using your notes, see if you can identify the stimulus and the response.

3)

Stimulus: _____

Response: _____

4)

Stimulus: _____

Response: _____

How did you do?

1. S - sun, R - flower bending toward the sun
2. S - hunger, R - horse eating oats in the pail
3. S - hunger, R - girl eating ice cream
4. S - hot, R - guy cooling himself with a fan

Now, try your hand at completing the chart below

Statement	What is the Stimulus?	Is this an internal or external stimulus?	What is the Response?
You have a stomach ache and decide to lay down.			
A bird is thirsty and drinks some water.			
A mouse sees a cat and hides under a log .			
You see a spider and scream.			
A dog sits when it is given a treat.			
Winter is coming so a squirrel stores nuts.			

Let's see how you did

Statement	What is the Stimulus?	Is this an internal or external stimulus?	What is the Response?
You have a stomach ache and decide to lay down.	Stomach ache	Internal	Laying down
A bird is thirsty and drinks some water.	Thirst	Internal	Drinks water
A mouse sees a cat and hides under a log .	Seeing the cat	External	Hiding
You see a spider and scream.	Seeing the spider	External	Screaming
A dog sits when it is given a treat.	treat	External	sitting
Winter is coming so a squirrel stores nuts.	Winter coming	External	Storing nuts

Can plants also respond to stimuli?

Watch this video and answer the questions below. Stop the video at 2:47.

1. What is growth in response to stimuli called?
2. What is phototropism?
3. What is gravitropism (geotropism)?
4. What is hydrotropism?
5. What is thigmotropism?
6. Auxin causes cells to do what?
7. What is a positive tropism?
8. What is a negative tropism?
9. What are nastic movements?
10. Give an example of photonasty.
11. Give an example of thigmonasty.

Can plants also respond to stimuli?

1. What is growth in response to stimuli called? tropism
2. What is phototropism? Responding to light (usually bend toward the light)
3. What is gravitropism (geotropism)? Response to gravity (roots grow down, shoots grow up)
4. What is hydrotropism? Response to water (grows toward)
5. What is thigmotropism? Response to touch
6. Auxin causes cells to do what? elongate
7. What is a positive tropism? Movement toward the stimuli
8. What is a negative tropism? Movement away from the stimuli
9. What are nastic movements? Rapid movements in response to stimuli
10. Give an example of photonasty. Purple shamrock will sag in response to no light
11. Give an example of thigmonasty. Touch-me-nots sag in response to touch, Venus fly trap closes in response to touch

How about a little practice with plants? Read the statement and cirle the answer

Light, touch, or gravity that causes plant growth toward or away from a stimulus is a (chemical hormone, tropism).

A plant's tropism to light is called (phototropism, gravitropism).

Bending toward the light is a (positive, negative) tropism.

If a planter is turned so the plant bends away from the light, the plant will gradually (bend lower, straighten).

How about a little practice with plants? Read the statement and cirle the answer

Roots that grow (toward, away from) the Sun help anchor the plant in the soil.

Some plants respond to touch. This is called (thigmotropism, photoperiodism).

A higher level of a plant hormone called (gibberellins, auxin) on the dark side of the plant causes plant cells found there to grow longer.

When plant cells on the dark side of a plant grow longer, the plant (bends, dies).

Check your work

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A plant's tropism to light is called (phototropism, gravitropism).

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Additional Resources

Powerpoint on Stimuli

Video on plant tropisms