

Thursday, June 18

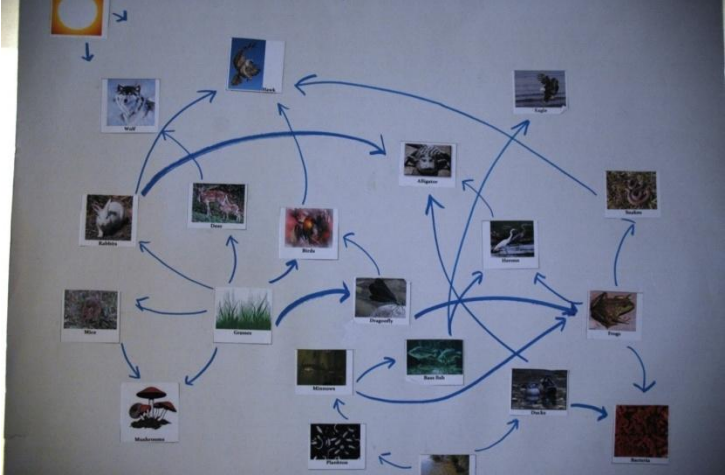
Objective

Domain: Ecology

- Students use diagrams to interpret the interactions of organisms within food chains and webs.
- Students determining the role of different organisms in food chains and webs.

Time	Activity/Task	Assessment
10 min	<p><i>Guiding Questions Preassessment</i> Ask students to answer the guiding questions on Interactions of Organisms within food chains and webs. (See Guiding Questions in the Thursday's 18, materials section). <i>Teacher notes:</i> conduct a short discussion around the questions as a manner to introduce the students to today's lesson.</p>	Answer guiding questions. Participation in classroom discussion
15 min	<p><i>Organisms and their roles within food chains and webs</i> The teacher shows the Organisms in their environment video clip from United Streaming. Students should complete the Organisms in their environment video information sheet. (See Organisms in their environment video information sheet in the Thursday's 18, materials section). <i>Teacher notes:</i> Students do not need to watch the last two segments of the video; the carbon cycle and the quiz.</p>	Video information sheet
15 min	<p><i>Card Activity</i> The instructor passes out a set of index cards with roles and pictures. Students in groups of two arrange the roles and pictures as a pre-assessment probe. (See Organisms Matching cards in the Thursday's 18, materials section). The teacher asks the students to generate definitions for the terms used in the pre-assessment. (See Key Concept Definitions handout in the Thursday's 18, materials section).</p>	Constructed definitions.
20 min	<p><i>Generating a Food Chain</i> Divide the students in groups of two. Provide each group with a packet food chain manipulatives with descriptor role terms with directions and threat scenarios. (See food chain manipulatives in the Thursday's 18, materials section). Student groups arrange the species into a food chain. Students select threat cards and describe in their notebooks what will happen to organisms in the food chain due to the threat card event.</p>	Notebook reflections.

Thursday, June 18 (continuation)

Time	Activity/Task	Assessment
30 min	<p><i>Food Web Construction, question generation and discussion</i></p> <p>Use the organisms in the baggie to construct a food web (see organisms manipulatives in the Thursday's 18, materials section). This is an open ended activity. Students place the organisms on the poster and use a dry erase marker to draw arrows between the organisms, indicating their relationships. Each students group creates a scenario (disruption threat or question and writes it on their whiteboard) other groups circulate and respond to the question created by the group who created the food web.</p>  <p><i>Teacher notes:</i> This activity is designed to draw in and review information on ecology presented on Monday and Tuesday relationships between organisms, populations, communities, ecosystems, and biomes as well as matter and energy as they move through food chains and food webs. Class discusses the webs, questions and responses.</p>	<p>Students construct a food web.</p> <p>Students generate and answer questions on interactions and changes in the webs.</p>
20 min	<p><i>Review Questions 14</i></p> <p>Provide students with a set of questions (see Review Questions 14 handout in the Wednesday's June 17, materials section) about the interaction of organisms within food chains and webs. Give them 15 minutes to answer the questions individually.</p> <p>Conduct a group discussion of the answer to the questions and ask the students to correct their own answer if necessary and to write an explanation of why the answer needed to be corrected. The explanation must state the original reason the student chose the wrong answer and what makes the correct answer correct.</p>	<p>Student questionnaire</p>

Thursday, June 18 (continuation)

Objective

Domain: Forces, Waves and Electricity

- Students understand the properties of electricity and magnetism

Time	Activity/Task	Assessment
15 min	<p><i>Guiding Questions – Electricity and Magnetism Assessment Probe and Task Challenge</i></p> <p>Students complete an introductory assessment probe. (See Electricity and Magnetism Assessment Probe in the Thursday’s 18, materials section).</p> <p>Teacher and students then discuss responses. The teacher challenges class to make suggestions on how to turn on the light bulb (making a complete circuit) with one battery, ONE wire, and one bulb.</p>	Students complete assessment probe and build a circuit.
30 min	<p><i>Series and Parallel Circuit Activity</i></p> <p>Follow the instructions given on the Series and Parallel Circuits Activity (see Series and Parallel Circuit Activity in the Thursday’s 18, materials section) in groups of three.</p> <p>Ask the students to write a two paragraph conclusion about the things that they learned in their notebooks.</p>	Completion of the activity
20 min	<p><i>Electricity Board Activity</i></p> <p>Students review concepts in electricity by placing card terms in a concept map (see Electricity Concept Board Activity in the Thursday’s 18, materials section). Instruct the students to take the words out of the plastic bag and placed them on the correct place in the concept maps.</p> <p>Teacher and student discuss maps completed to clear up any misconceptions before the students tackle the problem set in the next activity.</p> <p><i>Teacher notes:</i> The concept maps need to be put together before issuing them to the students. Follow the directions at the top of each concept map page.</p>	Students complete the Concept Maps
20 min	<p><i>Electromagnets</i></p> <p>Show the Unitedstreaming video Electromagnets. Ask the students to complete the Electromagnet video handout and conduct a group discussion about what the students have watch.</p>	Completion of Electromagnets video handout
20 min	<p><i>Making an Electromagnet</i></p> <p>Group the students in groups of three or four and challenge them to use materials in the lab to design an electromagnet that will pick up paper clips.</p> <p>Students describe how they build their electromagnet and how it works.</p>	Description of experiment results.

Thursday, June 18 (continuation)

Time	Activity/Task	Assessment
20 min	<p><i>Review Questions 15</i></p> <p>Provide students with a set of questions (see Review Questions 15 handout in the Wednesday's June 17, materials section) about electricity and magnetism. Give them 15 minutes to answer the questions individually.</p> <p>Conduct a group discussion of the answer to the questions and ask the students to correct their own answer if necessary and to write an explanation of why the answer needed to be corrected. The explanation must state the original reason the student chose the wrong answer and what makes the correct answer correct.</p>	Student questionnaire

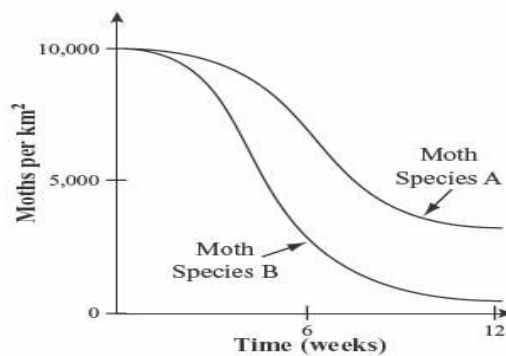
Thursday's June 18

Materials Section

Guiding Questions
The role of organisms within food chains and webs

What is an example of ecological succession?

The praying mantis is a predatory insect that often eats moths. The graph below shows the relative numbers of two species of moths over 12 weeks after the introduction of the predatory praying mantis.



What characteristic of this ecosystem is **best** indicated from this graph?

**Organisms in their Environment
Video Notes**

What are ecosystems?

What factors help define the characteristics of a particular ecosystem?

What is a population?

What is a niche?

What are species?

What is a habitat?

What are food chains?

What are food webs?

Organisms in their Environment
Video Notes

What are food producers?

What are the first order consumers?

What are the second order consumers?

What are decomposers?

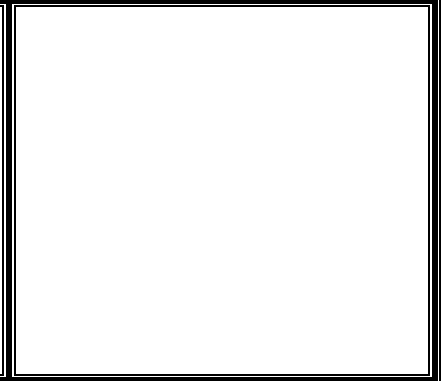
What is a pyramid of energy?

How much energy passes from one level to the next?

Organisms Matching Cards
Terms

HETROTROPH	AUTOTROPH	PRODUCER
PREY	PREDATOR	CARNIVORE
HERBIVORE	OMNIVORE	Primary (1 ST ORDER) CONSUMER
Secondary (2 ND ORDER) CONSUMER	3 RD ORDER CONSUMER	Top Level Consumer
SUN	SCAVENGER	DECOMPOSER

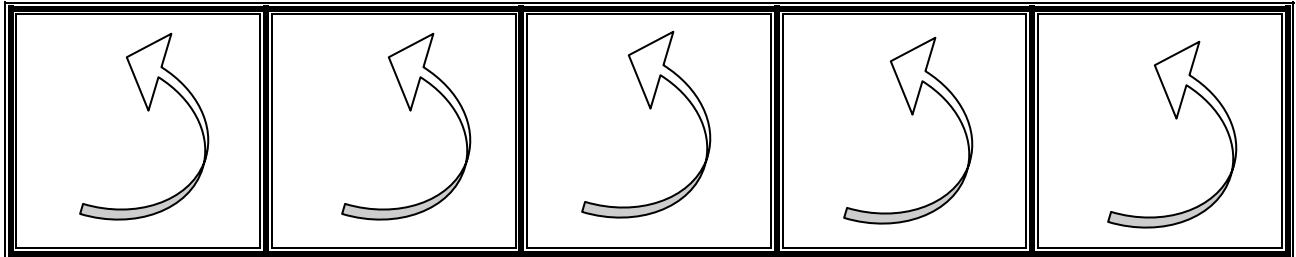
Organisms Matching Cards
Pictures



Food Chain Activity

Instructions:

1. Place the organisms in the correct order of the terrestrial food chain.
2. Lay the proper term beside each organism that defines its role in the food chain.
3. Use the arrows and “gives energy to” signs to indicate the direction of energy flow.
4. Use your threat scenario cards in the lower half of you whiteboard poster. Explain what you think would happen to the food chain after the event on the threat card occurs at the bottom of your white board using the dry erase marker.









Gives energy to	Terrestrial Food Chain			
Gives energy to	Gives energy to	Gives energy to	Gives energy to	Energy Source

**Food Chain Manipulatives
(Continuation)**

HETEROTROPH	HETEROTROPH	HETEROTROPH
HETROTROPH	AUTOTROPH	PRODUCER
PREY	PREDATOR	CARNIVORE
CARNIVORE	PREDATOR	HERBIVORE
CARNIVORE	OMNIVORE	Primary (1 ST ORDER) CONSUMER
Secondary (2 ND ORDER) CONSUMER	3 RD ORDER CONSUMER	Top Level Carnivore (4 TH ORDER) CONSUMER
SUN	PREY	PREDATOR

**Food Chain Manipulatives
(Continuation)**

	 1000kCal	 2 kCal
 200 kCal	 50 kCal	 10 kCal

Card for students who are not familiar with ecosystems in Georgia or who show confusion as they attempt this activity:

In a sunny field containing a small pond in Georgia, organisms cycle nutrients and pass energy in one direction through a food chain. In this ecosystem, grasshoppers love to eat the leafy plants surrounding the pond but must watch out for hungry frogs. The frogs are the favorite food of the snakes which are careful to hide their movements from the hawks that use them as a primary food source.

Food Web Manipulatives

Directions:

1. All of these organisms make up the community of a portion of Georgia's Okefenokee swamp. Use the organisms in your baggie to construct a possible food web for the Okefenokee. Use an Expo marker to show the movement of matter and energy from one organism to another.
2. Create a question to ask other student groups about your food web. Write that question at the end of your white board. You pose a question about a possible disruption threat or about the relationships between organisms, populations, communities, ecosystems, and biomes you have reviewed earlier in the week. Be creative!!!
3. Once you have completed your web and written the question you are asking about your web and the bottom of your whiteboard, circulate with the other members of your group and respond to the questions created by other groups using the dry erase markers. Make sure to include the names of your group members with the responses you make to the other groups' food webs.

**Food Web Manipulatives
(Continuation)**



Sun



Mushrooms



Bacteria



Wolf



Hawk



Grasses



Bird



Rabbit



Mice



Snake



Frog



Hérons

**Food Web Manipulatives
(Continuation)**



Bass fish



Plankton



Alligator



Ducks



Dragonfly



Eagle



Deer



Algae

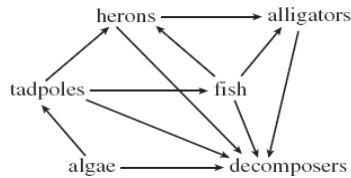


Minnows

Review Questions 14

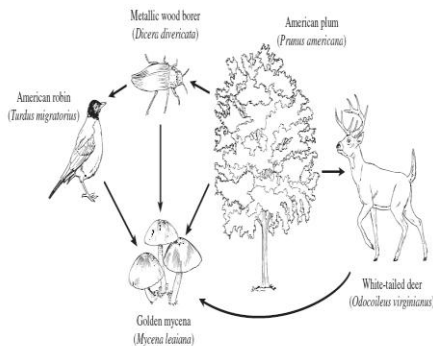
Organisms' Interactions within Food Chains and Webs

1. The diagram below shows a food web.



Which population would **probably** increase if the tadpole population decreased?

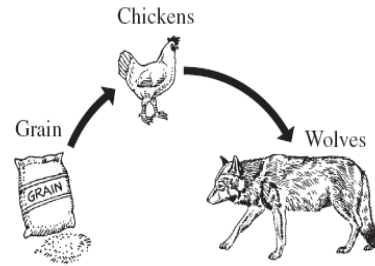
- A. herons
 - B. alligators
 - C. fish
 - D. algae
2. A food web is shown below.



Which organism in this food web is a decomposer?

- A. American plum
- B. Golden mycena
- C. Metallic wood borer
- D. White-tailed deer

3. The figure below represents the flow of food energy through a system.



In an experiment, chickens were fed grain that contained a chemical marker in its protein. The presence of the marker can be detected in organisms.

Which of the following is the **MOST** reasonable prediction from this experiment?

- A. The marker will only be found in the grain.
 - B. Both chickens and wolves will have the marker.
 - C. Wolves will have the marker, but chickens will not.
 - D. The marker will only be found in the animal's wastes.
4. Plants → Aphids → Spiders → Sparrows
- In this food chain, the spiders are
- A. Hawks
 - B. Weasels
 - C. Raccoons
 - D. Mice

5. Many species of beetles, fungi and bacteria feed exclusively on dead plants and animals in the tropical rainforest biome so that the nutrients are very rapidly recycled in the biome. These organisms would be considered:

- A. Producers
- B. Carnivores
- C. Herbivores
- D. Decomposers

6. Major ecosystems that occur over wide areas of land are called

- A. Communities
- B. Habitats
- C. Biomes
- D. food chains

7. A relationship between a producer and consumer is best illustrated by

- A. a snake eating a bird
- B. a fox eating a mouse
- C. a lion eating a zebra
- D. a zebra eating grass

8. The physical location of an ecosystem in which a given species lives is called a

- A. habitat
- B. tropical level
- C. community
- D. food zone

9. Animals that feed on plants are least in the

- A. first trophic level
- B. second trophic level
- C. third trophic level

D. fourth trophic level

10. An organism's niche includes

- A. what it eats
- B. where it eats
- C. when it eats
- D. all of the above

11. An ecosystem consists of

- A. a community of organisms
- B. energy
- C. the soil, water, and weather
- D. all of the above

12. In the study of ecology, what is a population?

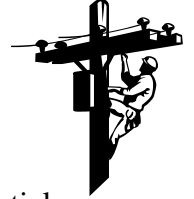
- A. all plants and animals in a given place
- B. all the living and nonliving things in an environment
- C. all the organisms of one particular species in a given place
- D. different plants interacting with each other in a given place

13. Physical and chemical factors may affect an organism's survival. These abiotic factors may include

- A. infectious parasites
- B. autotrophs and chemoautotrophs
- C. pathogens such as fungi and bacteria
- D. available gases such as O₂, CO₂ and N₂

14. Replacing inorganic nutrients in soil is accomplished primarily by the

- A. second-order consumers
- B. first-order consumers
- C. decomposers
- D. herbivores



Electricity and Magnetism Assessment Probe

One of the four fundamental forces, electromagnetic force, operates between charged particles (like protons and electrons) and electromagnetic fields that they create. Like charges repel and unlike charges attract. This basic law of nature results in many phenomena known as “electricity”, “magnetism” and “electromagnetism”. Listed below are some terms. Check all the ones you think are associated with electricity and magnetism. On right column of the table write a brief explanation outlining how each of the words you checked is associated with things that surround you.

	Current	
	Direct Current	
	Generator	
	Electromagnet	
	Motor	
	Resistance	
	Battery	
	Series circuit	
	Conductor	
	Voltage	

Series and Parallel Circuit Activity

Materials

- 1 AA battery
- 5 Christmas tree lights
- Wires from the lights cut in different lengths

Directions

1. Construct a series circuit by using three or more tree lights (see figure 1 below).

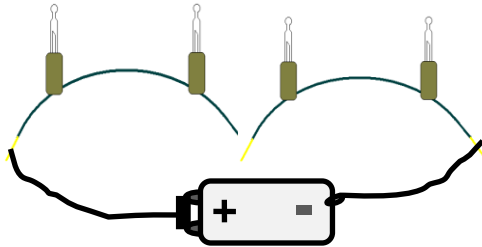


Figure 1

2. Complete the table below with your observations.

OBSERVATIONS	
1	
2	
3	
4	
5	

3. Modify your circuit if necessary to find out the answers to the questions on Table 2.

Inquiry Questions	
Are all the tree lights equally bright?	
What happens when one tree light is removed from the circuit and the remaining stay connected?	
	Why?
What happens if one of the lights will burn out?	
	Why?

4. Construct a series circuit by using three or more tree lights (see figure 2 below).

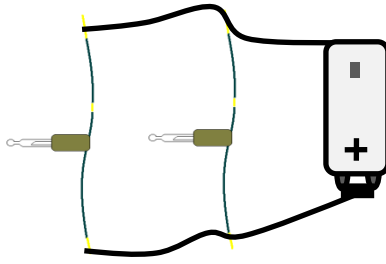


Figure 2

5. Complete the table below with your observations.

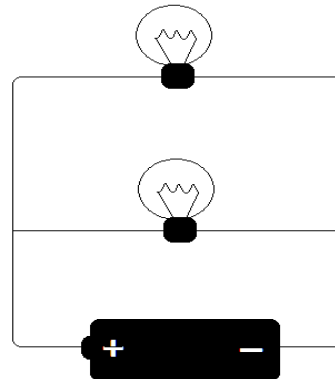
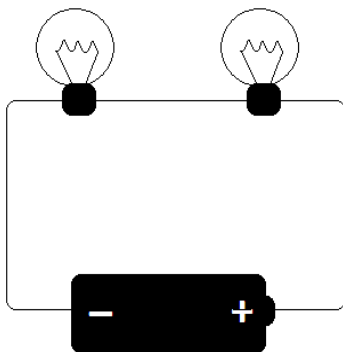
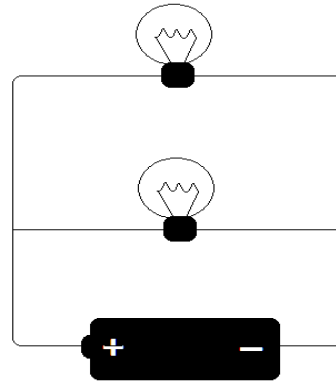
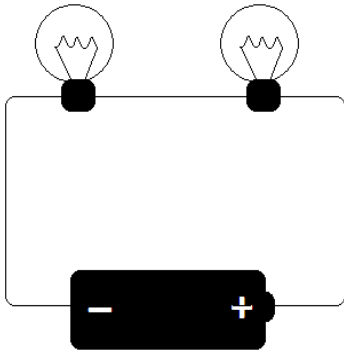
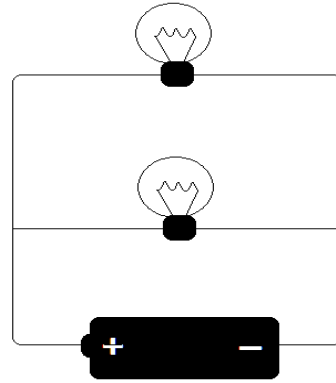
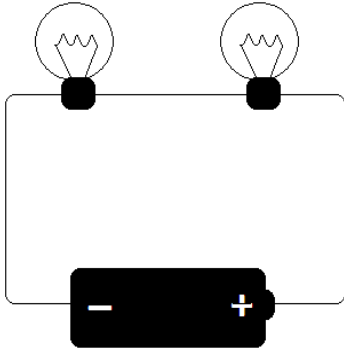
OBSERVATIONS	
1	
2	
3	
4	
5	

6. Modify your circuit if necessary to find out the answers to the questions on Table 2.

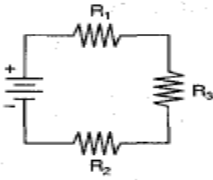
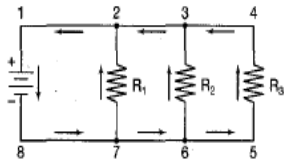
Inquiry Questions	
Are all the tree lights equally bright?	
What happens when one tree light is removed from the circuit and the remaining stay connected?	
	Why?
What happens if one of the lights will burn out?	
	Why?

QUESTIONS:

Look at the diagrams of the circuits below. Label each circuit as a series circuit or a parallel circuit. Draw some switches at various places in the circuit and describe what will happen to the flow of current if the switch is opened.

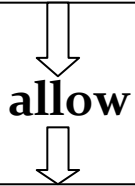


Electricity Concept Map

Flow of charges	The easy flow of charges	Copper & silver
Plastic and rubber	Electrical circuits	Volts
Ohms	Amperes	Resistance to current
Current	Force of charge through conductors	I
V	R	Series Circuits
Parallel Circuits	$V=IR$	
		

(top left)

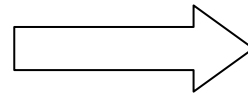
**Some materials are
CONDUCTORS such as**



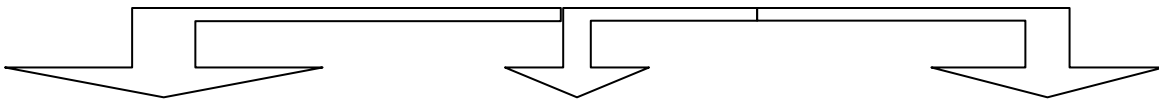
Can be used to build



This can be



That can be measured with units called



or

or

(bottom right)

which measures



who's symbol is



which measures



who's symbol is



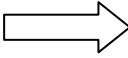
which measures

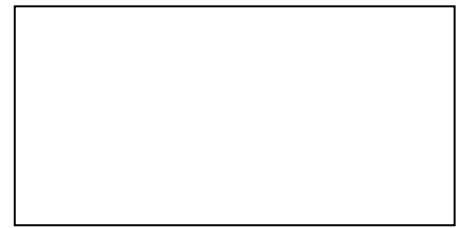


who's symbol is

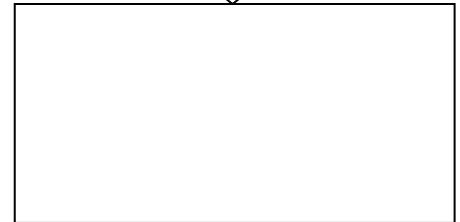


(top right 1/2 page)

And some are
INSULATORS such as 



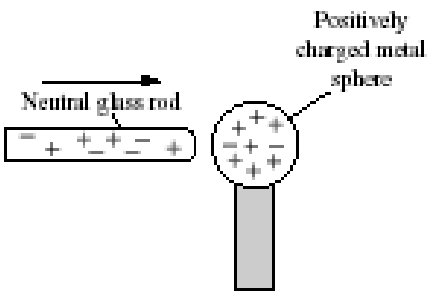
which prevent



Review Questions 15
Electricity and Magnetism

1. If a circuit has a current equal to 10 amps and a resistance equal to 2 ohms, what is the voltage in the circuit?
 - A. 5 volts
 - B. 20 volts
 - C. 0.2 volts
 - D. cannot be determined
2. Which of the following statements about circuits is true?
 - A. As you add light bulbs to a parallel circuit, the light bulbs will become less bright as less current flows through each.
 - B. If you stop the flow of current in one branch of a parallel circuit, the entire circuit MUST stop carrying electric current.
 - C. If you stop the flow of current in one part of a series circuit, no current will flow in any part of the circuit.
 - D. All of these statements are true.
3. Electric charges are usually transferred by
 - A. electrons
 - B. the nucleus
 - C. protons
 - D. neutrons
4. Appliances connected so that they form a single pathway for electricity to flow are connected in a(n)
 - A. a series circuit
 - B. a parallel circuit
 - C. an open circuit
 - D. not enough information
5. If a circuit has a voltage of 60 volts and a resistance of 5 ohms, what is the current flowing through the circuit?
 - A. 300 amps
 - B. 1/12 amp
 - C. 12 amps
 - D. 55 amps
6. A dry-cell battery produces _____.
 - A. direct current
 - B. alternating current
 - C. both direct and alternating current
 - D. neither a direct current or alternating current
7. If you want holiday lights to operate so that when one bulb burns out and the rest stay lit, you will want to get lights that
 - A. are connected in series
 - B. are only white
 - C. are connected in parallel
 - D. have many colors
8. A negatively charged rubber rod was brought near some small pieces of paper. The rod's charges repelled the negative charges in the pieces. Which of the following caused the repulsion of the negative charges?
 - A. conduction
 - B. gravitation
 - C. induction
 - D. insulation

9. The figure below shows a neutral glass rod and a positively charged metal sphere.



Which of the following **best** describes the movement of charges as this glass rod touches the sphere?

- A. Negative charges move from the sphere to the glass rod.
 - B. Negative charges move from the glass rod to the sphere.
 - C. Positive charges move from the sphere to the glass rod.
 - D. Positive charges move from the glass rod to the sphere.
10. Which of the following is common to all electric motors?
- A. battery power
 - B. magnetic forces
 - C. hydroelectric power
 - D. internal combustion engines
11. In which way do permanent magnets and electromagnets differ?
- A. Electromagnets have fixed magnetic strength
 - B. Permanent magnets can only be used in fixed positions
 - C. Electromagnets can attract other substances besides metals

- D. The largest permanent magnets are weaker than the largest electromagnets
12. An electric generator converts
- A. solar energy to electric energy
 - B. thermal energy to electric energy
 - C. chemical energy to electric energy
 - D. mechanical energy to electric energy
13. A student's hair stands out when the Van de Graff generator charges them. The reason for this is
- A. hair strands are at a high voltage
 - B. hair is a good conductor
 - C. the student is in a strong electric field
 - D. like charges repel
14. Reginald has set up an electromagnet, but it is weak and won't even attract paperclips. How might Reginald make the electromagnet stronger?
- A. Increase the current
 - B. Increase the number of turns
 - C. Use a soft iron core instead of a nail
 - D. Decrease the amount of wire used
15. In which way do permanent magnets and electromagnets differ?
- A. Electromagnets have fixed magnetic strength
 - B. Permanent magnets can only be used in fixed positions
 - C. Electromagnets can attract other substances besides metals
 - D. The largest permanent magnets are weaker than the largest electromagnets