***The Blobz Guide to Electric Circuits***

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bell: \_\_\_\_\_\_\_\_\_\_\_**

**Purpose:** To explore how electrical circuits work.

**Procedure:**

1. Enter the following website: <http://www.andythelwell.com/blobz/>

2. Identify how many students are working on this activity (1 or 2)

3. Type your name in the box, and your partner in the next box.

4. Read the “Welcome” section for directions.

5. Enter the activities at the bottom of the page and complete the exercises below.

**Section 1: What Makes Circuits Work?**

Circuits need to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for them to work properly.

This means that the wires must go in a full \_\_\_\_\_\_\_\_\_\_\_\_\_ around from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ source and back again.

Circuits that are not complete \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_.

Circuits that are not complete will not work because the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can not travel around them properly.

A power source can be either \_\_\_\_\_\_\_\_\_\_\_\_\_ (batteries) or \_\_\_\_\_\_\_\_\_\_\_.

Remember that \_\_\_\_\_\_\_\_\_\_\_\_\_\_ electricity is \_\_\_\_\_\_\_\_\_\_\_\_\_ more powerful than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and can be very dangerous.

If you are using more than one \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a circuit, remember that they need to be connected so that they are all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_ direction in the circuit.

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (bumpy end) of one cell should connect to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (flat end) of the next.

**Click the GREEN ARROW and complete the activity.**

**Click on the “?” to complete “The Quiz #1”.**

1. Which of these things does a circuit need so that it can work properly?

A. Bulbs B. a power supply C. Crocodile Clips D. Plastic

2. If a circuit is not complete, what happens?

 A. It won’t work B. It works

 C. The bulbs glow D. It might work

3. What do cells (batteries) do in a circuit?

 A. nothing B. light up

C. Provide electricity D. Use up electricity

4. Will the bulb light up?

 A. sometimes

 B. No – this is not a complete circuit.

 C. No – there are not enough cells in the circuit.

 D. Yes

5. Why do circuits need to be complete?

 A. To make them round in shape.

 B. So that the wires are all the same size.

 C. To make the bulbs go out.

 D. So that electricity can travel all the way around.

**Section 2: Conductors and Insulators**

Some materials will allow electricity to travel through them. We call these materials \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The piece of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in this circuit allows electricity to travel through it, so the bulb lights up.

Other materials do not allow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to pass through them. We call these materials \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

There are lots of different insulators, such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, rubber and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The plastic does not allow electricity through, so th bulb does not light up.

Some wires have a plastic coating. In fact, the wires you use in class probably do.

The copper is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and carries electricity. The plastic is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and stops electricity from travelling into other objects that touch the wire.

Metals like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. iron, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are very good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Graphite which is a type of carbon, also conducts electricity, but most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Graphite is what pencil “lead” is made from.

**Click the GREEN ARROW and complete the activity.**

List the materials that are conductors and the ones that are not.

 Conductors Non-Conductors

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Click on the “?” to complete “The Quiz #2”.**

1. What name is given to materials that do not allow electricity to pass through?

 A. insulators B. conductors

 C. metals D. plastics

2. Which of these pairs of materials DO conduct electricity?

 A. Plastic & carbon B. metal & carbon

 C. metal & rubber D. carbon & plastic

3. Which of these items is an example of a good conductor?

 A. a plastic doll B. a wooden stick

 C. a silver spoon D. a glass vase

4. Why are electric wires often covered in plastic?

 A. to make the wires colorful

 B. so the wires are easy to see.

 C. to keep the wires cool.

 D. to insulate the wires.

5. How many of these items will conduct electricity?

 A. none B. one

 C. two D. three

**Section 3: All About Switches**

A simple circuit with a cell and a bulb is not very useful because to turn the lamp on and off you would have to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one of the wires.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are useful because they give you \_\_\_\_\_\_\_\_\_\_\_\_\_\_ over the circuit.

Switches allow you to “\_\_\_\_\_\_\_\_\_\_\_\_\_\_” or “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a circuit.

When a switch is in the \_\_\_\_\_\_\_ position, the circuit is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When the switch is in the \_\_\_\_\_\_\_\_\_\_ position, we say the circuit is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Switches come in all shapes and sizes, and there are different types.

Two types you might use are \_\_\_\_\_\_\_\_\_\_\_ switches and \_\_\_\_\_\_\_\_\_\_\_\_\_ switches.

Switches are used in lots of things that use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, so that they can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The button on things like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ keyboards are just switches.

**Click the GREEN ARROW and complete the activity.**

Identify the switches with each item;

 No Switch One Switch Many Switches

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Click on the “?” to complete “The Quiz #3”.**

1. Which of these items does NOT contain any switches?

A. A torch B. a television

C. a cell (battery) D. a mobile phone

 2. When a switch is “closed” it means that…

 A. electricity cannot flow through the switch

 B. electricity can flow through the switch

 C. the circuit is broken

 D. the switch is turned off

 3. What happens if we turn on switch “a”?

 A. the circuit is complete

 B. switch B will close

 C. the bulb will light up

 D. the switch is closed but the circuit is still not complete.

 4. When a circuit is “broken” by a switch, what does this mean?

 A. the switch is turned on

 B. the switch is turned off and makes the circuit incomplete.

 C. The circuit is complete.

 D. The circuit is damaged and needs to be thrown away.

 5. What do we call this type of switch?

 A. a push switch

 B. a toggle switch

 C. a light switch

 D. a flick switch

**Section 4: Changing Circuits**

You can change circuits by adding more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or adding more \_\_\_\_\_\_\_\_\_\_\_.

If you add more bulbs to a circuit, the bulbs will glow \_\_\_\_\_\_\_\_\_\_ brightly (dimmer), because the bubs have to \_\_\_\_\_\_\_\_\_\_\_\_\_ the electricity that the \_\_\_\_\_\_\_\_\_\_\_ provides.

Adding more cells in a \_\_\_\_\_\_\_\_\_\_\_\_ (in a line) to a circuit will make the bulbs glow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because there is more electric \_\_\_\_\_\_\_\_\_\_\_\_\_\_...

… but is you add too many cells, the bulbs could \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

You can also change a circuit by changing the \_\_\_\_\_\_\_\_\_\_\_\_ of the connecting wire.

As the wire gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the bulb gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Making the wire \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ makes the bulb get \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Click the GREEN ARROW and complete the activity.**

Make changes to the circuits by changing the number of bulbs and cells. Have your teacher sign off on the construction of 4 changes

Change #1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Change #2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Change #3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Change #4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Click on the “?” to complete “The Quiz #4”.**

1. If we add more bulbs to a circuit, what happens to the bulbs?

A. they go out B. they get brighter

C. they get dimmer D. they burn out

 2. Which of these things would make bulbs in a circuit get brighter?

 A. adding more bulbs B. using a more powerful cell

 C. adding more wires D. removing a cell

 3. As it becomes more difficult for electricity to travel around a circuit, we say there is more…

 A. power B. voltage

 C. current D. resistance

 4. If we add more cells (batteries) to a circuit the bulbs get brighter, but what happens if we add too many?

 A the cells may explode B. the bulbs may burn out

 C. the cell stops working D. the bulbs get too bright to see

 5. Fill in the blank: “If we shorten the resistance wire in a circuit, the bulbs will get \_\_\_\_\_\_\_\_\_\_”.

 A. brighter B. dimmer

 C. broken D. burned out

**Section 5: Circuit Diagrams**

When you want to draw a circuit, you can use circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to represent the different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has its own symbol. The \_\_\_\_\_\_\_\_\_\_\_\_\_ are the same for everyone so that people can read each other’s diagrams.

Using circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , you can draw circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to represent any circuit.

Circuit diagrams are used for drawing circuits in a way that that everyone can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

Draw the symbol for the following components:

Bulb = Cell = Switch=

Buzzer= Motor=

Once you know and remember the different circuit symbols, you can build \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from circuit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that other people have drawn.

**Click the GREEN ARROW and complete the activity.**

Once you are finished the activity, have you teacher sign below.

Circuit Diagram Activity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Click on the “?” to complete “The Quiz #5”.**

1. What do we call the different bits and pieces that go together to make a circuit?

A. companies B. computers

C. components D. compartments

 2. Which is the symbol for a buzzer?

 A. symbol “A” B. symbol “B”

 C. symbol “C” D. symbol “D”

 3. What does the symbol represent?

 A. a bulb B. a motor

 C. a cell D. a wire

 4. Which component is grouped with its symbol?

 A. pair “A” B. pair “B”

 C. pair “C” D. pair “D”

 5. What do the two symbols represent?

 A. a cell and a buzzer B. a bulb and a switch

 C. a switch and a motor C. a switch and a buzzer