



Name \_\_\_\_\_.

# ***Bill Nye the Science Guy***

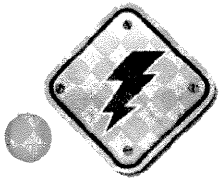
Bill – Bill – Bill – Bill – Bill

Time to pay props to the craziest science man alive. Give it up for Bill Nye. Pay attention to watt (that's an electricity joke) he's got to say 'cause here are some questions below that you need to answer.

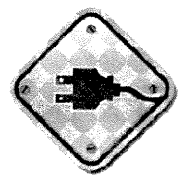
1. Electricity is the \_\_\_\_\_ of tiny \_\_\_\_\_ called \_\_\_\_\_.
2. Electrons flow in a \_\_\_\_\_ path called an electrical \_\_\_\_\_.
3. The word "circuit" means go \_\_\_\_\_.
4. The flow of \_\_\_\_\_ is like the flow of \_\_\_\_\_.
5. Describe how electricity flows in bumper cars:
6. Your brain uses the same power as a \_\_\_\_\_ light bulb.
7. Solar cells convert \_\_\_\_\_ into electricity.
8. When electrons flow, they jump from one \_\_\_\_\_ to another.
9. Things that let electricity go through them are called \_\_\_\_\_ ... things that don't are called \_\_\_\_\_. A resistor lets some \_\_\_\_\_ go through, but \_\_\_\_\_ all.
10. What is the combination of volts and amps called?
11. The sun is a wonderful source of \_\_\_\_\_.
12. Why can birds sit on powerlines and not die?
13. For electricity to do work, it has to flow in a loop called a \_\_\_\_\_.

## Mechanical

[illegible]



# Just Give Me the Facts Jack



## The Facts on Current Electricity:

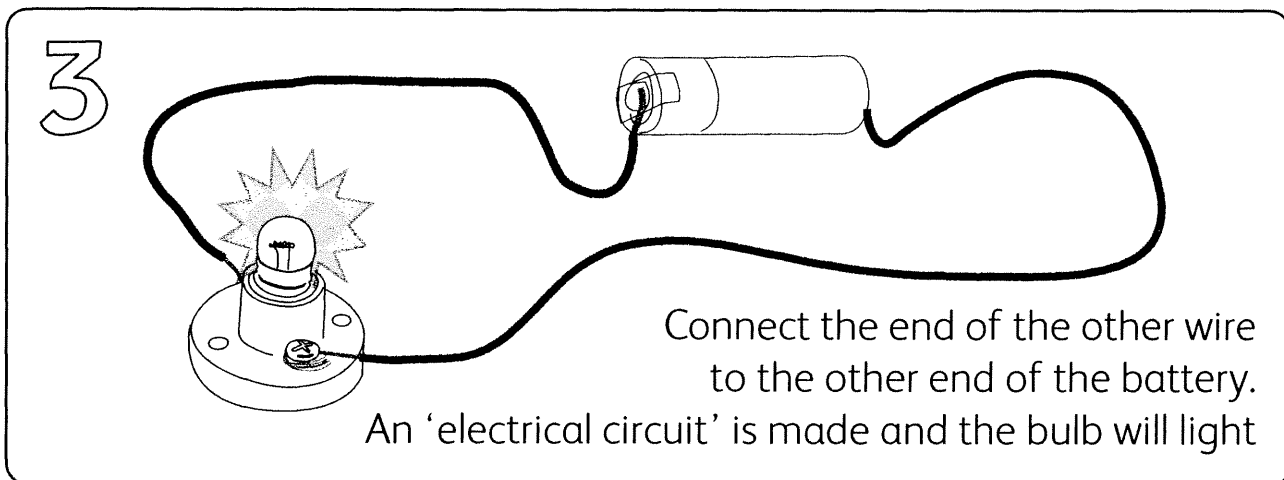
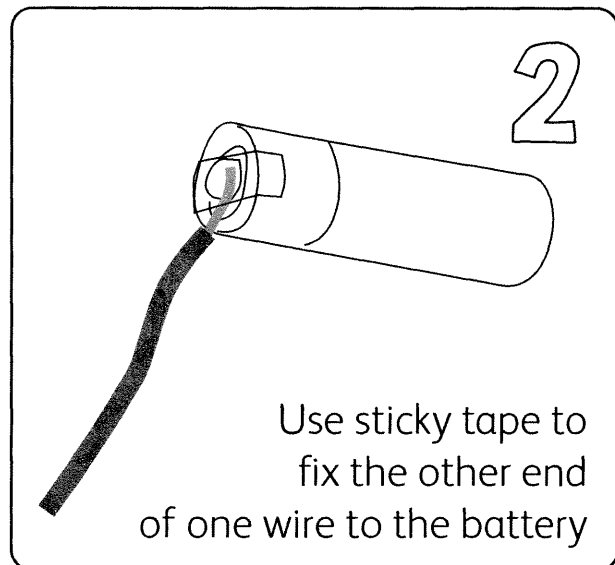
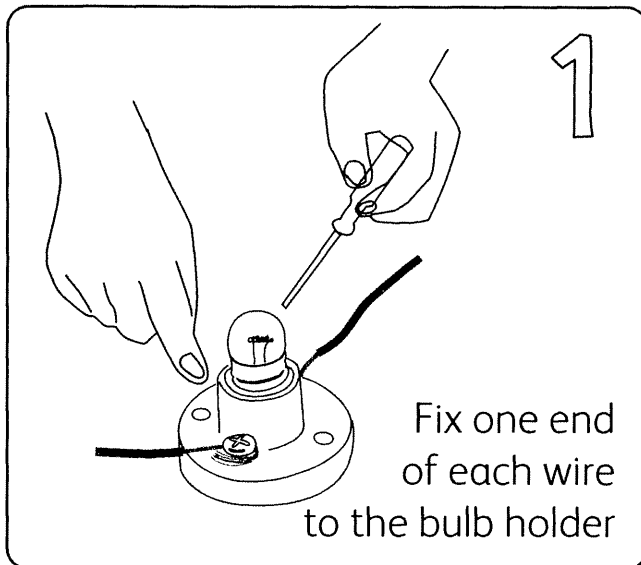
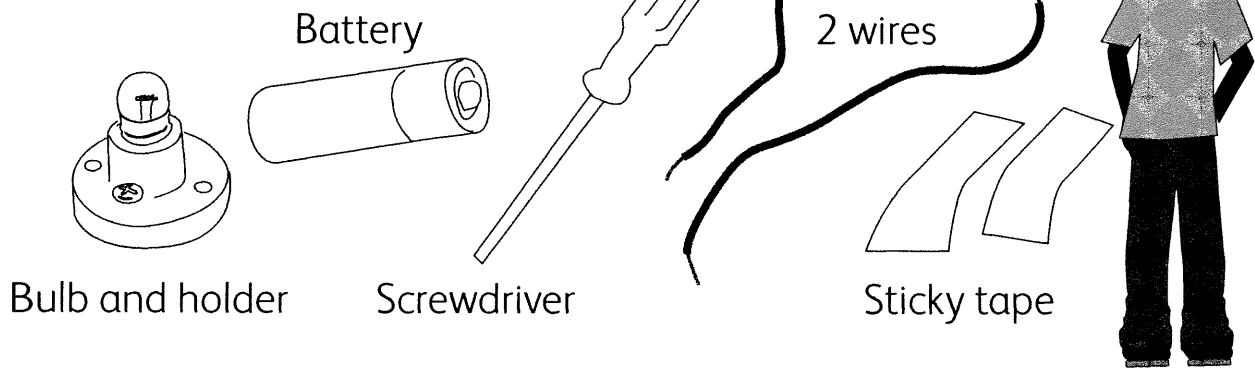
- ◆ The steady flow of electrons between objects or places. It comes to our homes from far away places through the use of honking big wires.
- ◆ This flow is a lot like the flow of water as it will try to find the easiest way to get from the start to the end.
- ◆ For flow to happen, the electrons need a conductor. This is a substance that allows electrons to move easily through it...for example, metal.
- ◆ This system will only work in a closed circuit. Remember, a closed circuit just means that the electrons are forced to stay on a path and that the path is clear for electron movement. No clogs, no worky.
- ◆ This is the kind of electricity that powers appliances in your home such as your washing machine, your hair dryer and your TV.
- ◆ This is also the same electricity that is found in batteries. You know, batteries. Those things that keep your i-pod tunes pumpin'.

## The Facts on Static Electricity:

- ◆ This is just a simple build up of electrons.
- ◆ It is produced by friction like when you rub your feet on carpet or a balloon on your hair.
- ◆ The friction causes some objects to become more negatively charged.
- ◆ It stays in one place until it jumps to another object.
- ◆ Static does not need a closed circuit. This means it does not need a path (like wires) to follow.
- ◆ Static electricity is usually weak and not dangerous.
- ◆ Lightning though is caused by static in clouds and IT IS DANGEROUS!
- ◆ When it has built up enough, a bundle of static (electrons) will try to find the quickest way to get to a positively charged object (usually the ground).

# A simple circuit

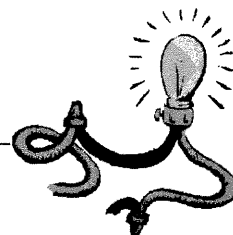
## What you need.



# SIMPLE CIRCUITS

Definition:	Word or Concept <u>Source</u> Example	Diagram/Example
Definition:	Word or Concept <u>Conductor</u> Example	Diagram/Example
Definition:	Word or Concept <u>Load</u> Example	Diagram/Example
Definition:	Word or Concept <u>Switch</u> Example	Diagram/Example

# Insulators and Conductors



## Student Worksheet: Insulators and Conductors Activity

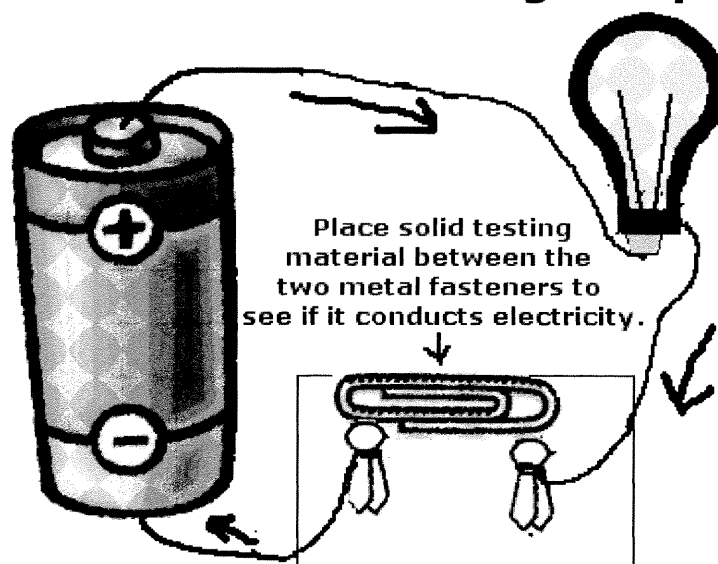
### ◆ Procedure

Your team will be provided with wires, a bulb, and a battery. Assemble a conductivity tester similar to the one below.

Then, as a team agree on five materials you believe will conduct electricity (conductor), and five others you think will not (insulator). List these on your Student Worksheet. Exchange your completed Student Worksheet with that of another team. You will test each other's predictions.

Test each material, and provide the results back to the team whose predictions you tested. Discuss as a group your findings. What surprised you?

### Solid Conductor Testing Setup

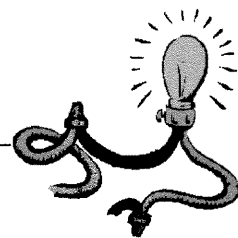


You can make a solid conductor testing set up with a battery, three wires, and a bulb as seen below. If a material is placed between the two metal fasteners that does conduct electricity, the bulb will light up. If the material placed between the fasteners does not conduct electricity, the bulb will not light up. In a way, by introducing a solid conductor into the circuit, and then removing it, you are creating a switch.

### Insulators and Conductors

Developed by IEEE as part of the IEEE Teacher In-Service Program  
[www.ieee.org/organizations/eab/precollege](http://www.ieee.org/organizations/eab/precollege)

# Insulators and Conductors



**Student Worksheet:**

**Student Team One Predictions:**

Materials Team One Predicts are Conductors	Materials Team One Predicts are Insulators
1	1
2	2
3	3
4	4
5	5

**Student Team Two Outcomes:**

Test the materials selected by team one, then list each in the appropriate box.

Conductors	Insulators

What percentage of Team One's predictions were correct?

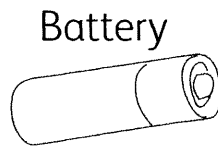
## Insulators and Conductors

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# A simple switch

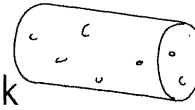
## What you need.

2 drawing pins



Battery

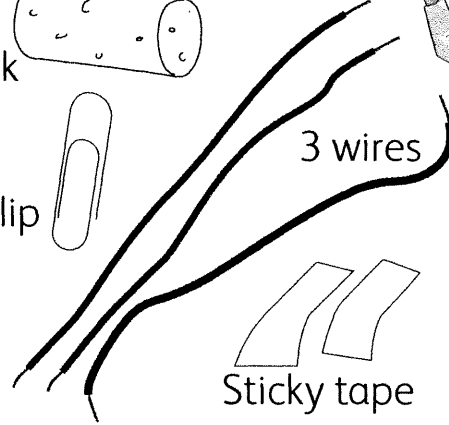
Cork



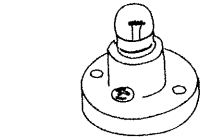
Paperclip



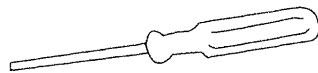
3 wires



Sticky tape



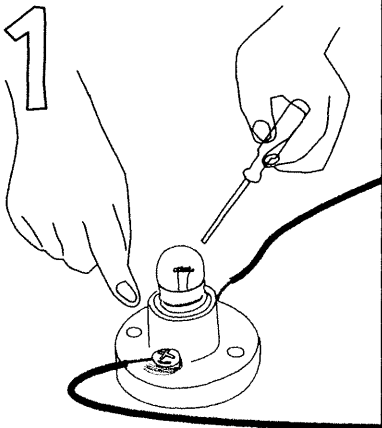
Bulb and holder



Screwdriver

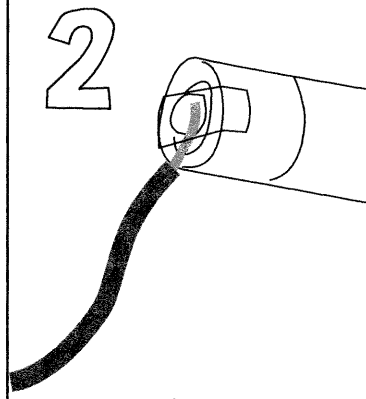


1



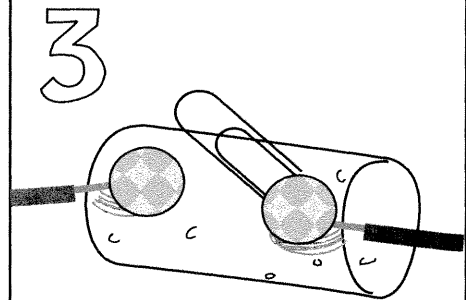
Fix one end of each wire to the bulb holder

2

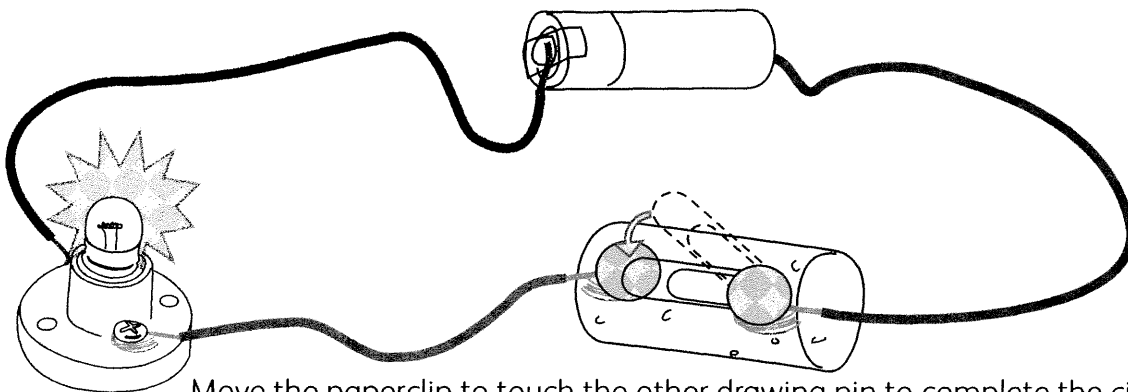


Use sticky tape to fix wires to each end of the battery

3



Twist the wires around the drawing pins. Push them into the cork with the paper clip under one



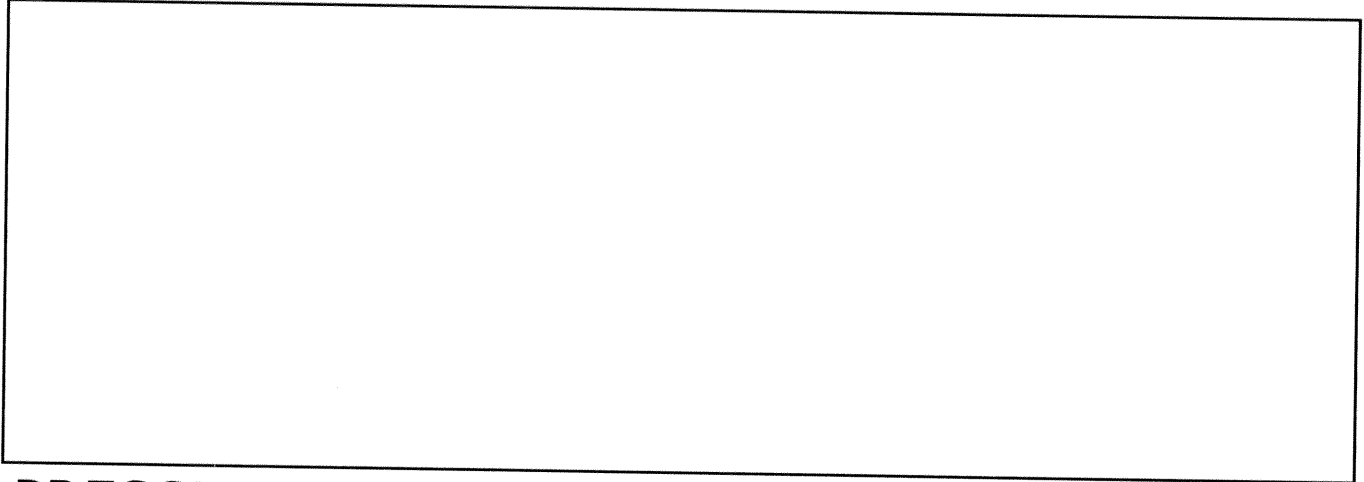
Move the paperclip to touch the other drawing pin to complete the circuit. This simple 'switch' can be used to turn the bulb ON and OFF.



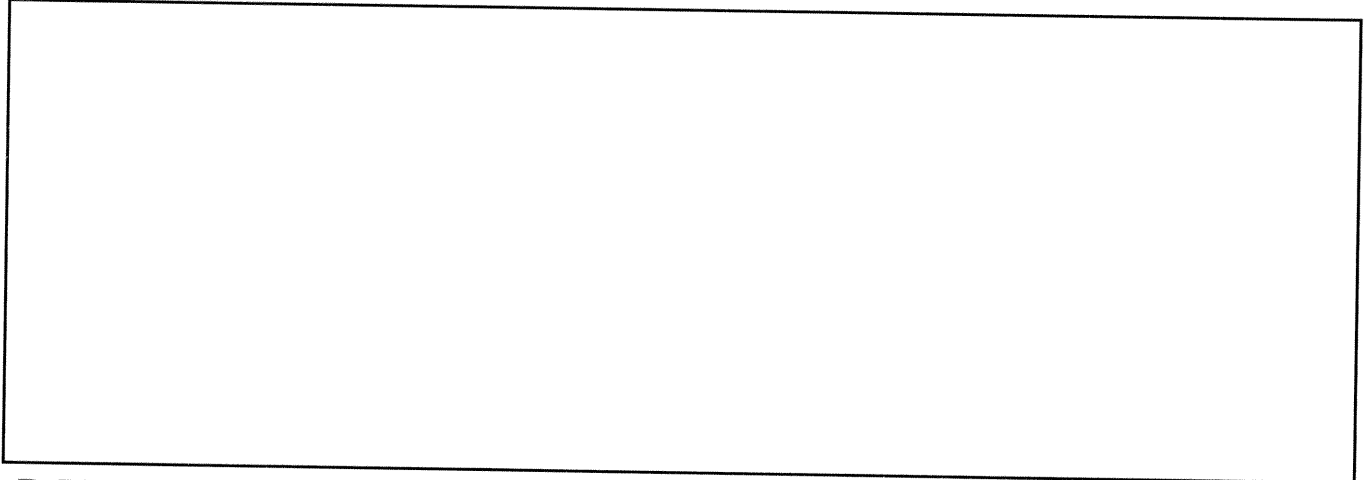
# SWITCHES

Diagram and Explain each kind of switch (use a pencil).

## SIMPLE SWITCH



## PRESSURE SWITCH



## DIMMER SWITCH

