Name _____ Hour _____

Electronics Components

POLARITY means a component has one side that is POSITIVE and one side that is NEGATIVE.

Component	What does it look like?	What does it do?	Does it have polarity? If yes…which side is -?
Resistor (p.87)		**Slows down** (opposes) the current	NO
Diode (p. 90)		Acts as a **conductor** one way and an **insulator** the other. (allows e- to flow 1 way and blocks them from flowing the other way)	Striped side negative
Electrolytic Capacitor (p. 90)		**Stores electrons**	Shorter side negative
Ceramic capacitor (p.90)		**Stores electrons**	NO
LED (p. 92)		LED stands for: **Light emitting diode** DIODE: Acts as a **light**, and **conductor** and **insulator**	Shorter side negative
Transistor (p. 93)		Adjusts the voltage and current in a circuit **USED AS A SWITCH**	Tab is negative or line up shape so flat side lines up
Integrated circuit (spider) (p. 94)		**Entire circuit.** (Contains transistor, diode, resistor, etc)	Notch or dot is negative

Resistors:

How to find the value of a resistor: *Turn it so the gold band is last, & find the resistor decoding info. on your equation sheet (or p. 87-88 of blue PLANETS book)*

*The 1st band color gives you the **1st digit**. Write down that digit.*
*The 2nd band color gives you the **2nd digit.** Write down that digit.*
*The 3rd band color tells you what to multiply those 2 digits by, so go over to the **multiplier** column.*
*The 4th band is the **tolerance**, or how accurate it is. Most of our resistors will have gold as their last band meaning the actual value of it is ±5% of what you found its value to be.*

Example 1 *Let's say you have a resistor that is yellow, red, brown, gold.*
This tells you that it's value is 4 2 x 10 = 420 Ω ±5%

Example 2 *If you need a resistor that has a value of 530,000 Ω ± 5%, the colors it would be are: green (for the 5), orange (for the 3), then yellow (because you need to multiply the 53 by 10,000), then gold (for the ± 5%).*

1. Pick out 1 resistor from your kit. Calculate the resistance. (Resistors are color coded because too small to write on round surfaces.)

2. If you had a resistor that was green, yellow, red, gold-what value would it have? _____
3. What color bands would be on a 45,000 Ω resistor with ± 5% tolerance?

Name _____ Hour _____

Electronics Components

Building circuits:

1. Make the buzzer work using p. 9-10: Project Diagram 1
   Did you get it to work? _____

2. Make an LED dimmer control using p. 18-19: Project Diagram 5
   Did you get it to work? _____

Have more time? Try building any of the following circuits for 2 stickers. ***Keep in mind these are old…they have about a 75% chance of working even if you build it correctly!**

p. 32 frog croaker p. 33 British police siren p. 60 London fog horn

ELECTRONICS UNIT

You will be building electronics kits in physics next. They are fun kits that are yours to keep. Mrs. B. has sirens, roulette wheels, reaction tester games, etc. ☺

It is important that you recognize what each piece is and whether or not polarity matters so that you build your kits correctly.

75 points total: 20 pts- **Quiz** on electrical components (recognize, function, polarity) **TUES. 5/13**
10 pts for your PINK electronic component sheet DUE **TUES. 5/13**
20 pts. for your **first kit** (Level 1 or 2)
25 pts. for your **second kit** (Level 2, 3, or 4 depending on your comfort and interest)

***You need <u>one 9-Volt battery</u> per group.** Please look through your junk drawers at home to see if you have one!

<u>Here is what you need to know for the QUIZ:</u>

<u>Recognize and be able to name the components:</u>

1) Be able to recognize a **resistor**, **diode**, **electrolytic capacitor**, **ceramic capacitor**, **LED** (and know what **LED** stands for), **transistor**, and **integrated circuit**.

<u>Know the polarity of each component:</u>

2) What is the negative for a **resistor**? (none)
3) What is the negative for a **diode**? (striped side)
4) What is the negative for an **electrolytic capacitor**? (shorter side)
5) What is the negative for a **ceramic capacitor**? (none)
6) What is the negative for an **LED**? (shorter side)
7) What is the negative for a **transistor**? (tab or shape lined up)
8) What is the negative for an **integrated circuit**? (notch or dot)

<u>Know what each component does in a circuit</u>:

9) What does a **resistor** do in a circuit? *(slows down (opposes) the flow of electrons)*
10) What does a **diode** do in a circuit? *(conducts one direction and insulates the other)*
11) What does an **electrolytic capacitor** do in a circuit? *(stores electrons)*
12) What does a **ceramic capacitor** do in a circuit? *(stores electrons)*
13) What does an **LED** do in a circuit? *(light and conducts one way, insulates the other)*
14) What does an **integrated circuit** do in a circuit? *(entire circuit)*
15) What does a **transistor** do in a circuit? *(switch)*