**LAB 12-1: Electrical Circuits** **Name:** _____

AP Physics 1 – McNutt Date: _____ Period: _____

# Create Your Own Working Flashlight

**Due Date**: [PENDING] Projects will be complete and ready at the beginning of class. No time will be allotted to make/adjust your flashlight and materials will not be provided to you on the due date.

**Challenge:** Create your own ***non-traditional flashlight*** using household/scrap materials. Find anything usable, renewable and create something new!
*What is a non-traditional flashlight?* Exactly what it sounds like: a flashlight that does not look like what you'd expect…it does create light, but does not look like the one pictured to the left. **Seriously – bring your maximum creativity!**

## Your Project Must include:

- Materials List
- Illustrated Circuit Diagram
- The Physical & Nontraditional Fully Operational Flashlight

**Rules:** You are to design and create your own working flashlight.
**REMEMBER** this is an individual project.
Everyone will be required to turn in his/her OWN project.

- Your flashlight must consist of at least 1 bulb, 1 power source (battery), and one switch.
- **You may purchase the bulb and battery, but everything else should be made out of everyday items**. You may buy a switch to use if you want, but extra credit (5 points) will be given if you make a one yourself. **You cannot use parts from a store bought new** or **old flashlight. No ready-made kits.**
- IMPORTANT ----**ALL components must be in some kind of enclosure**. A FLASHLIGHT WITHOUT AN ENCLOSURE OR WITH AN OPEN CIRCUIT BOARDS is NOT *ACCEPTABLE.*
- Along with your finished working flashlight, you will turn in a physical diagram as well as a circuit diagram of your flashlight. All the flashlights will be demonstrated to the class, who will then vote on which ones they like the best. The top three winners will receive an extra 5 bonus points on their Unit Exam ;)

**Grading:** This project is worth one full Lab [TEST] grade. You already know the game, so get creative!

- *(15points)* There is at least one bulb, battery, and switch, and they are electrically connected.
- *(15 points)* The components are in enclosure. All or nothing.
- *(15 points)* Proper bulbs and batteries are chosen (the battery is not too strong or weak for the bulb). The flashlight can be easily carried. The Flashlight looks cool/nice/neat/sleek.
- *(15 points)* ***Working consistently. Must turn it on and off five times.*** *(Yes, really, 5 times!)*
- (20 points) Oral presentation in the class. You will describe how you made your flashlight, ideas, problems, difficulties, and how you solved the difficulties. **Prepare** a 2 min presentation.
- (20 points) Along with your finished working flashlight, you will turn in a **physical diagram** as well as a **circuit diagram** of your flashlight. **Both of these drawings should be of high quality, drawn to scale (for physical diagram) and with a ruler (both diagrams).**

**Extra Credit**— 5 points for top 3 "best in class," as voted on by peers. Your flashlight must be working consistently to take part in the peer voting (light goes on when switch is closed).

**Extra Point**-- **5 points for building your own switch.** (Pulling a wire or connecting wires to light your flashlight will not be considered a switch. It is considered an open circuit and is NOT acceptable as a project.)

## The grading rubric:

| Criteria | Points | Your Score | Observational Notes |
|---|---|---|---|
| Bulb | 3 | | |
| Battery | 2 | | |
| Switch | 5 | | |
| Electrically connected | 5 | | |
| Enclosure | 15 | | |
| Proper bulbs & batteries chosen | 5 | | |
| Carried easy | 5 | | |
| Aesthetics | 5 | | |
| Working consistently | 15/10/5/0 | | |
| Oral presentation<br>• How it was made<br>• Ideas<br>• Problems/difficulties<br>• How difficulties got solved | <br>5<br>5<br>5<br>5 | | |
| Physical diagram | 10 | | |
| Circuit diagram | 10 | | |
| Bonus: Creativity | 5 | | |
| Bonus: Top 3 | 5 | | |
| Bonus: Built switch | 5 | | |

No late projects will be accepted.