

**COURSE:** MIDDLE SCHOOL

**UNIT:** ELECTRICITY

**EXERCISE:** BUILD A LED FLASHLIGHT

**TIME FRAME:** 2-3 Hours



**PREPARATION:** *Summary of "to do's" that the teacher should understand and prepare before bringing this lesson to the classroom.*

Teachers will need to ensure that the proper supplies are available for students to build their solutions.

You will need these items:

**Materials:**

- 1/8" Corrugated cardboard (5" x 7")
- Aluminum foil tape
- White LED
- 3V coin battery (CR2032)
- Clear tape

**Tools:**

- Ruler
- Pencil
- Cutting Mat
- Hobby knife; Box cutter; Scissors



**SAFETY:** *Summary of safety strategies in the lesson.*

**S1**

**DESIRED RESULTS:**

**ESTABLISHED GOALS:**

*Problem Solving Techniques and Applications Standards:*

**TRANSFER:**

*Students will be able to independently use their learning to...*

- Better understand electricity and circuits

**MEANING:**

**UNDERSTANDINGS**

*Students will understand that...*

- A circuit needs to be closed for current to flow and a LED to light up
- How electricity flows

**ESSENTIAL QUESTIONS**

*Students will keep considering...*

- How electricity is used and functions in everyday settings

**ACQUISITION OF KNOWLEDGE AND SKILL:**

*Students will know...*

- The difference between series and parallel circuits
- What is an open circuit and closed circuit
- How current flows
- What a LED is and how it works

*Students will be skilled at...*

- Designing a circuit
- Creating a circuit
- Testing a circuit
- Troubleshooting a circuit

**S2**

**EVIDENCE:**

**EVALUATIVE CRITERIA:**

**ASSESSMENT EVIDENCE:**

*Performance Task(s):*

**Task Placeholder**

The flashlight the student designs will be assessed based on the set up and proper function. The aesthetics should also be graded.

<b>COURSE:</b> MIDDLE SCHOOL		
<b>UNIT:</b> ELECTRICITY	<b>EXERCISE:</b> BUILD A LED FLASHLIGHT	<b>TIME FRAME:</b> 2-3 HOURS

*Other Evidence:*

- End of unit quiz

### **S3** LEARNING PLAN: *Summary of Key Learning Events and Instruction*

#### **1. Introduce Activity**

- Create a flashlight that will light up when you push a button

#### **2. Brainstorm**

- Students research and develop a few design ideas for a greeting card. Could be a birthday card, get well soon card, etc....

#### **3. Construct**

- Using supplies given, students will construct a working flashlight

#### **4. Test**

- Test the flashlight for proper operation.

#### **5. Communicate Results**

- Show the working flashlight to instructor

#### **Progress Monitoring:**

Teacher should observe students and provide on-going feedback during the activity. While introducing the unit, the teacher will pause and ask for questions to make sure everyone understands.

### DIFFERENTIATION: *Summary of Key Differentiation Techniques*

The ASCD Study Guide for Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids.  
by Carol Ann Tomlinson, Jay McTighe

Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids.  
by Carol Ann Tomlinson, Jay McTighe  
ISBN-13: 978-1416602842  
ISBN-10: 1416602844

Differentiating Reading Instruction  
by Laura Robb.  
ISBN13: 9780545022989

A Teacher's Guide to Differentiating Instruction  
The Center for Comprehensive School Reform and Improvement

### CAREER CONNECTIONS: *Summary of Career Opportunities Associated with this Lesson*

Good sources for career connections:

Occupational Outlook Handbook  
<http://www.bls.gov/ooh>

The National Career Clusters® Framework  
<http://www.careertech.org/career-clusters>

### KEYWORDS: *Please Insert Keywords from this Lesson with their Definitions*

Use resources like [dictionary.com](http://dictionary.com) to find definitions to your keywords