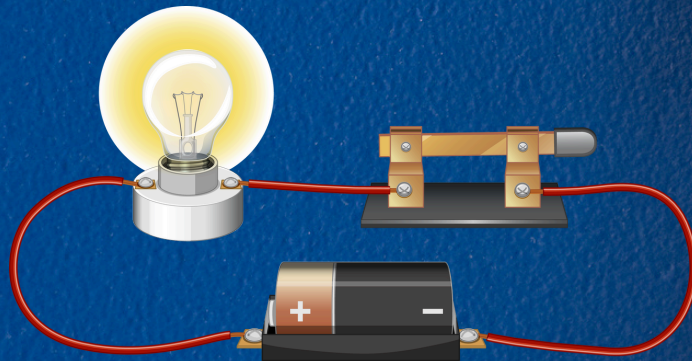


# Current Electricity and Circuits

## Complete 5E Lesson

- ✓ Complete 5E Lesson Bundle
- ✓ Hands-On & Digital Activities
- ✓ Google Classroom Ready
- ✓ Engaging Science Content



# Current Electricity and Circuits

## 5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom



- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate

# Complete Teacher Instructions

## Current Electricity and Circuits - 5E Lessons

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Grades 7-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Current Electricity and Circuits |
| Essential Questions:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | One                              |
| <b>Lesson Objective:</b><br>Students will: <ul style="list-style-type: none"> <li>Be introduced to current and static electricity</li> <li>Learn what electricity is and its relationship to electrons</li> <li>Design and draw simple parallel and series circuit diagrams</li> <li>Solve for voltage and current within simple parallel and series circuits</li> <li>Explain the characteristics of electric current, and potential difference in parallel circuits, noting how the quantities differ in the two circuits</li> </ul>                                                                                                                                                                                                                                                                    |                                  |
| <b>Possible Student Misconceptions:</b> <ul style="list-style-type: none"> <li>Electrons flow at nearly the speed of light</li> <li>Current flows from negative to positive</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
| <b>Materials:</b> <ul style="list-style-type: none"> <li>1 device (smartphone, chromebook, laptop, tablet, or computer)</li> <li>A means of projecting a PowerPoint presentation</li> <li>Internet access</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |
| <b>Teacher Notes:</b> <ul style="list-style-type: none"> <li>All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. Reason, right-click on the image and click <b>Edit Hyperlink</b> or something similar. I've created a video walkthrough if needed. It can be accessed here - <a href="https://youtu.be/oCKIP9SaDQ">https://youtu.be/oCKIP9SaDQ</a></li> <li>I don't believe in long lessons. If you feel your students are losing interest, stop the PowerPoint and give them a 5-minute break. If you'd like to recommend my video collection here - <a href="http://www.teachwithafery.com">http://www.teachwithafery.com</a> are tons of break-break videos to choose from.</li> </ul> |                                  |

## Current Electricity and Circuits - 5E Lessons

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Engagement Phase</b><br><b>Bill Nye – Electricity video question sheet</b> <ul style="list-style-type: none"> <li>Have your students answer the questions on the worksheet – <b>Engagement – Bill Nye Electricity</b> while watching the video</li> <li>Once the video is over, give your students 3-4 minutes to discuss any questions they didn't get with their neighbors</li> <li>Following this, review the questions with your students to ensure understanding</li> </ul>                                                                                                                                                                                        | Duration: 10-15 min<br><br>Teacher learning student |
| <b>Teacher Note:</b> <ul style="list-style-type: none"> <li>The Bill Nye episode is about 22 minutes long</li> <li>If for some reason the Bill Nye episode doesn't play you have three options               <ol style="list-style-type: none"> <li>Go to YouTube.com and type in Bill Nye Electricity</li> <li>Go to Vimeo.com and type in Bill Nye Electricity</li> <li>If those options don't work, simply have them watch this video without the questions - <a href="http://bit.ly/2hTJxyI">http://bit.ly/2hTJxyI</a></li> </ol> </li> </ul>                                                                                                                          | Duration: 10-15 min<br><br>Teacher learning student |
| <b>Exploration Phase</b><br><b>Physical and Chemical Properties and Changes Lab Station</b><br><b>Activity</b> <ul style="list-style-type: none"> <li>In groups of 2-3, have your students complete <b>Exploration – Lab Station Activity</b>. Once they're done, they will submit their passport to you.</li> </ul>                                                                                                                                                                                                                                                                                                                                                       | Duration: 10-15 min<br><br>Teacher learning student |
| <b>Teacher Notes:</b> <ul style="list-style-type: none"> <li>The complete instructions for my Lab Station activity can be found in the <b>START HERE – Instructions</b> file.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Duration: 10-15 min<br><br>Teacher learning student |
| <b>Explanation Phase</b><br><b>Electricity Lessons</b> <ul style="list-style-type: none"> <li>Over the course of 2-3 days, go through the two included lessons located in the folder – <b>Explanation – Electricity Lessons</b>. There are many opportunities to engage your students and show how the content is relevant to their lives.</li> <li>Lesson 1 – <b>Electricity and Current</b>. This lesson covers the following topics:               <ul style="list-style-type: none"> <li>How &amp; where it's used</li> <li>Review of the atom</li> <li>Overview of current and static electricity</li> <li>Types of circuits</li> <li>Coulombs</li> </ul> </li> </ul> | Duration: 10-15 min<br><br>Teacher learning student |

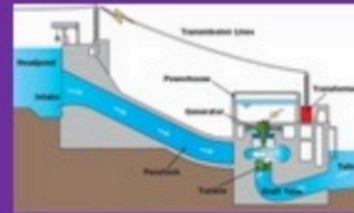
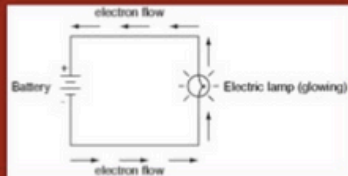
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Lesson 2 – <b>Solving Circuit Diagrams</b>. This lesson covers the following topics:               <ul style="list-style-type: none"> <li>Series Circuits</li> <li>Parallel Circuits</li> <li>Measuring Current</li> <li>Measuring Voltage</li> <li>Determining Current and Voltage using circuit diagrams</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                              | <b>Goals</b> <ul style="list-style-type: none"> <li>Students develop understanding of the content</li> <li>Observations and experiences are discussed and critiqued</li> <li>Students develop vocabulary</li> <li>Students are able to connect the content presented to previous experiences</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Teacher Notes:</b> <ul style="list-style-type: none"> <li>Atoms and their electrons will be introduced. Prior knowledge in this area will help but is not necessary for success</li> <li>All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select <b>Edit Hyperlink</b> or something similar.</li> <li>I've created a video walkthrough if needed. It can be accessed here - <a href="https://youtu.be/oCKIP9SaDQ">https://youtu.be/oCKIP9SaDQ</a></li> <li>I have also enclosed a .PDF version of both the teacher and student versions</li> </ul> | <b>Duration: 20-40 min.</b><br><br><b>Teacher Role – Facilitate learning and keep students focused</b><br><br><b>Goal</b> <ul style="list-style-type: none"> <li>Students use their newly obtained knowledge to propose solutions and extend their learning to new situations</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Elaborate Phase</b><br><b>Elaborate – Mystery Circuit Challenge</b><br>This Mystery Circuit Challenge will require your students to move beyond what was covered directly in the lessons and allow them to demonstrate their understanding of the concepts. Students will work individually.                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Duration: At least 1 hour in class plus time at home</b><br><br><b>Teacher Role – Distribute and collect evaluation</b><br><br><b>Goal</b> <ul style="list-style-type: none"> <li>Students are given the opportunity to demonstrate their understanding and evaluate their own progress</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Evaluate Phase</b><br><b>Evaluate – Drawing Circuit Diagrams &amp; Evaluate - Electric Circuits Online Lab</b> <ul style="list-style-type: none"> <li>Have your students complete – <b>Evaluate – Electric Circuits Online Lab &amp; Evaluate – Drawing Circuit Diagrams</b></li> <li>These tasks can be started in class then finished for homework or completely done in one setting</li> </ul>                                                                                                                                                                                                                                                                                                                  | <b>Teacher Notes:</b> <ul style="list-style-type: none"> <li>The <b>Evaluate – Electric Circuits Online Lab</b> can also be accessed here - <a href="http://phet.colorado.edu/en/simulation/circuit-construction-kit-dc">http://phet.colorado.edu/en/simulation/circuit-construction-kit-dc</a></li> <li>It's sometimes best to have the students peer evaluate</li> <li>Placing students in small groups and having them check each others answer will accomplish two things               <ol style="list-style-type: none"> <li>Provide immediate feedback on the activity they just completed</li> <li>Significantly reduce your marking time</li> </ol> </li> </ul> <p><b>**Peer evaluation is not needed, only suggested when appropriate</b></p> |

Each phase is clearly described

# Complete Lessons

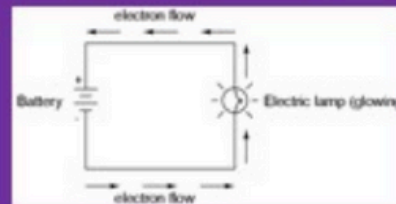
## Electricity

- How & where it's used
- Review of the atom
- Overview of current and static electricity
- Types of circuits
- Coulombs



## Circuits, Current and Voltage

1. Series Circuits
2. Parallel Circuits
3. Measuring Current
4. Measuring Voltage
5. Determining Current and Voltage using circuit diagrams



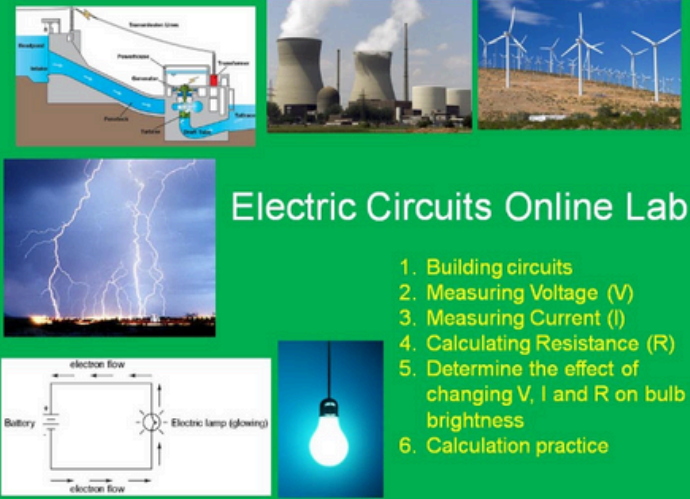
Student and Teacher versions of your lesson

# Interactive and Engaging Activities

## Current and Circuit Diagrams Lab Station Activity



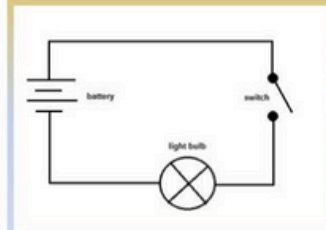
7 Lab Station Activities to get your kids out of their seats and engaged in their learning



### Electric Circuits Online Lab

1. Building circuits
2. Measuring Voltage (V)
3. Measuring Current (I)
4. Calculating Resistance (R)
5. Determine the effect of changing V, I and R on bulb brightness
6. Calculation practice

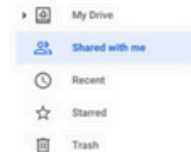
## Mystery Circuit Challenge



A challenging inquiry activity for your electricity collection

# Google Access

Thank you for your purchase. Clicking the link button below will automatically create a copy of the Google resources and place them into your Google Drive. You'll find the folder inside the 'Shared with me' section on the left side of your Drive.



**Important:** Before you click, make sure you're signed in to the Google account you'd like the resources placed into. If the resources are added to the wrong account, simply sign out and then into the correct one and repeat the process.

Click here to place a copy  
of your resources into your  
Google account



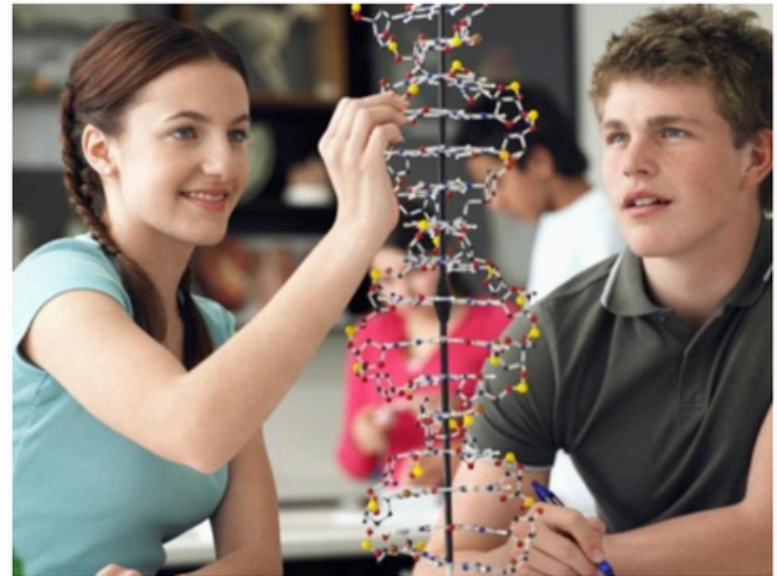
TWF

**Google Classroom Ready  
One-Click Google Slides Access**

# Get away from tired practices and unengaged students



# Provide a Scientifically-Proven means of instruction



# Incorporate Technology and Increase Collaboration



click here  
to START