

Wizards of Wright

Lesson: Little Bits, Introduction

Use WOW! Lesson Intro to begin.

Background Info for Wizards:	This lesson is used as a brief review of electricity, currents, and energy before introducing the students to Little Bits.
Materials:	Little Bits sets (18 piece box)
Lesson Time: 60 minutes	Introduction: 5-7 minutes Guided Lesson #1: 5 minutes Student Activity #1: 10-15 minutes Student Activity #2: 10-15 minutes Guided Lesson #2: during Student Activities 1 and 2 Student Activity #3: 10-15 minutes Conclusion: 5 minutes
Learning Targets:	Students will describe electricity and circuits. Students will develop ways for Little Bits to be used in real life. Students will apply their skills about electricity and circuits.
Introduction for Students: 5-7 minutes	<p>Discuss the following questions/topics:</p> <p>What is electricity?</p> <ul style="list-style-type: none"> - Electricity is a type of energy. - Electricity can build up and stay in one place or it can move. - Electricity happens when electrons transfer and move. - Electricity provides power for lighting, appliances, and other electric devices in our homes and businesses. <p>What is electrical current?</p> <ul style="list-style-type: none"> - When electrons move, they carry their energy to a new spot. This is called an electric current. - Electric currents are also involved in powering all the electrical appliances that we use. Washing machines, flashlights, telephones and iPads all need an electric current running through them. <p>What is potential energy and kinetic energy?</p> <ul style="list-style-type: none"> - Potential energy is energy that is stored for use in the future, and kinetic energy is energy being used at that moment. - Think about all of the times you've been told you have the potential to do

	<p>something. You have the potential to get straight A's, or you have the potential to hit a homerun, or you have the potential to become President. That means you have the ability to do it in the future, although you aren't doing it right now.</p> <ul style="list-style-type: none"> - Energy is the same. - Imagine a car parked at the top of a hill. It has the potential or ability to roll down the hill, but right now it's just sitting still. If we release the brake, and it begins to roll down the hill, the potential energy is converted into kinetic energy, because it's now moving. <p>What is an electric circuit?</p> <ul style="list-style-type: none"> - An electric circuit is a closed path or loop for electric current to flow around. - In a flashlight, there is a simple circuit with an on/off switch, a light bulb, and a battery linking everything together with some pieces of wire. When you turn the switch on, electricity should flow through the circuit. - The electricity will stop flowing if the path isn't complete. Think about walking up a flight of stairs. When you start going, you should be able to get to the top pretty easily. But, if there's a broken or missing step in the way, you would have to stop moving up those stairs. - In our flashlight, if one of the wires is broken, the bulb will not shine. The electricity won't flow. Electricity also won't flow if the switch is turned off.
<p>Guided Lesson #1: 5 minutes</p>	<p><u>Introduction to Little Bits</u></p> <ul style="list-style-type: none"> - Begin by asking students to brainstorm ways we use and rely on electronics every day. - As a class, rank the top five electronic devices they couldn't live without. - Have them explain how their lives would be different without these electronics. <p>Ask: What do we already know about electricity and circuits that helps us explain how electronics work?</p> <p>What do electronics need in order to work?</p> <p>After this introduction, explain to students that they are going to begin experimenting and investigating electronics with Little Bits.</p> <p>Show students the Little Bits, demonstrate how the power bit works, and discuss the difference between input and output bits. Show students that they need more than 1 bit for their results.</p>
<p>Student Activity #1: 10-15 minutes</p>	<ul style="list-style-type: none"> - Check with Teacher that student groups have already been made, if not ask the teacher to create groups of 3 or 4.

	<ul style="list-style-type: none"> - Give students the handout to follow. (Little Bits Introduction, Student Sheet) - Before giving the students the boxes, show them how to tell the name of each bit, so they can find the right one. <ul style="list-style-type: none"> - use the labels on the box - find the name on the bit - Give groups the Little Bits box. <p>The directions are on the Student Sheet. Make sure they are working on Activity #1.</p> <ul style="list-style-type: none"> - Test the different bits to see what they do. <p>Ask students to discuss the possible uses for the bits as they try them out.</p>
<p>Student Activity #2: 10-15 minutes</p>	<p>Give students directions to move on to Activity #2.</p> <ul style="list-style-type: none"> - Use the same Little Bits box. <p>Students will work with their groups to brainstorm a problem they can solve with a Little Bits creation.</p> <ul style="list-style-type: none"> - Students need to Build and Test their prototype. - Groups should explain their invention to their teacher or you.
<p>Guided Lesson #2:</p>	<p>As students are completing both Activity 1 and Activity 2, move around the room checking in on them, and helping them troubleshoot if needed.</p>
<p>Student Activity #3: 10-15 minutes</p>	<p>Give groups the Little Bits Circuit Building sheet to work on for the remainder of the time.</p> <p>Remind students that a circuit is a closed path for electric current to flow through. Electricity will stop flowing if the path isn't complete, if one of the wires is broken, or if the switch is turned off.</p>
<p>Conclusion: 5 minutes</p>	<ul style="list-style-type: none"> - Review what students learned about how Little Bits work. - Review what students know about electricity and circuits. - Ask a few students to describe a circuit they created. - Ask if any of the circuits they created have real-life scenarios. <ul style="list-style-type: none"> - As students are cleaning up, and as you are collecting and checking boxes, students can work on <u>The History of Electricity</u> worksheet. This introduces students to a few of the people who made important discoveries in the history of electricity. The back of the sheet is a review of <u>Simple Circuits</u>. The students can keep these sheets for reference.

Please have students make sure the battery is disconnected from the cable, and the power bit.

Remind students...

- Each Bit has its name on it.
- There are labels on the box.
- The trays are numbered.

Matching the name of the piece, and the number on the tray, to the labels should make it easier for pieces to be put back in the slot they came out of.

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