

8.1.7 Extension – ELECTRICAL CONDUCTION

Electrical conduction is the movement of electrically charged particles through a transmission medium

Directions - For this activity, you will build a variety of different circuits to demonstrate how electrical conduction works. You will need the Instruction manual to help you build each of the projects. Complete the questions for each project before moving on to the next project. When you are finished, place all circuit parts back into the storage box raise your hand to have the teacher verify all parts are in the original location, then clean up area.

Project #	Diagram of Circuit	Directions and Questions
<p>9 – Conduction Detector</p>		<p>When you place a _____ clip across the terminals as shown in the picture on the left, current flows from the _____ through the resistor, through the LED, and back to the battery. The paper clip completes the _____ and current flows through the LED. Place your fingers across the terminals and the LED does not light. Your _____ is too high of a resistance to allow enough current to flow to light the LED. If the _____, which is electrical pressure, was higher, current could be pushed through your _____ and the LED would light. This detector can be used to see if a material like _____ is a good conductor or a poor conductor.</p> <p>1. Explain why the paper clip is a good conductor and your fingers are not.</p>
<p>10 – Space War Alarm Combo</p>		<p>Build the circuit shown and add the _____ to complete it. Note that the red jumper wire connects to the alarm IC (U2) at _____ grid location C1 and not to the 3-snap wire that runs over it, and that some _____ points on the alarm IC (U2) are passed over _____ being connected to. Turn it on, press the press switch (S2) several times, and _____ your hand over the photosensitive resistor (RP) to hear all the sound combinations.</p> <p>2. How does this example show electrical conduction?</p>
<p>14 – The Fuse</p>		<p>When you close the _____ switch (S1), current _____ from the batteries through the slide switch (S1), the lamp (L1), motor (M1), and back to the battery (B1). Pretend the 2-snap wire marked _____ in the drawing on the left is a device that will _____ the circuit if too much current is taken from the battery. When press switch (S2) is _____, the light is shorted and motor speed increases due to an _____ in current to the motor. While still holding press switch (S2) down, _____ the 2-snap wire marked fuse and notice how everything stops. Until the fuse is replaced, the open circuit path _____ the electronic parts. If fuses did not exist, many parts could get hot and even _____ fires. Replace the 2-snap wire and the circuit should return to normal.</p> <p>3. What would happen if fuses did not exist?</p>

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<p style="text-align: center;">16 – Momentary Alarm</p>		<p>When you _____ the slide switch (S1), the music integrated circuit (U1) may _____ playing one song then stop. The song will be much _____ than in the previous project because it is now being used as an _____. Each time you _____ the press switch "alarm button" (S2) after the song stops playing, the song will play again, but only while you _____ the button down.</p> <p>4. How does this project show electrical conduction?</p>
<p style="text-align: center;">18 – Laser Gun</p>		<p>_____ the circuit shown on the left by placing all the parts with a black 1 next to them on the board _____. Then, assemble parts marked with a 2. When you _____ the slide switch (S1), the integrated circuit should start _____ a very loud laser gun sound. This integrated circuit is designed to _____ different sounds that can easily be changed. You can even switch the sound _____ and off quickly to add sound effects to your games or _____.</p> <p>5. How can you change the sound?</p>
<p style="text-align: center;">34 – Motor Space Sounds</p>		<p>Turn it on and _____ for any sounds to stop then _____ the motor and the sounds play again. Do you know why _____ the motor makes the sound play? Actually, the DC motor is also a DC _____ and when you turn it, the motor _____ a voltage that triggers the sound circuits.</p> <p>6. How does the circuit use the motor to activate the sound?</p> <p>7. How is this an example of electrical conduction</p>
<p style="text-align: center;">58 – Using Parts as Conductors</p>		<p>Turn on the switch and _____ the whistle chip (WC), it makes a machine gun sound (with _____ in the background). Thoroughly _____ the _____ with your hand and the sound becomes a siren. After a while the sound will stop, _____ the whistle chip and it resumes. Press the _____ switch (S2) and the LED (D1) lights, but the lamp (L1) does not _____ and the motor (M1) does not _____. Electricity is _____ through the lamp and motor, but not _____ to turn them on. So in this circuit they are acting like 3-snap wires.</p> <p>8. Explain why the lamp light doesn't turn on in this project.</p> <p>9. What parts are used as conductors in this project?</p>
<p style="text-align: center;">84 – Motor Sounds Combo</p>		<p>Place the _____ onto the motor. Turn the switch on and the lamp starts _____. Place your finger on point A; the motor should start _____. Your finger _____ the music IC that powers the motor. Remove your _____ and the motor will stop after a while.</p> <p>10. How did you change the sounds made with this project?</p> <p>11. How is this example of electrical conduction?</p>