

Satellite Electronics

Grade Level	5	Workable grades	4, 5, 6, 7
Recommended Time	1 hour		
Curriculum Alignment	<p>Topic A: Electricity and Magnetism</p> <p>General Learner Expectation:</p> <p>Science 5-5: Demonstrate safe methods for the study of magnetism and electricity, identify methods for measurements and control, and apply techniques for evaluating magnetic and electrical properties of materials.</p>		

Background Information (Science required for the lesson) :

- Electrons = subatomic particles with negative electrical charges; can only move along conductive surfaces (eg. metal wires)
- Electrical circuit = a continuous, closed path used for transmitting a flow of electrons
- Load = anything attached to an electrical circuit that draws power (eg. light bulb)
- Printed circuit board (PCB) = a laminated board with circuits etched on the surface or internally for conductivity; complexity of PCBs vary
 - Found in almost all electronics; made of insulating material

Explanation of Activity:	Notes:
<p>A step-by-step guide for your activity:</p> <ol style="list-style-type: none"> 1. Present the scenario for the activity. 2. Do a basic overview of the steps of the activity (no in-depth explanation yet). 3. Ensure that all required materials are ready for use and then begin step-by-step with the class. 4. First step is for the students to think of the image they want to draw (requires paper and sketching materials): <ol style="list-style-type: none"> a. Sketch image on paper (make sure to decide location of LED) b. On the backside of the paper, sketch the path the circuit will 	<ul style="list-style-type: none"> - If the LED isn't lighting up and the switch is closed, flip the battery (LEDs are polarized)

<p>follow (make sure to include a spot for the LED, a switch, and a battery)</p> <ol style="list-style-type: none">5. Next step is to build the circuit (requires aluminum foil, scissors, and glue/tape):<ol style="list-style-type: none">a. Cut out and glue/tape strips of aluminum foil along the path of the circuit.6. Then we have to add the circuit's components (requires LED, tape, and batteries):<ol style="list-style-type: none">a. Switch: Make one piece of foil a little too long and fold it back-and-forth to open/close the circuit.b. LED: Push the metal leads on the LED through the page and fold them back along the aluminum foil. Tape them in place.c. Batteries: 2 AA batteries must be sandwiched between the foil (batteries must be in the same direction). Ensure the switch is off when adding the batteries, and tape them in place.7. Activity is now complete. Test out the circuits. After doing so, students can finish off by coloring in their images.8. Within the last 15 minutes of the lesson, ask some students to volunteer and showcase their art. Ask them why they chose their design and what it means to them.9. Last 5 minutes is for a wrap-up and any questions the students want to ask.	
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Materials Required (INCLUDE ALL MATERIALS NEEDED EVEN PEN AND PAPER)

- Paper

- Sketching materials like pens, pencils, coloring crayons/markers/pencils
- Tape
- Glue
- Scissors
- Aluminum foil
- LEDs
- Batteries

Changes to the activity for COVID-19

Send the teacher the pre-made kits (ziplock bags with all material for one student) and have AlbertaSat members present the slides remotely