

Conductive Obstacle Course

How to Build it:

Materials:

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|---|---|---|
| <input type="checkbox"/> Conductors | <input type="checkbox"/> Christmas light | <input type="checkbox"/> Construction paper |
| <input type="checkbox"/> Insulators | <input type="checkbox"/> Pencils | <input type="checkbox"/> Markers |
| <input type="checkbox"/> Alligator clips | <input type="checkbox"/> Notebook for brainstorming | <input type="checkbox"/> Scissors |
| <input type="checkbox"/> AA batteries and holders | <input type="checkbox"/> Cardboard for base | <input type="checkbox"/> Arts and crafts supplies |

Procedure:

1. Review using a prepared diagram the parts of a circuit: Input (battery), Output (light, motor, etc.), Continuous loop (wire).
2. Hand out materials to students and have them construct simple circuits using a AA battery pack, alligator clips, and a Christmas light bulb. Ask for a student volunteer to trace flow of electricity through the circuit from start to finish.
3. Discussion: Circuits can be broken. What happens when the circuit is broken? Also, things can be added to them and taken away from circuits. What happens when a nail or spoon is added to the circuit? What happens when a clothespin or plastic spoon is added to the circuit?
4. Introduce the concepts of conductors and insulators.
5. Explain and demonstrate how to use the simple circuit as a conductivity tester by breaking the circuit in one place and inserting the object in question into the circuit.
6. Allow students time to test and record in their notebook objects that are conductors and insulators.
7. When students have finished testing materials, reconvene as a group and review the list of conductors and insulators. Record what the similarities and differences are between conductors and insulators.
8. Introduce the Conductive Obstacle Course challenge below. Show students the example electrical obstacle course and let them play with it to understand how it works.
9. Allow the students plenty of time to design their course in their sketchbooks using the brainstorming worksheet as outlined below.

The Challenge:

A conductive obstacle course uses alligator clips to help connect the battery to the light bulb by using conductive materials to make the wires stretch across the board. Design an electrical obstacle course based on a theme that you will choose. Create pieces that match the theme out of conductors and insulators. You must use at least three conductors and at least three insulators somewhere on the board.

Experiment!

Can you disguise insulators as conductors?

How many conductors and insulators can you include on your board?

What is the way across the board that uses the most alligator clips? What way uses the least?