

CIRCUIT WIZARDRY

Description:

This event will challenge the student's knowledge of direct current (DC) circuits using low voltage batteries. Wall socket (AC) current will not be used!

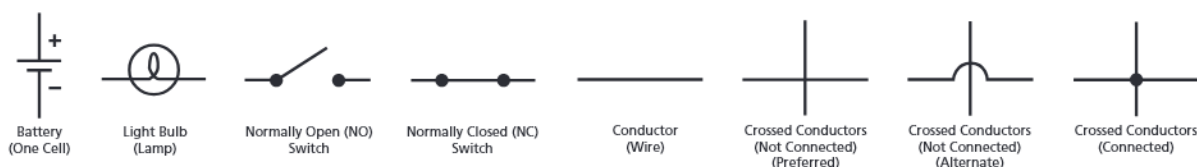
Number of Participants: 2

Approximate Time: 30 minutes

The Competition:

Participants should be familiar with the terms: conductor, insulator, open circuit, short circuit and know the difference between normally open and normally closed switches, series, parallel, and series-parallel circuits. They should be able to identify and draw, from written instructions, circuits using the schematic symbols below.

SCHEMATIC SYMBOLS



Part I

Students will be given a set of circuit drawings and asked to answer questions (some with multiple parts) regarding the circuits. They may be asked what happens when a switch is closed/opened or whether a lamp in a given circuit will light or not and to identify series, parallel, and series-parallel circuits. Point(s) will be awarded for each correct answer.

Part II

The student(s) will build a continuity tester from the materials provided (battery, lamp, and wires), and use it to accomplish the following tasks: Given 5 different circuit cards or circuit boxes having contact points labeled A, B, C, etc., that are internally connected to form one or more multi-point circuits, determine which combinations of points on each card are connected together. Given a tray of common household items, classify them as conductors or insulators. Point(s) will be awarded for correctly identified circuits and conductors/insulators.

Part III

Point(s) will be awarded for successfully completing each task. Students will be given written instructions for three different circuits and asked to do:

1. Neatly draw each circuit using schematic symbols.
2. Answer questions about the drawn circuits.
3. Construct one of the three circuits using the materials provided.

Scoring:

The team with the highest total number of points from Parts I, II, and III will be the winner. The shortest amount of time used will break ties.