# *Unit 1 Analog Circuits

Content Area: **Technology**
Course(s): **Robotics**
Time Period: **September**
Length: **9 blocks**
Status: **Published**

## Transfer

Electricity is a form of energy that can be transformed by moving electric charges doing work in various devices.

## Enduring Understandings

1. A circuit is comprised of a power source, a load and a conductor.

2. Voltage, current and resistance are related and their values in a circuit are reliant on one another.

3. Electricity is a form of energy that can be transformed by moving electric charges doing work in various devices.

4. A potential difference has to be maintained in order to move charges between two points.

5. There are many components that can be arranged in many ways to control circuits.

6. Analog circuits are systems that contain a continuously variable signal.

7. Analog signals have an infinite range of values.

8. Electrical signals can be manipulated and changed to perform a number of useful tasks in our daily lives.

## Essential Questions

1. How is an electrical circuit similar to a water pipe?

2. How are voltage, resistance and current related in an electrical circuit?

3. How are electrical circuits a part of everyday life?

4. In what devices would you find the various circuits we are creating?

5. How can an electrical circuit be controlled?

6. What are the safety issues that need to be taken into consideration when creating electrical circuits?

## Content

Vocabulary:

circuit, voltage, amperage, resistance, electron, conductor, insulator, potential difference, multimeter, ampere, watt, resistor, ohm, light emitting diode, light dependent resistor, potentiometer, variable resistor, switch, SPST, SPDT, DPST, DPDT, battery, 555 timer, diode, transistor, Wheatstone Bridge

## Skills

1. Calculate voltage, current and resistance in an electrical circuit.

2. Operate a multimeter to record electrical measurements in a circuit.

3. Create an  electrical circuit given a written description of it.

4. Create schematic diagrams of electrical circuits.

5. Create a physical electrical circuit using a schematic diagram as a guide.

6. Manipulate an electrical circuit to change its characteristics and output.

## Resources

Electrical components (various)

Multimeters

Eletrical prototyping tools

Eletrical prototyping materials

## Standards

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| TECH.8.2.12.B.2 | Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product. |
| TECH.8.2.12.C.2 | Analyze a product and how it has changed or might change over time to meet human |

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| | needs and wants. |
| TECH.8.2.12.D.1 | Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review. |
| TECH.8.2.12.D.4 | Assess the impacts of emerging technologies on developing countries. |
| TECH.8.2.12.D.CS1 | Apply the design process. |