

4th Grade
Technology Standards
[K-8 Technology Standards | Idaho Department of Education](#)

Computational Thinking (CT) - Grades 3-5

CT.1.1: Identify, using accurate terminology, simple hardware and software problems and apply strategies for solving these problems. In the lesson, students troubleshoot and analyze circuits, helping them identify problems in their circuit constructions.

CT.2.4: Explore or solve problems by selecting technology for data analysis, modeling, and algorithmic thinking. Students apply critical thinking and problem-solving skills to troubleshoot circuit challenges, exploring various solutions to their problems. Additionally, students will record their circuit models.

Digital Literacy (DL) - Grades 3-5

DL.3.1: Identify how computational devices impact daily life. The lesson discusses the role of semiconductors and chips in technology, highlighting their impact on everyday life and society.

Idaho Content Science Standards
[Science Content Standards \(idaho.gov\)](#)

Physical Science

4-PS-1.2: Make observations to provide evidence that energy can be transferred by heat, sound, light, and electric currents. By building circuits, students observe how electric currents can transfer energy, reinforcing this concept through hands-on experience.

4-PS-1.4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. The lesson involves students designing and testing circuits, which inherently requires them to convert electrical energy into light and sound.

Engineering and Technology (ETS1)

ETS1.A Define a design problem that can be solved through engineering. The lesson encourages students to identify engineering problems through circuit challenges, fostering critical thinking and problem-solving.

ETS1.B Develop possible solutions to a design problem. Students collaborate in teams to find solutions to circuit-building challenges, emphasizing teamwork and communication.

Crosscutting Concepts

- **Patterns:** Students observe patterns in how different circuit configurations affect functionality, enhancing their understanding of cause and effect relationships.
- **Systems and System Models:** This lesson allows students to view circuits as systems, understanding how components (like semiconductors) work together to achieve a function.

Science and Engineering Practices

- **Asking Questions and Defining Problems:** Throughout the lesson, students are encouraged to ask questions regarding circuit functionality and engineering challenges.
- **Developing and Using Models:** The circuit-building activity serves as a model for students to understand electrical engineering concepts practically.

Overview: 4th grade

Idaho Science Standards: 4-PS-1.2, 4-PS-1.4, ETS1.A, ETS1.B

4th Technology Standards: CT.1.1, CT.2.4, DL.3.1

5th Grade

Technology Standards

[K-8 Technology Standards | Idaho Department of Education](#)

Computational Thinking (CT) - Grades 3-5

CT.1.1: Identify, using accurate terminology, simple hardware and software problems and apply strategies for solving these problems. In the lesson, students troubleshoot and analyze circuits, helping them identify problems in their circuit constructions.

CT.2.4: Explore or solve problems by selecting technology for data analysis, modeling, and algorithmic thinking. Students apply critical thinking and problem-solving skills to troubleshoot circuit challenges, exploring various solutions to their problems. Additionally, students will record their circuit models.

Digital Literacy (DL) - Grades 3-5

DL.3.1: Identify how computational devices impact daily life. The lesson discusses the role of semiconductors and chips in technology, highlighting their impact on everyday life and society.

Idaho Content Science Standards

[Science Content Standards \(idaho.gov\)](#)

Physical Science

5-PS-1.1 Develop a model to describe that matter is made of particles too small to be seen. While focusing on electricity, students can discuss how electrical components (like atoms and electrons) are fundamental to understanding circuits, linking physical science concepts

5-PS-1.3 Use models to represent the energy transfer in a system. The lesson allows students to build circuits as models to visualize and understand energy transfer from the battery through the circuit to the light or sound output.

Engineering and Technology (ETS1)

ETS1.A Define a design problem that can be solved through engineering. The lesson encourages students to identify engineering problems through circuit challenges, fostering critical thinking and problem-solving.

ETS1.B Develop possible solutions to a design problem. Students collaborate in teams to find solutions to circuit-building challenges, emphasizing teamwork and communication.

Crosscutting Concepts

- **Cause and Effect:** Students explore cause and effect relationships in how changes in circuit configurations affect the output (light, sound).
- **Systems and System Models:** The activity reinforces the concept of systems by having students understand how different components work together in a circuit.

Science and Engineering Practices

- **Planning and Carrying Out Investigations:** Students engage in hands-on circuit-building, observing and documenting their results.
- **Analyzing and Interpreting Data:** As students test their circuits, they gather data to analyze the effectiveness of their designs.

Overview: 5th grade

Idaho Science Standards: 5-PS-1.1, 5-PS-1.3, ETS1.A, ETS1.B

5th Technology Standards: CT.1.1, CT.2.4, DL.3.1

6th Grade

Technology Standards

[K-8 Technology Standards | Idaho Department of Education](#)

Computational Thinking (CT) - Grades 6-8

CT.3.3: Demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions. The focus on designing circuits in the lesson correlates with understanding automation and algorithms in technology.

CT.5.3: Apply an iterative design process (define the problem, generate ideas, build, test, and improve solutions) in problem-solving. The circuit-building activity allows students to follow an iterative design process as they create and refine their circuits based on testing results.

Digital Literacy (DL) - Grades 6-8

DL.3.2: Analyze the impact of technology on social interactions and culture. Discussions around technology's role in society can help students reflect on how innovations like semiconductors and circuits influence daily life and social structures.

Idaho Content Science Standards

[Science Content Standards \(idaho.gov\)](#)

Physical Science

6-PS-1.1 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. While the focus is on electricity, students can explore how energy is conserved in a closed circuit, discussing the importance of energy transfer in physical systems.

Engineering and Technology (ETS1)

ETS1.A Define a design problem that can be solved through engineering. The lesson encourages students to identify engineering problems through circuit challenges, fostering critical thinking and problem-solving.

ETS1.B Develop possible solutions to a design problem. Students collaborate in teams to find solutions to circuit-building challenges, emphasizing teamwork and communication.

Crosscutting Concepts

- **Energy and Matter:** Students examine how energy flows through a circuit, enhancing their understanding of energy transfer principles.
- **Systems and System Models:** The circuit-building activity promotes the understanding of systems by illustrating how individual components interact to produce a functioning circuit.

Science and Engineering Practices

- **Engaging in Argument from Evidence:** As students test their circuit designs, they can debate the effectiveness of different configurations based on their results.
- **Constructing Explanations and Designing Solutions:** The hands-on nature of the lesson allows students to construct explanations for their findings and design solutions for circuit challenges.

Overview: 6th grade

Idaho Science Standards: 6-PS-1.1, ETS1.A, ETS1.B

6th Technology Standards: CT.3.3, CT.5.3, DL.3.2