

Lesson Plan: Simple Machines for Early Elementary

Grade Level: 1st through 3rd Grade

Lesson Title: Simple Machines for Early Elementary

Duration: 1 Week (5 sessions, 45 minutes each)

NGSS Standards Alignment:

1-PS4-4: Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

1-PS4-1: Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Lesson Objectives:

Introduce students to the concept of simple machines.

Identify and explore six types of simple machines: lever, wheel and axle, pulley, inclined plane, wedge, and screw.

Understand how simple machines make work easier by providing mechanical advantage.

Build simple machine models using Lux Blox.

Materials Needed:

Lux Blox sets

Pictures of simple machines

Chart paper and markers

Examples of simple machines (e.g., scissors, toy cars, ramps)

Worksheets for simple machine identification and activities

Lesson Outline:

Session 1: Introduction to Simple Machines

Warm-Up Activity: Discuss and show examples of simple machines found in everyday life (e.g., scissors, doorknobs).

Instruction:

Explain what simple machines are and their purpose.

Introduce the six types of simple machines using images and real-life examples.

Show a short video on simple machines to reinforce understanding.

Activity:

Students will identify simple machines in their classroom or at home.

Draw and label simple machines they found.

Wrap-Up:

Share and discuss the findings as a class.

Homework: Bring a small, safe example of a simple machine from home for the next class.

Session 2: Exploring Levers and Inclined Planes

Warm-Up Activity: Review simple machines and discuss examples brought from home.

Instruction:

Introduce levers and inclined planes in detail.

Discuss how levers work (e.g., seesaws) and the concept of fulcrum, load, and effort.

Discuss inclined planes and how they help move objects up or down with less effort.

Activity:

Build a lever and an inclined plane using Lux Blox.

Test the models by moving small objects (e.g., toy cars, marbles).

Wrap-Up:

Discuss how the models helped in understanding the mechanics of levers and inclined planes.

Session 3: Exploring Wheels and Axles and Pulleys

Warm-Up Activity: Recap on levers and inclined planes.

Instruction:

Introduce wheels and axles and pulleys.

Explain the function of wheels and axles using examples (e.g., toy cars, rolling pins).

Demonstrate how pulleys work using a basic pulley system.

Activity:

Build a simple wheel and axle system and a pulley system using Lux Blox.

Experiment with lifting small weights using the pulley system.

Wrap-Up:

Discuss observations and how these simple machines made the tasks easier.

Session 4: Exploring Wedges and Screws

Warm-Up Activity: Review the previously covered simple machines.

Instruction:

Introduce wedges and screws.

Explain how wedges work to split or cut objects (e.g., knives, axes).

Describe screws and how they convert rotational force into linear motion.

Activity:

Build models of wedges and screws using Lux Blox.

Use the models to demonstrate cutting and lifting actions.

Wrap-Up:

Discuss how these simple machines are used in daily life.

Session 5: Building a Compound Machine

Warm-Up Activity: Quick review of all six simple machines.

Instruction:

Explain what a compound machine is (a machine that combines two or more simple machines).

Discuss examples of compound machines (e.g., wheelbarrow, scissors).

Activity:

Students work in small groups to design and build a compound machine using Lux Blox that incorporates at least two simple machines.

Test and present their compound machines to the class.

Wrap-Up:

Discuss the importance of simple machines in engineering and everyday life.

Reflect on what was learned throughout the week.

Assessment:

Participation in class discussions and activities.

Completion of worksheets and drawings.

Ability to identify and explain simple machines.

Successful construction and presentation of simple and compound machine models.

Extensions:

Visit a local science museum to explore exhibits on simple machines.

Conduct additional experiments to explore more complex uses of simple machines.

Create a simple machines journal documenting different machines encountered at home or school.

Resources:

Lux Blox Website and Instructional Guides

Educational videos on simple machines (e.g., YouTube Kids)

Books on simple machines for early elementary students

For more lesson plans, go to Lux Blox Lessons.