

Jay Curriculum: Unit Cover Page

Unit title: Simple Machines

Grade Level: 3

Content Area(s): Science

Date Created:

Designed By: Jay Third Grade Teachers

Year 1 Map & Template Development

- Map/Matrix Completed
- Material & Resources Listed
- Draft Design Template Completed
- Initial Draft Template Document

Year 2 Piloting

- Develop:
- Performance Tasks
- Other Assessments
- Scoring Rubrics
- Piloted

Year 3 Review & Complete Assessment

- Performance Tasks Development
- Other Assessments Completed
- Scoring Rubrics Completed
- Reviewed/Revised Templates

Year 4

- Full Implementation
- Benchmarks Established

Standard(s)/Performance Indicators:

- I1 Describe the effects of different types of forces (e.g. mechanical, electrical, magnetic) on motion
- I2 Draw conclusions about how the amount of force affects the motion of more massive and less massive objects
- I3 Generate examples illustrating that when something is pushed or pulled, it exerts a reaction force
- J1 Make accurate observations using appropriate tools and units of measure
- J2 Conduct scientific investigations: make observations, collect and analyze data, and do experiments
- J3 Use results in purposeful ways: design fair tests, make predictions based on observed patterns, and interpret data to make further predictions
- J4 Design and build an invention
- J6 Explain how different conclusions can be derived from the same data
- K3 Draw conclusions about observations
- K5 Demonstrate an understanding that ideas are more believable when supported by good reasons
- K6 Practice and apply simple logic, intuitive thinking, and brainstorming
- L1 Record results of experiments or activities (e.g. interviews, discussions, field work) and summarize and communicate what they have learned
- L3 Reflect on work in science and technology using such activities as discussions, journals, and self-assessment.
- L4 Make and/or use sketches, tables, graphs, physical representations, and manipulative to explain procedures and ideas
- L7 Function effectively in groups within various assigned roles (e.g. reader, recorder)
- M1 Explore how cultures have found different technological solutions to deal with similar needs or problems (e.g. construction, clothing, agricultural tools and methods)
- M2 Investigate and describe the role of scientist and inventors
- M3 Explore how technology (e.g. transportation, irrigation) has altered human settlement

Unit: Simple Machines

Brief Summary of Unit/Topic

Summary:

Students will become aware that simple machines make work easier. Some simple machines make it easier to lift things. A pulley is such a machine, as is a lever. A ramp is a simple machine known as an inclined plane. A jack has a simple machine in it called a screw. Inclined planes and screws help to lift things. A wedge is a simple machine used as a cutting tool. The simple machine called the wheel and axle is used to turn things and make it easy to open a door. In their work, people use simple machines in many ways. Inventors utilize simple machines to problem-solve.

Stage #1: Identify Desired Results

Essential Question/s:

General understanding/s (What is worth being familiar with?)

- Students will understand the function on each of the simple machines
- They will research an inventor
- They will design their own machine using the concepts learned

Students will know:

- Simple machines are tools we use to make work easier
- Levers, inclined planes, screws and pulleys lift things
- Wheels and axles turn things and wedges cut things
- Physical problem-solving can be accomplished by applying simple machine concepts
- Inventors utilize simple machines to problem solve

Students will be able to:

- Make prediction
- Record observations in a journal
- Do research on an inventor
- Problem solving
- Make observations using appropriate tools and units of measure
- Conduct scientific investigations

Enduring Understanding/s:

- Students will understand that simple machines make work easier
- Students will identify lifting machines, such as levers, inclined planes, screws, and pulleys
- Students will identify cutting machines as wedges
- Students will identify the wheel and axle as a machine to turn things

Stage #2: Evidence

What evidence will students have to provide in order to demonstrate that they have developed the skills, knowledge and understanding to successfully complete this unit?

Performance Tasks/Products/other assessments Performance tasks should have a <u>scoring guide</u> .	<i>Performance Indicators</i> for this task.* Example: ELA: C- 1,2,3 Science: B- 3,5,7 SS His: H- 2	<u>Modalities</u> K =Kinesthetic O =oral V =visual W =written	Are <u>examples</u> available to students? Y, N, or N/A	Component of Local Assessment System? Y or N (See aligned scoring guide .)
Discuss the way machines have made life easier, effected human settlement and the ways different culture have utilized different machines	M1, M3			
Given example simple machine groups of students will predict what will happen when a force is applied, test the prediction and record these observations in a journal. Using these observations, students will develop rules explaining how simple machines work	I1,2,3; J1,2,3; K3,5,6; L1,3,4,7			
Given a problem and a set of materials, individual students will design and construct a device to solve the problem and present a written explanation of how the device works	J3,4,6; K6; L4			
Students will research an inventor and report their finding	M2, L5			
QUIZZES, TESTS, PROMPTS				
Inventor report				
Unit text on simple machines				
OTHER				
Each student will contribute to the discussion				
Teachers will evaluate group rules for validity				
Teachers will evaluate by rubric				
Teachers will assess by written report rubric and oral report rubric				
STUDENT SELF ASSESSMENT				
Determine participation in discussions				

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Tally accuracy simple machine rules developed from observations				
Students will assess finished product to project standards given by teacher prior to rubric assessment by teacher				
Self-assess unit review prior to unit text administration				

*Abbreviate: English Language Arts= ELA, Career Preparation=CP, Modern and Classical Languages=MCL, Social Studies=SS, Visual and Performing Arts=VPA

Stage #3: Plan learning experiences & instruction

What teaching & learning experiences may equip students to develop & demonstrate the targeted understanding(s)? (activities/plans):

*Unit lessons and activities located in teacher binder

- Students will become aware that simple machines make work easier
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- A jack has a simple machine in it called a screw
- Inclined planes and screws help to life things
- A wedge is a simple machine used as a cutting tool
- The simple machine called the wheel and axle is used to turn things and makes it easier to open a door
- In their work, people use simple machines in many ways
- Inventors utilize simple machine to problem-solve

REFERENCES: