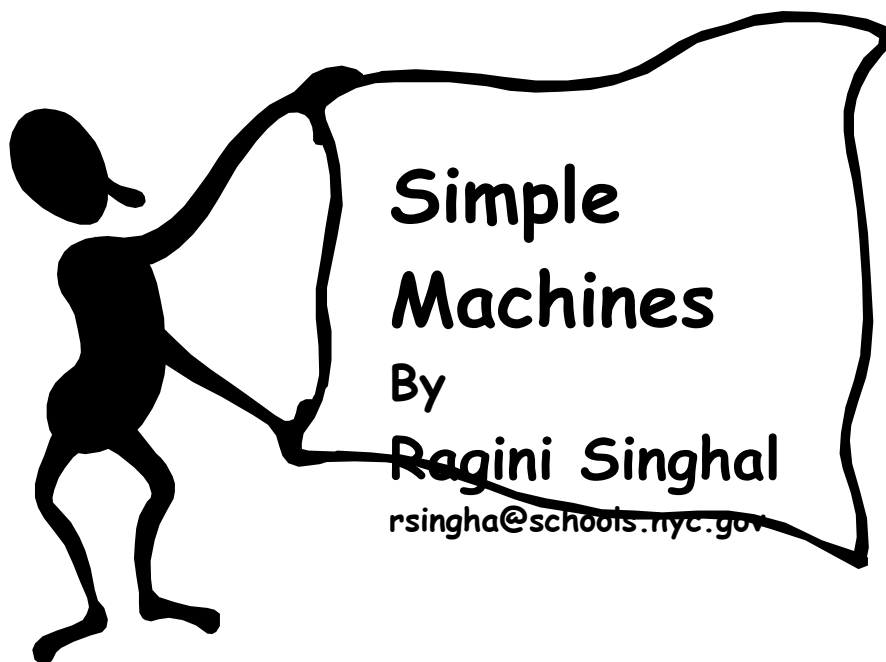


New York City Department of Education Magnet Program District 25 & 28

Robert Van Wyck MS 217



Essential Question: Does technology equal quality of life?

Suggested Time Frame: 4 to 6 weeks

Theme: Technology and the environment

Graphic Overview of Unit

Suggested Time Frame: 4 -6 weeks

Essential Question: Does technology equal quality of life?

Unit name:
Simple Machines

Mini-unit name:

Energy & forms of energy

How do machines work?

Inclined planes

Levers

Pulleys

Mini-Units
* It is recommended that each mini-unit end with a standardized test that reflects the state / city assessment

Unit's Culminating Project: (briefly explain in 2-3 sentences):

Students will explore the use of machines for construction and farming in different parts of the world, and debate the pros and cons of simple vs. complex machines with special focus on their environmental impact.



Stage 1- Desired Results

Standards-Based Learning Goals: • Potential and kinetic energy PS 4.1e

- Mechanical energy PS 4.1d PS 5.2c
- Machines can affect the magnitude or direction of a force required to do work, or the distance over which that force is applied. PS 5.2f
- Simple machines include the lever, the pulley, the wheel and axle, and the inclined plane. PS 5.2g
- Complex machines PS 5.2g
- Transformation of energy within simple and complex machines PS 4.1c PS 5.2c
- Principle of the conservation of energy PS 4.5a,b PS 5.2c
- Friction and machines PS 5.2d,e

Concepts

Big Ideas for this Unit

**Technology must be in balance with the environment for the survival of humanity.
Complex machines always consume energy.**

Magnet School Theme:

Environmental stewardship and career exploration through multimedia technology.

How does the Big Idea in your unit connect to your theme?

**Environmental stewardship implies responsible use of complex machines that use energy.
Complex machines improve quality of life and support many careers.**

Enduring Understandings

Students will understand that technology has both a positive and negative impact on us and our environment.

Overarching Essential Question: (this question should connect to your school theme)

Does technology equal quality of life?

Content and Skills

Content

Skills

<p>Students will know... Mechanical energy, potential and kinetic energy, transformation of energy principle of conservation of energy, forces, work, friction, simple machines, levers; 3 classes of levers Fixed and moveable pulleys, wheel and axle, inclined plane, screw, wedge, mechanical advantage, complex machines</p>	<p>Students will be able to... Follow safety procedures in the classroom and laboratory. – Safely and accurately use the following measurement tools: - metric ruler - spring scale. – Use appropriate units for measured or calculated values. – Recognize and analyze patterns and trends. – Sequence events. --Identify cause-and-effect relationships. --Identify the simple machines that make up all complex machines --Demonstrate the mechanical advantage of the lever, inclined plane and the fixed and moveable pulleys. ---Build a complex machine that uses a predetermined amount of force to lift a given mass _Explore the validity of using simple vs. complex machines in different parts of the world. --Debate the impact of complex machines on the environment. -- Recognize the impact of human activities on the environment</p>
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Stage 2- Summative Assessment Evidence
If students understand, know and are able to do the items in Stage 1, they should be able to show their understanding by completing an authentic task found in the world beyond the classroom.

Design the Culminating/Summative Task:

Please note: The Essential Question and the Grasp are interconnected. The GRASP is a way for students to demonstrate their knowledge and understanding unit by answer of the Essential Question. Or you can say, they are answering the essential question through their GRASP.

G- (goal) To persuade inhabitants of a remote tsunami devastated island to accept/decline modern construction and farm machinery

R- (role) representative of an international relief agency/
environmentalist

A- (audience) inhabitants of the island who do not wish to give up their way of life.

S- (situation) Inhabitants of a tsunami ravaged island must be persuaded to accept technological aid. The chief has organized a village meeting in which you will participate in a debate with the villagers about the social, economic and environmental impact of the construction and farm machinery you are offering.

P- (purpose and product) To convince the inhabitants to accept/decline aid by participating in a general debate with the environmentalist/representative. Prepare some visuals to support your argument. (Posters, power points, graphs)

S- (standards for performance)

Ability to analyze and convincingly debate the social, economic and environmental impact of transitioning to complex machines from the simple machines.

Visuals to support the argument

Written document that supports your point of view.

Student Task

In the space below, write the task exactly as students will see it.

You should give this task to them on the first day of the unit. This way they know where they are going.

A devastating tsunami has wiped out the houses in a remote island village. The village was entirely self dependent and all the houses were built by the residents using simple machines and man power. The primary occupation of the villagers is farming and fishing. They have had little interaction with the 'modern' world.

An international relief agency offers the villagers construction and farm equipment so they are able to rebuild their homes and return to farming as soon as possible.

You are an environmentalist working for a conservation program in the area. You must educate the villagers about the long term implications of their decision.

The village chief has given you permission to debate the pros and cons with the representative from the agency offering aid so the villagers could make an informed decision whether to accept the offered aid.

The debate will be held in the village town hall.

Students will work in groups of 4. Each group must:

1. Select the role of either the representative of the relief agency, or the environmentalist.
2. Write and deliver a five minute speech giving your reasons why the inhabitants must accept or decline the aid depending on your choice of role. In you speech you must address the following issues:

A: What will be the social, economic and environmental impact of accepting or declining the offered aid? Try to persuade the audience to your point of view.

B: Must present convincing visuals supporting your point of view. (Posters, photographs, power-point)

Each student in the group must have an assigned role: writer, debater, media specialist and researcher. Information gathering for the debate must be a collaborative effort.

**Rubric For Culminating Project
Group/Individual grade**

www.rubistar.com

Project Component	1	2	3	4
Research Social impact Environmental Economic impact	No research to support argument	Social, environmental and economic impact superficially researched and discussed	Social, environmental and economic impact adequately researched and discussed	Social, environmental and economic impact well researched and thoroughly discussed
Speech Persuasive writing Analysis of situation	Many grammatical and spelling errors, or no written speech	4 to 6 grammatical and spelling errors, superficial analysis of the situation	up to 3 grammatical and spelling errors, good analysis of the situation	No grammatical or spelling errors, excellent analysis of the situation
Oral presentation	NO eye contact, inaudible irrelevant arguments	Some eye contact, sometimes inaudible, irrelevant arguments	eye contact, audible articulation, logical arguments	Good eye contact at all times, clear and audible articulation, logical Creative arguments
Collaboration Team work Contribution to research	Minimal or sporadic participation by group members	Group members participate in some aspects of the projects	Participation in all aspects of the projects	Full participation in all aspects of the projects
Visual aids	No visual aids to support	One visual aid to support	Some visual aids to support	Multiple visual aids to support

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