Republic of the Philippines
Department of Education
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UNIFIED SUPPLEMENTARY LEARNING MATERIALS
(USLeM)

SCIENCE 6
Week 6

Writer / Illustrator
Louwila D, Celevante

Layout Artist
Margie S. Mahinay

Content and Language Editor
Nelsie B. Caculitan

MANAGEMENT TEAM

Malcolm S. Garma
Regional Director

Romela M. Cruz
Schools Division Superintendent

Genia V. Santos
CLMD Chief

Alyn G. Mendoza
CID Chief

Micah G. Pacheco
EPS, CLMD (Science)

Dennis M. Mendoza
Regional LR EPS

Roxane S. Villanueva
EPS, SDO (Science)

Nancy Mabunga
Regional Librarian

Ruby E. Baniqued
SDO LR EPS

Dorothy Grace I. Reyes
SDO PDO II - LRMDS

Calixto N. Camangeg
SDO Librarian

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Grades 6 SCIENCE

LESSON 1: Simple Machines – Their Characteristics and Uses

EXPECTATIONS

Our mastery of using tools and simple machines has been our most important trait as a successful species. Simple machines are important and common in our world today in the form of everyday devices (brooms, knives, bottle caps, stairs, etc.) that we use daily.

Using simple machines makes our work easier. They allow their user to accomplish more work while exerting less effort. The amount of effort needed to do a job is decreased by using one of these machines.

In this lesson, you are going to describe and manipulate the different types of simple machines.

PRETEST

Directions: Write the name of the simple machine described below. Choose your answer from the word bank.

inclined plane	pulley	screw	lever	wedge

_____ 1. It uses grooved wheels and ropes/chains to raise, lower, or move a load.
_____ 2. It is a bar that lays on a support that be used to raise or move loads.
_____ 3. It is an object with a slanted edge that is sharp. It can be used to cut materials apart.
_____ 4. It is a slanted surface used to connect lower surfaces to higher ones.
_____ 5. It is an inclined plane wrapped around a shaft that holds things together or lifts objects.

LOOKING BACK TO YOUR LESSON

Directions: Put a check mark (/) on the space provided if the picture shows a good practice of conserving energy, and an **X** mark if otherwise.

1. ___ 

Source: commons.wikimedia.org

2. ___ 

Source: commons.wikimedia.org

3. ___ 

Source: commons.wikimedia.org

4. ___ 

5. ___ 

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BRIEF INTRODUCTION

What do you use when you want to open a bottle, move a big box, or slice an apple? When you open a bottle, lift a heavy object, slice fruits and vegetables, you use machines. Bottle openers, ramps, and knives are simple machines. What are simple machines? How do machines help you?

ACTIVITY

"Let's Investigate!"

A. Directions: Find out how the different simple machines work. Manipulate the following machines to describe their characteristics and uses. List down the observation in the chart below.

Problem: What are the characteristics of simple machines?

What you need: mop, doorknob, screw, stairs, nail, pulley in a flagpole

Machines	How it Works	Characteristics	Types
mop			
doorknob			
screw			
stairs			
nail			
pulley			

B. Answer the following questions:

1. What are the different types of simple machines?

2. What are the distinguishing characteristics of each simple machine?
   - a lever _____
   - b inclined plane _____
   - c wheel and axle _____
   - d pulley _____
   - e wedge _____
   - f screw _____

3. Make a conclusion based on the given problem.

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REMEMBER

There are six basic types of simple machines: wheel & axle, pulley, lever, inclined plane, wedge, and screw. Simple machines make our work easier either by altering the directions of forces applied to them or multiplying their effects.

CHECKING YOUR UNDERSTANDING

Directions: Give three (3) examples of situations in your daily life that use simple machines.

POST TEST

Directions: Below are illustrations of simple machines that can most likely be found around your home or in the community. Classify them according to the type of simple machine they belong to. Write your answers on the table provided.


knife


bicycle gear


cheese grater


end of a light bulb


broom


clothesline


slide


spoon


bolt


stairs


doorknob


crane

Inclined Plane	Lever	Wedge	Screw	Pulley	Wheel and Axle

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LESSON 2: Lever, Inclined Plane, and Wedge

EXPECTATIONS

Simple machines are basic tools that multiply the amount of force to make work easier. In this lesson, you will describe the characteristics and functions of a lever, inclined plane, and wedge. You will also classify and give applications of a lever.

PRETEST

Directions: Read each item carefully and choose the letter of the best answer.

1. Which is a characteristic of simple machines?
   a. They run on electricity. b. They are difficult to use.
   c. They have few or no moving parts. d. They have motors.

2. Which is not a type of simple machine?
   a. spring b. lever c. wedge d. inclined plane

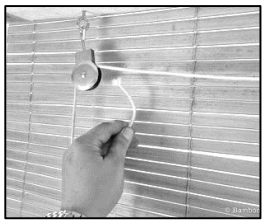
3. Which of these is an example of a wedge?
   a. wheel b. spoon c. seesaw d. butter knife

4. Which of these is not an example of an inclined plane?
   a. ladder b. slide c. wall d. driveway

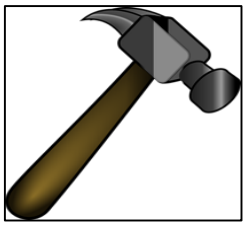
5. Which of the following situations shows the use of a simple machine to do work?
   a. a boy throwing the ball upward b. a banker counting money
   c. a mother pushing a stroller up a ramp d. a lady watching the sunset

LOOKING BACK TO YOUR LESSON

Directions: Identify the type of machines below.

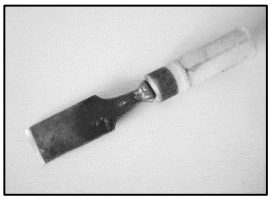


Source: commons.wikimedia.org



Source: commons.wikimedia.org

Source: commons.wikimedia.org



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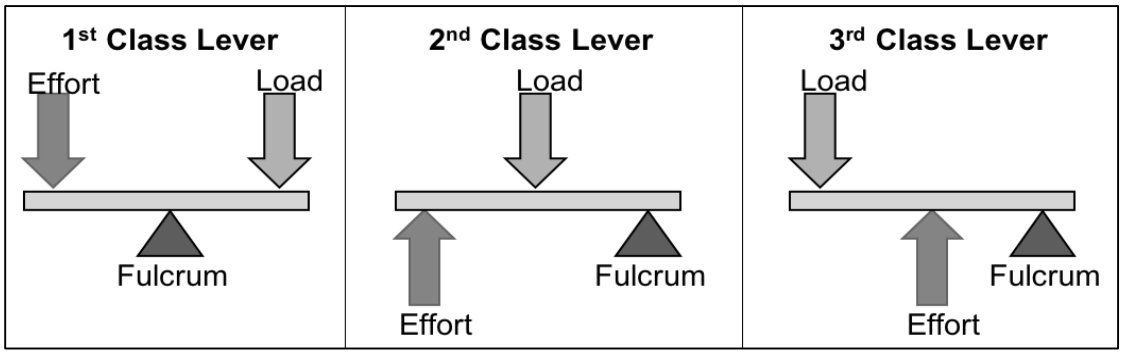
BRIEF INTRODUCTION

You have probably seen in the television or movies how someone would move something heavy like a big rock. He would pick up a long stick, place one end under the rock, and push down on the other end. He is then able to move the rock without exerting too much effort. Simple machines are just that - the simplest form of using one thing to accomplish something faster or easier. What type of simple machine is used to move the rock? How did the machine help him?

ACTIVITY 1 A. "Investigating Levers"

Problem: What are the characteristics of a lever?
What you need: scissors, spoon, broom, pliers, bottle opener
What to do:
1. Use the different objects. Identify the fulcrum, load resistance, and effort.
2. Classify the given materials according to the type of lever they belong to. Study the picture below for your reference:



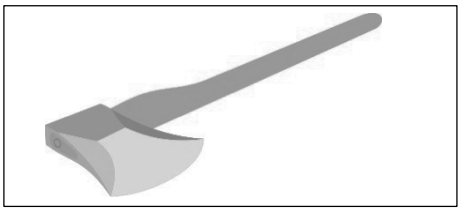
Object	Uses	Location of Fulcrum	Resistance/ Load	Effort	Type of Lever
wheelbarrow	moving heavy loads	wheel	load	handle	second-class lever
scissors					
spoon					
broom					
pliers					
bottle opener					

What have you found out?

Describe a fulcrum.	What are the different kinds of levers?
How do types of levers differ?	

ACTIVITY 2 "Work with Wedges"

Directions: Look at the picture below. What type of simple machine is it? Complete the tables below.



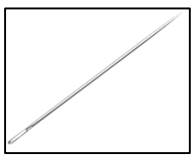
https://pixabay.com/vectors/ax-tool-head-database-background-2519840/

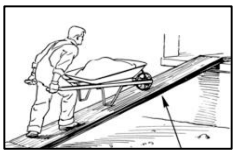
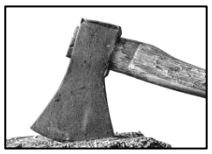
Words to describe this simple machine	Uses for this simple machine

How are wedges used in our daily life? Cite three (3) examples.	How do they make work easier?

ACTIVITY 3 "Which is Which?"

Directions: Look at the pictures of simple machines. Number each sentence to identify what it is referring to.

Source: Creative Commons

1 2 3 4 5

___ This inclined plane permits persons with disabilities to move between areas of different heights.

___ This wedge is used as a cutting tool for shearing the excess layer of material.

___ This wedge is used to split and cut wood.

___ This inclined plane is used by construction workers to move heavy loads to a higher area.

___ This wedge has a sharp point at one end, which is for sewing.

REMEMBER

Simple machines transform or transfer energy, multiply speed or force, and change the directions of the forces. Levers, inclined planes, and wedges are three of the six types of simple machines.

A lever is a simple machine made of a rigid bar that pivots on a support called the fulcrum. It is used to increase physical force.

An inclined plane consists of a sloping surface, used for moving loads between areas of different heights.

A wedge is a simple machine that narrows to a thin edge and is used to separate two objects or portions of an object, lift an object, or hold things together.

CHECKING YOUR UNDERSTANDING

Directions: Look around your house. List down the simple machines that you can find and classify them as lever, wedge, and inclined plane.

POST TEST

Directions: Write **TRUE** if the statement about simple machines is correct and **FALSE** if incorrect.

_____1. Levers can help lift a heavy object with less effort.
_____2. Crowbar and wheelbarrow are levers.
_____3. Inclined planes allow things to move from a low point to a high point or vice versa.
_____4. A wedge is a double inclined plane that is sharpened at the end.
_____5. Stairs and slides are examples of wedges.

REFERENCES

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ANSWER KEY

Lesson 1: SIMPLE MACHINES - THEIR CHARACTERISTICS AND USES

Pretest

1. Pulley
2. Lever
3. Wedge
4. Inclined plane
5. Screw

Looking Back to Your Lesson

1. /
2. /
3. /
4. X
5. X

Activity:

Machines	How it Works	Characteristics	Types
mop	The upper hand serves as the fulcrum, the lower hand provides the force and the mop end pushes against the resistance of the dirt and floor	Long sturdy object, supported by a fulcrum which move loads with lesser effort	Lever
doorknob	When the **knob** on one side of the door is turned, the shaft retracts the spring-loaded latch that holds the door closed.	has a wheel, axle and shaft; the wheel spins with the axle	Wheel and axle
screw	Provides strength and holds things together	has threads, pitch and head. It is round.	Screw
stairs	Make objects easier to move objects to a higher elevation	has a slope/slanting surface connecting a lower level to a higher level.	Inclined plane
nail	When driven into wood, the nail pushes apart fibers as it penetrates.	Thick on one end and tapers to a thin or sharp edge on the other end	Wedge
pulley	When you pull the rope, you move the load.	has a rope, pulley, and wheel with a groove	pulley

B. What have you found out?

1. The different types of simple machines are lever, wheel and axle, screw, inclined plane, wedge and pulley.
2. a. lever - It is a bar that rests on a support and can use to lift or move loads.
   b. inclined plane - It is a slanted surface to connect lower surfaces to higher ones
   c. wheel and axle - A wheel, when combined with a rod through its center can be used to lift or move loads.
   d. pulley - It uses grooved wheels and ropes/chains to raise, lower, or move a load.
   e. wedge - It is an object with a slanted edge that is sharp. It can use to cut materials apart.
   f. screw - It is an inclined plane wrapped around a shaft which hold things together or lift objects.
3. The six simple machines are the wedge, screw, lever, pulley, inclined plane and the wheel and axle. The y all make work easier.

Check Your Understanding

Answers may vary.

Posttest

Incline Plane	Lever	Wedge	Screw	Pulley	Wheel and Axle
slide stairs	spoon broom	knife cheese grater	end of a light bulb bolt	Flag in a pole crane	bicycle gear doorknob

Lesson 2: LEVER, INCLINED PLANE AND WEDGE

Pretest

1. c. They have few or no moving parts.
2. a. spring
3. d. butter knife
4. c. wall
5. c. a mother pushes a stroller up a ramp

Looking Back to Your Lesson

1. pulley
2. lever
3. inclined plane
4. wedge
5. wheel and axle

Activity 1:

Object	Uses	Location of Fulcrum	Resistance/ Load	Effort	Type of Lever
wheelbarrow	moving heavy loads	wheel	middle	handle	second-class lever
scissors	cutting thin objects	center	Pointed end	handle	First-class lever
spoon	Tool for eating	handle	food	center	third-class lever
broom	top	the hand that holds the top	Bristles at the other end that move dirt	center	third-class lever
pliers	Bend or hold objects firmly	the nut where the pliers rotate	jaw	handle	First-class lever
bottle opener	removes metal bottle caps from glass bottles	One end which removes the cap	middle	handle	second-class lever

B. What have you found out?

1. Fulcrum is the point on which a lever rests or is supported and on which it pivots.
2. The different kinds of levers are first-class, second-class, and third-class levers.
3. The difference between the three classes depends on where the force is, where the fulcrum is and where the load is. In a first-class lever, the fulcrum is located between the input force and output force. In a second-class lever, the output force is between the fulcrum and the input force.

Activity 2:

3 This inclined plane permits persons with disabilities to move between areas of different heights.
1 This wedge is used as a cutting tool for shearing the excess layer of material.
5 This wedge is used to split and cut wood.
4 This inclined plane is used by construction workers to move heavy loads to a higher area.
2 This wedge has a sharp point at one end, which is for sewing.

Activity 3:

Words to describe this simple machine	Uses for this simple machine
It has two inclined planes brought together in a sharp edge.	It is used to split or pierce objects.

How are wedges used in our daily life? Cite three (3) examples.	How do they make work easier?
Answers may vary.	Answers may vary.

Check Your Understanding

Answers may vary.

Posttest

1. TRUE
2. TRUE
3. TRUE
4. TRUE
5. FALSE