Republic of the Philippines
Department of Education
NATIONAL CAPITAL REGION
Misamis Street, Bago-Bantay, Quezon City

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
(USLeM)

SCIENCE 6
Week 7

Writer / Illustrator
Mila C. Taño

Layout Artist
Margie S. Mahinay

Content and Language Editor
Nelsie B. Caculitan

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
Grades 6 SCIENCE

LESSON 1: Screw and Pulley

EXPECTATIONS

We need to work every day to survive. Work requires exerting a certain amount of force. To help us in doing work, we use tools that change the amount and /or direction of the force that we exert. These are called simple machines.

In this lesson, you will describe the characteristics and functions of a screw. You will also describe the characteristics and functions of a pulley. Lastly, you will identify the types of the pulley and their uses.

PRETEST

Directions: Read the questions carefully and choose the letter of the correct answer.

1. Which of the following is <u>not</u> a simple machine?
   A. screw B. pulley C. lever D. board
2. Which of the following makes use of the principle of the screw?
   A. knife B. faucet C. scissors D. pencil sharpener
3. This consists of an inclined plane wrapped around a pole or a cylinder.
   A. friction B. screw C. pulley D. wheel and axle
4. A group of workers will unload the big boxes from a ship. Which will help them make their work easier?
   A. lever B. screw C. wedge D. pulley
5. Which simple machine can be used in raising the flag?
   A. rope B. wedge C. pulley D. inclined plane

LOOKING BACK TO YOUR LESSON

Directions: Classify the following as lever, wedge, or inclined plane. Write your answers in the table provided.

broom	seesaw	ramp	stairs	knife
wheelbarrow	spoon	ladder	ice pick	

Lever	Wedge	Inclined Plane

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
Grades 6 SCIENCE

BRIEF INTRODUCTION

Have you noticed how some appliances, cabinets, and other furniture are assembled? Look at your electric fan. How are the parts put together to make it work? You can see how these parts are held together with the help of a simple machine.

Have you experienced watching how heavy loads like steel, logs, and big containers are unloaded from trucks? What makes this possible? What helps the men do their work easier and faster? Just like the electric fan in the previous paragraph, another type of simple machine is used in the situation.

As you learned in the previous week, the screw and the pulley are simple machines. The **screw** is an inclined plane wrapped around a central cylinder. A **pulley** is a grooved wheel that turns around an axle with a rope or a chain that is used to lift objects. There may be several of these mounted in a framework called a **block.**

A fixed pulley is attached to something that does not move in the position**.** It changes the direction of the force just like in the flagpole**. A movable pulley** is a pulley in which only one of the ropes or chains is attached to a fixed object, like a wall or a beam. It is free to move up and down or left and right. Both the load and the movable pulley move from one point to another. **Block and tackle pulley** is a combination of fixed and movable pulleys used to help a person lift heavy objects, as in cranes and lifts. The types of pulleys are summarized in the table below:

Types of Pulley	Description	Examples
Fixed pulley	Attached to something that does not move in the position	flagpole
Movable pulley	Movable pulley system which requires less force. It is free to move up and down or left and right.	zipline
Block and tackle	Combination of fixed and movable pulleys and used to lift heavy objects	cranes and lifts

ACTIVITY 1

A. Directions: Look at the illustration below. What simple machine do you think is it? What does it do? Complete the table on the right.

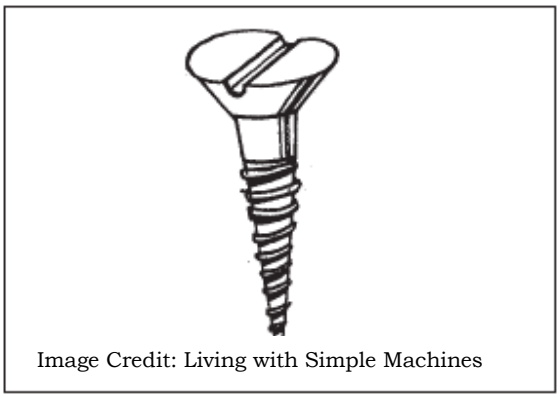


Image Credit: Living with Simple Machines

Words to describe this simple machine	Uses for this simple machine

B. Answer the following questions:

1. You probably observe in the drawing that a screw has threads in it. Try to imagine a spiral staircase or spiral ramps on parking spaces in malls. Are they like the threads in a screw? With this similarity, what can you say about screws and inclined planes?

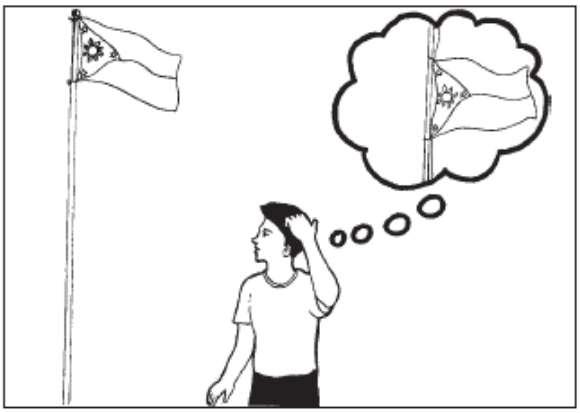
2. Cite three (3) examples of objects that use screws in making our work easier.

REMEMBER

A **screw** is an inclined plane wrapped around a central cylinder. The screw fastens things driven into the wood, like nuts and bolts. Other examples of screws are *drill bits* and jackscrews. Drill bits are screws used to make holes. A *jackscrew* is used to lift heavy objects like a car jack.

ACTIVITY 2

A. Directions: Look at the cartoon below. Describe how you think the flag got up the pole.



How did the flag end up there?

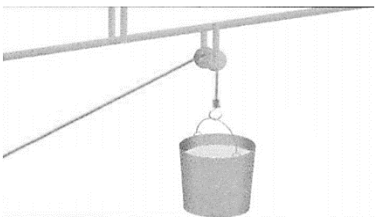
_____
_____
_____
_____
_____
_____
_____
_____

Picture Credit: Living with Simple Machines

B. Directions: Answer the following questions.

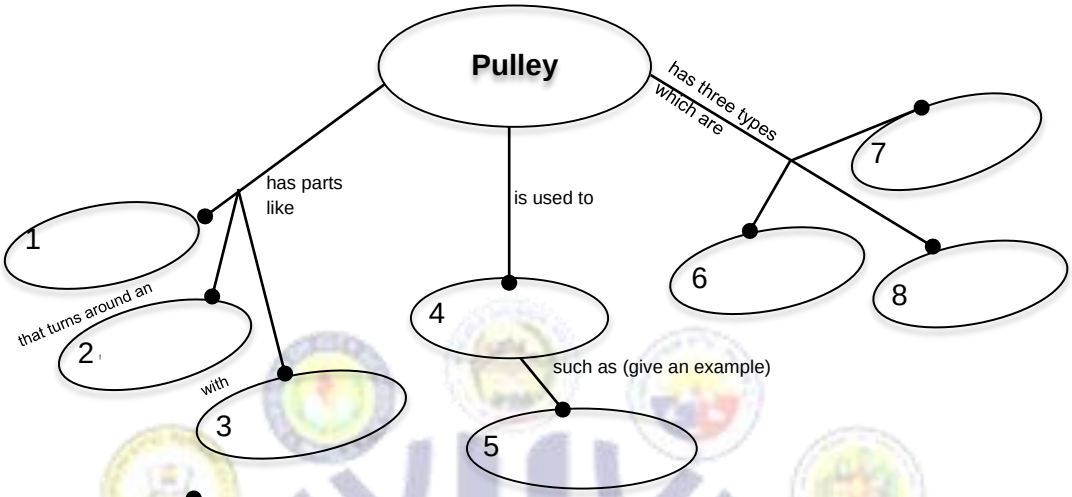
1. Shown below are two activities that make use of the simple machine present in the flagpole above. Write down the things that these objects have in common.

https://commons.wikimedia.org/wiki/File:Zipline_in_Lastiver_-_11.jpg



https://lrmds.deped.gov.ph/detail/17234

2. Complete the pulley concept map below.



REMEMBER

A **pulley** is a grooved wheel that turns around an axle with a rope or a chain that is used to lift objects. There may be several of these mounted in a framework called a **block.** There are three types of pulley: fixed pulley, movable pulley, and block and tackle.

CHECK YOUR UNDERSTANDING

Directions: Match the description in column A with the kind of simple machines in column B. Write your answer on the space provided.

.

A	**B**
_____1. a pulley that is attached to something that does not move	A. movable pulley
_____2. inclined plane wrapped around a central cylinder	B. fixed pulley
_____3. combination of movable and fixed pulleys used to lift a heavy object as cranes and lifts	C. screw
_____4. both the load pulley and the load move from point to another	D. pulley
_____5. a grooved wheel that turns around an axle with a rope or a chain used to lift objects	E. block and tackle pulley

POSTTEST

Directions: Read each question carefully. Write the letter of the correct answer on the blank before each number.

____ 1. A big ship will unload big crates at the pier. Which of these machines will the men use?
A. lever B. screw C. fixed pulley D. block and tackle pulley

____ 2. Which of the following makes use of the principle of the screw?
A. knife B. bulb C. scissors D. can opener

____ 3. To make sure that the frame is safely hung on the wall, which one is best to use?
A. nail B. screw C. wire D. rope

____ 4. In a construction site, how will the workers transfer mixed cement from the ground floor to the next floor?
A. by using a wedge C. by using a screw
B. by using a pulley D. by using a wheel and axle

____5. In which of the following activities should a screw be used?
A. moving the table C. arranging the books
B. cutting the wood D. assembling parts of the electric fan

LESSON 2: Wheel and Axle

EXPECTATIONS

Every day you use simple tools to help you do your work easier. Most of the things in your house are examples of simple machines.

In this lesson, you will describe the characteristics and functions of a wheel and axle.

PRETEST

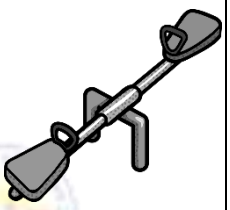
Directions: Determine whether each activity below requires the use of the wheel and axle or not. Draw a ☆ if it requires the use of wheel and axle and a ♡ if not.

_____1. Transferring the chairs to the next room.
_____2. Beating dozens of eggs.
_____3. Getting water from the fountain.
_____4. Unlocking and opening the door.
_____5. Riding a bicycle.

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
Grades 6 SCIENCE

LOOKING BACK TO YOUR LESSON

Look at the pictures. Identify what simple machine each picture represents.

 https://commons.wikimedia.org/wiki/File:Philippines_flag.jpg **A**	 https://pixabay.com/illustrations/ladder-steps-climb-stairs-up-high-4006376/ **B**	 https://pixabay.com/illustrations/axe-log-isolated-tribe-woodworks-2513045/ **C**	 https://pixabay.com/vectors/playground-seesaw-teeter-toys-1295285/ **D**	 https://pixabay.com/vectors/amigos-figures-hardware-nut-screw-2024565/ **E**

BRIEF INTRODUCTION

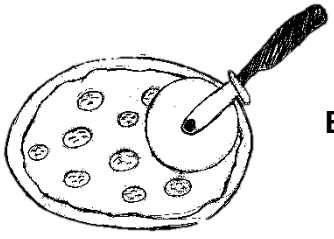
Every time you open and close your door, you use a doorknob. Just like when you go to the street, you see some children enjoying themselves on their skateboards and toy scooters. The doorknob, skateboards, and toy scooters have something in common. They all have wheels and axles. These devices utilize the wheel and axle in manipulating the force exerted and make movement faster.

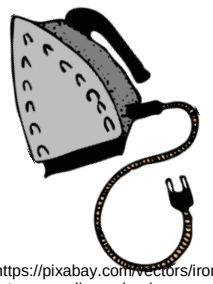
The wheel and axle can be used to lift heavy objects, move people fast, and as parts in more complex machines. In using the wheel and axle, force is applied either to the wheel or to the axle. Examples of these are given below:

Force applied to the wheel	Force applied to the axle
doorknob	bicycle
screwdriver	Ferris wheel

ACTIVITY 1

A. Directions: Which activities below use the wheel and axle? Choose the letter of your answer.

A. 

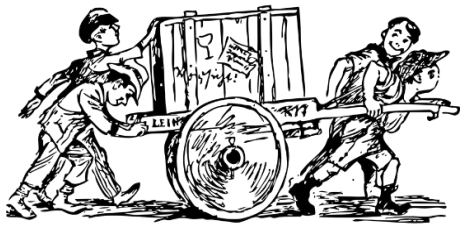
B. 

https://pixabay.com/vectors/iron-steam-appliance-ironing-

C. 

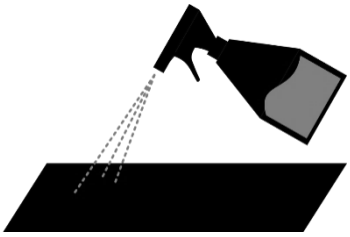
https://pixabay.com/vectors/ferris-wheel-amusement-park-

D.



https://pixabay.com/vectors/men-pulling-cart-black-and-white-37538/

E.



https://pixabay.com/vectors/spray-bottle-surface-disinfecting-5626565/

B. Directions: The following are examples of wheel and axle. Classify them according to where the force is applied when used. Write your answers in the appropriate box below.

Ferris wheel	bicycle	doorknob	screwdriver
electric fan	pizza cutter	car tires	windmill

Force is applied to the wheel	Force is applied to the axle

C. Based on Parts A and B, describe what a wheel and axle is and cite some of its uses.

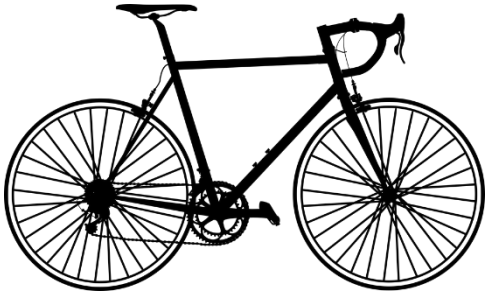
REMEMBER

Wheel and Axle is a simple machine consisting of a round object (wheel) and a cylindrical object (axle). In using the wheel and axle, force is applied either to the wheel or to the axle. Examples of objects that use wheel and axle are toy scooters, bicycles, and pizza cutter.

CHECKING YOUR UNDERSTANDING

Look at the pictures below and label where the wheel and axle are located.

A.



https://pixabay.com/vectors/bicycle-bike-silhouette-cycling-4917180/

B.

https://pixabay.com/vectors/ferris-wheel-amusement-park-4126146/

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
Grades 6 SCIENCE

POSTTEST

Directions: Read the questions carefully and write the letter of the correct answer on the space before each number.

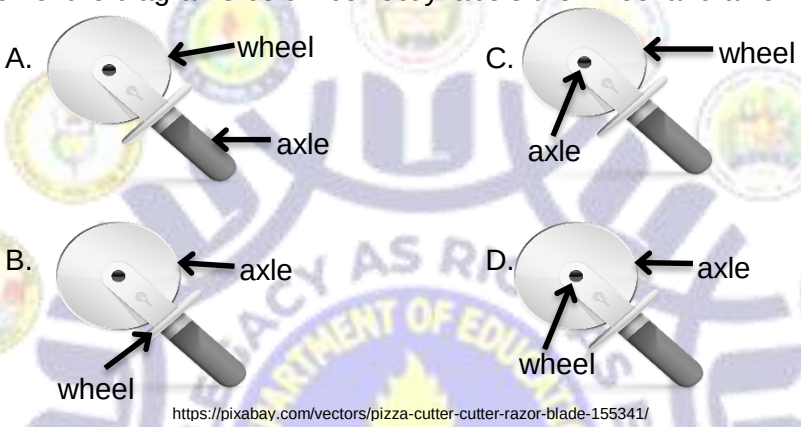
_____1. In which situation are the wheel and axle used?

A. going to the store using a bicycle C. running to the store
B. writing assignment using a pencil D. walking to the store

_____2. Which of the following playground equipment is an example of a wheel and axle?

A. merry-go-round B. seesaw C. slide D. swing

_____3. Which of the diagrams below correctly labels the wheel and axle in a pizza cutter?



https://pixabay.com/vectors/pizza-cutter-cutter-razor-blade-155341/

_____4. How does an eggbeater utilize its wheel and axle?

A. by applying force to the wheel C. by pressing
B. by applying force to the axle D. by squeezing

_____5. Which of the following are the characteristics of wheel and axle?

I. It has two parts. III. It helps us in many ways.
II. It is a simple machine. IV. When the wheel turns, the axle does not turn.

A. I & II B. I & III C. I, II & III D. I, II & IV

REFERENCES

n.d. *Living with Simple Machines.* Department of Education. Accessed December 2020. https://lrmds.deped.gov.ph/detail/1506.

n.d. *BEAM 5 Unit 5 DLP 40: Simple Machines.* Department of Education. Accessed January. https://lrmds.deped.gov.ph/detail/6373.

Ortega, F. *Simple Machines.* Department of Education. Accessed February. https://lrmds.deped.gov.ph/detail/17234

Philippine Flag. https://commons.wikimedia.org/wiki/File:Philippines_flag.jpg

Ladder. https://pixabay.com/illustrations/ladder-steps-climb-stairs-up-high-4006376/

Axe. https://pixabay.com/illustrations/axe-log-isolated-tribe-woodworks-2513045/

Seesaw. https://pixabay.com/vectors/playground-seesaw-teeter-toys-1295285/

Screw. https://pixabay.com/vectors/amigos-figures-hardware-nut-screw-2024565/

Flat iron. https://pixabay.com/vectors/iron-steam-appliance-ironing-

Ferris wheel. https://pixabay.com/vectors/ferris-wheel-amusement-park-4126146/

Men pulling cart. https://pixabay.com/vectors/men-pulling-cart-black-and-white-37538/

Ferris wheel. https://pixabay.com/vectors/ferris-wheel-amusement-park-4126146/

Pizza cutter. https://pixabay.com/vectors/pizza-cutter-cutter-razor-blade-155341/

ANSWER KEY

LESSON 1: Screw and Pulley

Pretest

1. D 2. B 3. B 4. D 5.C

Activity 1

A. Possible Answers:

Words to describe this simple machine	Uses for this simple machine
Cylindrical threads	Keep things in place Join two materials together

B. 1. The screw is like an inclined plane wrapped around a cylinder.
2. Answers may vary. Possible answers – bottle cap, jar lid, faucet, end of a light bulb

Check your Understanding.

1. B 2. C 3. E 4. A 5. D

Post Test

1.D 2. B 3. B 4. B 5. D

LESSON 2: Wheel and Axle

Pretest

1. 2. 3. 4. 5.

Looking Back

1. pulley 2. inclined plane 3. wedge 4. lever 5. screw

Activity

A. A, C, D

B. Force applied to the wheel: windmill, pizza cutter, doorknob, screwdriver
Force applied to the axle: electric fan, Ferris wheel, bicycle, car tires

C. A wheel and axle is a simple machine consisting of a round object (wheel) and a cylindrical object (axle). It is used in moving objects and people and as parts of more complex machines.

Checking your Understanding

A.

Post test

1. A 2. A 3. C 4. B 5. C

Looking Back

Lever	Wedge	Inclined plane
broom spoon seesaw wheelbarrow	knife icepick	stairs ladder ramp

Activity 2

A. A rope connected to something that changed the direction of the force applied raised the flag up the pole.

B. 1. They both use a grooved wheel that turns around an axle with rope or belt wrapped around the wheel.

2. 1-grooved wheel, 2- axle, 3 – rope, chain, or belt, 4 -lift objects, 5- (answers may vary) ex: ziplines, 6 – fixed pulley, 7 – movable pulley, 8- block and tackle *(nos. 6-8 may be in any order)*

Post Test

1.D 2. B 3. B 4. B 5. D