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|  | PLTW_M_L_4CP |

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| **Activity 5.3.2 Simple Machines Scavenger Hunt** |

Introduction

Simple machines are devices that have been used for centuries. Each one makes work easier. Simple machines provide a trade-off between the force applied and the distance over which the force is applied. There are six simple machines.

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| The inclined plane is a plane surface set at an angle other than a right angle against a horizontal surface. The inclined plane overcomes a large resistance by applying a small force through a longer distance to raise the load. It is easier to walk up the inclined steps than it is to climb the vertical wall. | | | | |  |
|  | A wedge is an inclined plane that moves. Most wedges are combinations of two inclined planes. Generally a wedge is used to split, cut, divide, or wedge apart another object. The axe blade makes it easier to split wood. | | | | |
| A screw is another form of an inclined plane. The threads  on a screw are wrapped around a cylinder to form a spiral. The screw is used when a very large mechanical advantage is needed in a small space. This wrench is used to convert rotary motion into linear motion. The worm gear locks in place so that the wrench opening does not loosen. | | | | |  |
|  | | A lever is a stiff rod that rotates around a pivot point. The pivot point is called the fulcrum. The object moved by the lever is called the load. The closer the object is to the fulcrum, the easier it is to move. Have you ever sat on a seesaw with someone whose weight is not the same as yours? | | | |
| A wheel and axle is a lever that rotates around a center point (fulcrum) 360 degrees. The effort or resistance force can be applied either to the outer wheel or the inner wheel (axle). | | | |  | |
|  | | | The last simple machine is a pulley. A pulley is a chain, belt, or rope wrapped around a grooved wheel. A pulley is used to change the direction of a force. If multiple supporting ropes are used, a pulley can change the amount of force needed to raise an object. | | |

Simple machines are "simple" because most have only one moving part. Some are so simple that they don't have any moving parts! When you put simple machines together, you get a complex machine, like a lawn mower or a car. Remember that a machine is any device that makes work easier. Work is performed when an object moves.

It is important to know that when you use a simple machine, you are actually performing the same amount of work, but it seems easier. A simple machine reduces the amount of effort needed to move something, but you wind up moving it a greater distance to accomplish the same amount of work. So remember, a trade-off of energy does occur when you use simple machines.

In this activity you will locate as many simple machines as you can in your school.

Equipment

* GTT notebook
* Pencil

Procedure

In your school there are examples of each of the six simple machines. Name as many as you can that you see throughout the day. Identify their location. This activity will be due at the beginning of your next class period. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (fill in date due.)

\* Screws can only be used in a non-hardware context. For example, you can list them if there is a screw-type can opener in the cafeteria, but not as a screw in the door hinge.

1. Only things found in the school count. You cannot bring items to school.
2. You may continue on your own paper if you do not have enough room on the chart.
3. For full credit on this assignment, you must find at least one example of all six simple machines. You must find simple machines in at least three different locations, complete the chart, and answer the conclusion questions accurately and neatly.

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| # | Type of Simple Machine | Example of Simple Machine | Location: Room Number and/or Name |
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1. Bring an example of a simple machine to class that you can share with your classmates.
2. Describe the type of simple machine that you brought in to share with the class. What type of simple machine is it? What is its purpose? Where did you find it? How do you think it makes work easier?

Conclusion

1. Which type of simple machine was the most difficult to locate? Why?
2. In which room did you find the most examples of simple machines?
3. Which simple machine example did you observe in several different locations?
4. Which type of simple machine seems to be used most often? Why?
5. Which type of simple machines seems to be used least often? Why?