AGRICULTURAL MECHANICS MASTER

Welcome to the wonderful world of machines and mechanics! Chances are you've been in a car at some point this week. You've probably seen a grown-up using a kitchen gadget, such as an electric mixer or a toaster. We see machines every day! They make many of the tasks we do easier. But did you know that farmers and ranchers rely on machines every day to get their job done? Machines help farmers and ranchers care for animals and work the land while conserving our resources. Many of the complex machines we know today have evolved because of the understanding of six simple machines: a pulley, a lever, a wedge, a wheel and axle, an inclined plane and a screw.

Directions

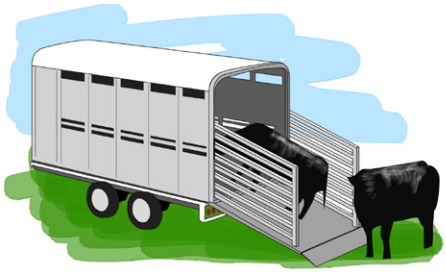
You are now the head mechanic on a farm! You have a lot of rookies on the team who need you to show them the ropes. Help them to understand the basics by completing the activity below.

1. Look at the words in the vocabulary box.
2. Check out the pictures of machinery from the farm, and label each of the images using a word from the vocabulary box.
3. Use the "Machine Master" guide if you get stuck!

Vocabulary Box

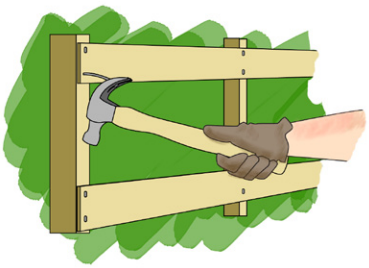
INCLINED PLANE	WEDGE	SCREW
WHEEL AND AXLE	PULLEY	LEVEL

1. _____

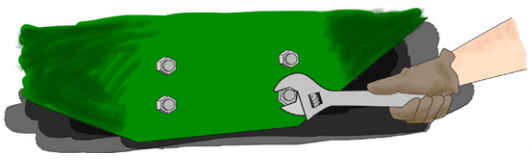


2. _____

3. _____



4. _____

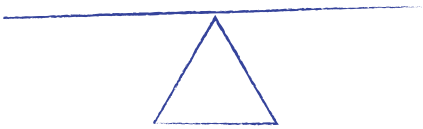


5. _____

6. _____

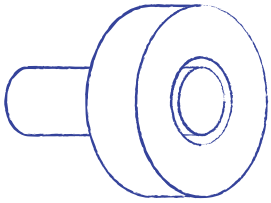
Answers: 1) wheel and axle 2) inclined plane 3) wedge 4) lever 5)screw 6) pulley

MACHINE MASTER



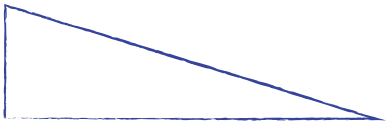
Lever

A lever is a simple machine that consists of a solid object (usually a bar) and a pivot. If you push down on one side of the lever, the other side moves up while the pivot point takes most of the weight. This makes it easier to move large or heavy objects. Often times, people will use the claw of a hammer or a crow bar to pry something apart, or push down on the handle of a shovel to pull dirt up from the earth. Even when you are on the seesaw at the park – you are actually taking a ride on a lever!



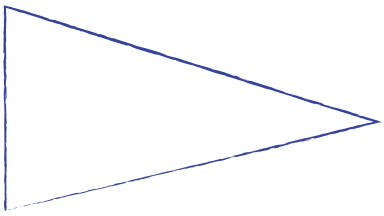
Wheel and Axle

A wheel is something that is round and is attached to a bar or solid object in its center. This object is called the axle. When the wheel rolls, the axle rotates, which magnifies the force. Many of our modes of transportation (form a bicycle to a school bus) utilize a wheel and axle to move about the road or sidewalk. We also see this simple machine in the kitchen - if you've seen a grown-up roll out dough using a rolling pin, you've seen them flattening the dough with a type of wheel and axle!



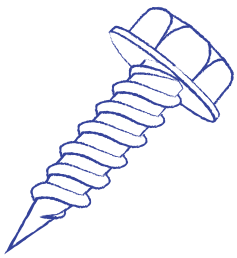
Inclined Plane

An inclined plane is a surface that is set at an angle. This makes it easier to move things, including heavy boxes or even animals up and down more easily. Think about how much easier it would be to roll a cart up a ramp than to lift it up straight onto the back of a truck. Inclined planes are used for work and play! If you or a friend has ever skated or rode their bike off of a ramp, you've witnessed one of the many uses of an inclined plane.



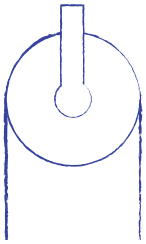
Wedge

A wedge is a double-inclined plane (both sides are inclined) that is used to lift and separate an object or push two objects apart. If we look closely, we can see wedges all around us! Lots of people use an axe to chop wood and when you see somebody use a knife to cut into a piece of cake or split a peanut butter and jelly sandwich, they are using the sharp edge of knife – which is actually a wedge!



Screw

A screw is a long cylinder that has an inclined groove along its surface (appearing to "wrap around" the shaft). When you twist the screw, the groove pulls or pushes the object. When we tighten the lid on a soda bottle or jar of jelly, it is a screw that helps us to get the lid extra tight! The most obvious example of a screw would be…a screw! Lots of structures use metal screws to hold them together and when somebody tightens the bolts on a piece of equipment, they are using a screw as well!



Pulley

A pulley is a wheel with a groove along its edge, where a rope, string or cable can be placed. The rope can have a hook or an object on one end of it. When force is applied to the opposite end, it allows you to lift heavy objects and the wheel takes most of the weight! Cranes use pulleys to lift heavy objects utilizing less energy and force. If you haven't seen somebody using a crane, look for a pulley in your own home. When somebody pulls on the string to raise the blinds on a window, it is a pulley that allows them to let the sun in so easily!