



Maggie's Activity Pack

Name _____

Date _____

Finding Out About Simple Machines: Pulleys

What simple machine is used by these fishers who live on Lake Tonle Sap in Cambodia? This fish trap is powered not by gasoline or electricity, but human muscle power, aided by the simple pulley. A pulley is one of six simple machines that we use in everyday life. You may not think about it much but you have seen pulleys all around you. As you read about these helpful objects, try to make a list in your mind of all the pulleys you have seen.



What Is a Pulley?

Think about a small wheel with a groove. There is a rope threaded through the groove. Pull the rope. This is a pulley at work. You may have seen a pulley like this on a sailboat. Sailors pull the rope. This lets out or brings in a sail.

There are two kinds of pulleys. A fixed pulley might be used on a flagpole to move a flag up and down. A moveable pulley attaches right to whatever you are trying to lift.

How Does a Pulley Help?

A simple machine such as a pulley can make our lives easier. Imagine trying to lift a huge box onto a high shelf. A pulley can help you. Wrap a rope around the box. Attach a pulley to the rope. This means you don't have to use as much force to lift the big box. The pulley cuts down on friction. It makes it easier to lift an object. This is because it is easier to pull something down than to lift something up. Use more pulleys and you may have even more force. This is one way pulleys help.

Another way pulleys help us is to serve as quick ways to get goods to a different place. Imagine you are working to build a tall building. Other workers could use a pulley system to get you the tools you need. Sometimes people dry their clothes on a line between tall buildings. A pulley helps to move the line so that the clothes can be hung out and taken in.

How Early Were Pulleys Used?

It may not surprise you to learn that many people think pulleys were first used around a shipyard. Some historians think a Greek mathematician and scientist named Archimedes did many experiments including work with simple machines. Archimedes lived around 250 B.C.E. and may have used a pulley to pull a ship from the harbor onto land. It is even thought that those huge stones sitting mysteriously at Stonehenge in England were dragged into place with the use of pulleys. Today pulleys are used to help move the space shuttle from place to place.

What Should We Know About Pulleys?

Even though pulleys are simple machines, we still need to be careful around them. You should take care not to stand under something that is being lifted with a pulley. You also need to be careful with clothing, your hair, and fingers so that nothing gets caught in a pulley.

Thinking About Pulleys

Below are some “cards” with answers to questions about pulleys. Read each answer. Then write a good question on the next “card.”

A - This pulley attaches to what you are trying to lift.

A -

B - He was a Greek mathematician and scientist.

B -

C - You can hang out clothes or pull them in.

C -

D - There are six of them.

D -

E - It may have been around a shipyard.

E -

F - They may have been dragged into place with the help of pulleys.

F -

G - You thread it through a groove.

G -

H - You do not want to stand under something being lifted with a pulley.

H -

I - When you are looking at a flagpole.

I -

J - You can use more pulleys.

J -

What was the most interesting thing you learned about pulleys?



Dear Colleague,

I remember as I stood on Lake Tonle Sap and looked at this pictured pulley system, I thought about the WAP that I would eventually write. I saw this as a good example of simple machines in action. But then I started to look around and saw so many wonderful examples of simple machines. I was amazed when I saw one of my student teachers teach her students about the screw. I never realized all the wonderful things that could be done with such a VERY simple machine! And then to further the hands-on learning, this student teacher had children use a simple piece of paper and simple pencil to make their own screw...talk about reinforcing the simplicity of it all for these very needed and helpful machines.

You may want to have children think about simple machines (or pulleys in particular) and ask them to make a list of all the places they have seen simple machines at work in daily life. We are so lucky today as there are numerous websites that provide wonderful videos of simple machines at work. I suggest viewing one of these videos and then asking children to make their own simple machine.

Before making a pulley system, ask children to try and lift a small bucket filled with dirt. Then model putting together your pulley system with a pulley, rope, and the bucket. Put the rope over a broom handle and have students pull down on the rope. This will help your class feel the power of a pulley.

In this activity, we have purposely provided complete sentence answers for your children as an appropriate model. You may want to point this out to your class and discuss the format of these answers. You can also use this type of activity as a template to help children better comprehend or review subject-area content. You may even want to use index cards and pair children to write questions and answers. Then use this "deck of cards" to play learning games. You may even want to use a child-created game board.

Happy teaching,
Kathy

Answer Key:

- A. What is a moveable pulley?
- B. Who was Archimedes?
- C. What would a clothes line pulley help with?
- D. How many simple machines are there?
- E. Where could a pulley first have been used?
- F. How might the big stones that make up Stonehenge have been dragged into place?
- G. What do you do with a rope to set up a pulley system?
- H. What is one safety rule when you are near a pulley?
- I. Where is one place you can see a fixed pulley?
- J. If you need more force what can you use?

Goals:

Students will read a nonfiction article about pulleys, including the mechanics of these simple machines and interesting historical facts. As a follow-up, students write questions for answers that are presented in complete sentences. The activity correlates with Content Standard B, Physical Science, of the National Science Standards.