Hand Crank Winch

Do you want to make something easier to do? Then a **simple machine** might just be the answer! *Simple machines* have few or no moving parts and they work by changing the direction of a force or the amount of force needed to do something.

Make a simple machine by engineering a model of a hand crank winch!

Materials:

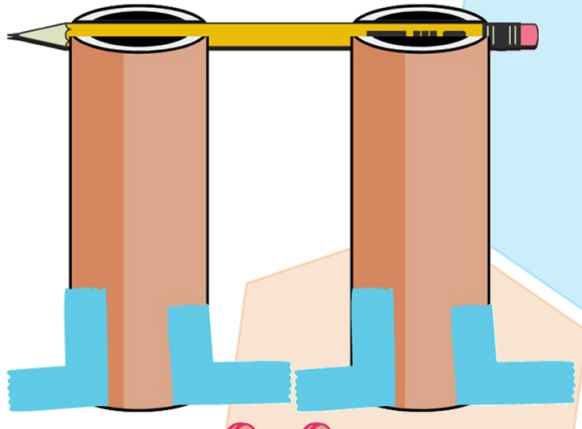
- 2 Cardboard Tubes
- Pencil or Straw
- String
- Tape
- Scissors
- Small Object

Optional Materials:

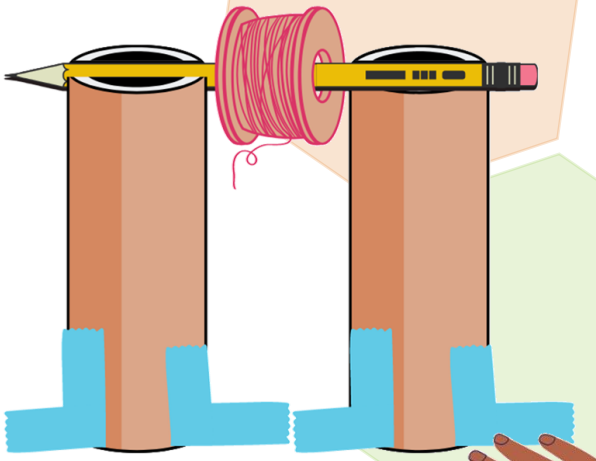
- Spool

Procedure:

1. Cut two slots at the top of each cardboard tube that are wide enough for your pencil or straw to fit in.

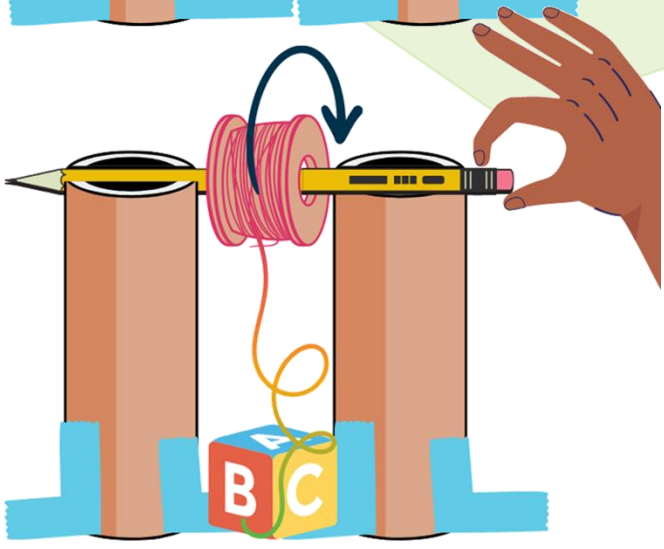


2. Tape the two cardboard tubes to a flat surface. Use your pencil or straw to space the tubes apart.



3. If you are using a spool, place it on your pencil or straw and then tape one end of the string to the spool. If you are not using a spool, tape one end of the string to your pencil or straw.

4. Tie the other end of the string to the small object you are using.



5. Test out your hand crank winch by turning your pencil or straw. What happens? Do you think a machine like this would help lift heavy things?

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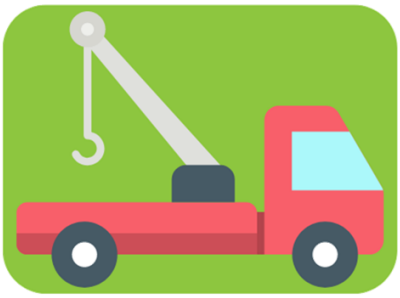
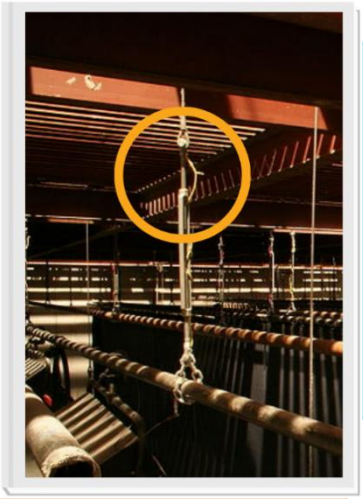


What's happening? A **winch** is a mechanical device that is used to pull in (wind up) or let out (wind down) or adjust the tension of a rope or wire rope. In its simplest form, it consists of a spool attached to a hand crank. Winches are the basis of such machines as tow trucks, steam shovels, and elevators.

A **fly** system or rigging system is used in theaters to safely change scenery during a performance or for adjusting the lighting. The lights or scenery are attached to long pipes called **battens**. When lowering these heavy *battens*, a winch is used to assist the **flyman**. The *flyman* always calls out "Heads Up!" to make sure everyone is out of harm's way.



DID YOU KNOW?

An **engineer** is someone who invents, designs, and maintains machines, structures, and data systems! If you liked exploring this activity, maybe engineering is for you!