



# DRAG RACING SPOOLS

Off to the races! Expand your physics knowledge while designing a wooden spool that uses mechanical energy to drive across the ground.

## MATERIALS:

- Golf pencil
- Rubber band (size #30)
- Small paperclip
- Small washer
- Tape
- Wooden spool

## TEKS:

**SCI 4/5.4 A:** The student is expected to explain how scientific discoveries and innovative solutions to problems impact science and society.

**SCI 4.8 A:** The student is expected to investigate and identify the transfer of energy by objects in motion, waves in water, and sound.

**SCI 5.7 A:** The student is expected to investigate and explain how equal and unequal forces acting on an object cause patterns of motion and transfer of energy.

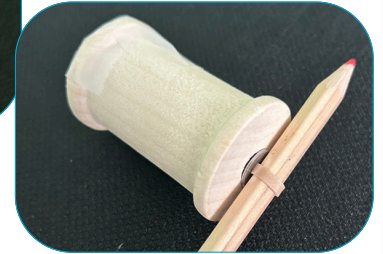
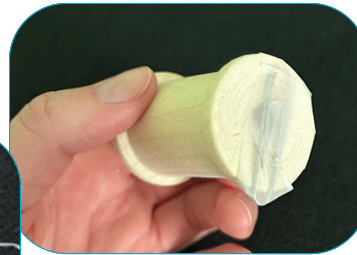
## HOW TO:

See page 2 for pictures of each step!

1. Thread the paperclip onto the rubber band.
2. Holding one end of the rubber band, push the paperclip through the hole in the middle of the spool until it dangles out of the opposite end of the spool. *\*The golf pencil can help push the paper clip through!*
3. Adjust the paper clip so it lays flat against the end of the spool. Place a piece of tape over it to hold the paperclip in place on the spool.
4. Thread the loose end of the rubber band through the hole in the middle of the small washer.



5. Insert the golf pencil through the loop of the rubber band.
6. Wind up your drag racing spool by spinning the pencil. Place the spool on a flat surface, release the pencil, and watch it move!



## STEM EXPLANATION:

How did a rubber band, paper clip, washer, and pencil make the spool move? It's all about energy! Twisting the pencil wound the rubber band inside the spool, storing energy in the rubber band as **potential energy**. When you released the pencil, this stored energy turned into **kinetic energy**, which made the car move!

Each time you twisted the pencil, you added more potential energy to the drag racing spool. The more potential energy the spool has, the more kinetic energy it can use to move! How can you use this knowledge to make your spool travel even faster?

## CAREER: MECHANICAL ENGINEER

Mechanical engineers create machines and tools that move and work, like cars, robots, and engines.



### MEET DEBBIE STERLING!

Debbie is an engineer, entrepreneur, spokesperson, and a leader in the movement toward getting girls interested in STEM. In 2015, Debbie was honored by the National Women's History Museum with a "Living Legacy" Award for her work to empower girls around the world. Debbie received her degree in Engineering at Stanford University in 2005, and she is the founder and CEO of GoldieBlox, a company that inspires girls to explore STEM through creative toys.



Learn more about Debbie!

### RESOURCES

<http://www.physicsclassroom.com/class/energy/>  
[www.ifthencollection.org/](http://www.ifthencollection.org/)