

WORKSHOP EXTENSION ACTIVITY

Built by The Home Depot Kids Workshop

March 2023: Pinball

Ages 5-12

CONNECT.

Put on your sneakers and slide your foot across your kitchen floor. Is it easy or hard to move your foot?

Then remove your sneakers but keep your socks on. Slide your foot again across the floor. Is it easier or harder to move your foot than it was before? Why may this be the case?

INVESTIGATE.

It all comes down to friction! When an object wants to move in one direction, friction is the force that acts in the *opposite* direction and slows or even stops the object from moving. Different materials will have different amounts of friction between them.

Let's see if or how the friction of different surfaces affects the movement of your pinball game.

You'll need:

- Your pinball ball
 - A piece of wood at least two feet long and six inches wide
 - Tape
 - Different materials to cover the wood, such as:
 - Carpet samples
 - Fabric
 - Aluminum foil
 - Sandpaper of different grades
1. Choose a spot to prop the piece of wood on so it's at a gentle incline. The ball should roll when placed at the top, but it shouldn't move too quickly. Observe the ball several times as it rolls down the ramp.
 2. Then cover the wood with the materials you selected, one at a time. It's okay if the board isn't entirely covered, but try to create a path that the ball can roll down.
 3. Observe how the ball rolls over the material. Does the material seem to add friction, reduce friction, or change how the ball rolls?
 4. Once your observation is complete, remove the material and sort it into one of three categories: Added Friction, No Difference, Reduced Friction.
 5. Then move on to the next material and repeat steps 2, 3, and 4 until you've tested and sorted all of your materials.

INNOVATE.

Now apply what you've learned as you innovate your pinball game by changing how the ball rolls.

You'll need:

- Your pinball game
 - The materials you sorted above
 - Scissors
 - Duct tape
1. To begin, play the game a couple of times without making any changes.
 2. Think about what you know about each material's texture and where you'd like to make the game easier and harder. Then carefully cut out the materials and attach them to the game board using loops of tape. Be sure to keep the holes open.
 3. Once the board is entirely covered, give the game another try and see if the textures impact the game in the way(s) you anticipated. Make changes until you're happy with the result!



In your activity, you learn about friction, which is an important part of an Electrician's job. An **Electrician** is an expert at electrical wiring and helps keep the power on.

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