

Materials Investigation Worksheet

Does sole material affect friction?

Objective: Modify three soles with three different materials to determine the effect of each material on friction.

Prepare your models

1. Using the shoe print template provided, make three shoe prints on cardboard or card stock.
2. Select three different materials to use for your soles.
3. Cover the entire bottom of each shoe print cutout in one of your chosen materials. It is important that the material covers the entire sole.

Collaborate: Compare your designs with a friend's. Are there any similarities? How did they decide on their designs?

Test your models

1. Attach a weight to the top of the model.
2. Let the model slide down the ramp, and time how long it takes to reach the bottom. Record the time in the table below.

Extension

Calculate the speed of each model using the formula $Speed = Distance/Time$, and record the speed.

Model	Material	Time (s)	Speed (m/s)	Notes
Design #1				
Design #2				
Design #3				

Reflect: What conclusions can you draw from your data? *Remember, a slower speed indicates an increase in friction.*

Use the grid below to create a bar graph of your data.

