

Objective

By the end of this lesson, the student will understand the basic principles of physics involved in sledding, including concepts such as friction, gravity, and motion. They will also explore how different sled designs can affect the sledding experience.

Materials and Prep

- A sled (or any makeshift sled, like a cardboard box)
- Snow or a safe slope (if available)
- Measuring tape (optional, for measuring distances)
- Notebook and pencil for observations
- Warm clothing for outdoor activities

Before the lesson, ensure that the sledding area is safe and that the student is dressed appropriately for the weather. Discuss the importance of safety while sledding.

Activities

• Sled Design Challenge

Have the student design their own sled using materials they can find around the house. They can draw their design and explain how it will work. Discuss how different shapes and materials might affect speed and control.

• Friction Experiment

Using the sled or a makeshift one, have the student slide down a hill and observe how far they go. Then, try different surfaces (like grass, snow, or a smooth path) to see how friction affects the sled's speed. They can record their findings in a notebook.

• Gravity and Motion Discussion

After sledding, sit down and discuss what they experienced. Ask them questions about how gravity helped them go down the hill and how they felt about the speed. This can be a fun way to relate their experiences to scientific concepts.

Talking Points

- "What do you think happens when you go down a hill on a sled? That's gravity pulling you down!"
- "Can you feel how different surfaces affect how fast you go? That's called friction!"
- "Why do you think some sleds are faster than others? It could be the shape or the material!"
- "What would happen if we tried to sled on a flat surface? Would we go as fast?"
- "How does the angle of the hill change your speed? Steeper hills are usually faster!"
- "Did you notice anything surprising when you went sledding? Sometimes science can be surprising!"
- "How can we make our sledding experience safer? Safety is super important when having fun!"
- "Why do you think people enjoy sledding so much? It's a fun way to experience motion and speed!"
- "What other winter activities do you think use similar science principles? Ice skating or skiing!"
- "How can we use what we learned today in other areas of science or sports?"