

January 16 -

It is that time of the year. Time to hit the slopes. Whether you snowboard or ski, this is the time of year for you! While you are out hitting the slopes, you can also learn about science. Have you ever wondered why people prefer to have their skis or snowboards waxed before they head out? Does it really make a difference? Let's investigate.

***Remember to ask an adult for help.**

Materials

paraffin wax
2 ice cubes
2 short plastic glasses
2 scrap pieces of wood (approximately 60 centimetres long)
helper/partner

Procedure

1. Take one of the boards and rub it down with the paraffin wax. This may take some time, as you want it to be quite thick.
2. Take the piece of wood without the wax and place it on the table.
3. Have your partner hold the ruler on the side of the piece of wood.
4. Hold the piece of wood approximately 2 centimetres off of the table.
5. Take one ice cube and place it at the top of the board.
6. Release it.
7. Observe what happens.
8. Lift the board up until the ice cube starts to slide down the piece of wood.
9. Record the height in which the ice cube is able to slide all the way to the end of the board.
10. Repeat with the piece of wood that you waxed.
11. Is there a difference in the heights of the two pieces of wood?
12. Does waxing your skis make a difference?

Explanation

The ice cube should have slid down the waxed board at a lower height. You should have had to lift the unwaxed board up quite high before the ice cube would slide down that board.

By doing this experiment, you also investigated the effect of friction on a moving object. With the rough or unwaxed surface, the friction is much greater. By waxing the wooden board, the surface becomes much smoother. Friction is also decreased, making it much easier for the ice cube to slide down the board. Skiers and snowboarders wax their skis to decrease the amount of friction they experience between their board and the snow. This in turn makes them go faster! Watch out below!

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January 23

This experiment may look easy, but I can guarantee that you may not get the results you think without trying it! It is short and quick, take a minute and start experimenting!

***Remember to ask an adult before doing this experiment.**

Materials

cone shaped cup or funnel

ping-pong ball

scissors

Procedure

1. If you are using a paper cup, cut the tip off of the cup. You will now have a funnel.
2. Drop the ping pong ball into the funnel.
3. Hold the funnel directly over your head and blow into the small end.
4. The objective is to blow the ball out of the funnel.
5. Blow hard and steady. Be careful you do not pass out from blowing too hard!
6. Are you able to blow the ball completely out of the cone?

What is going on?

It should have been impossible for you to blow the ping-pong ball out of the funnel. This is because the passage of air around the ball makes it jump and bounce, but the ball will not be able to leave the funnel.

The ball will not leave the funnel because the air you blow into the funnel surrounds the ball; it does not push the ball up and out of the funnel. The ball will jump up and around in the funnel. At times, it may even appear as if the ball is going to jump out of the funnel. No matter how hard you blow, the ball will not be able to leave the funnel.

In this experiment, you were also testing a principle known as Bernoulli's principle. Bernoulli's Principle states that: the faster the flow of air, the lower the pressure. Try researching Bernoulli's Principle to find out how this principle can be applied to such things as how an airplane can fly.

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January 30

With winter bearing down on us once again, many of you are probably getting outside and enjoying some of the winter sports. One winter sport that amazes me is figure skating. I often wonder how do they keep spinning so fast? They only push off once, but it seems as if they keep spinning forever! I think that we should investigate this further.

*** Remember to ask an adult before doing this experiment.**

Materials

chair that swivels
2 large, heavy books
someone to help you

Procedure

1. Find a large open area or room that you can use. Make sure the chair can turn freely without knocking anything over or breaking anything.
2. Place the chair in the middle of the room.
3. Sit in the chair and place the two books in the middle of your lap.
4. Hold your feet slightly off of the ground.
5. Have your helper push the chair once so that it spins.
6. What happens?
7. Now, sit in the chair, holding one book in each hand.
8. Stretch your arms out and hold them in the air. Hold your feet off of the ground.
9. Have the helper push your chair once again.
10. What happens as you spin this time?
11. Repeat the entire process. This time, hold your arms closer to your body.
12. Keep trying, but change how far out you hold your arms.

Explanation

The first time you spun around in the chair, you should have gradually slowed down and then stopped. When you held the books out, you should have slowed down much more quickly. If you held your arms outstretched slightly, holding the books away from your body slightly, you will actually speed up a little bit.

Whenever something rotates (or spins), it will keep rotating until it comes to a stop. This is also known as the law of angular momentum. Next time you see a figure skater, carefully watch what they are doing. They will start their rotation or spinning with their arms out. As they are spinning, they bring their arms closer to their body, which allows them to spin faster. The closer their arms are to their body, the faster they spin. If they want to slow down, they just stretch their arms out and they reverse the entire process.

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