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Science Action Labs

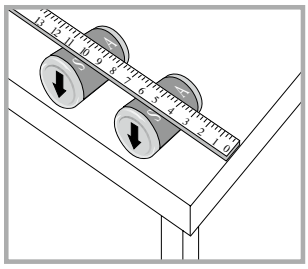
Name _____

NEWTON'S ACTION LAB
Science Puzzlers
1

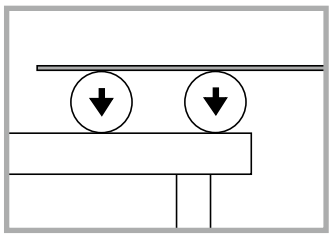
Rolling into Space

Newton's Puzzler Description

Newton has placed two full soda cans on a table. Each can has an arrow marked on it which is pointing down. A yardstick is placed over both cans. The zero end of the yardstick is lined up exactly with the end of the table.



What's the Problem?



The yardstick will be rolled over the cans until the cans make a full turn of 360°. How many inches (centimeters) will the yardstick extend outward from the table after the cans turn completely around?

What Do You Think Will Happen?

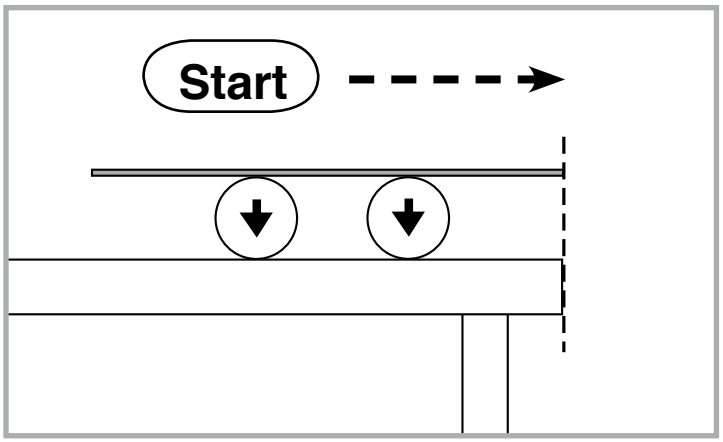
As usual, Newton wants you to solve the puzzle mentally before actually trying it. Here are some helpful hints.

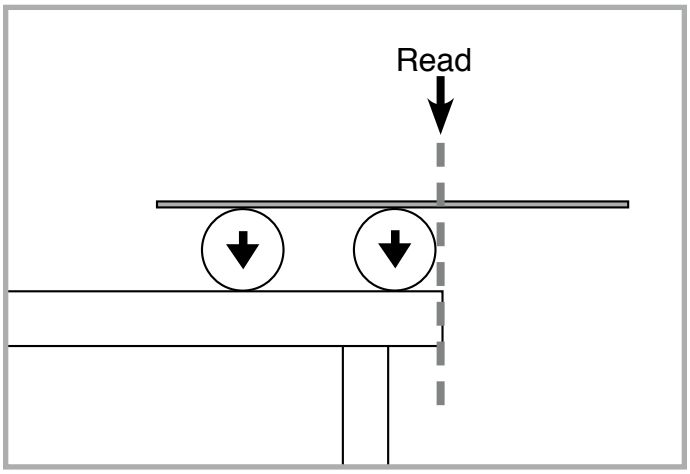
1. You can find the can's circumference by measuring its diameter and using the formula πD (π x Diameter). Example: A can with a 2″ (5 cm) diameter works out to be 3.14 (π) x 2 = 6.28 inches (15.7 cm).
2. You can use a piece of string to measure the can's circumference directly.
3. Write your estimate for the yardstick's extension beyond the table. _____ inches (cm)

Name _____

How to Build Newton's Puzzler

1. Obtain two soda cans and a yardstick.
2. Mark an arrow on the bottom of each can.
3. Place the yardstick over the cans. The zero end of the yardstick should be lined up exactly with the table end.
4. Adjust the cans with the arrows pointing down. The cans shouldn't be too close to the end of the table. Readjust the yardstick so it is lined up exactly with the table.
5. Push down slightly on the yardstick and roll it toward the table end.
6. Stop rolling when the cans have made one complete revolution.

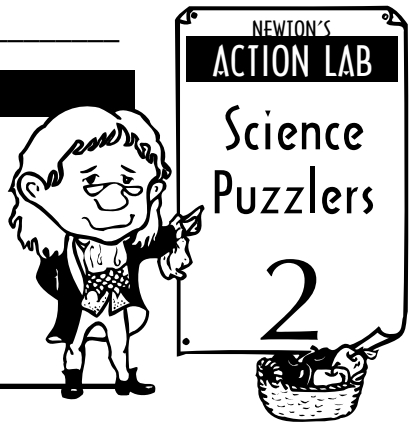




7. Read, in inches (centimeters), the distance the yardstick extends out. _____ inches (cm)

Newton has fooled a lot of people with this puzzler. Before you look in the answer key to find out why your prediction was so far off, try to outsmart the puzzler. You now know how far the board really sticks out. Compare that to your estimate in "What Do You Think Will Happen?" Doesn't that distance give you a clue as to what must have happened?

Name _____



Balloon Puzzlers

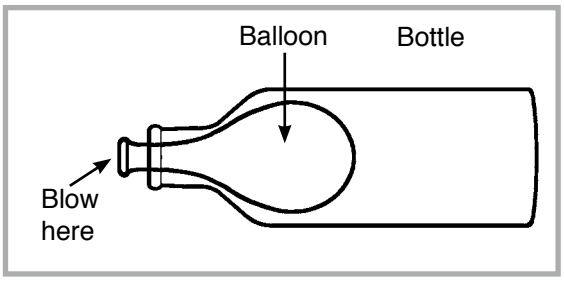
Newton Lost His Balloon

Newton had many balloons at his last birthday party. His favorite was a blue balloon with his name on it. It got free and drifted skyward.

Will Newton's balloon get bigger, smaller or remain the same size as it rises? _____

_____

Balloon in a Bottle



Newton thought that it would look festive to have his birthday balloons blown up inside bottles. The sketch to the right shows what Newton did.

Will Newton be able to blow up a balloon in a bottle?

Try the experiment yourself.

What are your results? _____

_____

_____

Newton learned how to blow up a balloon in a bottle. He used a common straw to help him.

How do you think Newton blew up his balloon using a straw? _____

_____

_____

Try it yourself. If you fail, look in the answer key for help.