



Sent in by Layne and Sam P. of Suffolk, VA



Try It Out!

What You Need

- 12 nickels
- flat, metal spatula

- 1 **Stack** the nickels.
- 2 Use the spatula to push out the **bottom nickel** without knocking over the stack.

Science Scoop

Take a look at the stack of **nickels**—they are at rest, or not moving. Objects at **rest** don't move unless you **push** or **pull** them. So, to make the bottom coin move, you need to push or pull it. To make it move without knocking over the whole stack, you need to push or pull **quickly**. Why? Because of **friction**. Friction is a “**sticky**” force that appears when two objects (like coins) **rub** against each other. If you push the bottom nickel **slowly**, friction helps pull the stack along with it by “sticking” the coins together. If you push the bottom nickel **quickly**, the coins still rub, but the friction force doesn't have time to get the stack moving. So, the coin shoots out without pulling the stack with it.



Now it's time for you to **experiment**. What happens if you stack **other objects** like checkers, washers, or pennies? Or what happens if you stack more than 12 nickels? Try using **other tools**, such as a fork, a playing card, or a ruler, to remove the bottom nickel. Choose one thing to change (that's the **variable**), and **predict** what you think will happen. Try it out and send your results to ZOOM.



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