

Investigating Newton's 3rd Law: Coin Flick

Summary

In this elementary physics investigation, students explore Newton's 3rd Law of Motion: To every action there is an equal & opposite reaction. Pairs of students will line up 5 pennies, (touching each other), between 2 rulers. The row of pennies should be an inch from one end of the rulers. They will place a 6th penny on the other end between the rulers & flick it at the 5 coins. Students will repeat the activity several times. They will draw a diagram of their observations. Students will repeat the process, flicking 2 coins, then 3 coins at the row of 5 coins & drawing what they observe. Students will summarize their understanding of the 3rd law of motion & think of another evidence and/or application of the law in their everyday lives.

Description and Teaching Materials

Materials needed per student pair: 2 rulers, 6 pennies, tape, science log books

Students arrange the 2 rulers on the table top with the line of 5 pennies between them, all touching & 1 inch from one end. Secure the rulers to the table with tape. They will place a 6th penny on the other end between the rulers & flick it at the 5 coins. The whole group of coins will move a little, but the end coin will fly off. Students will repeat the activity several times. This phenomenon is explained by Newton's Third Law of motion which states that to every action there must be a reaction. When you flick the coin, it hits the first one (the action) and that coin then tries to move away from the first one (the reaction). But it can't move because it is prevented from doing so by the next coin in the line. So, the force of the impact is passed on to the next coin until it gets to the end of the line. At this point there is nothing preventing the last coin from moving, so it flies off. Students will draw a diagram of their observations. Students will repeat the process, flicking 2 coins, then 3 coins at the row of 5 coins & drawing what they observe. The number of coins that are flicked into the row of coins will be the same as the number of coins that fly off. Students will summarize their understanding of the 3rd law of motion in their science log books & think of another evidence and/or application of the law in their everyday lives.

<http://serc.carleton.edu/sp/mnstep/activities/19866.html>