Curiosity Guide #404
Central Nervous System

Accompanies Curious Crew, Season 4, Episode 4 (#404)

Uncontrollable Hands

Investigation #1

Description

Can you make your friend's hand move all by itself?

Materials

- Stack of books, weighing between 4 and 5 pounds
- String
- A friend

Procedure

1. Place the pile of books in a neat stack.
2. Tie a piece of string around the books so they easily stay together.
3. Ask your friend to hold out his or her left hand.
4. Place the stack of books on top of your friend's hand.
5. Leave the books on your friend's hand for 5 seconds, and then lift the books upward off the hand.
6. What did you notice?
7. Repeat the experiment with your friend's right hand, and then with both hands.
8. What did you notice?
9. Why do your friend's hands automatically move upward when the books are removed?

My Results

Explanation

As soon as the books are placed in the person's hands, the muscles in the upper arm fire a stretch reflex that provides more support to hold the weight of the books. The signal is quickly looped through the spinal cord and fires back on the motor nerves. The bicep suddenly contracts and shortens the length of the muscle, which prevents the muscles from being overstretched and hurt. When the load is abruptly removed, the contracted muscle pulls the hands upward. When we pick up things that are heavy, the muscle-stretch reflex quickly engages to protect our muscles from being damaged.

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