



## Curiosity Guide #406

### Torque

Accompanies Curious Crew, Season 4, Episode 6 (#406)

#### Torque Trials

Investigation #2

#### Description

Challenge a friend to go up against torque!

#### Materials

- $\frac{1}{2}$  inch wooden dowel, at least 36 inches long
- Clamp weight
- A friend
- Measuring tape

#### Procedure

1. Slide the clamp weight on the dowel so that the weight can move freely.
2. Have your friend hold the end of the dowel in one hand and slide the weight near his or her hand.
3. Challenge your friend to hold the dowel in front of him or her.
4. Slide the weight several inches away from the friend's hand, wait several seconds, and move the weight further away still.
5. What do you notice?
6. How far could you slide the weight before your friend couldn't hold it? Why?

## My Results

### Explanation

Torque is any kind of force that applies rotation. Our bodies may experience torque in our joints when we lift something. If the object is too heavy, our joints may rotate at the elbow or wrist, for example. When the dowel is first held with the weight near the hand, it is easier to support and resist the rotation in the wrist. However, as the weight moves away from the hand, the torque increases until the wrist can no longer resist the rotational force, and the dowel and weight begin to fall.

**Think about this:** Have you ever seen someone trying to loosen a very tight bolt with a wrench? This can be difficult and might require a lot of force to get the bolt to turn. If you apply a rotational force, we say you are applying torque, a force that causes something to turn. Wow! That is tight! Looks like I need more torque! To get more torque, I can push harder. Better yet, I can get a wrench with a longer handle. The greater the distance away from that bolt, the bigger the torque. Hey, I got it!

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