



## Curiosity Guide #309

### Inertia

Accompanies Curious Crew, Season 3, Episode 9 (#309)

#### Nutty Challenge

Investigation #3

#### Description

Your challenge is to see how many hex nuts will fall into a container, using Newton's Law of Inertia.

#### Materials per person

- Wide-mouth, empty bottle. Heavier bottles work better.
- 10 hex nuts
- Embroidery hoop or tape roll
- Table

#### Procedure

- 1) Place the bottle on the table.
- 2) Balance the embroidery hoop or tape roll on the top of the bottle.
- 3) Center a hex nut on top of the hoop, over the opening of the bottle.
- 4) Carefully slide your hand or fingers in the hoop.
- 5) With a quick sideways motion, pull the hoop to the side of the bottle.
- 6) Could you make the hex nut fall into the bottle?
- 7) Try stacking a series of hex nuts on the hoop.
- 8) How many hex nuts can you catch in the bottle?
- 9) You can try other objects, too. For example, stand golf tees or clothes pins on end.

## My Results

### Explanation

This investigation is a good example of Newton's First Law of Motion, the Law of Inertia. The First Law of Motion says that an object that is still or at rest will stay at rest. An object that is in motion will keep moving unless another force acts on it.

At the beginning of the investigation, the ring and hex nuts are both at rest. Gravity is pulling down on each object. An opposite force, called the *normal force*, is pushing up, so nothing is moving. When you pull out the ring, the force of gravity is still acting on the hex nuts, so they fall straight down into the bottle.

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