



Buzzy Balloon

The Physics of Sound

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Supplies:

- balloon
- hex nut

Extension Supplies:

- different size and shape balloons
- different size hex nuts
- marble
- quarter

Directions:

- Squeeze a hex nut through the lips of the balloon. Be sure to push it all the way down the neck and into the body of the balloon.
- Blow up the balloon, but not too full. If the balloon is overinflated, it can easily burst. Tie the neck of the balloon.
- Grip the balloon at the neck end as you would a bowling ball. The neck of the balloon will be in your palm and your fingers and thumb will extend down the sides of the balloon.
- While holding the balloon palm down, swirl it in a circular motion. The hex nut may bounce around at first, but it will soon begin to roll around the inside of the balloon.
- Once the hex nut begins to spin, use your other hand to stabilize the balloon. Your hex nut should continue to spin for 10 seconds or more.

Why:

- The hex nut move in a circular path around the inside of the balloon. If it were not in the balloon, it would continue to move in a straight line. The hex nut has six sides; that causes a tiny bit of friction between the sides of the hex nut and the balloon.
- The real force in action here is a centripetal, or center-seeking, force. Centripetal force is the inward force on a body that causes it to move in a circular path.
- A hex nut has six sides and these flat edges cause the hex nut to bounce or vibrate inside the balloon. The buzzing sound is made by the sides of the hex nut vibrating against the inside wall of the balloon.

Extensions:

- Change the size of the balloon.
- Change the size of the hex nut.
- Add more hex nuts to a balloon.
- Use a marble instead of a hex nut.
- Use a quarter instead of a hex nut.

