



1L20.17/1Q40.70 Ball in Funnel

1L20.17: To show how a ball's orbit changes as it rolls down a funnel.

1Q40.70: To show that a ball rolling down a funnel conserves angular momentum.

DESCRIPTION A ball rolls down the inside of a funnel. At the mouth of the funnel where the radius of the ball's trajectory is large, its rotational frequency is small. As the ball travels towards the bottom of the funnel where the radius is much smaller, its rotational frequency increases dramatically to conserve its angular momentum.

[LINK TO VIDEO](#)

SUGGESTED TECHNIQUE

1. Set the marble on the rim of the funnel and release it. Don't toss the marble into the funnel or you could crack the glass.
2. Note the speed of the marble as it travels down the funnel.

TECHNICAL DETAILS

LOCATION OF APPARATUS

EQUIPMENT	LOCATION
Funnel	General Use E
Marble	General Use E
Ring Holder	???

LOCATION OF COMMON ACCESSORIES

SETUP INSTRUCTIONS

Setup Time ~20 min

1. Screw a rod about 1 meter tall into a table.
2. Mount the ring holder near the top of the rod with a right angle clamp.
3. Place the funnel in the ring holder.
4. Place a box or cup beneath the funnel to catch the ball when it comes out the bottom of the funnel.
5. Make sure there is a clean, white background behind the funnel to improve visibility.
6. Provide a couple marbles in case one rolls away. Dark colors are preferable.
7. You may need to set up a camera to project the image of the funnel and marble to the class.

ADDITIONAL RESOURCES