

Bathroom Physics Demos by Russ Poch, Professor Emeritus, Howard CC

- These demonstrations, using illustrations from a bathroom, illustrate physics concepts such as Newton's Laws, Bernoulli's Principle, capillary action, heat transfer and change of phase, etc. The demos feature readily available and inexpensive materials.



Newton's Laws

Demo w/roll of Toilet Paper

Materials: Roll of toilet paper, rod

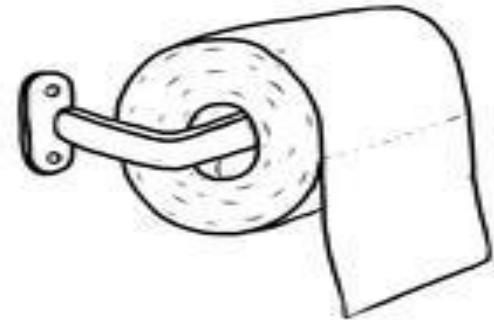
Procedure:

Pull quickly on roll to break off a piece of toilet paper

Pull on roll at moderate speed and twist sharply

Pull slowly on roll and tear off a piece of toilet paper

- This demo illustrates Newton's 1st Law that an object in motion stays in motion while an object at rest stays at rest unless a sufficient outside force acts on it.



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Capillary Action w/ towel hanging in water and outside tub

Materials: 2-3, 150 mL
beakers, two sheets of
paper towels, dye, H₂O

Procedure:

Fill one 150 mL beaker
2/3rds full with water and
place the empty one next
to it.

Roll one sheet of paper
towel into a cylinder,
dampen, and insert it into
the wet beaker and the
other end into the dry one.

Raise the beaker with
water above the dry one.

- This demo illustrates the principle of capillary action and a siphon. The end of the towel in the bathtub gradually absorbs the water and slowly transfers it to the bathroom floor.



Bernoulli's Principle w/ clinging shower curtain

Materials: 2 cans of
soda, 8-10 soda straws,
strong pair of lungs

Procedure:

Place 2 cans of soda
on about 8 to 10 soda
straws placed parallel
to each other a few
mm apart.

After a strong inhale
breath blow between
the center of the cans.

- This demo illustrates Bernoulli's principle that when you turn on the shower for a faster stream of water, the shower curtain is attracted toward you due to the reduced air pressure surrounding the moving water.



Cooling Effect after stepping out of shower w/fan on.

Materials: Lab Quest 2 w/temperature probe, 450 mL beaker, hot water source (e.g. electric coffee pot)

Procedure: Fill a 250 mL beaker w/hot H₂O ~60°C Place a temp probe connected to Lab Quest in hot water.

Remove probe from hot water and blow on or wave quickly in the air.

Record the temp plot.

- The demo shows the concept of how evaporation of water by fast moving air produces a cooling effect. This removes the hotter, faster moving molecules of water on the surface reducing the temperature of the object.



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For more information or to share
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