

# The Melon Drop Demonstration

Target Audience: Children, Grades 4–8





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### Description:

In this demonstration, the melon represents a head/brain. The demonstration shows what can happen when a head (melon) is not protected by a bicycle helmet.

The Melon Drop demonstration consists of two drops. In the first drop, the melon is protected with a bicycle helmet. Because it is protected, the melon should not break. In the second drop, the melon has no protection and breaks.

### Objectives:

By the end of this session, student will be able to:

- ✓ Discuss the importance of wearing a bicycle helmet;
- ✓ Explain what the experiment taught them; and
- ✓ Explain why they need to wear bicycle helmets every time they ride.

### Room Set-Up:

Gather students in a semicircle or to the side of the demonstration area. Allow an open space of at least 8' x 8' for the demonstration.

### Materials:

- ✓ A bicycle helmet with no cracks or damage, with the Consumer Product Safety Commission (CPSC) sticker and sized to fit the honeydew melon
- ✓ One head-size honeydew melon, not ripe enough for seeds to rattle inside when you shake it
- ✓ Tarp
- ✓ Paper towels
- ✓ Ladder, chair, or stool
- ✓ Marker
- ✓ Handouts:
  - *Easy Steps to Properly Fit a Bicycle Helmet:*  
English: [www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsWeb/index.htm](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsWeb/index.htm)  
Spanish: [www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsSpan/index.htm](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsSpan/index.htm)
  - *The Bicycle Helmet Pledge* ([click here](#))

## Demonstration Steps:

### Step 1: Introduction:

A. Engage the students by asking:

- ✓ Who rides a bike?
- ✓ Who wears a helmet? Always? Sometimes?
- ✓ Has anyone ever been involved in a bicycle crash or known someone to be involved in a bicycle? Was that person wearing a helmet?
- ✓ Who knows someone who has hit his or her head hard and possibly had a concussion?

B. Discuss falling off a bicycle:

- ✓ Many bicycle injuries are due to falls; children young and old, adults, and even experienced riders can fall off their bicycles. You never know when a crash will happen and that's why it is important to always wear a helmet when riding.
- ✓ Reasons why people fall/crash:
  - Learning to ride a bicycle for the first time, or getting used to a bicycle;
  - Riding over road hazards (debris, gravel, wet leaves, or sand), or damaged sidewalks or roads (cracks, pot holes, uneven roads);
  - Bicycle failure (flat tire, bad brakes, etc.);
  - Bicycle rider's inexperience riding;
  - Motorists' unsafe driving behavior; or
  - Bicyclists' unsafe riding behavior.

**Motorists' unsafe driving behavior:** Motorists' driving behavior causes some crashes with bicyclists. Some examples include:

- Driving too closely to a bicyclist;
- Distracted/not paying attention (cell phone, etc);
- Turning directly in front of a bicyclist;
- Opening a car door in the path of a bicyclist; or
- Failing to see or yield for a bicyclist.

**Bicyclists' unsafe riding behavior:** Bicyclists' riding behavior causes some crashes between bicyclists and motor vehicles. Some examples include:

- Riding on the wrong side of the road;
- Not paying attention;
- Failing to stop and look left-right-left when entering street from a driveway;
- Failing to see or yield (stop) to traffic at road signs or signals; or
- Failing to ride in a predictable way, i.e., straight versus weaving between traffic.

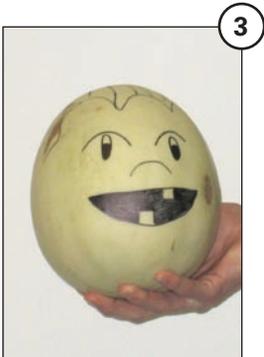
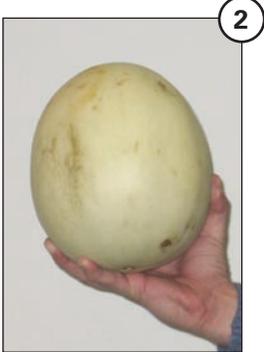
C. Discuss the purpose of the demonstration:

- ✓ Illustrate why wearing a helmet is important; and
- ✓ Demonstrate how a helmet protects a rider's head and brain.

**Importance of wearing a bicycle helmet:**

- Wearing a properly fitted bicycle helmet can protect your brain from injury and can possibly save your life.
- Helmets are 85- to 88-percent effective in reducing head and brain injury.





- Wearing a bicycle helmet is the single most effective way to reduce head injuries and fatalities resulting from bicycle crashes.
- A properly worn bicycle helmet cushions the head when it hits a hard surface such as a road or sidewalk, even from hard impacts on grass and dirt. The inner portion of a helmet is a crushable liner that absorbs and reduces the force of impact to the head.
- Always wear the proper helmet for bicycling; there are varying types of helmets for different sports. Each helmet is designed based on the particular sport. There are some helmets designed for multi-sport use; make sure the helmet label reads the helmet is suitable for bicycling.
- A proper bicycle helmet should include a manufacturer's label on the inside of the helmet stating the helmet meets the CPSC safety standards. (Image 1)

**The demonstration will show:**

- What can happen to your head and brain when you crash.
  - As you hold up the melon state that the melon represents a human head—it is fragile; the fruit and seeds inside represent the brain. (Image 2)
  - If a head hits a hard surface it may crack and the brain would be injured.
- How a bicycle helmet helps protect the head and brain from severe injury.
  - In this demonstration we will place a bicycle helmet on the melon to protect it when it is dropped.
  - After the drop, the melon will show minimal damage due to the bicycle helmet protection.

**Step 2: Prepare the Melon:**

- A. Personalize the melon by naming it and drawing on a face and hair. (Image 3)
- B. Indicate that melons are delicate like our own heads and brains and need to be protected.
- C. Properly fit the helmet on the melon, ensuring that the chin straps are tightly secured. If you choose to do this step ahead of time, indicate to the students that you have adjusted the helmet to make it fit properly. (Image 4)

**Step 3: Involve the Students: (Optional)**

- A. Ask for a volunteer to help with the demonstration.
- B. Choose a student who can stand on a chair, stool, or ladder safely.

### Step 4: First Drop (Melon in Helmet)

- A. Set up the ladder or chair above the hard floor surface that is covered by a plastic tarp.
- B. Ask a volunteer to stand on a ladder or chair. Hand the volunteer the melon to drop onto the tarp from six feet above. Drop the melon with the helmet facing down so the helmet hits first. (Image 5)



### Step 5: Discuss Outcome

- A. The melon most likely did not break.
- B. Explain this demonstrates how the head is protected because the helmet absorbed the force of the fall.
- C. If the melon gets injured, note that even with a helmet, the head can get injured but the amount of damage is less than if a helmet is not worn.

### Step 6: Second Drop (Melon Without a Helmet)

- A. Repeat the first drop, this time without the helmet—make sure the drop is over the tarp. (Image 6)
- B. Ask the class to watch what happens when the drop is made without any helmet. (Images 7 and 8)

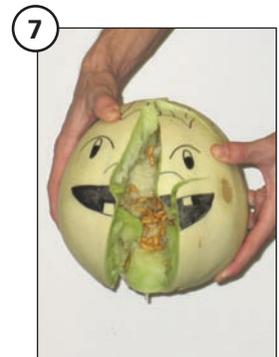


### Step 7: Discuss Outcome

- A. A head is fragile: it may crack causing temporary damage (concussion) or permanent brain damage as the result of falling off a bicycle. This demonstration emphasizes the delicacy of skulls and brains. Explain that if a bicyclist falls or crashes and hits his or her head, wearing a helmet significantly reduces the chances of serious brain injuries or death.
  - ✓ Most likely, the melon broke. If the melon did not break, it was bruised. Look for a soft spot on the melon and explain that this will be a larger bruise in a few days. Explain that the same happens with a head. “After you hit your head, even if you can’t see blood, there can be swelling inside that can cause permanent brain damage.”
  - ✓ Talk about brain damage what it means and how it changes a life.

Explain that a helmet absorbs the force of hitting a hard surface only once. A cracked helmet should be replaced because it cannot protect a head. Optional: pass around a cracked helmet and discuss helmet care. Helmets are made to absorb force one time. Once the foam is crushed or the helmet is cracked, it should be replaced.

- B. Note: Anytime someone hits his or her head hard an adult should be told, and a doctor should check the person out to see if there is swelling to the brain and a possible concussion. The doctor can instruct the parent or adult about signs to look for at home for 24 hours after the impact that could indicate swelling and need for additional medical attention.



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## Step 8: Summary Discussion

- A. Every bicycle rider should wear a helmet on every ride.
- B. A helmet should be worn and secured properly. Discuss the basics of properly fitting a bicycle helmet.
  - ✓ Helmet should fit level on the head (one to two fingerbreadths above eyebrow). (Image 9)
  - ✓ Helmet straps should form a “V” under the ears. (Image 10)
  - ✓ Helmet straps must be buckled and tight enough so no more than two fingers can fit between the chin and the strap. (Image 11)
  - ✓ When adjusted, the helmet should not move more than about an inch in any direction. (Image 12)
- C. Since the naked eye cannot always see crushed foam or a crack in a helmet, a helmet that has been involved in a crash where the head struck a hard surface should be replaced. For the most recent recommendations on helmet replacement go to: [www.helmets.org/replace.htm](http://www.helmets.org/replace.htm).

**Optional:** Pass your helmet around to the class, pointing out the outside and inside of the helmet that protects the head. Both the inner and outer shell of the helmet needs to be inspected after a crash. If your helmet has been in a crash, the helmet needs to be replaced because partly crushed foam or small cracks in the lining reduce the protection for your head and brain. You should never use a cracked or otherwise damaged helmet because once damaged it isn't able to do its job to protect you.

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- D. Certified and Proper Helmets:
  - ✓ The CPSC sticker tells the consumer that the manufacturer of the helmet certifies the helmet meets the safety standards established by the CPSC.
  - ✓ There are different helmets for different sports.
    - Make sure the helmet you buy is for bicycling; there are varying types of helmets now for different sports. Each helmet is designed based on the particular sport.
    - Some helmets are designed for multi-sport use; read the label inside the helmet to make sure you are buying one suitable for bicycling.

## Step 9: Discuss and Provide Handouts:

- A. Easy Steps to Properly Fit a Bicycle Helmet: Include this handout in each child's take-home material and encourage the child to share this with family and friends. This handout provides the child and parents/caregivers with step by step instructions on how to fit a bicycle helmet.  
English: [www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsWeb/index.htm](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsWeb/index.htm)  
Spanish: [www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsSpan/index.htm](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/EasyStepsSpan/index.htm)
- B. The Bicycle Helmet Pledge: The helmet pledge serves as a commitment that students promise to wear bicycle helmets every time they ride. Everyone should encourage their family members and friends to be safe as well.
  - ✓ Encourage them to make the commitment and to sign it before the end of the session.
  - ✓ Include a blank copy of this handout in each student's take-home material ([click here](#)).

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## Step 10: Discussion of Properly Fitted Bicycle Helmet.

- A. Using the “Easy Steps to Fitting a Bicycle Helmet” handout, demonstrate how to properly fit a bicycle helmet.
- B. Emphasize that many who wear bicycle helmets wear them incorrectly. The most common mistakes are:
  - ✓ Wearing the helmet too high or too low on the forehead. The helmet should be no more than one to two fingerbreadths above the eyebrows (demonstrate based on picture in handout).
  - ✓ Not buckling the helmet.
  - ✓ Not tightening the chin strap so it holds the helmet securely on the head. The strap should be tight enough so not more than one or two fingers fit under the strap when it is buckled.)

## Step 11: Other Helpful Resources:

- A. How to Fit a Bicycle Helmet Streaming Video. This video shows how to select and correctly wear a bicycle helmet. Available on the NHTSA Web site at: [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov), under traffic safety, bicycles. Available in English or Spanish.
- B. Ride Smart. It’s Time to Start. This 10-minute video is part one of a two-part series. It discusses the importance of wearing a bicycle helmet and is presented by middle-school-age youth. The video may be viewed on NHTSA’s Web site or ordered through e-mail at: [www.intraweb@nhtsa.gov](mailto:www.intraweb@nhtsa.gov).
- C. Bike Safe. Bike Smart. This 10-minute video is part two of a two-part series. It discusses the importance of wearing a bicycle helmet and is presented by middle-school-age youth. The video may be viewed on NHTSA’s Web site or ordered through e-mail at: [www.intraweb@nhtsa.gov](mailto:www.intraweb@nhtsa.gov).

## Helmet Replacement:

For the most recent recommendation on helmet replacement see:  
[www.helmets.org/replace.htm](http://www.helmets.org/replace.htm).

## Bicycle Helmet Site:

For the most up to date information on bicycle helmets see the Bicycle Helmet Safety Institute:  
[www.helmets.org](http://www.helmets.org).