RURAL ROADWAY SAFETY

Seat Belt Sanity

Seat belt use in rural areas is often lower than in urban areas. When teaching the concepts of safety on rural roads stress the importance of using seat belts. Use examples from rural settings to stress seat belt importance such as:

- Coming up on a slow-moving vehicle like a combine
- Coming over a hill and not seeing a tractor until it’s too late to slow down
- Losing control of a vehicle on gravel surfaces and crashing into a ditch

Studies show that you are more likely to be thrown from a vehicle when in rural areas. Seat belts give you a better chance of survival by keeping passengers inside the vehicle. When in open vehicles such as a tractor, farm implement, or the back of pickup, unrestrained passengers are more likely to be ejected in a collision.

ACTIVITY 1
Build an Air Car
Targeted Audience: Middle to High School age

Learning Objective: Students will understand the importance of wearing a seat belt while traveling on rural roads.

Concept: Newton’s First Law of Motion helps explain how a seat belt helps protect your body. Because of inertia, objects tend to remain in motion. This means moving objects will continue to move in a straight line unless a force is applied to change that direction. If a vehicle you are riding in happens to stop suddenly or collides with another object, wearing a seat belt may save your life. If the car suddenly stops, your body, because of inertia, will keep moving at the same speed and direction as the vehicle. Seat belts restrain you when the car slows or stops suddenly.

You will need:
- A balloon
- A small square of Styrofoam such as a meat tray
- A small empty thread spool
- A small object to represent a person
- Tape

Follow these steps:
1. Using a ballpoint pen or other sharp object, punch a 1/8 inch hole in the center of the Styrofoam square.
2. Tape the spool directly over the hole. Place tape over the ridge that sticks out around the bottom of the spool sealing tightly all the way around the spool.
3. Inflate the balloon. Twist and pinch the top of the balloon’s neck so no air escapes. Keeping the balloon twisted, stretch it over the neck of the spool. This is easier when two people work together. Do not allow the air to escape.
4. Place the small object on the Styrofoam platform. The Styrofoam represents the vehicle, the balloon the power, and the object a person.
5. Place the air car on a smooth floor or counter. Let go of the balloon neck and give the car a small push.
6. Have students observe what happens to the small object when it thrusts forward. What happens when the car comes to a stop or hits another object?
7. Repeat the procedure after taping the object to the car. What happens to the object this time? Make the analogy between the tape and a seat belt.
Seat Belt Sanity (continued)

Normally the force of friction will slow down the object, but it’s not the case here. Air escaping from the balloon formed a thin, low-friction layer between the surfaces of the air car and the smooth surface. Because there was almost no friction to act upon the car, you were able to see inertia in action. The car moved in the direction in which you pushed it. The small object moved with the car if taped in place or was thrown off by the initial thrust of power from the releasing air.

ACTIVITY 2
Seat Belt Simulation

Targeted Audience: Elementary age

Learning Objective: Students will illustrate the need for seat belt restraint use.
Concept: Unrestrained passengers in a vehicle are more likely to be thrown out of the vehicle than those wearing seat belts in a collision. This exercise will show the difference between restrained and unrestrained passengers.

You will need:
- Convertible toy car and/or pickup toy truck large enough to allow passengers/driver
- Toy figures or dolls proportional in size to the car/pickup
- Solid objects, such as textbooks or blocks of wood
- 36 inch plywood or piece of sturdy cardboard
- Tape

Follow these steps:
1. Set up a 1 inch high ramp using the books or wood to prop up the plywood or cardboard. Make a barrier at the bottom of the ramp out of more books or a wall.
2. Place a toy figure or doll in the vehicle as a driver. If using the pickup place a doll in the bed.
3. Place the vehicle with its “driver” at the top of the ramp and let it roll down the ramp. (Let the car go without pushing it.)
4. Observe the relative speed the vehicle is traveling and record the distance the passenger was thrown.
5. Increase the height of the ramp by 1-2” and repeat the activity, recording observations.
6. Increase the height to approximately a 45 degree angle.
7. After each test discuss speed, time from start to crash, and distance of passenger from vehicle.
8. If you have a vehicle that allows for more than one person, tape one in place to represent a seat belt and allow the other to sit freely. Repeat the demonstration and compare results.

Questions to ponder:
- What happened to the passenger in the first trial? Why?
- How far did the passenger travel from the vehicle in the first trial?
- If using a pickup, what were the differences among the driver, cab passenger, and the person in the pickup bed?
- Did the speed of the vehicle make a difference in how far the passenger traveled? If so, how?
- What conclusions can you make about speed on the impact of car passengers if a crash takes place?