What do we observe when objects collide?

Activity 6

Analyze Like a Scientist

Energy and Collisions

Think of all the objects you bump into every day, such as walking into your friend in the hallway or hitting your toe on the leg of a chair. Ouch! Consider what happens to your body and the other person or object when these accidents happen. **Think** about what you already know about energy transfer. **Read** the text. Then, **complete** the activity.

Energy and Collisions

Children Running

When two things bump, or crash, into each other, we can say a **collision** has taken place. When this happens, an energy transfer occurs. Think about this: If you are running down the street without looking, and you run into a sign, what happens? The chances are you will stop moving, perhaps bounce off, and get hurt. The sign may wobble a bit and rattle. When you hit the sign, you would stop moving forward. What happened to your kinetic energy? What energy changes were taking place here? How would things be different if you were walking? What could have happened if you were running faster?

How does the speed of an object affect what happens in a collision

Activity 7

Analyze Like a Scientist

The Effect of Speed on Collisions

Remember when you rolled toy cars down a ramp? You learned that the speed of the car affected how far the cup moved when the car crashed into it. As you read, **highlight** information in the text that supports the patterns you saw in your data from the investigation Racing Downhill.

The Effect of Speed on Collisions

Accident

The amount of kinetic energy an object has depends upon its speed. The faster an object travels, the more energy it has. When a speeding object hits another object, it transfers some of its energy to it. The faster the object, the more energy it transfers. Some of this energy may be in the form of heat, light, or sound. Because of their extra energy, fast-moving objects can do much more damage than slow ones. When they hit an object, they exert more force. This force can smash a car fender or, in some cases, damage the car beyond repair.

If a car increases its speed, its kinetic energy increases. All this energy will result in a large force being exerted in an accident. This is one reason why driving fast is so hazardous. If two cars drive headlong into one another, then the forces exerted in the accident depend upon the combined speed of both cars. Damage would be much more severe. What do you think would happen if two cars traveling at different speeds in the same direction collided? How would the forces in this rear-end collision compare to those in a headlong collision?