

Activity 1 - A Running Start and Frames of Reference

Activity/Demo

This activity will be a demonstration. Using a skateboard or rolling chair, someone will demonstrate both parts of Newton's First Law, also known as the Law of Inertia. In another demonstration/discussion, Newton's 1st Law will be modeled with respect to driving in a car.

For the second part of this demonstration, someone will model a moving "frame of reference". We'll see how an object appears to move compared to people in two different frames of reference.

Activity/Demo:

1. A person is standing on a skateboard not moving.
 - a) State the part of Newton's 1st Law that this demonstrates. Using the wording of Newton's 1st Law, what would have to happen for the person to start moving?
2. A person on a skateboard is moving across the front or back of the room.
 - a) Is the person accelerating or moving at a fairly constant velocity?
 - b) What part of Newton's 1st Law does this demonstrate?
 - c) Again, using the wording of Newton's 1st Law, what would have to happen to change the motion you observe in the skateboarder.
3. A person will now sit in a chair and model riding in an automobile.
 - a) As the car accelerates away from an intersection at high speed, what does the rider experience? What part of Newton's 1st Law does this demonstrate?
 - b) As the car comes to a sudden halt, what does the rider experience? What part of Newton's 1st Law does *this* demonstrate?
4. Discuss the case of someone riding up or down in an elevator, and describe how when the elevator starts or stops it demonstrates the same principles as the automobile example in #3.
5. Someone stands at the front of the room tossing a ball or bean bag up and down.
 - a) Describe the motion of the object with respect to the person tossing the object.
 - b) Describe the motion of the object with respect to the other people in the room.
6. Someone walks across the front of the room tossing a ball or bean bag up and down.
 - a) Describe the motion of the object with respect to the person tossing the object. Did the motion in this example change from the previous example with respect to the person tossing the object? If so, how?
 - b) Describe the motion of the object with respect to the other people in the room. Did the motion in this example change from the previous example with respect to the other people in the room? If so, how?