

Speed and Velocity

Read from **Lesson 1** of the **Circular and Satellite Motion** chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/circles/u6l1a.html>

MOP Connection: Circular Motion and Gravitation: sublevel 1

Review:

- A quantity that is fully described by magnitude alone is a _____ quantity. A quantity that is fully described by both magnitude and direction, is a _____ quantity.
 - scalar, vector
 - vector, scalar
- Speed is a _____ quantity. Velocity is a _____ quantity.
 - scalar, vector
 - vector, scalar
 - scalar, scalar
 - vector, vector
- State the equation for calculating the average speed of an object:

Circular Motion:

- An object that moves uniformly in a circle can have a constant _____ but a changing _____.
 - speed, velocity
 - velocity, speed
- The direction of a velocity vector is always _____. Circle all that apply.
 - in the same direction as the net force that acts upon it
 - in the opposite direction as the net force that acts upon it
 - in the same direction as the object is moving
 - in the opposite direction as the object is moving
 - ... none of these!
- True or False:**
The direction of the velocity vector of an object at a given instant in time depends on whether the object is speeding up or slowing down.
- For an object moving in uniform circular motion, the velocity vector is directed _____.
 - radially inwards towards the center of the circle
 - radially outwards away from the center of the circle
 - in the direction of the tangent line drawn to the circle at the object's location
- Use your average speed equation to determine the speed of (Given: Circumference = $2 \cdot \text{PI} \cdot R$)
 - ... a rider on a carousel ride that makes a complete revolution around the circle (diameter = 21.2-meter) in 17.3 seconds. **PSYW**
 - ... your clothes that are plastered to the wall of the washing machine during the *spin* cycle. The clothes make a complete revolution around a 61.9-cm diameter circle in 0.285 seconds. **PSYW**
- A roller coaster car is traveling over the crest of a hill and is at the location shown. A side view is shown at the right. Draw an arrow on the diagram to indicate the direction of the velocity vector.

