

Name _____ per. _____ Date _____

The Basics of Motion

1. How is distance different from displacement?
2. Fluffy the Wonder Hamster rides his unicycle around a circular track that has a circumference of 9.4m and a diameter of 3 m. If Fluffy rides his unicycle 4.5 times around the track, how much distance does he travel? What is his displacement?
3. What is the basic unit of speed and velocity?
4. Speed is a scalar quantity while velocity is a vector quantity. What is the difference?
5. What is the difference between average speed and instantaneous speed?
6. If a toy car has a constant speed of 5 m/s, what is its instantaneous speed? Explain.
7. What is acceleration? What is the unit of acceleration?
8. Acceleration can be both positive and negative. What occurs if there is a positive acceleration? What occurs if there is a negative acceleration?

9. A young driver practicing in a parking lot drives 200m north. He then turns east and drives 75 meters. He then turns south and drives 200m. Finally, he drives 25 m west. It takes 40 seconds to complete his drive.
- (a) What is his average speed? Use his distance.
- (b) What is his average velocity? Use his displacement.
10. A tennis ball is served and travels 24.0 m across the court in 0.60 seconds. Calculate its average velocity.
11. A boy rides his bicycle at an average speed of 8.5 m/s for 300s. How far does he ride?

13. While out driving the hamstermobile one day, Fluffy drives by the cat, who recognizes him and begins to chase him. Fluffy, who was originally driving at a rate of 5 m/s speeds up at a rate of 8m/s^2 . If he accelerated for 10s, what is his final velocity? How far did Fluffy travel while he accelerates?
14. A jet lands on a runway with an initial velocity of 72 m/s. 12 seconds later it comes to a stop. What was the jet's acceleration?