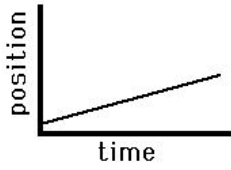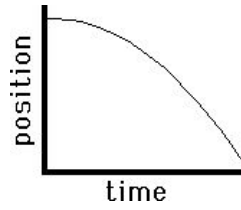**Motion Practice**                                        Name_____
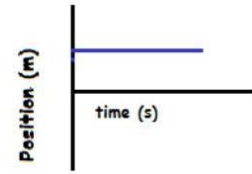
Label the following graphs with the type of motion they show: high constant speed, low constant speed,  no motion, positive acceleration, and negative acceleration.
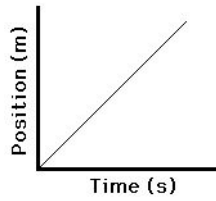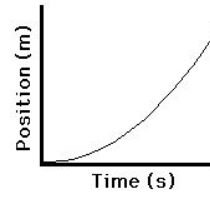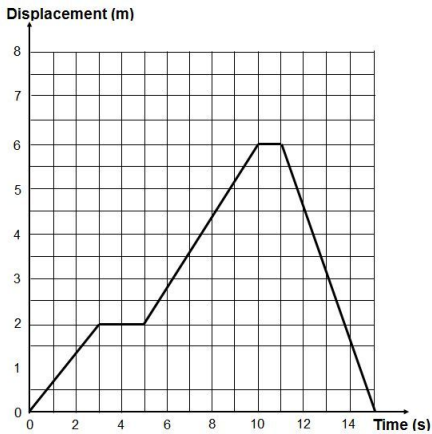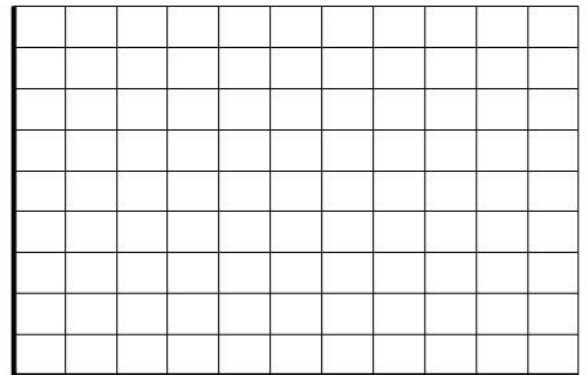
1. _____          2.  _____          3. _____

4._____          5. _____

6. Write a short story for this graph

7. Write your own motion story and draw a graph that shows that motion.

**SPEED**

1. If a car travels 400m in 20 seconds how fast is it going?


2. If you move 50 meters in 10 seconds, what is your speed?


3. You arrive in my class 45 seconds after leaving math which is 90 meters away. How fast did you travel?


4. A plane travels 395,000 meters in 9000 seconds. What was its speed?


**TIME**

5. How much time will it take for a bug to travel 5 meters across the floor if it is traveling at 1 m/s?


6. You need to get to class, 200 meters away, and you can only walk in the hallways at about 1.5 m/s. (if you run any faster, you'll be caught for running). How much time will it take to get to your class?


7. In a competition, an athlete threw a flying disk 139 meters through the air. While in flight, the disk traveled at an average speed of 13.0 m/s. How long did the disk remain in the air?


**DISTANCE**

8. How far can you get away from your little brother with the squirt gun filled with paint if you can travel at 3 m/s and you have 15s before he sees you?


9. How far can your little brother get if he can travel at 2.5 m/s and in 5 seconds you will discover that his squirt gun has run out of paint?


10. If you shout into the Grand Canyon, your voice travels at the speed of sound (340 m/s) to the bottom of the canyon and back, and you hear an echo. How deep is the Grand Canyon at a spot where you can hear your echo 5.2 seconds after you shout?


**CHALLENGE PROBLEM** Bill and Amy want to ride their bikes from their neighborhood to school which is 14.4 kilometers away. It takes Amy 40 minutes to arrive at school. Bill arrives 20 minutes after Amy. How much faster (in meters/second) is Amy's average speed for the entire trip?

**ACCELERATION PRACTICE PROBLEMS** YOU MUST SHOW YOUR WORK. You can use a calculator but you must show all of the steps involved in doing the problem.

1. A roller coaster car rapidly picks up speed as it rolls down a slope. As it starts down the slope, its speed is 4 m/s. But 3 seconds later, at the bottom of the slope, its speed is 22 m/s. What is its average acceleration?

2. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration ?

3. A car advertisement states that a certain car can accelerate from rest to 70 km/h in 7 seconds. Find the car's average acceleration.

4. A lizard accelerates from 2 m/s to 10 m/s in 4 seconds. What is the lizard's average acceleration?

5. A runner covers the last straight stretch of a race in 4 s. During that time, he speeds up from 5 m/s to 9 m/s. What is the runner's acceleration in this part of the race?

6. You are traveling in a car that is moving at a velocity of 20 m/s. Suddenly, a car 10 meters in front of you slams on it's brakes. At that moment, you also slam on your brakes and slow to 5 m/s. Calculate the acceleration if it took 2 seconds to slow your car down.

**CHALLENGE QUESTIONS**

14. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 50 m/s/s for 3 seconds, what will its final velocity be?

15. Falling objects drop with an average acceleration of 9.8 m/s2 . If an object falls from a tall building, how long will it take before it reaches a speed of 49 m/s?