Name _____ Date _____ Period _____

Worksheet: Linear Motion

C O N C E P T U A L P H Y S I C S : U N I T 1

DIRECTIONS: Use the equations below to solve the following problems. You must show all of your work to receive credit. This includes: 1) list what is given 2) show equation 3) show your work 4) answer with correct units.

Average speed

$$v = \frac{d_1 - d_0}{t_1 - t_0} \qquad v = \frac{d}{t}$$

Acceleration

$$a = \frac{v_1 - v_0}{t_1 - t_0} \qquad a = \frac{\Delta v}{t}$$

Linear motion

$$v = v_0 + at \qquad d = \frac{1}{2}at^2$$

1. What is the average speed of a cheetah that runs 88 m in 5 seconds?

2. What is the average speed of a cheetah that runs 67 m in 6 seconds?

3. A car travels 1000 meters in 25 seconds. What is the average speed of the car?

4. A bicycle travels 15 m in 30 seconds. What is its average speed?

5. A bicycle travels 10 m in 3 seconds. What is its average speed?

6. What is the average speed of a car that travels 600 m in 90 seconds?

7. A car travels 2 hours at 45 miles/hour. How far did it go?

8. A car travels 2 hours at 65 miles/hour. How far did it go?

9. How far would you run if your average speed was 8 m/s for 7 seconds?

10. How long would it take to travel 200 meters at 5 m/s?

11. How long would it take to travel 800 meters at 4 m/s?

12. You are taking a trip and travel 650 miles traveling at an average speed of 65 miles/hour. How long did it take you? *(Show answer in hours)*

13. What is the average acceleration of a car that goes from rest to 30 m/s in 8 seconds?

14. What is the average acceleration of a car that goes from rest to 25 m/s in 7 seconds?

15. A jet aircraft is launched off the deck of an aircraft carrier. What is the average acceleration of the jet if it goes from rest to 25 m/s in 2.5 seconds?

16. A skateboarder starting from rest accelerates down a ramp at 2 m/s^2 for 2 s. What is the final speed of the skateboarder?

17. A skateboarder starting from rest accelerates down a ramp at 5 m/s^2 for 4 s. What is the final speed of the skateboarder?

18. A race car starting from rest accelerates down the track at 3.5 m/s^2 for 10 s. What is the final speed of the race car?

19. A car accelerates from rest at 2.0 m/s^2 for 10 seconds. What is the cars final speed?

20. A car accelerates from rest at 3.5 m/s^2 for 6.5 seconds. What is the cars final speed?

21. You are running a 100 meter dash and accelerate at 1.5 m/s^2 for 4 seconds. What is your final speed?

EXTRA CREDIT QUESTION: You are competing in a bicycle race and travel from 0 m/s to 12 m/s in 3.0 seconds. What is your final speed and how far did you travel?