Problems:

1. Convert 60 miles to the equivalent expression in feet. (1 mile=5280 feet)
2. Convert 1 hour to the equivalent expression in seconds.
3. Convert $\frac{60 \text{ miles}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

4. Determine the number of seconds in a year.
5. Determine your height in meters. (Use 1 in = 2.54 cm)
6. Convert a length of 1 m to the equivalent length in cm, mm, μm, and km.
7. Convert $\frac{1 \text{ m}}{\text{s}}$ to the equivalent expression in $\frac{\text{km}}{\text{h}}$.

8. Convert $\frac{10 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

9. Convert $\frac{20 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

10. Convert $\frac{30 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

11. Convert $\frac{40 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

12. Convert $\frac{50 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

13. Convert $\frac{70 \text{ mi}}{\text{h}}$ to the equivalent expression in $\frac{\text{ft}}{\text{s}}$.

14. Make a graph of speed in feet per second vs. speed in miles per hour based on the above conversions.

15. Make a graph of distance traveled in feet in 1 s vs speed in mph.

16. Using dimensional analysis, determine a relationship between x, v, and t. To do this, write an equation with these variables so that the dimensions match on each side of the equals sign.

17. Using dimensional analysis, determine a relationship between x, v, and a. To do this, write an equation with these variables so that the dimensions match on each side of the equals sign.

18. Using dimensional analysis, determine a relationship between v, a, and t. To do this, write an equation with these variables so that the dimensions match on each side of the equals sign.

19. Using dimensional analysis, determine a relationship between x, a, and t. To do this, write an equation with these variables so that the dimensions match on each side of the equals sign.

20. Use the equations derived in problems 16 and 19 to determine the equation relating the distance traveled by an object initially traveling at a speed v_0 and then accelerating at a constant acceleration a for a time t.

21. Determine the distance traveled by a car initially at speed v_i that brakes at a constant deceleration a to a final speed of v_f. Use the relationship determined in problem 17.