Problem Solving Scaffold
(for use in solving complex problems)

Name:_____
Class:_____
Period:_____

Problem # or description:_____

1) summarize the problem as clearly as you can (only put it the information that is necessary)

2) Write down all the given (known) information and assign each variable a letter. Then write down the thing(s) you are trying to find and assign them a letter.
Knowns:

Want to find:

3) Draw a picture which shows what is going on (label as much information as you can):

4) Write down any relationships (equations) you know that involve the variables you have listed above.
Equations:

5) Use the given information and the relationships listed to solve for what you want to find. DO NOT ERASE ANYTHING. If you make an error, simply draw a single line through it and go on.
Remember: start by writing the general equation, then rearrange it, THEN plug in numbers with units!

6) When you are done, go back and annotate your solution, so that your audience knows what you were doing and why (imagine you are writing this for a student in chemistry who is an intelligent person, but knows very little about physics).

Problem Solving Guide for Physics in Mr. Ronneberg's Class

One of the tasks that creates difficulties for students in the sciences is problem solving. Most students don't really have any strategies in place to solve problems. This guide is intended to help you adapt to this task, so that you experience the greatest possible success in this class.

Here are a number of things that you can do to improve your problem solving:

1) Read the problem carefully. Several times if necessary. Make sure you understand the situation that is being described.

2) Determine if the problem involves only one event or process, or if it involves multiple events or processes.

3) Start doing something on paper. Never leave the problem blank, whether it is on a homework assignment or quiz. If you don't start, you will never solve the problem. Don't worry about putting correct things down right away, just start doing something that seems sensible or related to the problem. Maybe there is a simpler, but related problem you can solve first to help you see how to handle the more difficult problem.

4) Draw pictures or graphs to aid in your understanding. If the problem involves multiple events or processes, those should be reflected in your drawings or graphs.

5) Write down the knowns and unknowns. Decide what depends on what in the problem. Assign sensible symbols to the variables in the problems.

6) Decide what physical processes relate to the events and processes in the problem.

7) Determine what physics concepts govern those physical processes.

8) Write down any equations that pertain to the physics concepts and relate the relevant variables. Don't worry about writing too many equations down – you can always pick through them later.

9) Decide which equations you think are relevant, solve them algebraically for the appropriate variables. Insert any numerical values and calculate final answers including units.

10) Check your answer – Are the units correct? Is the answer reasonable? A snail shouldn't be traveling at half the speed of light and a baby shouldn't have the mass of a hippopotamus. Do you have special knowledge that allows you to know the possible range of correct answers? For example, assume a car is constantly speeding up. Let's say that you know that its speed at 10 seconds is 30 miles per hour, and at 20 seconds it is 90 miles per hour. At 15 seconds, you would certainly expect the speed to be between those values.