**Applied Mathematics**
**Walla Walla High School**

Team Leader: _____

Team Member: _____



## Unit 15 – Using Formulas to Solve Practical Problems

**Lab Activity:** Solar Car Races

**Objective:** Students, working in teams of two, will assemble a solar car kit and race the car against other teams over a twenty-four (24) foot track. Teams may modify the basic kit, but must use all the parts provided.

The solar panel in the kit is the only source providing power to the motor of the solar car. This is called a propulsion system. All transportation vehicles have some type of propulsion system. Propulsion systems consist of a source of energy, a way of converting the energy into useful power, and a way of transmitting the power to move the vehicle. Vehicle design involves potential/kinetic energy, friction, power to weight ratios, and alignment.

**Materials Provided:**
Solar Car Kit
Stop Watch
Tape Measure
Masking Tape and/or Clear Tape
Whiteboard and Markers
Graph Paper – ¼" squares
Miscellaneous Tools

**Materials and tools needed that are not provided must be procured by the team!**

**Procedure:** Use the problem-solving outline described below:

1. Select one partner.
2. Set goal(s) and assign responsibilities.
3. Research possible modifications to the basic Solar Car Kit.
4. Assemble the Solar Car Kit.
5. Test, adjust, and make modifications to the basic Solar Car Kit.
6. Compete.
7. Calculate speeds and averages of your Solar Car.

**Evaluation:**

| Requirements | Points Possible | Your Points |
|---|---|---|
| Completed Solar Car ready for Test Drives<br>- Creativity (15 Points)<br>- Workmanship (15 Points) | 30 Points | |
| Five Test Drives | 30 Points | |
| Data – Drive Times, Speeds, Averages calculated | 10 Points | |
| Drawings, Procedures, Documentation – Steps 1-7 above | 30 Points | |
| **Total** | **100 Points** | |

Bonus points will be awarded for the following categories:

- Highest speed per class (3 points)
- Highest speed for all classes (5 points)
- Greatest average speed after five test drives per class (5 points)
- Greatest average speed after five test drives for all classes (10 points)
- Most creative, as voted by class (5 points)
- Best built, as voted by class (5 points)

**Data:**

| | Test Drive #1 | Test Drive #2 | Test Drive #3 | Test Drive #4 | Test Drive #5 | Average |
|---|---|---|---|---|---|---|
| Time | | | | | | |
| Speed | | | | | | |

**Formulas:** List the formulas you will use for this lab below:

**Analysis:** Why did some solar cars go faster than others?