

Solar Car Log: Day 1:

Date: _____

Student Name: _____

Group Name: _____

Hohenemser:09

Newton's Laws of Motion Review: Applications for Solar Cars

1a. What does Newton's 1st Law of Motion state?

1b. How does Newton's First Law of motion apply to the Solar Car project?

2a. What does Newton's 2nd Law of Motion state?

2b. How does Newton's second law of motion apply to the Solar Car project?

3a. What is the relationship between weight and friction that we learned about in EMM lesson 6?

3b. How does this concept apply to the Solar Car project?

4. Notes and sketches from Al's Introduction Movie.

Solar Car Log: Day 2

Date: _____

Gear Ratios: after reading through the Gear link on my website, complete the following questions. They have been taken directly from the exercises found on the gears website: You should look there for the animations.

1. Fill in the blanks

Low gear ratio = more _____ = less _____

High gear ratio = less _____ = more _____

2a. Calculate the gear ratio if gear "B" the driver has 36 teeth and gear "A" follower has 12 teeth.

2b. If "B" turns 4 complete revolutions clockwise how many times will "A" rotate and in what direction?

2c. Is the answer you got for question 2a. a high gear ratio or a low gear ratio?

3a. Calculate the gear ratio if gear "B" is the driver and has 12 teeth and gear "A" has 24.

3b. If "B" turns 8 complete revolutions clockwise how many times will "A" rotate and in what direction?

4. Use your gear set for the solar car and find a gear arrangement that will give you a gear ratio of 2:1 or 2.5:1. Draw a labeled diagram of the gears below (include labels of the # of teeth and which gear is the driver).

5. Notes and sketches from Al's second movie Design Thoughts:

Solar Car Log: Day 3

Name _____

Group Name _____

1. Notes and sketches from Al's 3rd movie: **Design and Construction.**

2. Notes and sketches from Al's 4th and final movie: **Construction Tips.**

Instructions: Each person in your group will now research one topic (listed in questions 1, 2 and 3 on the next page). You will use up to five sources of information to answer the questions. These include your notes from Al's movies (or watching the movies again on your own computer), the Solar Car Planning Guide, the Spencer Butte Secrets link, and the Solar Car a la Pat link on the Solar Challenge website as well as looking at the actual solar cars from previous years and the various photos of possibilities that I have located on the front counter. Record your notes on the next page

Solar Car Log: Day 3 & 4

1. Find out what you can about chassis design and options for mounting the solar panel: Record what you learn or know about shape, aerodynamics, and reducing drag.

2. Record what you find out about which wheels to use to reduce friction and increase speed and what options you have for attaching the axels: (You may want to review Al's second movie) These are key decisions to making your car run straight and fast.

3: Write down what you find out about gear choice and gear ratio and motor placement and attachment. Finding a gear ratio that will give you enough speed and force will be critical to winning the race. The placement of the motor can also affect the power of the car and can help your car to run straight.

4. Share your notes with your group members. After you have completed these first 4 pages, show them to a teacher or adult helper who will initial right here → _____
You may now start to draw the designs for your solar car (on the next two pages).

Day 3 and 4 Solar Car Log:

The Solar Car Sketches:

On the next two pages you will use everything you have learned to complete sketches of your own solar car design. The more details you include, the more likely you will be able to convince your partners to use your design instead of theirs☺. When all three of you have completed your sketches, you will present them to each other and make a decision as to whether to use one person's design or to combine all the designs into one super car! (the more labels and reasons the better!)

**Day 3 and 4 Solar Car Log:
The Solar Car Sketches Continued:**