Race Car Challenge - Lesson 1

Gravity Power

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| LESSON VOCABULARY | DEFINITION |
| Gravity |  |
| Drag |  |
| Friction |  |
| Elevation |  |

**Chat it Up!**

Working with a partner, explain the difference between gravity and drag. Discuss why it is important to understand these forces to design the best race car.

Notes:

**Imagin-eer**

Draw 2 cars - 1 with lots of drag and 1 with very little drag. Describe the features of your car with less drag. What makes it a better design?

Car 1 - lots of drag:

Car 2 - very little drag:

Describe the features of car 2. What makes it a better design?

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**Write On!**

Write a letter in reply to the President and General Manager of Sonoma Raceway and the Publisher of *Kid Scoop News*. Tell them your feelings about the project and some of your initial plans.

April \_\_\_\_, 2016

Dear President and Publisher:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Sincerely,

Race Car Challenge - Lesson 2

Friction

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| LESSON VOCABULARY | DEFINITION |
| Friction |  |
| Burn Out |  |

**Chat it Up!**

Working with a partner, explain the relationship between friction and motion. How will this information make you a better engineer?

Notes:

**Imagin-eer!**

Design 2 ramps with very unique and different surfaces (mirror vs. eggshells, gravel vs. tin foil, etc.).

Ramp 1:

Ramp 2:

Describe which surface will be better for racing your car and why. Use all five of these words in your explanation: SMOOTH, ROUGH, FRICTION, RAMP, GRAVITY.

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Race Car Challenge - Lesson 3

Aerodynamics

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| LESSON VOCABULARY | DEFINITION |
| Aerodynamics |  |
| Drag |  |
| Wind Resistance |  |

**Chat it Up!**

We’re heading to the teacher parking lot! Observe the different shapes and designs of cards. Discuss with a small group which cars you claim are more aerodynamic. Defend your claim with evidence. Use these words to describe your observations: AERODYNAMICS, DRAG, WIND RESISTANCE.

Notes:

**Write On!**

How many words can you make from the letters in:

A E R O D Y N A M I C S

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Race Car Challenge - Lesson 4

Make Your Own Gravity Racer

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| LESSON VOCABULARY | DEFINITION |
| Engineering |  |
| Weight |  |

Names and Roles of My Engineering Team:

|  |  |
| --- | --- |
|  | Engineer’s Name |
| Supply EngineerGathers materials from the supply station to build the Gravity Racer |  |
| Chief EngineerReads directions |  |
| Design EngineerLays out all the pieces for construction and selects materials |  |
| Construction EngineerMakes sure all steps are followed in the right order |  |
| 1. TAKE TURNS BUILDING THE GRAVITY RACER
2. COLLABORATE ON A NAME FOR THE GRAVITY RACER
 | ALL TEAM MEMBERS |

**Chat it Up!**

Work with your team to complete the following math problems:

1. Drivers who complete the Toyota/Save Mart 350 will make 1,100 turns around the road course. The race spans 110 laps. How many turns is the per lap?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ turns per lap

2) A driver will travel nearly 220 miles by the end of the race. If the average speed was 80 mph, about how long will it take to complete the race?

\_\_\_\_\_\_\_\_\_ hours, \_\_\_\_\_\_\_\_\_\_ minutes

**Imagineer!**

Sketch some ideas for decorating your car.

**Write On!**

Describe your experience including all the steps you followed to build your Gravity Racer. Use one of these sentences to begin your description:

1. Today was no ordinary day at school.
2. Learning something new can be both challenging and exciting.
3. I never thought I would build a car at school, but today we did exactly that!
4. It’s one thing to ride in a car, and something entirely different to build one!

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