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## START YOUR JOURNEY

### Journey into Rocketry

Your journey into rocketry has now begun. During the journey you will answer the following questions:

1. **Do I have to use water? Why can't I just use pressurized air?**
2. **Is more water better?**
3. **How can I modify the design of the rocket to increase the duration of the flight?**
4. **What effect will the wind have on the way I launch the rocket?**
5. **How will the wind affect the rocket after it is launched?**
6. **How can I modify the design of the rocket to increase its chances of making a field goal or reaching a goal?**

Experience the practice of true engineering as you explore the concepts presented in the lessons, experiment with a computer simulation of a water bottle rocket, conduct the hands-on experiment, and compare the computer simulation results with the actual results. You will learn about problem solving--researching a problem, proposing an answer, testing the answer, and analyzing the data produced by the test to figure out if you have the answer or not. Math and science studies are necessary to complete the process . . .they are tools that an engineer uses to solve a problem. When you have the tools, you can attack the problem--that's what engineers do!

There are three sections to help you in your journey:

- Rocket Research 101
- Rocket Research 102
- Rocket Research 103

At the completion of the three sections, you will understand thrust, acceleration (change in speed), and stability.

Before you begin Rocket Research 101, you might like to try a hands-on experiment. **Have you ever wondered why releasing air from a balloon propels the balloon forward?** Balloons can be used to conduct an experiment that demonstrates rocket propulsion. The air in the balloon represents fuel for a rocket propulsion system, and the relationship between volume of fuel and distance can be examined. **Directions** explain how to design and conduct the experiment. Afterwards, discuss your understanding of the results with others. Review your answers **here**.

*Now that you have completed the hands-on experiment, let's continue the journey by testing what you know:*

**Pre-test** - Answer the questions to the best of your ability. At the end of your journey you will given an opportunity to take a post-test with similar questions so that you will know that you have

