Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Lesson 1: How Does the Launch Angle Affect Rocket Flight?**

The angle at which you launch a rocket plays a role in determining how far the rocket will go. In this study you will investigate whether it is better to launch a rocket parallel to the ground (0 degrees), perpendicular to the ground (90 degrees), or somewhere in between. Protractors ready? Launch!

**Doing the Science**

1. Start the Water Rockets Simulation by clicking on the “Sim” tab.

2. Make the following selections:

* Angle: 0°
* Fluid Volume: 200 mL
* Pumps: 4
* Fluid Type: Glycerin
* Air: Off
* Wind: Off

3. Click on the “Launch” button.

4. Record the flight distance in meters in Table 1.

5. Click on the “RESET” button.

6. Repeat steps 2-5 increasing *only the angle* by 10° until you have completely filled out Table 1.

**Table 1.**

|  |  |
| --- | --- |
| **Launch Angle** | **Flight Distance (m)** |
| 0° |  |
| 10° |  |
| 20° |  |
| 30° |  |
| 40° |  |
| 50° |  |
| 60° |  |
| 70° |  |
| 80° |  |
| 90° |  |

**Do You Understand?**

1. What launch angle produced the longest horizontal distance traveled by the rocket?

2. Look at the two angles in your table that resulted in the longest flights and test the 5° angle in between the two. What distance does that angle produce? Does your answer to #1 change?