



Water Rockets

STEM Sims

Lesson 4: How Does the Type of Liquid Affect Rocket Flight?

The type of liquid fuel used makes a big difference in the physics of a rocket launch. Liquids have many different properties, some that can affect how rockets fly. Density is one important property of a fluid. Fill up your tank and start this investigation of liquids and rockets.

Here are some definitions to help you in your investigation.

- Fluid - something that flows freely; a liquid or a gas
- Property - a characteristic of something used to identify
- Quantity - the amount of something
- Mass - the amount of matter in something
- Volume - the amount of space taken up by something
- Density - a measure of the compactness of something
- Viscosity - a measure of how easily a fluid flows

Doing the Science

1. Start the Water Rockets Simulation by clicking on the "Simulation" tab.
2. Make the following selections:
 - Angle: 30°
 - 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 changing *only* the Fluid Type to Water, and then Methanol so that you have completely filled out Table 1.

Table 1.

Fluid Type	Flight Distance (m)
Glycerin	
Water	
Methanol	

Do You Understand?

1. What liquid type produced the longest distance traveled along the ground by the rocket?

2. Use table 2 to describe the relationship between liquids' viscosity and the flight distance along the ground by the rocket?

Table 1.

Fluid Type	Liquid Viscosity (m)
Glycerin	
Water	
Methanol	

3. Based on the liquids' viscosities, explain why the rocket flew the longest distance using this type of liquid.

4. Use table 3 to describe the relationship between the liquids' density and the flight distance along the ground by the rocket?

Table 1.

Fluid Type	Liquid Density (m)
Glycerin	
Water	
Methanol	

5. Based on the liquids' densities, explain why the rocket flew the longest distance using this type of liquid.