

## How Far Will A Missile Go?

**What does the volume of a submarine missile have to do with the distance it travels?**

Below is a table showing the missile volumes and their ranges for the six US Navy Fleet Ballistic Missiles.

### Volume and Range

| <b>Name of Missile</b> | <b>Volume (cubic feet)</b> | <b>Range (statue miles)</b> |
|------------------------|----------------------------|-----------------------------|
| <b>Polaris A-1</b>     | <b>222.7</b>               | <b>1380</b>                 |
| <b>Polaris A-2</b>     | <b>270.4</b>               | <b>1730</b>                 |
| <b>Polaris A-3</b>     | <b>286.3</b>               | <b>2880</b>                 |
| <b>Poseidon C-3</b>    | <b>702.7</b>               | <b>2880</b>                 |
| <b>Trident I C-4</b>   | <b>702.7</b>               | <b>4600</b>                 |
| <b>Trident II D-5</b>  | <b>1252.5</b>              | <b>7000</b>                 |

*Source of data: US Navy and Wikipedia*

Use the table above to complete the questions below.

1. Using Grid paper make a scatter plot to display the relationship between missile volume and the range of the missile. Describe the relationship you see.
2. Draw a line through the points on the graph. Use the line to find the equation for the line of fit. Write the equation for the line in slope-intercept form.
3. Use the graph of the line and the equation of the line to identify the slope and the y-intercept. Explain what these values tell about the volume and the range of the missiles.

4. Use your equation to find the range of the missile that has a volume of 500 cubic feet.
5. Use your equation to find the range of the missile that has a volume of 1500 cubic feet.
6. Use your equation to find the volume of a missile that traveled a range of 3500 miles.
7. Use your equation to find the volume of a missile that traveled a range of 800 miles.
8. **Using Technology.** Using the graphing calculator enter the data points into the list menu.
  - A. Use the calculator to determine the equation that will best describe your data. Compare it to the equation you developed in question.
  - B. Using the table set and table key options on the calculator, find the range for a volume 500 cubic feet and 1500 cubic feet.
  - C. Using the table key option on the calculator. Find the volume of a missile that traveled 3500 miles and 800 miles.