

## Introduction

In this activity, students examine the relationship between the body weight and blood volume of a human.

## Grades 6-8

### NCTM Algebra Standards

- Understand patterns, relations, and functions
- Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations

### Files/Materials Needed

*River1.act, River2.act*

**1**

- Launch TI-Navigator™ on the computer and start the session.
- Have each student log into NavNet on their calculator.
- Tell students that when donating blood, usually one pint is taken. The body replaces this volume within 24 hours.
- Load the activity settings file *River1.act* and start the activity. By starting the activity, students will receive the data shown in the table below which represents the estimated blood volume in pints for a given weight in pounds.

Weight in Pounds	Blood Volume in Pints
60	5
84	7
108	9
132	11
156	13
180	15
204	17
228	19
252	21
276	23

**2**

- Have students exit out of NavNet and pair up with a partner to study the lists which can now be found in the statistics editor. Have them discuss with each other what they observe about the relationship between body weight and blood volume.
- Have them choose any two ordered pairs to determine the linear equation. Tell them to express their answer in slope-intercept form ( $y = mx + b$ ) and enter it in Y1.

**3**

- Have students log back into NavNet.
- Use **Quick Poll** (with *Open Response*) to ask the following questions:
  - *What is the change in weight (measured in pounds) from data point to data point?*
  - *What is the change in blood volume (measured in pints) from data point to data point?*
  - *What is the value of the ratio “change in pints to change in weight?”*

**4**

Press the **List-Graph** tab. On the left, under Configure Plots, check Plot 1 “On.” The data from the lists will be displayed as a scatter plot.

# River of Life

## 5

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- a. Load the activity settings file **River2.act** and start the activity.
- b. Have students press **SEND** to send their equation from step 2b.
- c. Stop the activity when students are finished. Discuss the relationship (slope and  $y$ -intercept) between the scatter plot and the equations. The graphs of all the equations should be the same and should contain the data points on the scatter plot.
- d. If there are graphs that are different, discuss the possible reasons why and make corrections.

## 6

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- a. Use **Quick Poll** (with *Open Response*) to ask the following.
  - *Where does the graph of your equation cross the  $y$ -axis?*
- b. Use **Quick Poll** (with *Multiple Choice A Thru C*) to ask the following.
  - *What would happen to the graph if the slope (ratio of change in pints to change in weight) was changed to 2?*
  - A) Nothing
  - B) Steeper
  - C) Flatter