

## STRAIGHTENING OUT “THE BENDS” Teaching Guidelines

**Subject:** Mathematics

**Topics:** Algebra—Patterns, Functions and Relations, Linear Equations and Functions

**Grades:** 6 - 12

### Concepts

- Function
- Independent and dependent variable

### Knowledge and Skills:

- Can plot a point in a two-dimensional coordinate system, given the coordinates, or determine the coordinates of a given point
- Can determine the equation of a linear function that closely matches a set of points

**Materials:** None

**Procedure:** Distribute the handout and ensure that students understand the meaning of the data in the table. Tell them that before they graph the data they will need to decide which is the independent and dependent variable, and discuss that as a class if you wish.

Once students have graphed the data, ask them whether or not it seems to be a function, and review the concept of function if it is not clear.

Answers will vary. To check the work, verify that students have graphed their own equations correctly, and that those graphs come close to the data points.

## Straightening Out "The Bends"

### Skill Set

When a diver is underwater, he is breathing air at a higher pressure than usual. If he stays too deep for too long, the high pressure of the air causes some of it to dissolve in his blood. Then, if he ascends too quickly, the air will "un-dissolve" and make bubbles in his blood, a very painful experience called "the bends."

The US Navy has established time limits for how long a diver can stay at certain depths before he is in danger of the bends. That table is below.

depth	# of minutes
25	595
30	405
35	310
40	200
50	100
60	60
70	50
80	40
90	30
100	25
110	20
120	15
130	10

1. Graph the data.
2. The data points ranging from 25 feet in depth to 50 feet in depth seem to be nearly linear. Find the linear equation that closely matches those points. Draw it on your graph.
3. Do step 2 for the data from 60 feet in depth to 90 feet in depth.
4. Do step 2 for the data from 100 feet to 130 feet.