

## 2H Graphing Practice

### Read:

When you graph data from an experiment, you create a visual representation of your work that makes it easier to find a mathematical relationship between the dependent and independent variables. In other words, a graph can help you see if there is a cause and effect relationship between your variables.

The parts of a graph include:

- Data pairs:** Graphs of experimental data are made using pairs of numbers. Each pair of numbers represents one data point on a graph. The first number in the pair represents the independent variable and is plotted on the  $x$ -axis. The second number represents the dependent variable and is plotted on the  $y$ -axis.
- Axis labels:** The label on the  $x$ -axis is the name of the independent variable. The label on the  $y$ -axis is the name of the dependent variable. Be sure to write the units of each variable in parentheses after its label.
- Scale:** The scale is the quantity represented per line on the graph. The scale of the graph depends on the number of lines available on your graph paper and the range of the data. Divide the range by the number of lines. To make the calculated scale easy-to-use, round the value to a whole number.
- Title:** The format for the title of a graph is: "Dependent variable name versus independent variable name."

### Practice:

- For each data pair in the table, identify the independent and dependent variable. Then, rewrite the data pair according to the headings in the next two columns of the table. The first two data pairs are done for you.

	Data pair (not necessarily in order)		Independent ( $x$ -axis)	Dependent ( $y$ -axis)
1	Temperature	Hours of heating	Hours of heating	Temperature
2	Stopping distance	Speed of a car	Speed of a car	Stopping distance
3	Number of people in a family	Cost per week for groceries		
4	Stream flow rate	Amount of rainfall		
5	Tree age	Average tree height		
6	Test score	Number of hours studying for a test		
7	Population of a city	Number of schools needed		

2. Using the variable range and number of lines, calculate the scale for an axis. The first two are done for you.

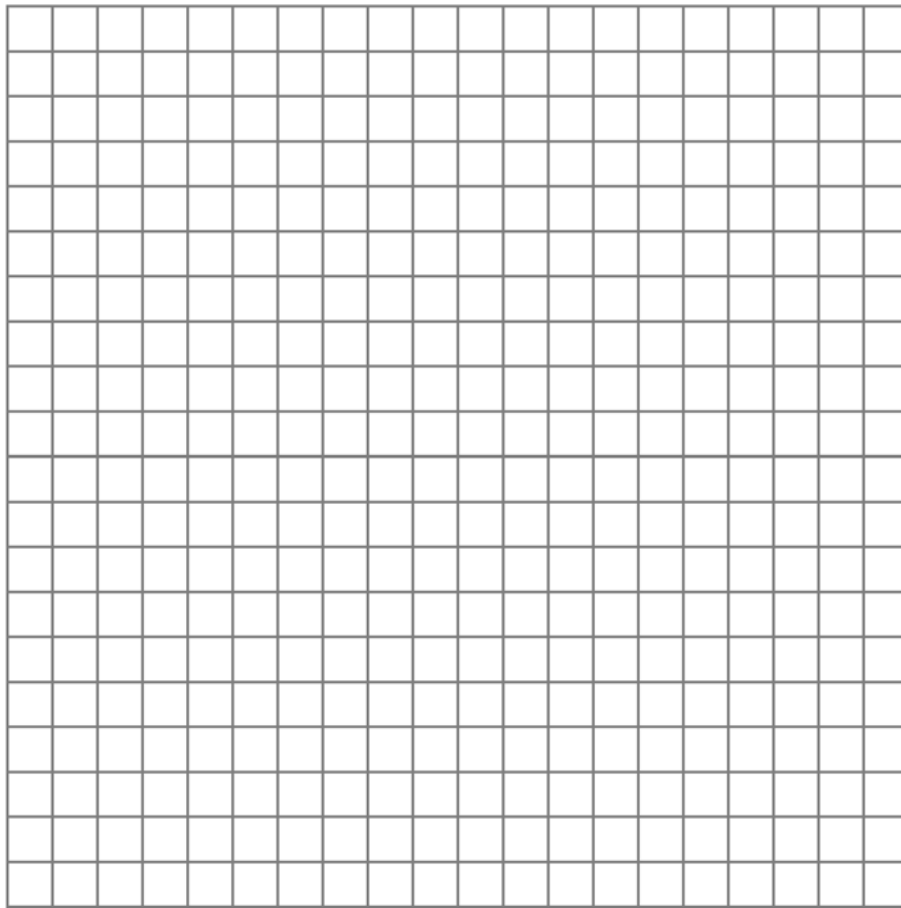
Variable range	Number of lines	Range $\div$ Number of lines	Calculated scale	Adjusted scale
13	24	$13 \div 24 =$	0.54	1
83	43	$83 \div 43 =$	1.9	2
31	35			
100	33			
300	20			
900	15			

3. Here is a data set. Follow these steps to make a graph of this data.
- a. Place this data set in the table below. Each data point is given in the format of  $(x, y)$ . The  $x$ -values represent time in minutes. The  $y$ -values represent distance in kilometers.  
 $(0, 5.0)$ ,  $(10, 9.5)$ ,  $(20, 14.0)$ ,  $(30, 18.5)$ ,  $(40, 23.0)$ ,  $(50, 27.5)$ ,  $(60, 32.0)$

Independent variable ( $x$ -axis)	Dependent variable ( $y$ -axis)

- b. What is the range for the independent variable?
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- c. What is the range for the dependent variable?
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- d. Make your graph using the blank graph on the next page. Each axis has twenty lines (boxes). Use this information to determine the adjusted scale for the  $x$ -axis and the  $y$ -axis.
- e. Label your graph. Add a label for the  $x$ -axis,  $y$ -axis, and provide a title.
- f. Draw a smooth line through the data points.
- g. What is the position value after 45 minutes? Use your graph to answer this question.

*y-axis*



*x-axis*