

**Data Crunchers
Coach's Conference**

Station 1: Water Bottle

1. Using the instruments provided, determine the following quantities:

a) Liquid Volume

b) Liquid Mass

2. Using your results above, calculate the following quantities:

a) Liquid Density

b) Rest-Mass Energy (assume that $c = 3 \cdot 10^8$ m/s)

Your answers must have the correct significant figures and correct SI units.

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Station 2: Table Analysis

Use this table to answer the following questions:

March 6th High Temperature	
Year	Temperature (C)
1995	33
1996	37
1997	31
1998	33
1999	34
2000	31

1. Plot the data shown.
2. Propose a reason for any induced variation that may be present in this data.
3. Propose a reason for any natural variation that may be present in this data.

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Station 3: Accuracy and Precision

1. Using the provided notation, indicate if each of these statements is high or low accuracy (HA, LA) and high or low precision (HP, LP):
 - a) My cat weighs 4.1229 kg
 - b) Most cats have four legs
 - c) There are dozens of cats in my house
 - d) My house is 71.338 m tall
 - e) My cat is smaller than my house
 - f) All 12 of these questions were typed by my cat
2. Provide a statement about yourself that is high accuracy and low precision.

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Station 4: Math

Use the numbers provided to answer the following questions:

$$\{10,11,11,12,14,19,21\}$$

1. Calculate the following properties of this set of numbers:

- a) Median
- b) Mode
- c) Mean

2. Using the formula below, calculate the standard deviation of this set

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$$

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Station 5: Interpolation and Extrapolation

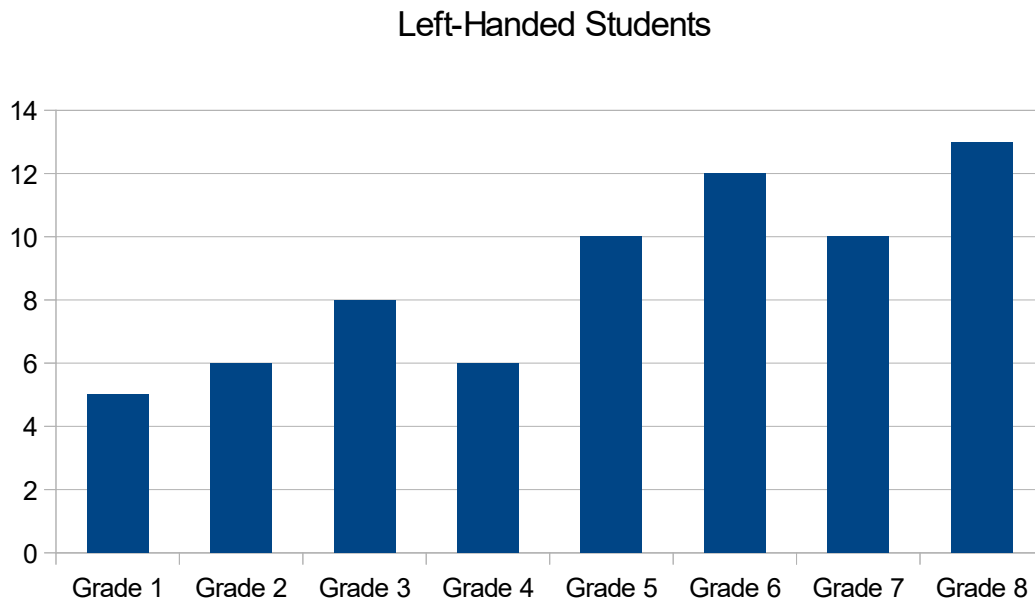
On the first day of the year, I own two pairs of shoes. On the fifth day of the year, I own four pairs of shoes.

1. Based on the provided information, how many shoes did I own on the second day of the month?
2. Develop a formula to predict how many shoes I will own on any given day of the year.
3. According your formula, how many shoes will I own on the seventieth day of the year?
4. Provide a reason that the prediction of your formula may be innacurate.

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Station 6: Chart Analysis

Answer the questions below using the following graph:



1. If there are 350 students at the school, what proportion of them are left handed? Express your answer as both a fraction and a percentage.
2. Describe the general trend of this data.
3. Propose a method of obtaining the above data using a categorical question.
4. Propose a method of obtaining the above data using a numerical question.

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Answers

Station 1:

- 1a) TBD
- 1b) TBD
- 2a) TBD
- 2b) TBD

Station 2:

- 1. Examine chart
- 2. Ex: Different thermometers were used
- 3. Ex: Yearly temperature is not constant

Station 3:

- 1a) HA,HP
- 1b) HA,LP
- 1c) LA,LP
- 1d) LA,HP
- 1e) HA,LP
- 1f) LA,HP
- 2. Many correct answers

Station 4:

- 1a) 12
- 1b) 11
- 1c) 14
- 2. SQRT(14)

Station 5:

- 1. 5
- 2. N+3
- 3. 73
- 4. Many correct answers

Station 6:

- 1. 1/5 20%
- 2. Increasing
- 3. Ex: Ask students are they right or left handed
- 4. Ex: Ask teachers how many left handed students they have