**Class Activity – Lesson 06** **Great Penny Experiment**

**Complete Part A before the start of class. You will complete Part B later in class. You must fully participate in the Great Penny Experiment to get these points.**

Part A: This part of the worksheet should be completed **BEFORE the start of class** with 50 pennies. Use your data to answer the **three** questions in Part A.

1. (4 points) Record in SPSS the year each of the pennies was minted. Then, calculate the age of each of your pennies.

To calculate the age in years, Use Transform->Compute Variable in SPSS, and subtract the date stamped on each penny from 2017. To do this:

1. In the Compute Variable window, type in *Age* in the Target Variable box.
2. Then in the Numeric Expression box, type in *2017-*.
3. Then in the box below the Target Variable box, click on the name of the variable that has column of years listed for each of your pennies (usually, the name of the variable is VAR0001 unless you changed the name).
4. Click on the arrow next to the Numeric Expression box. This will move the highlighted variable to the Numeric Expression box and it will be after *2017-*.
5. Then, click on [OK].

Report the mean and standard deviation of your pennies’ ages to the nearest hundredth (2 decimal places).

Mean = Standard Deviation =

2. (1 point) Use SPSS to make a histogram illustrating the distribution of the ages of your pennies.

**Affix your SPSS graph** on the next page. Type an “×” below the horizontal axis of your histogram to indicate the location of your sample mean.

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3. (1 point) Based on your sample, how would you describe the shape of the distribution

of circulating pennies’ ages?

Part B: This part of the worksheet will be completed in class. You will use *the combined data from the class* to answer the following questions.

4. Answer the following questions in class. Use complete sentences.

1. (1 point) Let X be a variable representing the ages of the pennies. Describe the shape of the distribution of X.
2. (1 point) Let be a variable representing the sample means. Describe the shape of the distribution of .

Everyone brought the same number of pennies. So, the mean of all students sample means is the same as the mean age of all the pennies on the board. The same is not true for the standard deviations.

1. (1 point) The mean ages of the pennies was entered on the instructor’s computer. Record the mean and standard deviation of the means. (In other words, record the mean and standard deviation of the distribution illustrated by the nickels.)

Mean() = Std. Dev() =

1. (1 point) Compare your sample mean from Question 1 to the grand mean for the entire class from Part (c) on this page. How close were these values?
2. (1 point) Compare your sample standard deviation from Question 1 to the standard deviation of the means from Part (c) on this page. How do these values compare? Explain the results.
3. (1 point) Do you think the distribution of the mean age of a sample of pennies, will be approximately normal, no matter what sample size is chosen? Justify your answer.
4. (1 point) What did the nickel represent?
5. (1 point) What did each student represent?
6. (1 point) When we calculate the standard deviation of the sampling distribution, the formula is . Referring to the Great Penny Experiment, is the sample size, n, the number of students who were in class or the number of pennies that each student brought to class?
7. (1 point) List the major items you learned from the Great Penny Experiment.