

Activity Sheet 14**Objective:**

Upon completion of this activity sheet you should be able to average a series of numbers and round numbers to their next highest or lowest value.

NATEF mathematics-related academic skills covered in this activity sheet:

- Determine the proper sequence of arithmetic operations that are needed to arrive at a solution that can be compared to other specifications when comparing system measurements or tolerances to the manufacturer's specifications.
- Calculate the average (mean) of several measurements to determine the variance from the manufacturer's specifications.
- Estimate the results of basic arithmetic operations, and accurately round up or down depending on the appropriate rule for the situation.

This activity sheet also covers, wholly or partially, the following NATEF language arts skills:

- Follow all oral/written directions that relate to the task or system under study.

Tools and Materials: Pen or pencil

PROCEDURE:

1. You are asked to measure the thickness of a section of sheet metal that has been shrunk by heating. You take thickness measurements at equally spaced places around the shrunk area. The thickness measurements are as follows:
.030 inch, .032 inch, .026 inch, .034 inch, .028 inch, .036 inch. What is the average thickness of the metal?
2. The manufacturer's specification for the metal thickness is .030 inch \pm .004 inch. Is the average within the manufacturer's specification?
Yes ___ No ___ If no, how much is it out? _____
Is any individual reading outside of the manufacturer's specification? Yes ___ No ___ If yes, how much is it out?
3. Round the following three digit (hundreds) numbers to the next highest or lowest two digit numbers (tens) as applicable.
a.412 ___ d.234 ___
b.326 ___ e. 555 ___
c.567 ___ f. 763 ___
g. 241 ___ j.823 ___
h.632 ___ k.335 ___
i. 556 ___ l. 893 ___

Name: _____ Date: _____

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4. The manufacturer's specification for a door to fender clearance is $.25 \text{ inch} \pm .5 \text{ inch}$. Measuring the clearance gives you a reading of $.301 \text{ inch}$. Explain how you would determine whether the clearance is within specifications.

5. Find the average of the following readings:

a. 22, 17, 19, 21, 20 _____

b. $.040$, $.042$, $.034$, $.030$, $.058$, $.06$ _____

c. $1/4$, $1 1/2$, $2 3/4$, $1 1/4$, $3 1/2$ _____

d. $.5$, 1 , 18 , 3 , $.8$ _____

e. 2340, 2350, 2290, 2310, 2295 _____

6. The manufacturer's specification for hood clearance on a certain vehicle is $.45 \text{ inch} \pm .2 \text{ inch}$. Could you use a metal ruler calibrated in $1/4 \text{ inch}$ lines to determine whether an actual hood gap is within specifications?

Yes ___ No ___ If no, what would you do to make an accurate measurement?

Activity successfully completed. Yes ___ No ___

Grade (if applicable) _____