

Name _____ -
Members' Names _____

Density of Pennies

Purpose: To compare the densities of pennies made before and after 1982

Introduction: Do a research on the composition of pennies made before and after 1982.

Hypothesis:

Materials:

- 40 pennies made before 1982;
- 40 pennies made after 1982;
- triple beam balance;
- 100-ml graduated cylinder

Procedure: Record all your measurements in a data table.

1. Using a balance, determine the mass of 40 pennies minted before 1982. Repeat your measurement two more times. Average the results of the three trials to obtain the average mass of the 40 pennies.
2. Follow the same process as in Procedure 1 with the 40 pennies minted after 1982.
3. Pour 50 mL of water into a 100-ml graduated cylinder. Add the 40 pennies minted before 1982 to the graduated cylinder. Find the volume of the pennies. Repeat your measurement two more times, making sure to dry the pennies before each trial. Average the results of the three trials to obtain the average volume of the pennies.
4. Follow the same process as in Procedure 3 with the pennies made after 1982.
5. Using the average volume and the average mass of the two sets of pennies, determine the average density of each set.
6. Review your data for any large differences between trials.
7. Compare the average experimental densities of the two sets of pennies with the densities of the metals listed in Appendix Table A-14, Properties of Common Elements.

Discussion

1. Why does the Procedure include three trials instead of one trial for each set of pennies?
2. (a) How would you recognize an inaccurate or incorrect set of data? (b) What might be some possible causes for such faulty data? (c) What would a scientist do with sets of data that appeared to be inaccurate or incorrect? Why?
3. On what experimental and accepted data do you base your conclusions about the composition of the two sets of pennies?