Isotopes of Pennies

Summary

Students use pre-1982 pennies and post-1982 pennies construct the concept of isotopes and weighted averages of elements.

Time Frame

1 class periods of 90 minutes each

Group Size

Pairs

Materials

- student worksheet
  (attached)
  7 pre-1982 and 7 post-1982 pennies in a container for each group of students (I think 2-3 per group works best)
  1 mystery sample of 10 pennies with "unknown" amounts of pre- and post pennies
  1 electronic balance per group
  1 calculator per group (student provided)

Student Prior Knowledge

Atomic number, atomic mass and isotopes.

Instructional Procedures

Pass out the lab packets, group students into pairs and review lab procedure.
Have students complete the pre-lab section of the lab packet, without books or notes, before they enter the lab. Initial that they have completed it and then allow them to begin the lab. Stress that pairs should be working together and that one of them cannot begin the lab before the other.
Once they have checked off their pre-lab, they should obtain one of the containers of pennies and proceed to their lab area to begin massing out the pennies. You will want to have a balance at each lab station and assign groups to the area they will be working in.
After they complete parts A and B, students should obtain a "mystery sample" from you to complete part C. Mystery samples contain ten pennies in dark film canisters. Students are not to look inside the canisters. The canisters should have their mass on the lid as well as an identifying letter. (i.e. canister A has a mass of 5.60g) Students have to calculate how many old and new pennies are in their canister without looking inside.
After they complete the lab, have students return the supplies to the correct area. They can then have time to do the assessment sheet together. I make #3 on this sheet extra credit for regular chemistry classes. Honors classes should be okay completing those calculations.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

Utah LessonPlans