



Atomic Mystery Model—Teachers' Instructions

- Background:** Just as scientists can learn more about subatomic particles even when they cannot see them, we can learn about things we cannot see through experimentation.
- Materials:** One clay (play dough) ball with an object inserted ahead of time. (This should be done so the students do not know what they contain.) We used pennies, screws, and small ball bearings.
Large pixie stick (or paper clip unfolded)
Plastic knife
Paper and pencil/pen
- Procedure:**
1. Plan how you will use the stick (or paper clip) to probe into the clay ball to discover what is inside and where it is located.
 2. You may probe in 8 locations only.
 3. On paper, log your activity by drawing a model (or sketch) of your hypothesis (guess) as to the location and size of the object inside the clay ball. You might also be able to determine what kind of material the object is made of. Can you determine anything else?
 4. Use the plastic knife to cut open the ball and see what's inside.
 5. What did you discover? How does your model/sketch compare to the interior of the clay ball?

Discussion Questions

1. Could you have made your hypothesis before your experimentation? Why or Why not?
2. Do you think you would be able to do accurate measurements to more precisely create your model?
3. What additional tools might you have used to gain more information about the contents?
4. How might you redesign this investigation/experiment?

You may have individual students try this first. Then have groups of students with several balls containing different contents work collaboratively. They can then present their findings as a group to the other researching groups. They should be able to present their method of research, their hypothesis, and their results. Would they modify their experiment? You may have one group of students prepare an experiment of the clay balls with contents for other groups.

What does this have to do with SNS?

Similar to the way you just used a probe to discover information about an object you couldn't see, neutrons will be used at SNS to discover the properties of objects that can't be seen with the human eye. What are materials made of? Everything in the world is made up of atoms. Your body, the car you rode in today, and everything around you is made up of atoms. Atoms are so small that we can't see them with our eyes. Atoms are about a billion times smaller than the item you found in the clay ball. Instead of a stick, SNS will use neutrons to "see" where atoms are in materials and to watch how they move around. WOW! 😊

