

Problem You have learned about the people who developed a picture of what atoms look like and you have learned the parts of an atom. Now, create an atom. Use craft materials to design and produce your own model of an atom.

Materials

dried peas
small balloons
medium balloons
large balloons

craft wire
small pompons
jelly beans
glue

Safety Precautions

Procedure

Directions: Check the boxes below as you complete each step of the procedure.

Select a Model

- 1. Read and complete a lab safety form.
- 2. Choose an element.
- 3. Draw an atomic structure diagram for that element in your Science Journal.

Hint: The atomic structure should include the number of protons, neutrons, and electrons. You can find this information in a periodic table.

- Remember that the atomic number tells the number of protons in the element. The number of protons and the number of electrons is always the same.*
- Draw the protons and neutrons located in the nucleus, and the electrons located outside the nucleus.
 - 4. List everything you know about protons, neutrons, electrons, and their behavior.

Plan Your Model

- 5. How will you model the atom? Decide what materials you will use for the atom.
- How will you arrange the electrons outside the nucleus? Do you want to put electrons on wire or in balloon clouds?

Hint: Think about what you know about electron clouds. How do electrons move? Where are most electrons likely to be located?

- What type of objects will you use to show protons, electrons, and neutrons?
- 6. Make sure your teacher has approved your model before you proceed.

Build Your Model

- 7. Create your atomic model.
- 8. Show and discuss your model with your classmates.

Lab: Version A CONTINUED

Analyze and Conclude

1. Describe how you represented the nucleus in your model. Do you think this worked well?

2. Describe how you represented electrons in your model. Explain how your model mimics how electrons behave.

3. Write a paragraph describing two of your classmates' models. What did you like about their models? What do you think they could have done better?

4. Explain how your model would work if you decided to make a smaller atom. Would another model work better? What if you tried to make a larger atom?

5. Infer How do the mass and distance ratios of your model compare with reality?

6. Error Analysis What could have been better about your model? Explain in detail how you could improve it.

5. Infer How do the mass and distance ratios of your model compare with reality?

6. Error Analysis What could have been better about your model? Explain in detail how you could improve it.

Communicate

Peer Review With your classmates, compare and contrast your models. Discuss the best features of each model and ways that each might be improved. Vote on which model does the best job representing:

- particles of the nucleus
- electrons
- size of the nucleus
- distance of electrons from the nucleus
- movement of electrons
- electron levels

Be prepared to defend your vote for each category. Can you explain why you voted the way you did?

Communicate

Peer Review With your classmates, compare and contrast your models. Discuss the best features of each model and ways that each might be improved. Vote on which model does the best job representing:

- particles of the nucleus
- electrons
- size of the nucleus
- distance of electrons from the nucleus
- movement of electrons
- electron levels

Be prepared to defend your vote for each category. Can you explain why you voted the way you did?