

LABORATORY EXERCISE: SCALE MODEL OF AN ATOM
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INTRODUCTION

This exercise will give students a clearer idea of a simple atomic model and introduce a few concepts of basic atomic theory.

Students make a paper scale model of an atom in which an atom is "blown up" to a visible size, strips of paper are taped together and marked to determine the relative distance between the nucleus and the closest electron.

DIRECTIONS

1. Divide the short end of the paper into 7 strips by measuring and marking every 3 cm (you will draw 6 marks).
2. Mark the bottom of the paper as you did the top and draw lines connecting the marks, giving you 7 strips.
3. Cut out each 3 cm strip of paper.
4. Tape the ends together so you have a long strip of paper. Do not overlap the ends.
5. Using a ruler, mark off and label each 20 cm (from 0 to 180 cm).
6. You will be making a scale model of an atom. The scale used here is 1 cm = 360 m. If an atom is blown up in size we can put it on your model.

Measure to find the center of the left side of the strip (skinny side). Put a very small dot here. Label it as "nucleus of atom".

7. The nearest electron on your model is found 180 cm from the nucleus on your model. Find and label this on your strip.

QUESTIONS

1. Since an electron is about 1840 times SMALLER than one proton in the nucleus, should you be able to see it on your model?
2. What makes up most of an atom, according to your model?
3. How is this model different from a real atom?
4. If a nucleus was blown up to the size of a golf ball (4.5 cm across), how many meters away would the first electron be found at? Use the scale for your calculations (hint: multiply).
5. Take your answer for number 2 and multiply it by 0.0006 to change your answer into miles. How far away would the electron be in miles if the nucleus of the atom was the size of a golf ball?

