

Relative Size of Atoms

Atoms are tiny particles and mostly empty space, because they are made up of smaller subatomic particles.

- one dust particle has millions of atoms
- 100 million million billion hydrogen atoms are in a regular size balloon
- twenty thousand billion billion atoms are in a 5 cent piece

Challenge students to write the numbers numerically. How many zeros are in each number. (23 zeros for balloon, 24 zeros for coin)

Students create table of subatomic particles (smaller than atom)

Review the particles. Show them 1 grain of rice. Ask them to imagine the grain of rice as one electron. Then show them 2,000 grains of rice. Tell them the the 2,000 grains of rice represent a proton. Which one is bigger?

Imagine that an electron is as big as 1 grain of rice. Then a proton would be as big as 2000 grains of rice.

Now **imagine** that an electron is as big as a grain of sand. Then the nucleus of an atom would be as big as a marble. The electron cloud would have a radius of 25 metres!

1. What two particles were represented by the marble?
2. Matter has mass and takes up space. What part of the atom takes up the space?
3. Which part of the atom has the most mass?
4. Are protons, electrons, and neutrons bigger or smaller than atoms?
5. Are electrons bigger or smaller than protons?

Atomic Model

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