

Try to imagine something so small that you cannot see it—not even with the most powerful microscope. Imagine something so small that several million laid end to end would be needed to equal the thickness of this page.

There is something that small. It is the *atom*. All matter is made of atoms. All solids, all liquids, and all gases are made up of atoms.

Atoms take up space—but the space they take up is very, very small. And atoms have weight. But the weight of any one atom is very, very small.

The atom is so small that two hundred and eighty thousand billion billions (280,000,000,000,000,000,000) of them would be needed to make 28 grams (one ounce).

You may wonder how we could know about anything that is too small to see and almost too small to measure. Scientists have learned how to study atoms. They study atoms by studying how matter behaves. They often use very complicated equipment. You can learn about atoms by studying what the scientists have learned.

## LARGE NUMBERS AND SMALL THINGS

There are about six sextillion atoms in just one drop of water. That's 6,000,000,000,000,000,000 atoms. If you tried to count to six sextillion it would take you about one hundred trillion years—If you counted fast!

Suppose each of those atoms were a drop of water. How much water would that be? It would be six sextillion drops of water.

That's more water than all the water that passes over Niagara Falls in 2000 years.

That's enough water to fill about six billion Empire State Buildings.

That's enough water to cover the entire United States, including Alaska and Hawaii, with water 31.4 meters (103 feet) deep.



**TRUE OR FALSE** Write T on the line next to the number if the sentence is true.  
Write F if the sentence is false.

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1. \_\_\_\_\_ An atom is very large.
2. \_\_\_\_\_ Scientists can see the atom with powerful microscopes.
3. \_\_\_\_\_ Solids are made of atoms.
4. \_\_\_\_\_ Liquids are made of atoms.
5. \_\_\_\_\_ Gases are made of atoms.
6. \_\_\_\_\_ Scientists know nothing about the atom.
7. \_\_\_\_\_ Scientists are still learning about the atom.
8. \_\_\_\_\_ We cannot study the atom because we cannot see it.
9. \_\_\_\_\_ We can study only things we can see.
10. \_\_\_\_\_ We learn about the atom by studying matter.

**WHICH IS SMALLEST? WHICH IS BIGGEST?**

Each group of words or terms below can be arranged by size or weight. Write them in correct order in the spaces below each group.

1. a piece of dust   an atom   an elephant

the smallest \_\_\_\_\_

\_\_\_\_\_

the biggest \_\_\_\_\_

2. the tip of a pin   a dime   an atom

the smallest \_\_\_\_\_

\_\_\_\_\_

the biggest \_\_\_\_\_

3. an atom   a rock   a pebble

the smallest \_\_\_\_\_

\_\_\_\_\_

the biggest \_\_\_\_\_