

What Is Matter?

(Everything Is, OK!)

Scientists say that all the objects around you are made of matter. Wow, that's a lot of things! Let's think about your classroom. As you look around, you probably notice doors, windows, walls, a floor, and the ceiling. Those are all examples of matter. Continue looking and you'll find blackboards, bulletin boards, desks, chairs, and lights. These are also kinds of matter. You need paper, pencils, pens, tape, staples, books, chalk, markers, scissors, and rulers to help you do your work. Right again—those are all kinds of matter. Maybe you have some plants, an aquarium, or a classroom pet. Once again, these are examples of matter.

The many kinds of matter found in your classroom are just a small part of all the matter found on Earth. With so many different kinds of matter around us, how can we know what is matter and what is not? We need to have a good definition to help us. Scientists define matter as **anything that takes up space and has mass.**

That's not too tough, as far as definitions go. It should be easy to prove if something takes up space. It's not too tough to prove if something has mass. Let's try some examples.

Is a rock matter? First of all, we have to check and see if a rock takes up space. Can you measure the size of a rock? Try using a ruler or a tape measure to see how long or tall your rock is. If you can measure it, it definitely takes up space! Now, we need to see if a rock has mass. You can use a simple balance scale to see if a rock fits the second requirement of our definition. Simply place the rock on the scale. If the side of the scale with the rock on it moves, it has mass. So, does a rock take up space? Yes. Does a rock have mass? Yes. Since a rock fits both parts of the definition, we can say that a rock is matter.

Let's try another example. Is water matter? It is a little bit harder to measure water all by itself. You can, however, put water in a container. As you can see, the water fills all or part of the container. That sure shows that it takes up space. Now, let's see how we can determine if water has mass. Find two matching containers. Place them both on a balance scale. The scale should stay evenly balanced. Now, place some water in one of the containers. If that side of the balance scale moves down, you have shown that water has mass. Okay, you have figured out that water takes up space and that it has mass. It, too, fits both parts of the definition, so it must be another kind of matter.

A third example to try is air. Get two matching balloons. Fill one of the balloons with air. (An easy way of doing that is by blowing into the balloon, using the air from your own body!) What happens to the balloon as you put air into it? When the balloon changes size and shape, you are showing that air can take up space. Now, get some string and a ruler. Tie a piece of the string to the middle of the ruler. Using two smaller pieces of string, tie an empty balloon to one end of the ruler and the air-filled balloon to the other end. Hold up the entire thing by the free end of the first piece of string. What happens to the ruler? Does the end that is holding the air-filled balloon tip lower than the other end? If it does, you have shown that air has mass. Since you can show that air takes up space and that air has mass, you can say that air is another example of matter.

As you think about the many objects around you—in the classroom, at home, outside—you can try to decide which of them are matter. Remember, matter must fill two requirements. Matter must take up space, and matter must have mass.

Name _____ Date _____

For the student:

1. How do scientists define matter?

2. How can you demonstrate that a piece of chalk has mass?

3. How can you demonstrate that helium takes up space?

4. Are you matter? Why or why not?

5. Can you see all kinds of matter?

6. Is light from a fire matter?

7. Does everything that you can see fit the definition for matter?

8. List five things (not already listed in the text) in your classroom that are matter.
