

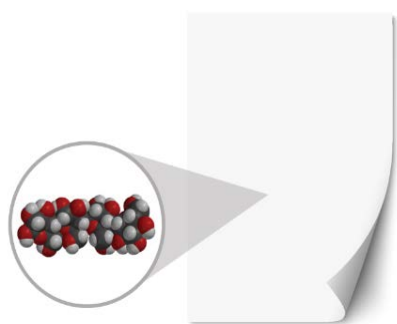
2nd Grade - Lesson 1.2

Testing Materials to Learn About Their Properties

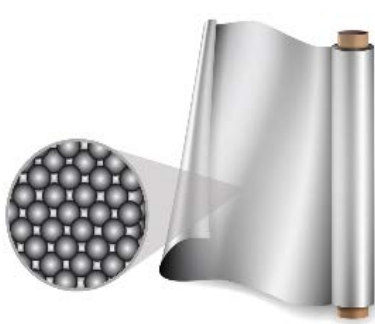
Teacher Background

In Lesson 1.2, students are guided to conduct simple tests to discover some of the properties of samples of paper, plastic, and aluminum foil. Students may initially believe that the characteristics of an object or sample of material are only those they can readily observe by looking at or touching the material. The lesson should help students develop the understanding that conducting controlled tests can reveal other less obvious properties of materials.

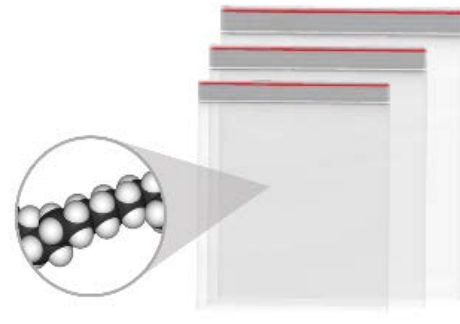
For second graders, you may not want to describe the different atoms or molecules that make up paper, aluminum foil, and plastic. But it is the atoms and molecules of the materials and the way they are processed to make the final product that gives each material its characteristic properties.



Cellulose Molecule



Aluminum Atoms



Polyethylene Molecule

Conducting a Fair Test

In addition to discovering properties of the three samples, one of the main purposes of testing the materials is to give students the experience of conducting a fair test. The key feature of a fair test is treating all materials being tested in the same way so that the results can be compared and provide meaningful information about the property being tested. Understanding the design of a fair test lays the foundation for conducting valid scientific investigations in the future.

Can't Necessarily Generalize

Some tests can be conducted on samples of material that can be generalized to apply to any sample. For instance, if a test for magnetism showed that a sample of steel was magnetic and a sample of wood was not, these results could be generalized beyond the particular samples tested to conclude that a characteristic property of steel is that it is magnetic and a characteristic property of wood is that it is not magnetic. The same is true for tests of electrical conductivity or density.

But the tests students do in Lesson 1.2 are not intended to be generalized beyond the samples being tested. For example, the fact that the plastic bag material is stretchy does not mean that all plastic stretches. Some plastics are very rigid like the plastic in playground equipment.

The “Strength test” is another example. Even though the paper holds up more pennies than the aluminum foil, students should not conclude that paper is stronger than aluminum or that paper is stronger than metal. The “Strength Test” students do is very dependent on the particular samples being used so the results should not be considered characteristic properties of the material itself, but a property of the sample being tested.

