

Can the Container Hold More?

The Action Help students study different sizes of molecules by filling an “already full” beaker of marbles, with more sand and more water.

Grade Level
Grade 1 – Classifying Matter
Grade 2 – Measuring Matter
Grade 3 – Properties of Matter
Grade 5 – Matter and its Changes

Materials A transparent container (500 mL beaker works good)
Marbles
Sand
Water

Instructions Fill the transparent container up to the brim with marbles. Show the students that the beaker is full, and point out that you still have sand and water to add to the beaker. Add sand to the transparent container first, shaking the beaker slightly so that the sand fills the spaces between the marbles. Yet again, add water to fill even smaller spaces between the sand and marbles.

Safety

Hints Do not neglect to tell the students that the marbles, sand, and water particles are only illustrating how molecules of matter are behaving and that they are not molecules themselves.

Science Principle The marbles, sand and water particles are used only as an analogy of how molecules of different sizes would behave. The smaller sized molecules can slip between the larger ones. Thus, it is possible to slip the sand or water between the marbles, but not the other way around. It is especially important to point out to students that the marbles or sand grains are not molecules, but that molecules are so small that we cannot see them, not even with a microscope.