

What Could It Be?

Description: Students try to identify objects that they cannot see by making inferences. They receive several film canisters with objects and without opening them they try to identify the objects inside.

Groups: Upper and lower elementary;
recommended group size: two.

Estimated Time: 15 minutes

Key Question: How can we identify an object without seeing it?

Content Expectations Addressed: Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.



Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.

Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science through history and within society.

Teacher Background: Scientists are not able to see atoms and most molecules because they are too small. However, they do have an idea how atoms and molecules look by the way they react with other materials. The scientists get a picture or idea of what things are like with partial information. This is called inference. The “black box” method of inquiry is a good way for the students to find out that even though they can’t see many things, they can tell what they are like or, in some instances, what they are. The students do this by using their senses and relating what they sense to other things they know about. These are called inferences.

Science Process Skills: Describing, inferring, observing, concluding, information gathering and recording.

Materials: Series of film canisters containing the following: 2 BB’s, 2 marbles, 2 toothpicks, 2 nails, 2 washers, 2 small paper clips, 2 bingo chips, 2 pieces of rock salt.

Procedure: Students are given the sealed film canisters and, without opening them, they try to decide what is inside. They can shake, roll or move the canister in other ways. They cannot open, crush, or put the canister in water. Students’ observations are recorded on the data table. They list as many properties as they can. Some possibilities are dimension, shape, hardness, mass and material composition. (Like metal, like glass, like rubber, etc.) After properties have been

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listed and predictions have been made, the canisters may be opened and the actual objects observed and recorded.

Resources:

Ashton, Stephen and Jane Pearson, Exploring Matter: Science Alive

Bronowski, J. Biography of an Atom

Mebone, Robert, Adventures with Atoms and Molecules, Books I-V, Enslow Publishing