

Student Handout

The Mystery Tube[®] — A Black Box Activity

Introduction

The Mystery Tube[®] investigation is designed to introduce you to the scientific process. Research scientists frequently face the difficulty of examining a subject without the advantage of being able to take apart the object of their investigation.

An example of this dilemma occurs when the subject is a living organism. A surgeon would not operate on a patient without an idea of what was occurring inside that individual. Therefore, an explanation of the observed symptoms of the subject must be hypothesized based on an examination made without destroying the object under investigation. This is sometimes called “a black-box activity”.

As you begin your scientific research you must keep in mind that there isn't an answer key of correct answers. You will not be able to ask, “Did I get the right answer?” The body of scientific knowledge grows and evolves based on continuing developments in technology which allow researchers to extend their powers of observation and refine their explanations. In this exercise you will be the research scientist, make observations and propose a mechanism which explains the properties of the mystery tube.

Materials

- 3D Molecular Designs Mystery Tube[®] — A Black Box Activity
- meter stick (or other measuring device)
- magnet
- lab journals



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Procedure

1. Observe the mystery tube with the members of your group.
2. Record your observations in your lab journal as your group investigates the properties of the mystery tube. Be sure to include both quantitative and qualitative observations. You may want to set up a data table to record your observations.

Tip: hold the tube at different angles as you conduct your investigation.

3. DO NOT remove the end caps. This would destroy the object of your investigation.
4. Collaborate with members of your group to propose your answer(s) to the question:

How could the mystery tube be constructed to produce the properties you have observed?

5. Identify and explain other tools you may need to refine your hypothesis.

