

Developing & Using Models

Activity #1: Syringe and Plunger

General Objective: The purpose of this activity is to make a model from the evidence based on observation. In this activity we will observe the phenomenon of a syringe and a plunger.

Materials: large syringes

Each group of students is given a syringe and a plunger. Students are instructed to complete two tasks:

1. Fill the syringe with air and place your finger over the end and observe what happens when the syringe is pulled back.
2. With the end still sealed, push the plunger in as far as you can and observe what happens.

Students then create models (drawings in a notebook) to show the phenomenon of what they think happens to one air particle. Students will draw three models, one showing a picture of a particle of air in the middle of the syringe when filled with air, one showing where and what the single particle looked like when the plunger was pulled back, and one with the plunger pushed in. In both instances the plunger returned to its original spot.

The students then share and describe their models. Students may struggle with this concept because it is difficult to picture one particle of air. It may be easier to show the relationship between particles, but looking at one particle might help students to understand the idea of compression and expansion.

Extension: Have students explore further to see what might

happen if water or bubbles were placed inside the plunger.

From Starr & Associates, Educational Consultants

Related Crosscutting Concepts:

- [Cause & Effect](#)
- [Structure & Function](#)

Related Disciplinary Core Ideas:

- [Core Idea PS1: Matter and Its Interactions](#)
 - [PS1.A: Structure and Properties of Matter](#)
- [Core Idea PS2: Motion and Stability: Forces and Interactions](#)
 - [PS2.A: Forces and Motion](#)
 - [PS2.B: Types of Interactions](#)
 - [PS2.C: Stability and Instability in Physical Systems](#)
- [Core Idea ETS1: Engineering Design](#)
 - [ETS1.A: Defining and Delimiting an Engineering Problem](#)