

Aquarium Analogy with One Aquarium

Models and Simulations



Introduction

Investigate homeostasis simply using water, beakers and an aquarium!

Concepts

- Homeostasis

Materials (for each demonstration)

Water, tap

Beakers, plastic, 400-mL, 2

Aquarium

Bucket

Safety Precautions

The materials used in this laboratory activity are considered nonhazardous. Follow all laboratory safety guidelines.

Preparation

Fill an aquarium about 2" from the top with tap water.

Procedure

1. Ask for two student volunteers.
2. Hand each student a 400-mL beaker.
3. Instruct volunteers that as one student pours in a beaker full of water the other student should remove a beaker full of water and discard it into the bucket.
4. The rules for the transfer are as follows:
 - The volunteers must pour at exactly the same time.
 - The beakers must be as full as possible when the transfers are made.
 - Water should not be caught during the pouring.
 - The aquarium cannot be tipped.
 - The beakers must be used as scoops, not shovels. The transfer must be done calmly.

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures governing the disposal of laboratory waste. The water used in this activity may be poured down the sink according to Flinn Suggested Disposal Method #26b.

Discussion

At first students might predict this demonstration represents an equilibrium analogy. It is important to discuss in order for equilibrium to exist the system must be closed. The system shown in this demonstration is not closed. New water is being added to the system while the water already in the system is being taken away. The system established is steady and keep-

ing relatively the same level of water in the aquarium, but it is not an equilibrium situation. This demonstration is an analogous example of a process known as homeostasis. Homeostasis is the steady-state physiological condition of the body. An example of homeostasis in the body is food intake and waste excretion.

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12

Evidence, models, and explanation
Constancy, change, and measurement
Evolution and equilibrium

Content Standards: Grades 5–8

Content Standard C: Life Science, structure and function in living systems, regulation and behavior
Content Standard F: Science in Personal and Social Perspectives, personal health

Content Standards: Grades 9–12

Content Standard C: Life Science, matter, energy, and organization in living systems
Content Standard F: Science in Personal and Social Perspectives, personal and community health

Flinn Scientific—Teaching Chemistry™ eLearning Video Series

A video of the *Aquarium Analogy with One Aquarium* activity, presented by Irwin Talesnick is available in *Models and Simulations*, part of the Flinn Scientific—Teaching Chemistry eLearning Video Series.

Materials for *Aquarium Analogy with One Aquarium* are available from Flinn Scientific, Inc.

Catalog No.	Description
AP6009	Bucket, Utility Pail
FB0210	Aquariums, All-Glass®, 169 5 89 5 109

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.