

Grade 6th

Topic: Pharmacology

Title: Dissolving Antacid Tablets

Science Standards:

6.7.2 Use models to illustrate processes that happen too slowly, too quickly, or on too small a scale to observe directly, or are too vast to be changed directly, or are potentially dangerous.

Objective:

Students will observe and record the reaction rates of whole antacid tablets and crushed tablets when each is placed in vinegar.

Materials:

For the teacher-

1 antacid tablet
1 piece of paper
1 heavy book for crushing the tablet
1 plastic cup, 2/3 filled with water

For each group of four students-

2 graduated cups, 30 mL
1 bottle of vinegar, 60 mL
2 antacid tablets
2 hand magnifiers
1 sheet of paper
Timer or clock with a second hand

For each student-

Activity sheet: Antacid Tablets- To Chew or Not to Chew

Procedure: One class session

Anticipatory Set: Introduce the topic of how we use over-the-counter (nonprescription) medications by asking a few questions. What kinds of medicines have you taken for a headache? Does a tablet get rid of your headache immediately after you take it? What do you think happens to a pill when it is swallowed? Make sure students understand that the medicine needs to dissolve and then be absorbed into their bodies in order to take effect.

Tell students that you have a case of indigestion and that you want to get rid of it as soon as possible. The directions on your indigestion medication tell you to chew the tablets and then to swallow. Unfortunately, you don't like the taste of the tablet. Is it okay to swallow the tablet without chewing it? Will the medicine work as fast?

Explain to the students that they are going to do an experiment to see if it makes a difference whether you chew medicine or swallow it whole. In order to do this,

instead of chewing you are going to crush the tablet. Demonstrate how to do this by putting a tablet inside a folded piece of paper and pressing down or banging gently with a book or other heavy object. Now use the creased paper to “funnel” the powdered tablet in to a cup filled with water. Ask the students to describe what they see happening. They shouldn’t see much, because these tablets don’t dissolve well in water. Explain that, because the tablets are designed to dissolve in the stomach, for this activity they will be using vinegar, a type of acid, to simulate the acid conditions found in the stomach.

Instructional Guidelines: Explain to the class that now they will observe how a “chewed” tablet compares to one swallowed whole. Distribute the materials to each group of four, distribute the *Antacid Tablets-To Chew or Not to Chew* activity sheets to each student, and allow them to begin the activity.

Give the following instructions (for each group of four students):

1. Fill each 30 mL (milliliter) graduated cup with 20 mL vinegar.
2. Place one of the antacid tablets inside a piece of paper that has been folded in half. Crush the tablet by putting a book (or other heavy object) on top and pressing down.
3. Have one partner pick up the whole tablet while another picks up the paper with the crushed tablet. On the command of a third partner, put the whole tablet in one cup at exactly the same time that the crushed tablet is poured into the other cup. The fourth partner should write down the exact time the tablets were added to the cups.
4. Record your observations (use as many of your senses as possible!) in the data table on the activity sheet in the row marked “Start.”
5. Make and record your observations of each cup every two minutes until the data table is complete.
6. Answer the questions 1 through 3 at the bottom of the activity sheet.

Follow-up Discussion: After the students have completed their experiments and recorded their observations, you may wish to poll them for the various reaction times and write them on the chalkboard.

Assessment:

- Ask the students to record combined class results on a bar graph.
- Ask the students to answer the following questions in their learning log:
- Did all the groups get exactly the same results?
- Why do the times vary among the groups?
- What are the variables of this experiment, such as the size of the pieces, the accuracy of observation, the lack of an easily observable ending point of the reaction?