

Studying Dust Mites

Lesson Plan

Grade Level: 6-8

Curriculum Focus: Ecosystems

Lesson Duration: One class period

Student Objectives

- Discover that much dust contains microscopic arachnids called *dust mites*.
- Understand that the various proteins contained in the feces of dust mites can cause allergies.
- Examine various samples of classroom dust through a microscope for dust mites and draw what they see.

Materials

- Video on *unitedstreaming: Discover Magazine: Hidden Worlds*

Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

1. Dangers in Your Dust: Of Dust Mites, Allergies, Mold, Mildew, Fungi, and Bacteria

- Computer with Internet access
- Slides
- Microscopes

Procedures

IMPORTANT: Before beginning this activity, be sure that neither you nor anyone in your classroom is allergic to dust. You may want to send notes home asking parents to confirm that it is safe for their children to participate in an activity requiring them to handle dust.

1. Ask students if they know anyone who is allergic to dust. Then explain that when people think they are allergic to dust, they are really reacting to tiny animals that live in dust, called *dust mites*. In fact, the actual *allergen*, or irritating substance, is any of a variety of proteins present in the feces of dust mites! Go on to inform students that dust mites are *arachnids*, animals related to spiders, and that they can be seen only under the lens of a microscope.
2. With the students, collect several types of dust in small containers. Take dust from different locations in the room, such as the backs of drawers and under tables. Turn pockets inside out and collect pocket lint also. You might use chalk dust, as well. Label the containers to show where the dust in each one was found.

3. Make a dry-mount and a wet-mount slide to view under a microscope each type of dust you find.
4. Have students view the slides and draw what they see, labeling the drawings with the locations in which the dust was found.
5. Have students share their drawings with the class. Discuss with students what they saw. Did they find any dust mites?
6. Have students use the Internet to find out more about dust mites. Ask them to list the facts they learn. Following are examples of facts students might come up with:
 - The average mattress contains about two million dust mites.
 - More than half the weight of an old pillow is accounted for by the weight of the dust mites it contains.
 - Not everyone has the same reaction to dust mite feces. Each individual reacts to different proteins in the allergen. People may not be allergic to all or any of the proteins that cause allergic reactions.
7. Share these facts with the class, then have students share their own facts about dust mites.

Discussion Questions

1. In the last 20 years, we have made tremendous strides in medicine and treatment of diseases. Even so, over 13 million Americans have asthma. Speculate on why deaths from asthma have risen 40% since 1977.
2. Discuss what would happen if all the dust mites in an in-service mattress were exterminated. Would bacteria or fungi or both proliferate?
3. If you were a medical researcher, what steps might you take to find the cause of allergic reactions in people?
4. NASA is very careful to clean dust particles off satellites and space probes before putting them into space. Special dust free "clean" rooms are used to outfit the craft for space flight. Explain why scientists take this precaution.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Student created neat, clearly labeled drawing; submitted numerous facts in a well-organized list.
- 2 points: Student created satisfactory drawing with labels; submitted some facts in an adequately organized list.
- 1 point: Student created messy drawing without clear labels; submitted few facts in a poorly organized list.

Vocabulary

aggressive sampling

Definition: Intense gathering of large sizes of random samples for examination or testing.

Context: In an example of aggressive sampling, the vacuum pump sucks air through minute holes and deposits dislodged particles on the petri dish inside.

allergen

Definition: A substance, such as pollen, that causes an allergy.

Context: Fungal spores, dust mites, cockroaches, cat dander, dog dander and mouse urine are examples of dangerous allergens found in dust.

allergic reactions

Definition: Physical symptoms, which may include sneezing, itching, and skin rashes, caused by abnormally high sensitivity to certain substances such as pollens, foods, or microorganisms.

Context: Microscopic plants and animals that live in household dust can trigger allergic reactions.

Academic Standards

National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following science standards:

- Life Science: Populations and ecosystems

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit

<http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Science – Life Science: Understands relationships among organisms and their physical environment.



Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>

