

Hidden Territories: A Virtual Investigation of Mold Growth in the Home

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Overview

In this lesson students will be introduced to fungi and the environmental conditions that promote mold growth. Students will use an interactive virtual house to identify possible areas of mold growth and use biological evidence to explain and support their findings. Students will then apply their knowledge by completing an observational scavenger hunt in their homes for mold susceptible areas. The objective of this activity is for students to learn about fungi and the environmental conditions needed for mold to grow.

Key Search Words

Fungi unit biology, NC Biology BIO 2.1 lesson, Environmental biology lesson, Kingdom Fungi, mold, fungi characteristics, Mold reproduction, Decomposers, Ecosystems, household mold, scavenger hunt, moisture

Learning Objectives

- Describe the characteristics of fungi.
- Explain the environmental factors required for mold growth.
- Predict locations where mold growth is likely to occur based on environmental conditions.
- Justify mold growth predictions using biological evidence.
- Analyze their own home environment for possible mold growth

Curriculum Alignment

NORTH CAROLINA SCIENCE STANDARDS:

- **BIO.2.1.1:** Explain how organisms interact with both living and non living components of ecosystems.
- **BIO.2.1.2:** Explain how environmental conditions affect the growth, survival, and distribution of organisms.

Classroom time required

One class period (70-90 minutes)

Materials & Technology

- The teacher's computer with internet access
- Student laptops with internet access
- Interactive Powerpoint Presentation
- Interactive Investigation worksheet
- Home Mold Scavenger Hunt worksheet
- Writing utensils

Safety

During the home investigation portion of this lesson, students should not touch, scrape, or smell suspected mold. Students should also not open crawl spaces, walls, or HVAC system areas to complete the mold investigation. For extra precaution, students should wear closed-toe shoes while completing the investigation at home.

Teacher Preparation for Activity

- Verify that all hyperlinks and pop-up explanations are working properly on the interactive powerpoint.
- Verify that all students have computers with internet access.
- Print or upload a copy of the Interactive Investigation worksheet and the Home Mold Risk Scavenger Hunt worksheet to your learning management system.
- Review the characteristics of living organisms and the role of decomposers in the ecosystem with students the day prior to this activity.

Student Preparation for Activity

Students should review the characteristics of living organisms and the role of decomposers in ecosystems. Students will need a charged computer/device with internet access to complete the virtual investigation section of this lesson. For the independent in-home scavenger hunt, students should communicate with their parents which areas of their home they plan to investigate.

Procedure

Engage: (5 minutes)

- Review the images from Slide 3 of the attached PowerPoint with the class. Ask students which locations do they think mold would grow the fastest and why. Allow time for open discussion.
- The images should include a dining table, a bathroom ceiling, a basement wall, and a dry bookcase. Two images should represent non-susceptible mold growth areas, the other two should depict mold prone areas (Feel free to swap images to your liking)

Explain: (15-20 Minutes)

- Explain to students that Fungi are Eukaryotic organisms that act as heterotrophs in the ecosystem, meaning they cannot make their own food. They absorb nutrients from their environment and act as decomposers that recycle nutrients.
- Discuss how mold is a type of fungus that grows as thread-like structures called hyphae. Inform students that mold reproduces by releasing microscopic spores.
- Inform students that in order for mold to grow, it requires specific conditions. These conditions include moisture, an organic food source (ex: wood, drywall, dust, or fabric), oxygen, warm temperatures, and time. Explain that moisture is the most important contributing factor.
- Inform students that mold is an important decomposer because it breaks down dead organic materials into smaller substances. This recycles nutrients back into the soil and environment for other organisms to use.
- Discuss with students the common causes of mold growth in home. These include plumbing leaks, roof leaks, condensation, high humidity, poor ventilation, and flooding.
- Express to students the potential harmful effects of having mold in our homes.

Explore: (20-25 minutes)

- Students will now independently explore the virtual house. Rooms available for exploration include the kitchen, bathroom, bedroom, basement, and living room.
- Explain to students they will be able to click on various objects in each room, such as the sink, dishwasher, carpet, and ceiling. Each click will reveal why mold could grow on that specific object, as well as a biological explanation.
- Students should complete the interactive investigation worksheet while exploring the virtual house.

Discuss: (15 minutes)

- Once students are finished with the virtual investigation worksheet, in discussion format, ask students the following questions:
 1. "What did the areas that had mold growth have in common?"
 2. " Why doesn't mold grow on every surface in our homes?"
- Allow time for student responses.

Exit Ticket: (10-15 minutes)

- Ask students to provide a written response to the following questions:
 1. Why are fungi considered decomposers?
 2. Name three environmental conditions mold requires to grow
 3. Why would mold grow underneath a kitchen sink cabinet after a plumbing leak?

ACTIVITY TWO: In-Home Mold Risk Scavenger Hunt- * Independent activity that should be completed for homework*

PLEASE REVIEW THE SAFETY SECTION OF THIS LESSON WITH STUDENTS BEFORE THEY BEGIN THIS ACTIVITY

- Students will find 8-10 locations to inspect in their home.
- Using the Mold Risk Scavenger Hunt Worksheet, students will record the following information for the selected locations:

1. Name of location
2. Would mold likely grow there?
3. What evidence supports your opinion?
4. Does this location have a high, medium, or low risk for mold growth?
5. What are some possible prevention steps to reduce the risk of mold growth in this location

Example:

1. Bathroom Grout lines
2. Yes
3. Due to frequent hot showers, bathrooms contain a lot of moisture and humidity. Without proper ventilation, water will settle on bathroom surfaces, creating an environment for mold growth in certain areas.
4. High risk due to frequent shower usage
5. Use bathroom fans after taking a shower

- For extra points students can rank their chosen locations from highest probability of mold growth to lowest probability of mold growth.

Differentiation

Students with learning disabilities

- Provide a word bank or picture glossary to assist with content comprehension.
- Provide guided notes to accompany the powerpoint presentation.
- Allow students additional time to complete the independent assignment.

English language learners

- Provide students with a vocabulary sheet of the terms discussed during the warm-up, as well as new vocabulary discussed in today's activity.

Advanced learners

- Have students research one species of indoor mold (ex: Penicillium or Aspergillus). They are to determine the species preferred environment, its health effects, as well as prevention methods. Students will then identify areas in a selected room where their mold species is likely to grow, providing environmental and biological factors that promote its growth. They will then redesign the room to include three evidence-based modifications that would make the environment less desirable for mold growth. Students will submit a before and after visual of their selected room, including justification of why their modifications reduce the likelihood of mold growth.

Assessment/Check for Understanding

Formative assessment:

- Assess completed worksheets

Summative assessment

- Exit Ticket

Required resources

[Interactive Virtual House Powerpoint](#)

Appendices

[Interactive Investigation worksheet](#)

[In-home Mold Investigation worksheet](#)