

# How do microbes spread? An interactive approach

## Summary

The objective of this lesson is to introduce students to various ways infectious diseases are transmitted in a community setting.

## Time Frame

1 class periods of 60 minutes each

## Group Size

Small Groups

## Life Skills

Thinking & Reasoning, Communication, Systems Thinking

## Materials

- Fluorescent powder
- Hand-held black light
- Sports ball of choice
- Worksheet

## Background for Teachers

The objective of this lesson is to teach students how disease agents spread in a community setting. Infectious diseases can be concisely described as a collection of symptoms (disease) that involves an agent and a host (infectious). The agent (often a bacteria, virus, fungus or parasite) is the culprit that enters a host and can cause a variety of effects. Usually these effects are harmful to the host, but sometimes can be beneficial or result in no noticeable change in the host. An important part of infectious diseases is the ability of the agent to move between hosts, or to be transmitted. This often involves a vector, or a 3rd party member to help move the agent around. This lesson will define three main modes of transmission (direct, indirect and airborne) and will also touch upon factors that can help or hinder the process of transmission.

Some helpful background can be found on the websites listed below.

## Student Prior Knowledge

Students should have adequate introduction to the topic of infectious diseases and what causes them.

## Intended Learning Outcomes

1. Use Science Process and Thinking Skills
  - a. Observe simple objects, patterns, and events, and report their observations.
  - b. Sort and sequence data according to criteria given.
  - d. Compare things, processes, and events.
3. Understand Science Concepts and Principles
  - a. Know and explain science information specified for the grade level.
4. Communicate Effectively Using Science Language and Reasoning

- a. Record data accurately when given the appropriate form (e.g., table, graph, chart).

### Instructional Procedures

The morning of the instruction, the teacher will powder specific classroom objects that are commonly handled by students. Each object will be powdered with a different color to distinguish apart which classroom objects are handled most often.

Next, the teacher will front load the students using an interactive, inquiry-based discussion on disease transmission. This will include the description of indirect, direct and airborne transmission. At the conclusion of the discussion, the teacher will reveal to the class that objects in the room have been powdered. Using the hand-held black light, the teacher will inspect the students' hands for fluorescence. Each student should write down the colors visible on their hands in science journals. A second inquiry-based discussion should begin and hypotheses can be made about difference colors and different classroom objects.

Then teacher will provide the students with a worksheet with various infectious diseases and various modes of transmission. Either in small groups or individually, students will match the diseases with the most likely mode of transmission. These worksheets can be given as take-home work or can be gone over together as a class.

At the conclusion of class, the teacher can lead a discussion to actively guide students in creating two extension lessons on: "How does hand washing change the likelihood of disease transmission?" and/or "Contact tracing by shaking hands."

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