

Microbe Math

Objectives:

- Apply math skills to learn about optimal conditions for bacterial growth
- Learn about the exponential speed at which bacteria can multiply
- Learn about the role of bacteria in promoting decay

Materials:

- Modeling clay, one or two colors
- Graph sheets

Procedure:

1. Ask students for examples of decay they have seen, such as food left in the refrigerator too long or a dead animal in the yard. Explain that bacteria and fungi cause most of the decay.
2. Explain that an individual bacterium is far too small to be seen by our eyes alone; most are about 1/1000 of a millimeter in diameter.
3. Divide the class into groups of four. Give each group a fist-sized piece of clay that represents a single bacterium. Every 30 to 60 seconds, have each group divide its "bacteria": first two, then four, then eight, then 16, then 32. Track the bacterial growth of the class on a class graph sheet or on the board.
4. Explain that real bacteria – including strains that make us sick – divide every 20 minutes under optimal conditions. The real bacterium would have gone from one to 32 in 100 minutes. Now ask them to calculate how many bacteria there would be after two hours, three hours and four hours at this fission rate.
5. Ask them to consider why such unchecked growth does not actually happen. (Finite food supply, limits of suitable living space, propensity for crowded bacteria to poison themselves with their own waste, antibiotics that are created by competing fungi, ability of humans and many animals to produce antibodies).

Interesting fact: In just 12 hours, one bacterium could multiply to over 8.5 billion under perfect conditions. After three days, with no bacteria dying, there would be enough of them to cover the entire earth.

Adapted from: www.healthyhands.com