Class Starters & Enders

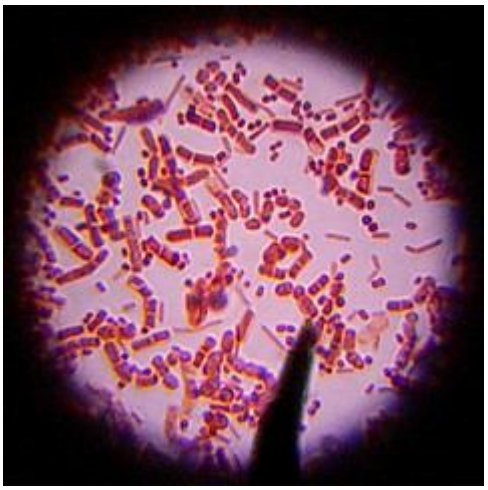
Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

Marvelous Microbes

Program Areas: Agriculture, Engineering, Culinary Arts, Marketing, and Healthcare.

Instructions: Read the narrative and make notes of important points, answer questions, if provided, and be ready to discuss this topic.



Bacteria, shown here under a microscope, are one of four main classifications of microbes.

Your parents and teachers probably tell you to cover your mouth and nose when you cough or sneeze so you won't spread germs. But how can you spread something you can't even see? It's because germs are actually **microorganisms** – or microbes – which are tiny living things that cannot be seen without a microscope.

Most microbes belong to one of four major groups – bacteria, viruses, fungi, or protozoa. They were first observed by the scientist Anton van Leeuwenhoek in 1675, but quite possibly were known about long before then. In the first century B.C., the Roman scholar Marcus Terentius Varro warned against locating farms near swamps. In his book On Agriculture, Varro wrote, "…and because there are bred certain minute creatures which cannot be seen by the eyes, which float in the air and enter the body through the mouth and nose and there cause serious diseases."

Most microbes are **unicellular** organisms found everywhere in nature, including extreme environments such as deserts, geysers, and the deep sea. They participate in the carbon and nitrogen cycles and decompose dead material. Many microorganisms have **symbiotic** relationships with larger organisms. Some of these are **mutualistic** relationships, where both organisms benefit from the partnership, while others are **parasitic** and the microbe can be damaging to its partner.

Microbes played many roles throughout history. During the Middle Ages, diseased corpses were thrown into castles as part of battle plans, and enemies exposed to deadly **pathogens** were likely to spread the disease to others. Microbes aid in growth promotion for livestock and are added to some foods to help balance digestion. They are used to **ferment** materials into fuels, ethanol, and methane. They are tools in biotechnology, biochemistry, genetics, and molecular biology, as many microbes are simple **eukaryotes** that can be rapidly grown in large numbers for research. Microbes can even be used for creating **steroids** and treating skin diseases.

Not all microbes are beneficial, however. Pathogenic microbes are harmful because they invade and grow within host organisms, causing diseases that kill millions of people, animals, and plants. Viruses such as influenza and chicken pox are examples of this type of microbe.

Review

1. What is a microbe?
2. When were microbes discovered?
3. What are two types of symbiotic relationships microbes can be involved in?
4. Name one use for microbes.
5. Why did Marcus Terentius Varro warn farmers against building near swamps?

Language Connection

Define the following terms.

Eukaryote	Mutualistic	Steroids
Ferment	Parasitic	Symbiotic
Microorganisms	Pathogens	Unicelular

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