Grade 7

Separating DNA

Students will experience how scientists separate mixtures by isolating DNA from bacteria

BIOlab Experiences Use a common molecular biology lab technique called miniprepping to separate and purify DNA from a sample of lab bacteria.

Time required
Half day (2h)

The Particle Theory of Matter cluster offers some great opportunities to experience techniques that are common to many medical research labs. Not only do we work with solutions and mixtures every day, we also need techniques to separate complex substances. Bacteria are often used to copy DNA, and the isolation and purification of the DNA molecule from these organisms is a key step in many molecular biology labs. It's easy for Grade 7s to do, and it draws on many concepts in the Particle Theory unit.

Specific Learning Outcomes Addressed		What students will experience in the BIOlab
7-1-13	Demonstrate proper use and care of the microscope to observe micro-organisms.	Use phase-contrast and compound microscopes to examine bacteria and appreciate the scale of microorganisms.
7-1-14	Identify beneficial and harmful roles played by micro-organisms.	Prepare samples of common bacteria for growth, connect to disease, digestion and research.
7-2-01	Use appropriate vocabulary related to their investigations of the particle theory of matter.	Describe bacteria in liquid media, identify solutions and mixtures.
7-2-14	Differentiate between the two types of mixtures, solutions and mechanical mixtures.	Identify solutions and mixtures used in the purification of DNA.
7-2-18	Demonstrate different methods of separating the components of both solutions and mechanical mixtures.	Perform miniprep (alkaline lysis) separation of DNA using mechanical separation, centrifuge, precipitation.
7-2-19	Identify a separation technique used in industry, and explain why it is appropriate.	Understand how the DNA preparation is important in disease research.