



SPARK QUESTIONS AND A LEARNING EXPERIENCE FOR SCIENCE 30

project AGRICULTURE Activity	SCIENCE 30
	CONCEPTUAL KNOWLEDGE
SPARK LEARNING SOURCE Why is balance important for sustainable ecosystems? Agriculture and sustainability go hand in hand. Agriculture affects and is in turn affected by the natural environment. LEARNING SOURCES What is the chemistry of food products? How can agricultural environments contribute to sustainability? Why should agricultural environments be monitored?	Unit B: Chemistry and the Environment 30-B3.3k Describe alternatives to the use of chemical technologies; e.g., bioremediation for contaminated soil, biological controls for pests, biodegradable products 30-B3.1sts Explain how science and technology have both intended and unintended consequences for humans and the environment (SEC3) [ICT F2-4.8, F3-4.1] - Explain the role of concentration in a risk-benefit analysis for determining the safe limits of particular substances; e.g., pesticide residues, chlorinated or fluorinated compounds 30-B3.2sts Explain that the appropriateness, risks and benefits of technologies need to be assessed for each potential application from a variety of perspectives, including sustainability (ST7) [ICT F2-4.2, F3-4.1] - Explain the meaning of technological fix and explain the need for broader considerations in reducing the environmental impact of the by-products of chemical processes Unit D: Energy and the Environment 30-D1.3k Apply the concept of sustainable development to increasing the efficient use of energy; e.g., efficient use of energy in the home, in industry and in transportation



The SPARK learning source can be used to introduce and “spark” discussion and investigations about the role of chemical technologies in agricultural ecosystems. Encourage students to explore the INVESTIGATE MORE questions for further research. Students can be asked to focus on the use of and alternatives to chemical technologies in agriculture, the monitoring of substances in the environment and energy uses and sources in different industries, including agriculture.

The LEARNING SOURCE and BUILD COMPETENCIES activities can meet specific learning outcomes in the Science 30 curriculum and can provide a follow up of these concepts. Students can focus on how acid deposition and other forms of pollution can affect agricultural activities. Encourage students to explore the affect that pollutants can have on agriculture as well as sustainability practices that farmers use to protect environments.

project AGRICULTURE Activity	SCIENCE 30
	PROCEDURAL KNOWLEDGE
BUILD COMPETENCIES Nutrient science   Sustainability practices   Environmental monitors  	Unit B: Chemistry and the Environment 30-B3.2s Conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information - Debate the issue of whether protecting the environment should have priority over economic interests (PR-SEC1) [ICT C1-4.4, C2-4.2] 30-B3.3s Analyze data and apply mathematical and conceptual models to develop and assess possible solutions - Interpret data from water quality tests, such as pH, BOD, dissolved oxygen and organic compounds - Analyze alternatives to the use of chemical technologies; e.g., bioremediation for contaminated soil, biological controls for pests, biodegradable products (AI-SEC2) Unit D: Energy and the Environment 30-D1.1s Formulate questions about observed relationships and plan investigations of questions, ideas, problems and issues - Identify questions to investigate that arise from science- and technology-related issues; e.g., "Which energy sources and technologies best balance the need for global energy demand with acceptable environmental impacts?" (IP-SEC1) [ICT F2-4.8] 30-D1.4s Work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results - Present a visual display of initiatives taken by industry to protect the environment (CT-SEC2) [ICT C1-4.4, P6-4.1]