Statewide Career Pathways Basic Skills Curriculum
Contextualized Science Module

OUTCOMES/ STANDARDS	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Explore careers and learn scientific process skills *IL STAN: 4.R.RS.1, 4.R.RS.4, 4.R.RS.11, 4.S.CC1*	Reasoning/problem solving	• Read "Think Like a Scientist" and pair-share ideas (Resources). • Complete worksheet with a partner. (Work is done together, but each student completes own worksheet.) • Discuss and explain why students chose to put each career with a specific skill. How were answers different between partners? What is at least one additional skill needed for each career? What characteristics were most important to you when you made the groups? • Complete the Extension Activity, *Communication in Action.* (Resources)	Student completion of Think Like a Scientist
2. Evaluate the forces that shape the lithosphere *IL STAN 4.R.RS.2, 4.R.RS.6, 4.R.RS.7, 4.R.RS.12, 4.R.FW.2, 4.W.WL.5, 4.2.CC1, 3.R.FW.4, 3.W.PD.5, 3.W.RB.1, 4.W.RB.1*	Earth Science	• Use Exploratorium website's "Faultline: Seismic Science at the Epicenter" to explore earthquakes, plate tectonics, and earthquake safety. (Use the wireless presentation remote to discuss earthquakes, plate tectonics, crustal plate movement and other areas of interest from the website.) • View problem statement sheet (Resources) in student pairs. Using Career Cards (Resources), discuss how each relates to the problem statement • Complete "Earthquake Job Information Sheet" in student pairs • Present job information based on the earthquake problem.	Instructor observation /student participation /student completion of Earthquake Job Information
3. Describe use of earth materials, including the economic use of rocks and minerals *IL STAN 4.4.RS.6, 4.R.RS.8, 4.W.WL.6, 4.R.FW.1, 3.W.RB.1,*	Geology/Earth Science	• Research the "Mineral and Gemstone Kingdom" site for background information on (http://www.minerals.net/) • Complete hypothesis column of "Uses of Rocks and Minerals" worksheet (Resources). Discuss and review correct answers. • Discuss other products made from rocks and minerals. • Brainstorm occupations that deal with rocks and minerals, emphasizing the importance of rocks and minerals to our	Instructor observation/ student completion of "Uses of Rocks and Minerals"

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4.W.RB.1, 5.R.FW.1, 3.R.FW.1, 3.R.FW.4, 4.R.RS.4, 3.W.RB.1 **4.** Apply concepts and design solutions for conduction, convection, and radiation *IL STAN: 4.R.RS.9, 4.R.RS.11, R.W.WL.6, 4.S.CC.4, 3.R.FW.1*	Energy and Energy Transfer	lifestyle and economy. • Research one rock/mineral and career per student, following the procedure on the worksheet. • View Energy Transfer video: https://www.youtube.com/watch?v=Atnjo7dD_bA • Conduct heating/cooling experiment, requiring students to maintain the warm temperature of one soda can filled with water at body temperature and an identical soda can filled with water at body temperature to cool as much as possible during a 30-minute time interval. Students design their solutions using only common, everyday materials and record water temperatures in the soda cans every five minutes. Prepare line graphs visually comparing results to the temperature of an unaltered control can of water. **Materials needed**: Empty soda cans, thermos filled with heated water, thermometer • Students approach the problems presented in this activity as engineers, using heat transfer principles to accomplish a goal. • Discuss concepts by asking students to define and give examples of heat transfer by means of conduction, convection and radiation. Ask students to describe ways people try to cause or prevent heating and cooling by conduction, convection and radiation in everyday life. Ask students to give examples of materials that serve well for heating by conduction, convection and radiation, and explain why these materials are particularly well suited for the type of heat transfer involved. • Discuss and research jobs that focus on energy: utility line person, HVAC (heating and air conditioning), refinery workers, wind turbine installer and repair, auto industry, tooling, plastics.	Instructor observation

Statewide Career Pathways Basic Skills Curriculum
Contextualized Science Module

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5. Explain how engineers use pH to measure cellular respiration/ importance of chemical balance in careers *IL STAN: 4.R.RS.2, 4.R.RS.3, 4.R.RS.4, 4.R.RS.9, 4.W.WL.2, 4.W.WL.3, 4.W.WL.6, 4.S.CC.1, 3.R.FW.1, 3.R.FW.4, 3.S.PK.4, 4.S.PK.4*	Bioremediation/ Soil contaminates	• Complete pH worksheet and discuss answers (Resources). • Conduct pH experiment (Resources) and complete *Breathing Bubbles* worksheet. (Resources also contains an Optional Post-Activity Discussion) • Brainstorm about how the expense and resources put into bioremediation might be different than developing tools and equipment to remove contaminants from soils and water. • Write a paragraph or discuss as a group, comparing bioremediation vs. land removal in contamination cleanup. • Discuss and research jobs using chemical balance: medical lab techs, sanitation/dishwashing, laundry and cleaning positions, agriculture, landscaper/lawn care techs, hair dressers, bottling plant workers, carpet cleaners, café workers, etc..	Student completion of pH and Breathing Bubbles worksheets and experiment
6. Understand cycle of matter and careers in soil science *IL STAN: 4.R.RS.2, 4.R.RS.6, 4.R.RS.12, 4.W.WL.3, 4.S.CC.1, 3.W.RB.1, 3.S.PK.4, 4.S.PK.4*	Life Science	• Applying inquiry skills, use Earthworm Problem Statement (Resources) to create yes/no questions and record them on the "Earthworm Student Sheet" (Resources). As a group, ask questions and instructor provides answers; then circle yes or no on sheet. • Discuss the role of soil conservationists. They provide technical help to farmers, ranchers, forest managers, state and local agencies, and other people who are concerned about the conservation of soil, water, and other related natural resources. Ask: Who employs conservation scientists? The USDA's Natural Resource Conservation Service employs many conservation scientists. Some conservation scientists are self-employed. They help private landowners, Federal and State governments, and forestry-related businesses.	Student completion of Earthworm Student Sheet

Statewide Career Pathways Basic Skills Curriculum
Contextualized Science Module

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		What type of degree do you need to be a conservation scientist? Most colleges do not offer a degree in soil conservation. Many soil conservationists have degrees in environmental studies, agronomy, general agriculture, hydrology, or crop or soil science. What type of activities do you need to enjoy being a good conservation scientist? --You need to like working outdoors. You need to be physically fit to handle the job and be willing to move where the jobs are located. You have to have good people skills.	
7. Understand how muscles and bones work together *IL STAN 4.R.RS.3, 4.R.RS.4, 4.R.RS.7, 4.W.WL.6, 4.S.CC.1, 4.S.CC.4, 3.R.FW.1, 3.R.FW.4, 3.S.PK.4, 4.S.PK.4*	Muscular/ skeletal system	• Create skeletal drawing. Divide students into small groups. Have one student lie on butcher paper and have another student trace the outline. Students then create the skeleton in the outline of the body, labeling the bones they draw (students can work from memory/knowledge or can work from a diagram or skeletal model). • Discuss what holds bones together and helps them move. • Complete the *Making Muscles Move* worksheet and experiment (directions in Resources.) • Discuss what careers would need to learn about bones and muscles and why this knowledge would be helpful. (Answers may include radiologists, fitness instructors, rehabilitation therapists, radiation therapists, nurses, physicians, coroners, dental hygienists, etc.)	Instructor observation; student completion of Making Muscles Move worksheet and experiment
8. Describe and research space exploration careers	Space exploration	• Research the career of someone who has helped to plan, create, build, assemble, or work on the International Space Station, using International Space Station worksheets	Student completion of Space Station

Statewide Career Pathways Basic Skills Curriculum
Contextualized Science Module

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IL STAN: 4.R.RS.1, 4.R.RS.5, 4.R.RS.8, 4.S.CC.2, 4.R.FW.1, 5.R.FW.1		(Resources). • Discuss individual findings. • Discuss space travel and inventions that have made it possible. • Read and complete the "Slinky®" lesson. (in the Resources)	worksheet
9. Explore concepts of sound and how they can be applied to careers *IL STAN: 4.R.RS.2, 4.R.RS.3, 4.R.RS.12, 4.W.WL.6, 3.R.FW.1, 3.R.FW.4,3.R.FW.3, 4.R.FW.1, 5.R.FW.1*	Sound properties	• Review knowledge and concepts of the properties of sound and how it relates to musical instruments, using "Student Study Guide: Nature of Sound, Properties of Sound, and Combining Sound Waves (Resources). • Discuss careers in the music industry, using the U.S. Department of Labor Statistics' *Occupational Outlook Handbook* page, "Musicians and Singers," i.e., sound technician, recording engineer, music therapist, orchestra member, singer, song writer, etc. • Complete the sound experiment "Musical Notes" (directions in Resources).	Instructor observation of student experiment
10. Analyze law of conservation of energy *IL STAN: 4.R.RS.3, 4.R.RS.4, 4.R.RS.10, 4.S.CC.1, 4.R.FW.1, 5.R.FW.1, 3.S.PK.4, 4.S.PK.4*	Energy transfer relationships	• Complete the "Energy Transfer Relationships" worksheet (Resources). • "Skateboard Scenario" (instructions in Resources) • "A Bright Idea: Energy Conservation" (Instructions in Resources) • Complete "Energy Job Information Sheet" (Instructions in Resources) • Discuss and research energy conservation jobs: recycling industry, waste management, alternative fuel industry (wind, electric cars, solar energy support), mass transportation, i.e. bus drivers, mechanics, logistics), hazardous materials removal.	Student completion of experiments and worksheets

Statewide Career Pathways Basic Skills Curriculum
Contextualized Science Module

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11. Explore lung volume and capacity *IL STAN: 4.R.RS.1, 4.R.RS.3, 4.R.RS.8, 4.R.RS.9, 4.R.RS.11, 4.W.WL.2, 4.S.CC.1, 3.R.FW.1, 3.R.FW.4, 3.W.RB.4, 3.S.PK.4, 4.S.PK.4*	Healthcare; Athletics	• Discuss athletic training. • Explore what lung capacity is and why it is important. (The amount of air your lungs can hold or the combination of different lung volumes. An average pair of lungs can hold 6 liters of air, but only a small amount of that is used in normal breathing. Lung capacity enables your body to get oxygen when it is needed.) • Brainstorm professions where it would be extremely important to have good lung capacity. (Examples may include firefighters, athletes, fitness instructors, coaches, referees/umpires, chefs, day care workers, military careers, musicians, singers, swimmers, etc.) • Discuss what factors can affect lung capacity. Examples of things that could affect lung capacity include a person's height, whether a person smokes, the altitude where a person lives, gender, athletic activity, diseases of the lungs, etc.) • Complete "What Is Your Lung Capacity?" experiment and worksheets (Resources).	Student completion of What Is Your Lung Capacity? experiment and worksheet