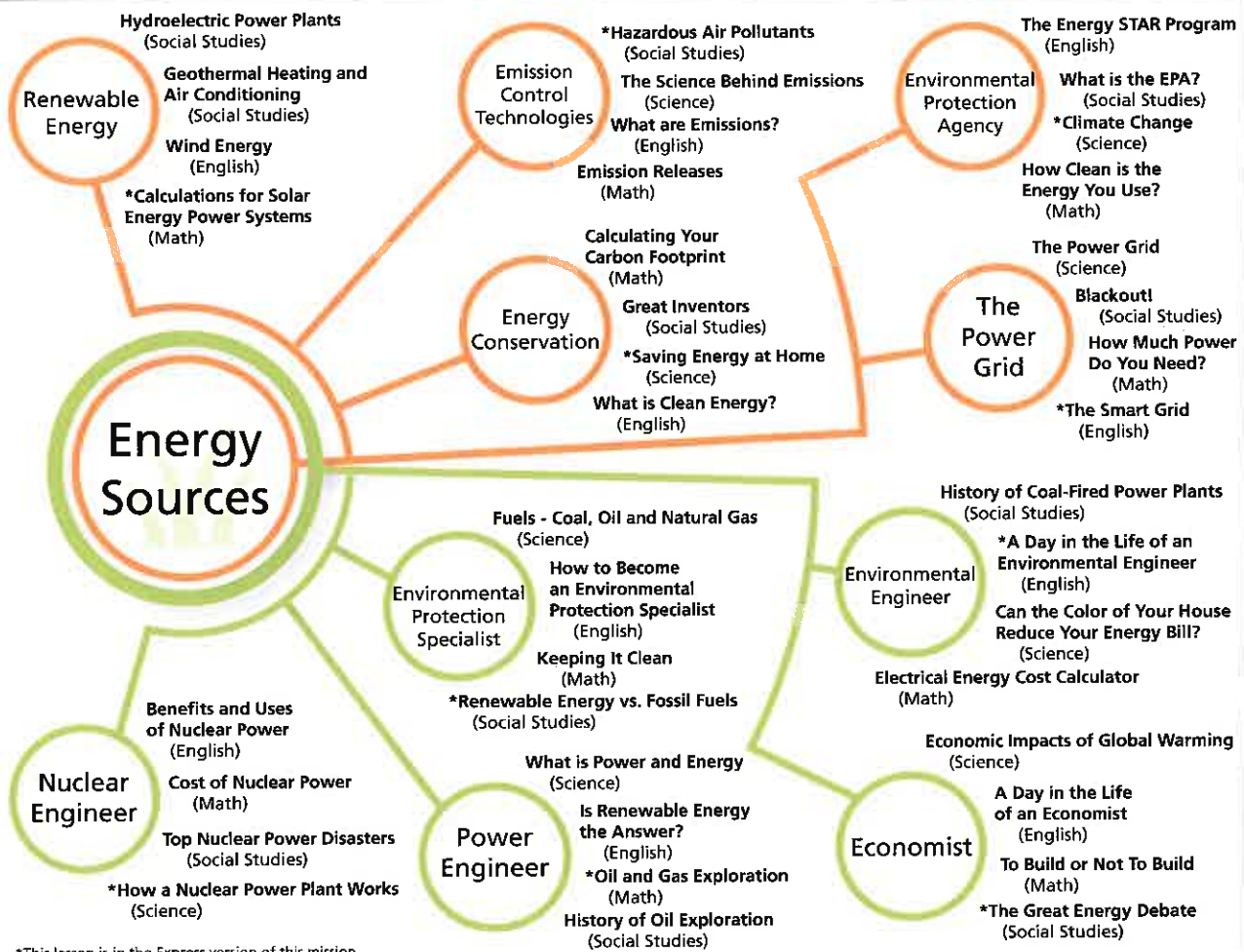
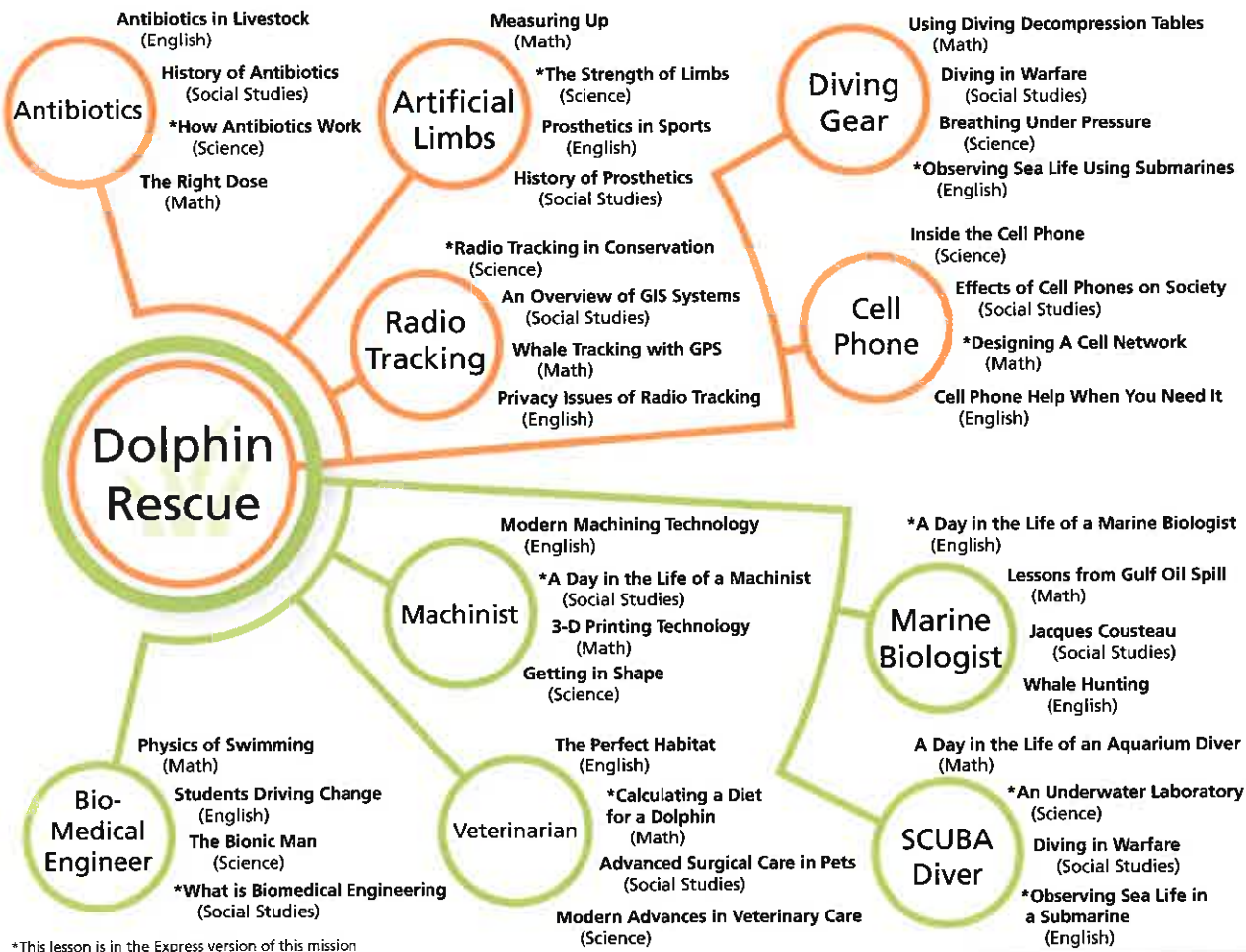
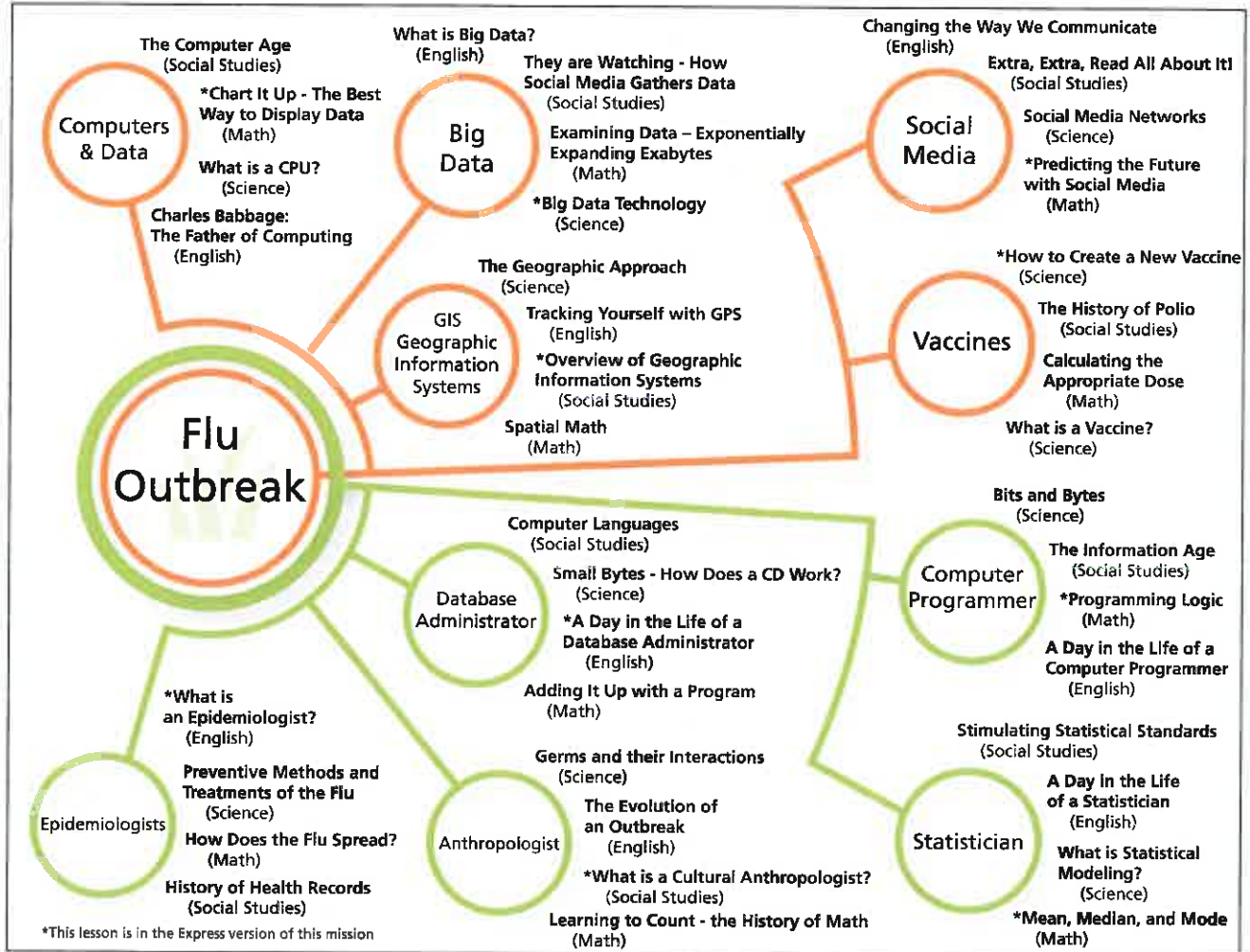
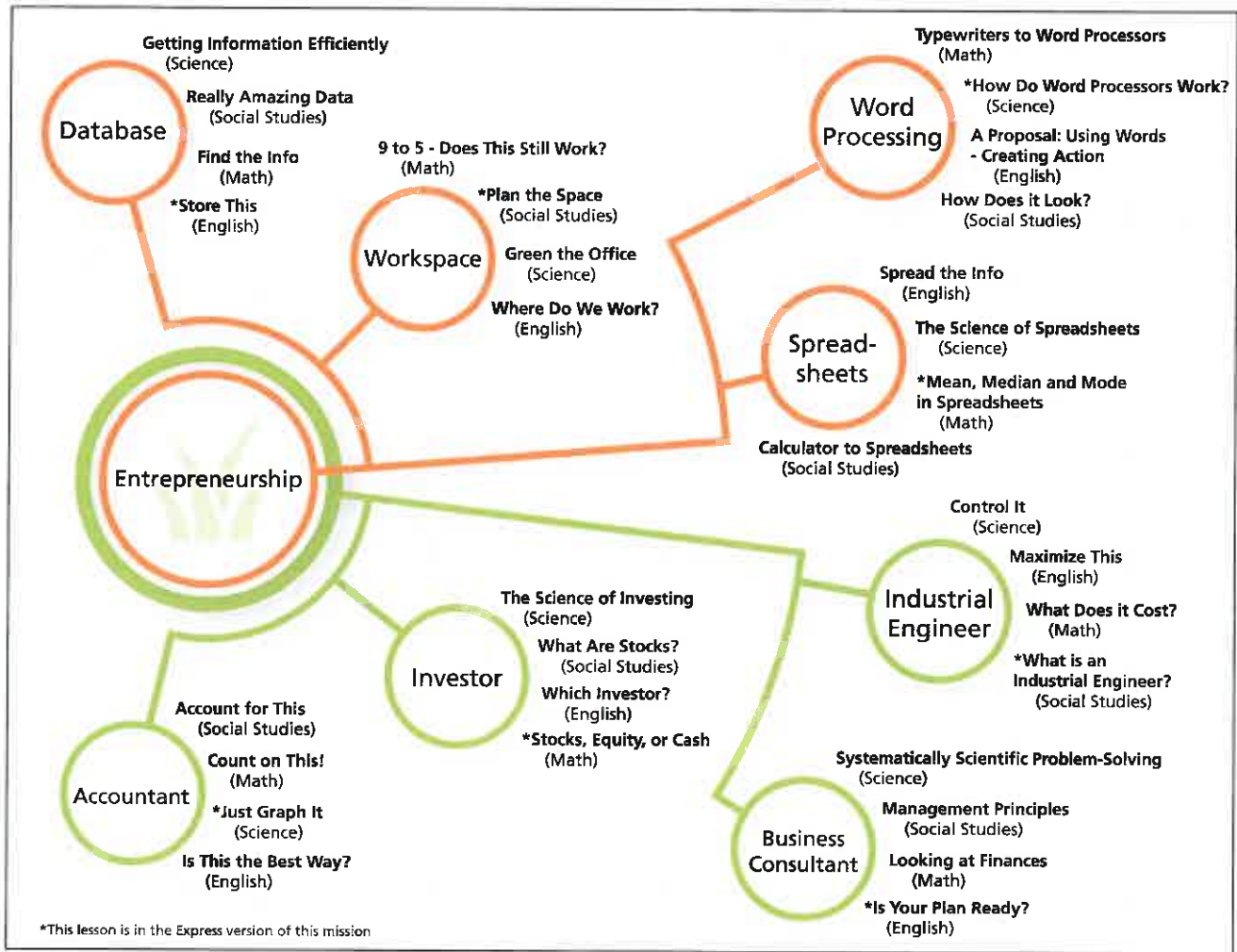


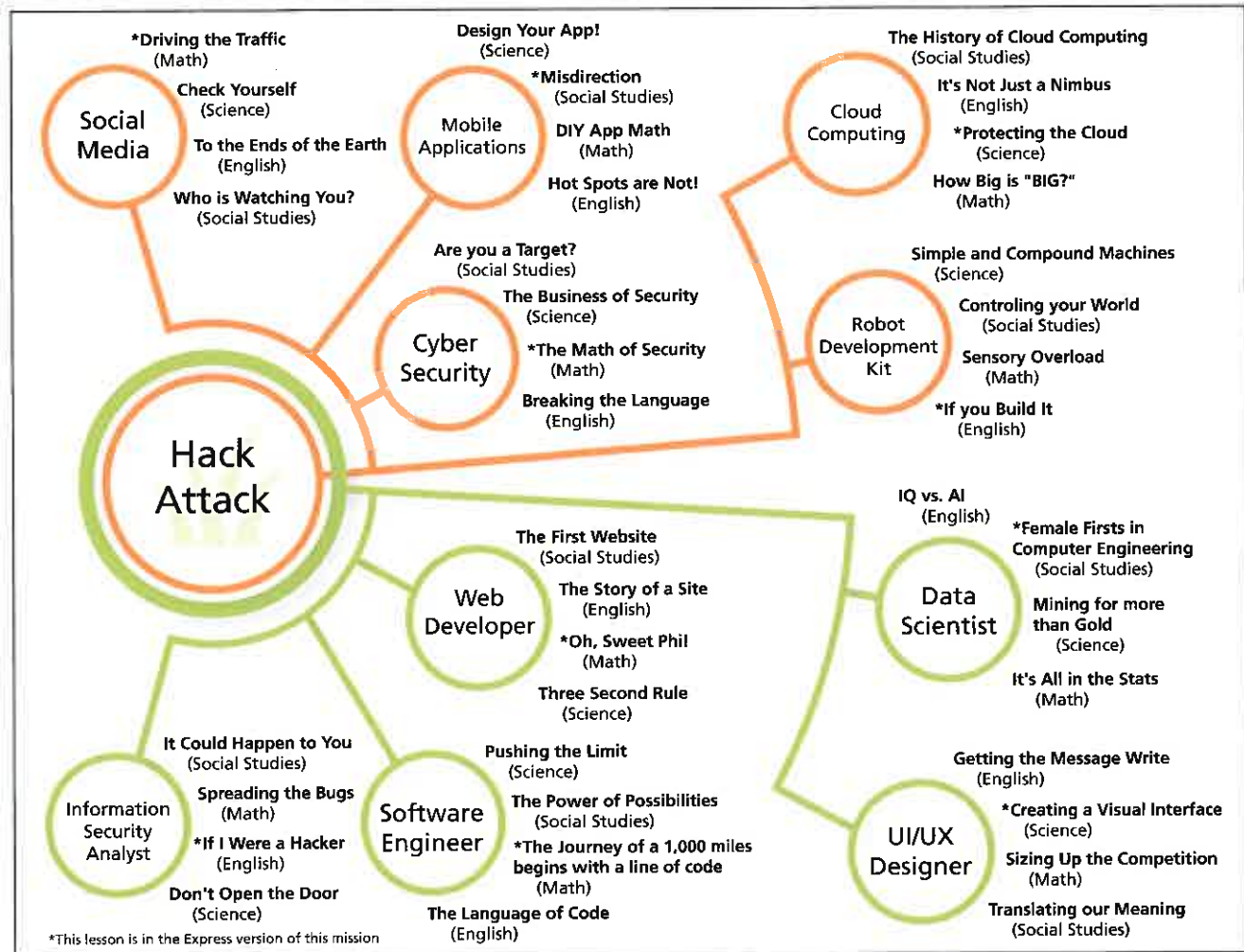
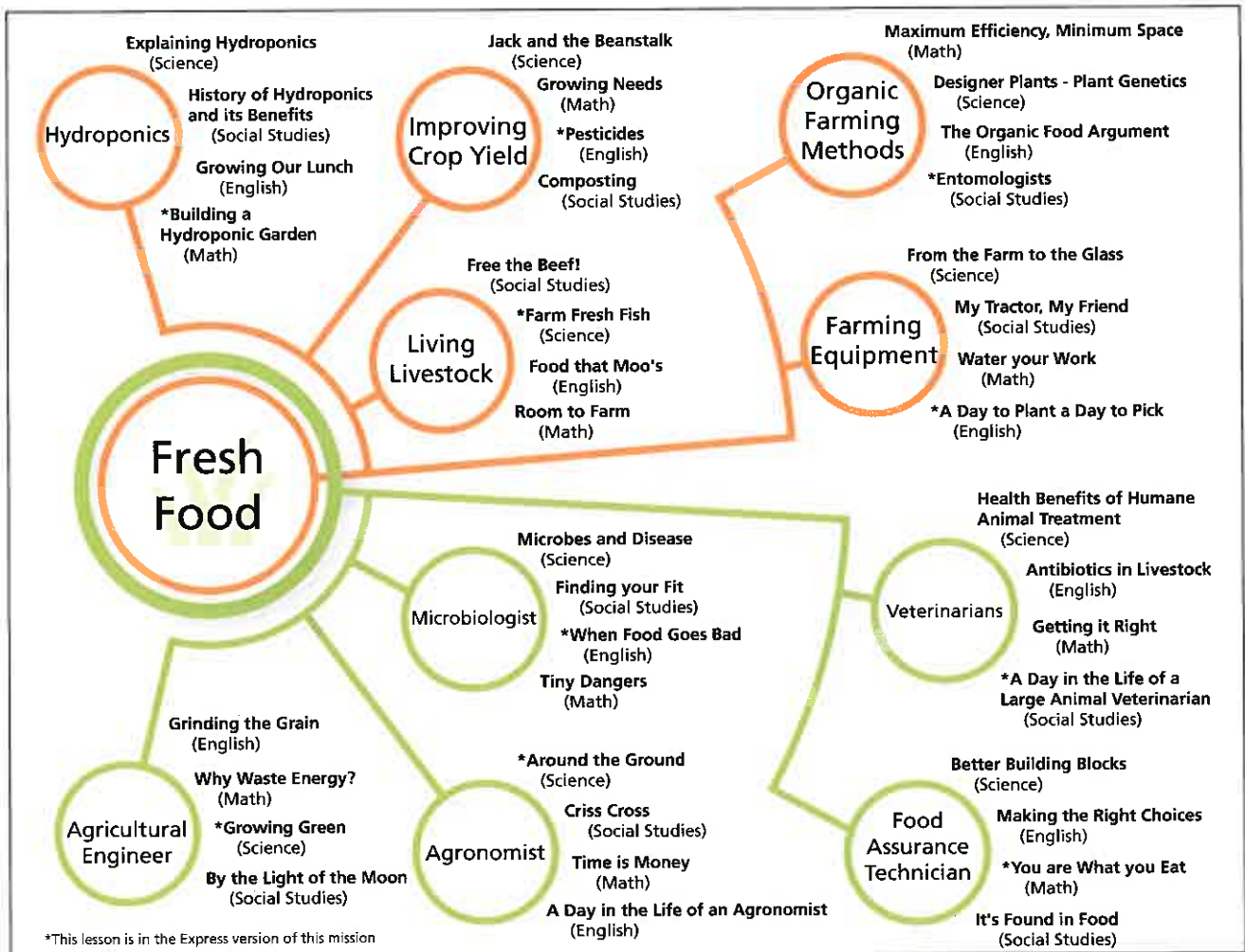


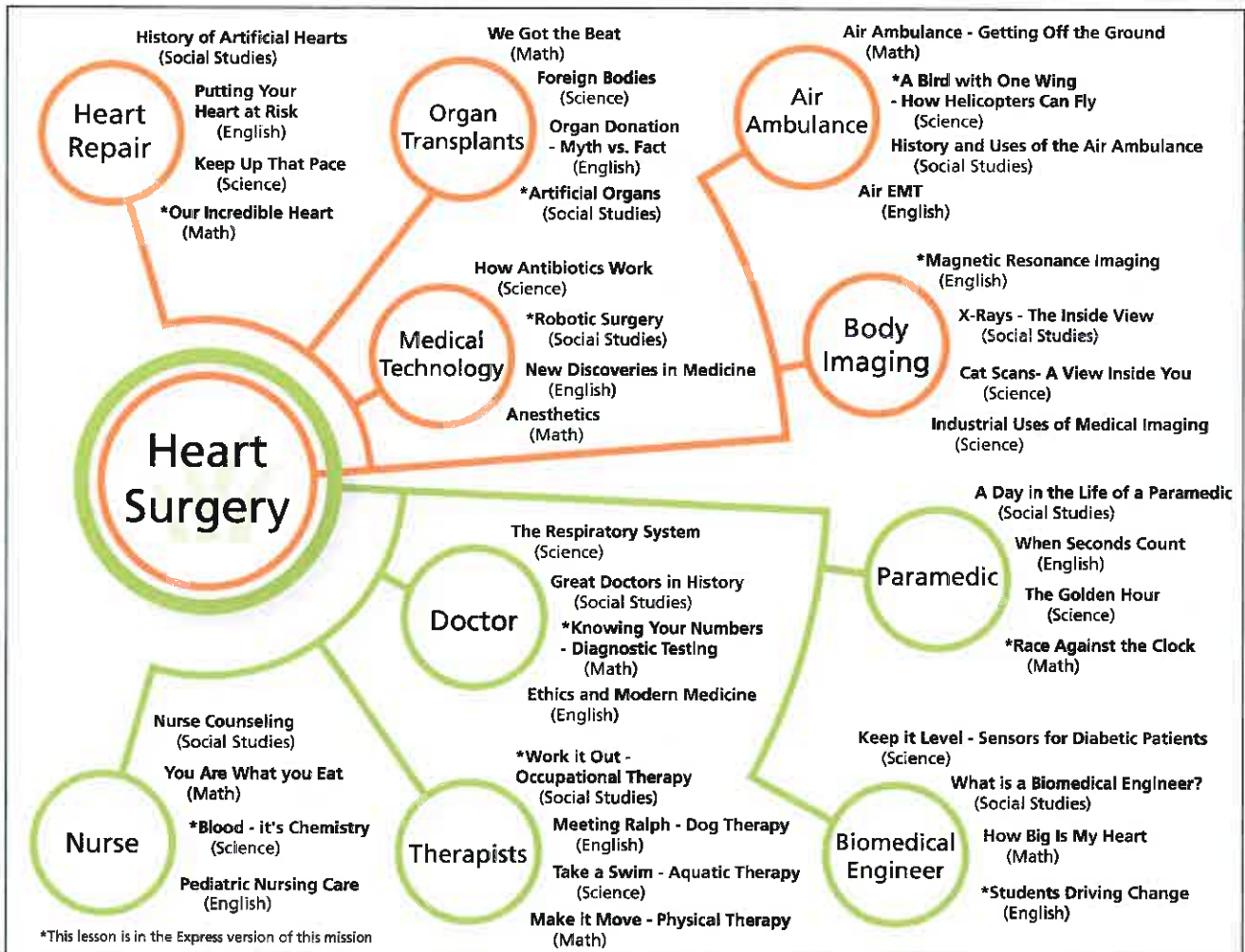
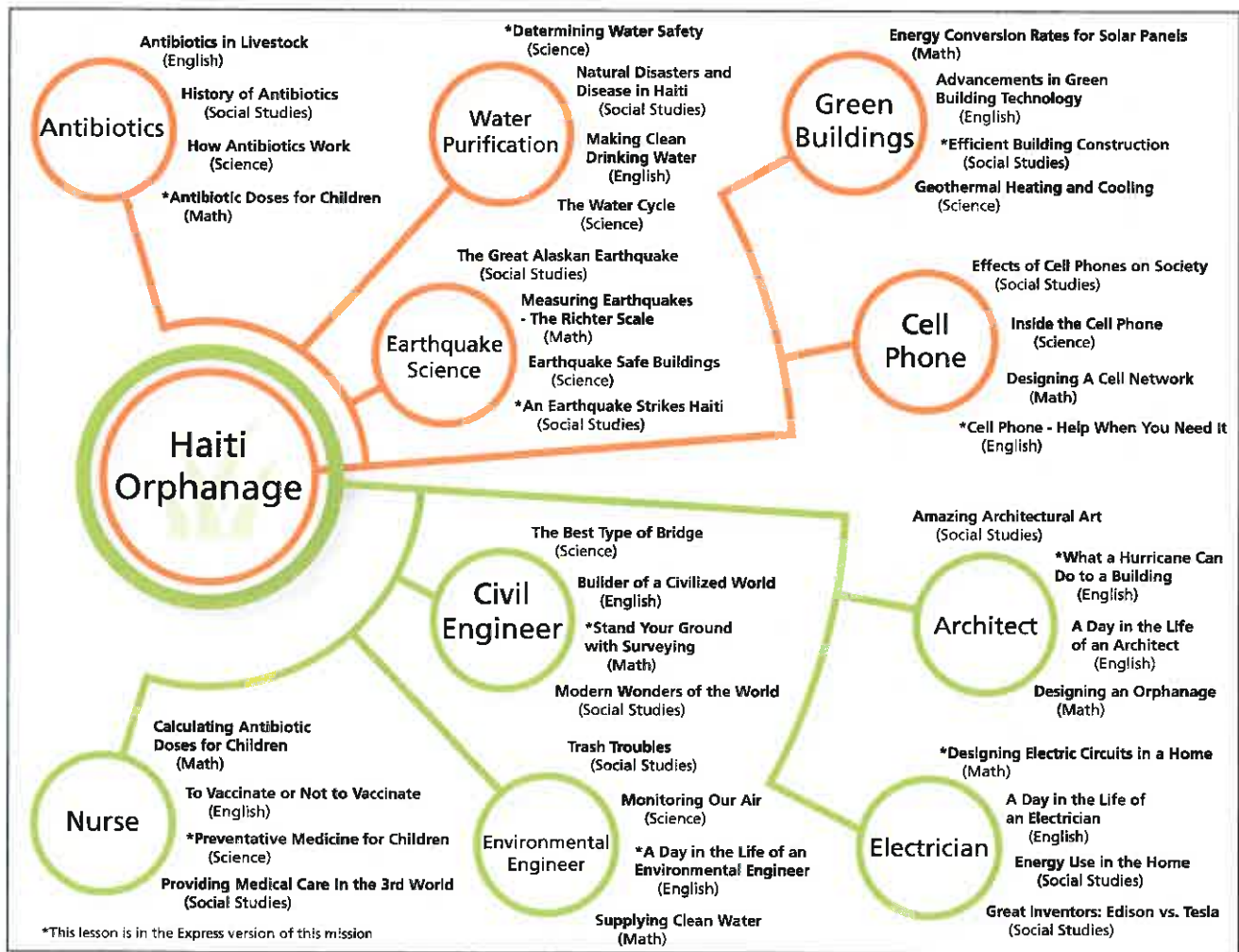
MISSION OUTLINE DIAGRAMS

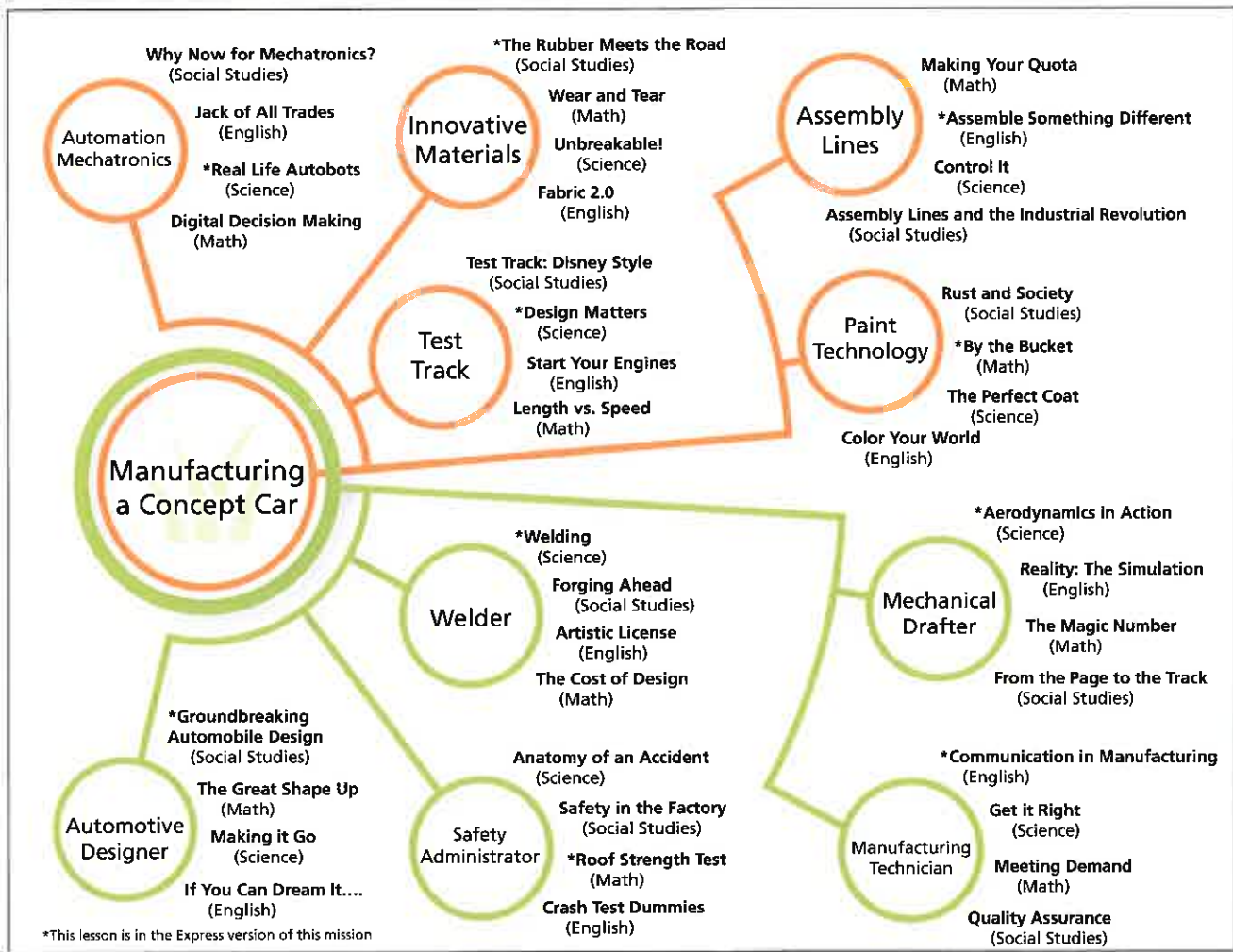
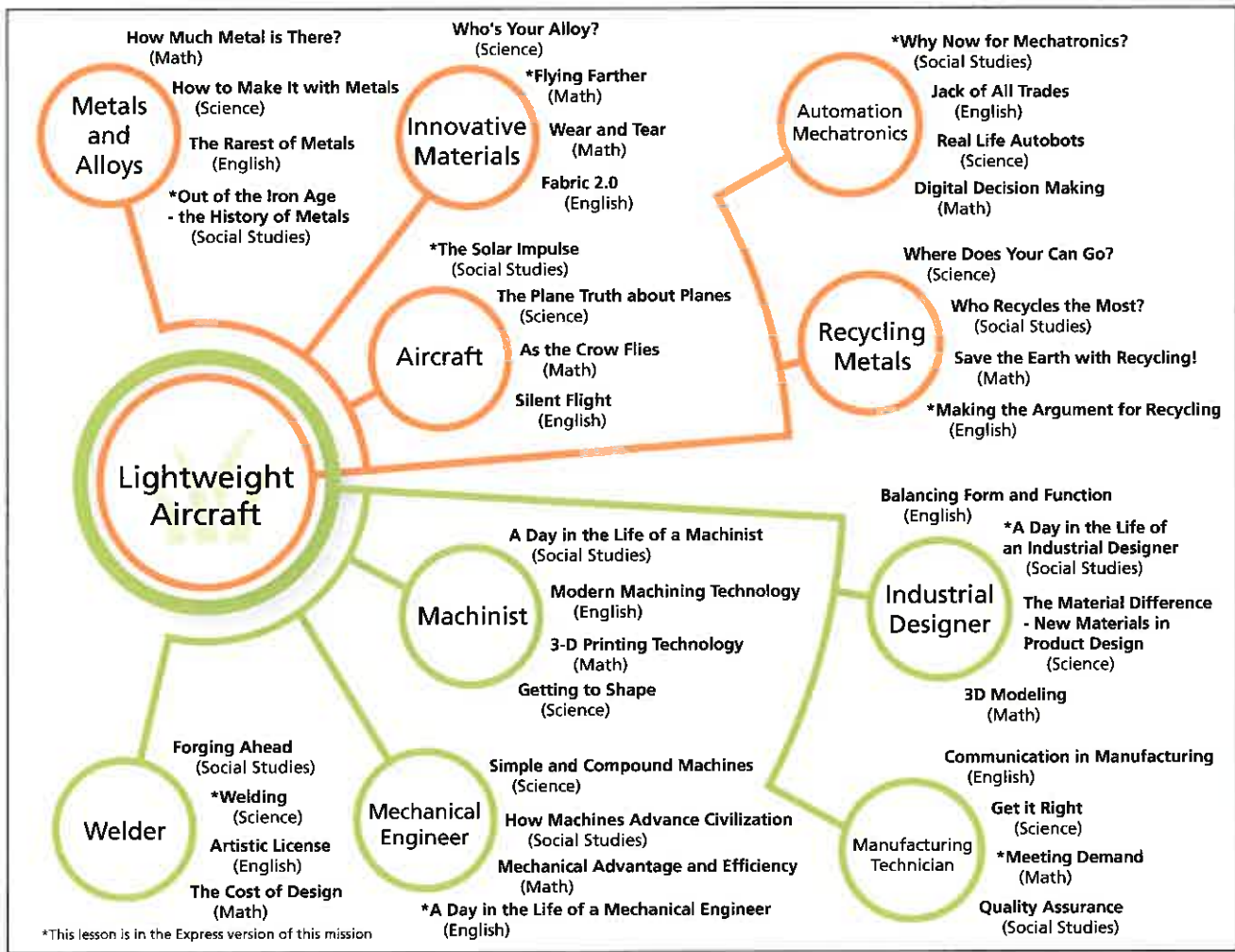
Mission	Description	Career Clusters
Dolphin Rescue	Help rescue rehabilitate an injured dolphin, including creating an artificial prosthetic tail	Biomedicine, Marine Science
Energy Sources	Evaluate alternative or upgraded energy sources for a city that currently has an old coal-fired power plant	Energy Production, Environment
Entrepreneurship	Set up a new business with a focus on entrepreneurship	Finance, Business
Flu Outbreak	How health and IT professionals can use data warehousing and analysis to predict flu outbreaks using GIS and social media data	Information Technology
Fresh Food	Consider methods to increase production of local foods in a community	Agriculture
Hack Attack	Learn about methods to create and protect website, apps and social media after a school's website and media are hacked	Computer Science
Haiti Orphanage	Design and build an environmentally-sound orphanage for children left homeless by an earthquake in Haiti	Construction, Sustainability
Heart Surgery	Conduct heart surgery and therapy for a child with a heart defect; evaluate the use of artificial hearts or heart components	Medicine
Lightweight Aircraft	Design a lightweight and easily maintained aircraft for distant missions	Lightweight Metals Manufacturing
Manufacturing Concept	Use modern manufacturing techniques to design and build a new concept car	Advanced Manufacturing
Rescue Robot	Explore technology used for robotics design, such as sensors, electrical circuits, industrial design and computers	Electronics, Computer Science
Transportation Congestion	Evaluate new transportation methods for a city that has a traffic congestion problem	Transportation

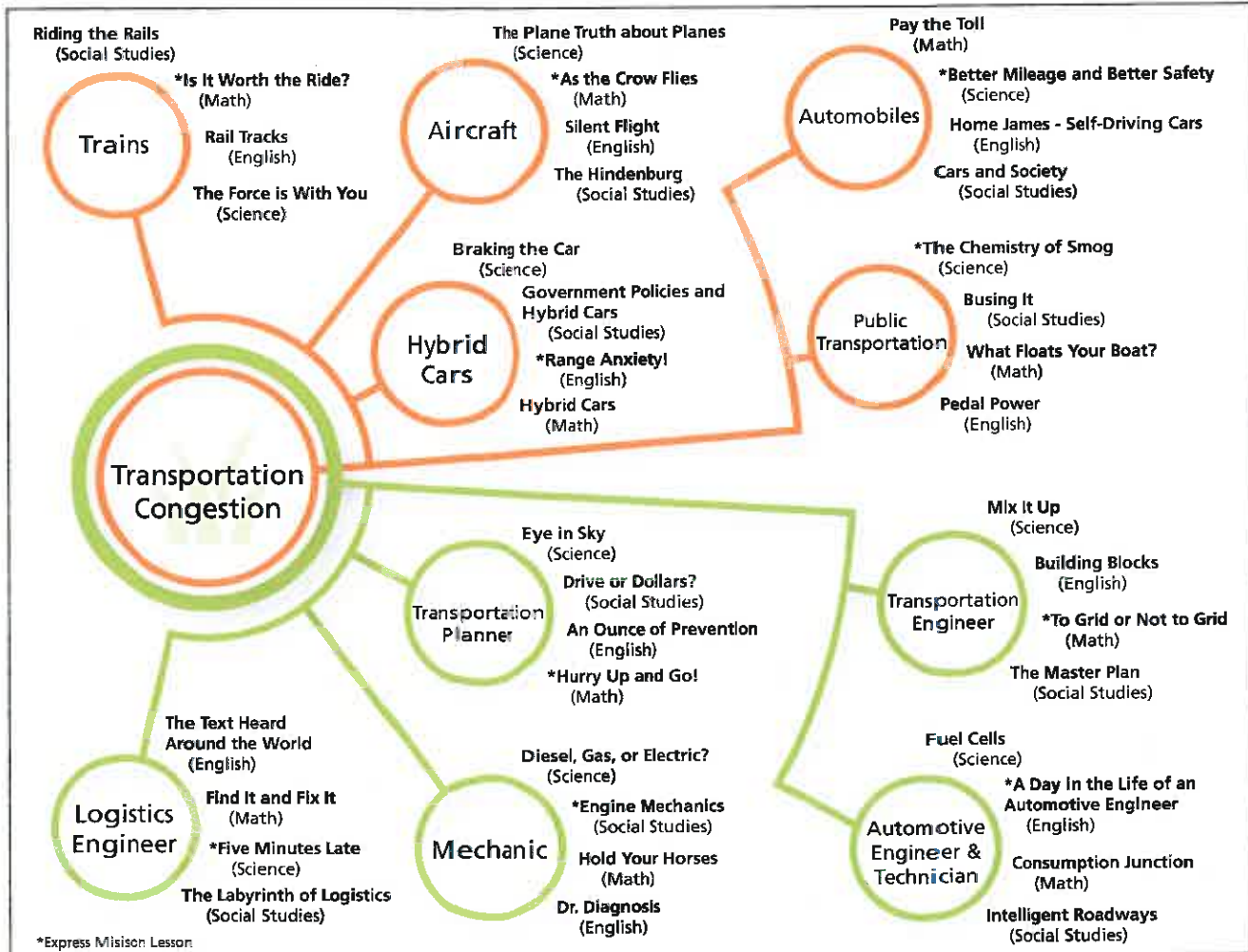
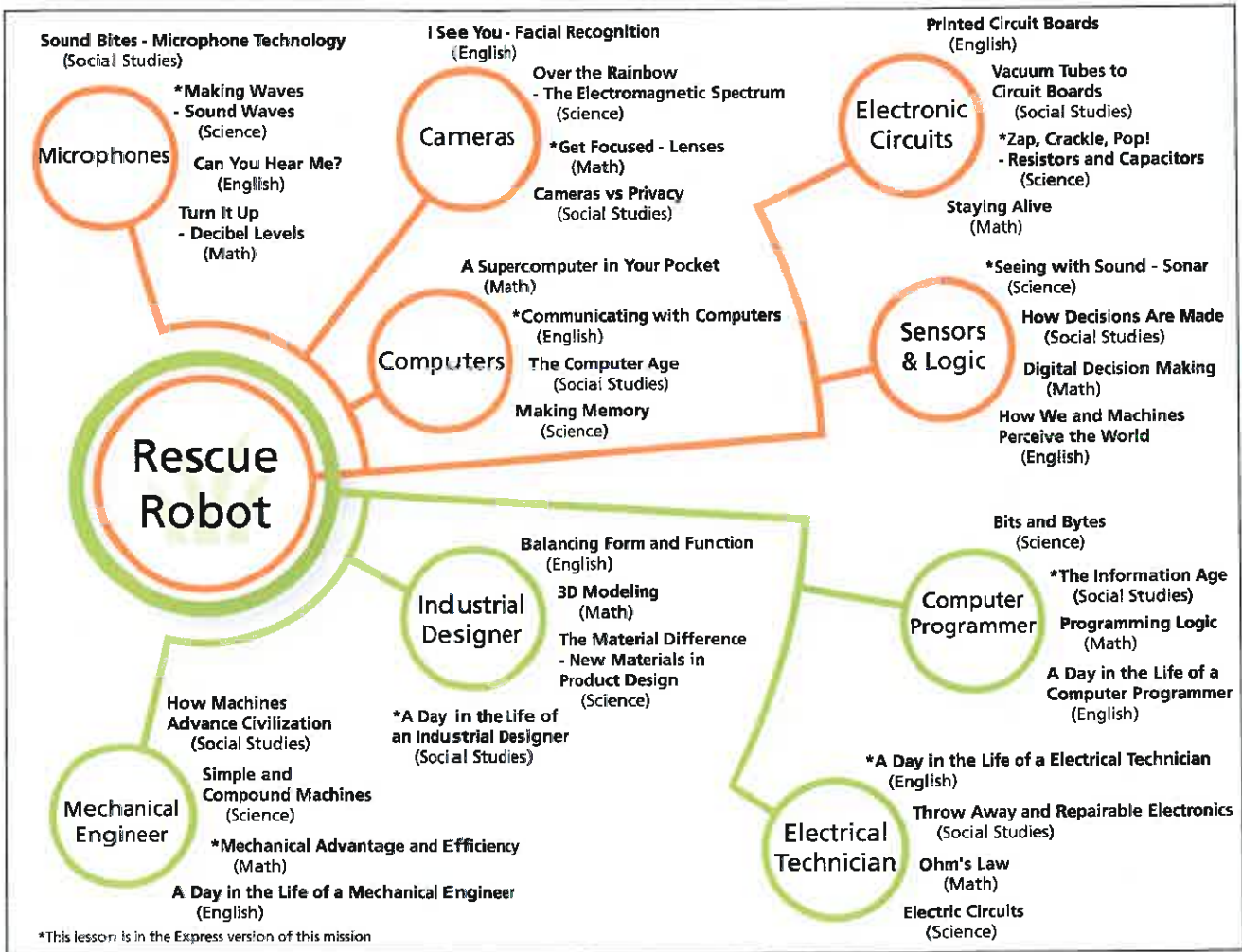












Mission Challenges

The Mission Challenges provide simple, hands-on activities emphasizing problem solving, critical thinking, teamwork and communications. These mission capstone projects require simple, readily-available materials.

Look for the Mission Challenges in the Resources section of your teacher account!



Low Voltage ENERGY PRODUCTION MISSION CHALLENGE

Objective
To understand how a wind turbine can produce power from wind energy.

Classroom
Students will build a simple wind turbine using common items, and discuss the effects of changes in turbine design.

Outcome
Students will gain a better understanding of how wind turbines are designed, and how they are used to generate clean, renewable energy.

Materials
Two 1 or 2 liter bottles
Sharp 100 mm ruler (with a 1 cm scale)
Markers, pushpins, or paper fasteners for weights
String (about 12 inches long)
Tape
Newspaper (to use as a stand)
Small fan (to use as a wind source)
Protractor (to use as a scale)
String (about 12 inches long)
1 meter (1)

Construction

1. Make sure that both bottles are clean and dry. The 1 or 2 liter bottle will be the turbine's tower. Carefully cut the neck of this bottle leaving two side panels with enough space for the 100 mm ruler to be inserted as shown in Figure 1. Pass the ruler through the holes in the neck of the larger bottle.
2. Use the 100 mm ruler to measure and carefully cut a 100 mm x 100 mm square and in the bottom of the 100 mm x 100 mm square. Make sure a drilling gear can fit through each hole and also pass the 100 mm ruler horizontally across the top of the 100 mm x 100 mm square and tape the side panels of the larger bottle to the smaller bottle so that the square is centered as shown in Figure 2.
3. The string will be the turbine's rotor and shaft. The string is cut into 1-inch sections in the end of a string. Make sure the string is on opposite sides of the square as shown in Figure 3. Lay a ruler and pencil on a flat surface to measure and mark the string at 100 mm intervals. Figure 4 shows the center of the first cut done around the middle of the second meter and tape them together, in careful steps to form other cuts. The two pieces should form a 100 mm square as shown in Figure 5. The middle of the 100 mm square is the turbine shaft. To make the rotor cap from the 100 mm bottle and side panels.

Papercraft Figures

As students complete each tool or teammate in a mission, they can access collectable papercraft figures. These foldable, 3D figures include a summary of the career or technology and can help provide further rewards to students.

Teachers can access the papercraft figures in the Curriculum Preview in the Resources section of your teacher account.

