Middle School Introduction to STEM

Career Cluster	Middle School
Course Code	21050
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Cluster course
Student Organization	None
Coordinating Work-Based Learning	field trips
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	Architecture & Construction Cluster Endorsement; STEM Cluster Endorsement; 7-12 Technology Education Endorsement
Resources	https://Vimeo.com/67277269

Course Description: This course serves as an introduction to Science, Technology, Engineering and Mathematics (STEM) with primary areas of focus on aviation, energy, engineering, and robotics. It will provide a basic background to allow students to identify interests which may assist students in pathway and course selection at the secondary level.

Program of Study Application

This is a STEM Cluster Course in the STEM Engineering Pathway. It is recommended that the course be preceded by a series of foundation courses followed by additional cluster courses and more specialized pathway courses at the secondary level. These pathways may include courses related to Robotics, Energy, Engineering and Aviation.

Course Standards

Indicator # STEM 1 Understand the components of STEM

Webb Level	*Sub-indicator*	*Integrated Content*
	STEM 1.1 Understand the components of STEM and the impact of STEM on society	
	Examples:	
Three Strategic Thinking	• Investigate and explore the components of STEM and its global impact.	
One Recall	• Identify components of STEM and explore the role of STEM in society	
Two Skill/ Concept	• Observe and Investigate where STEM appears in daily life	
Three Strategic Thinking	• Analyze how STEM has impacted the student's life	
	STEM 1.2 Explore the impact of STEM related careers	
	Examples:	
Two Skill/ Concept	• Research, explore and analyze how STEM is involved in careers globally	
One Recall	• Explore different fields of work related to STEM based career	
Two Skill/ Concept	• When given a STEM based career, research education commitment, cost requirements and financial benefits	Research, language arts, math
Three Strategic Thinking	• Research and create a presentation related to a STEM based career of interest **May be used as an introductory or culminating course activity*	Research, soft skills (teamwork, communication)

Notes:

Indicator # STEM 2 Understand the foundation of STEM in aviation.

Webb Level	*Sub-indicator*	*Integrated Content*
	STEM 2.1 Identify how STEM is applied in the field of aviation.	
	Examples:	
One Recall	• List the different types of aviation	Research
Two Skill/ Concept	• Explore the role of aerodynamics in flight	Physics, math, soft skills (communication), design process
Three Strategic Thinking	• Investigate how the shape of a wing impacts flight dynamics	Physics, math, soft skills (communication)
Four Extended Thinking	• Analyze weight in relation to flight	
	STEM 2.2 Evaluate careers related to aviation	
	Examples:	
Three Strategic Thinking	• Investigate the importance of STEM in an aviation career	
One Recall	• Explore multiple careers in aviation	
Two Skill/ Concept	• Compare and contrast salary options for various aviation careers	Math, soft skills (communication)
Three Strategic Thinking	• Analyze the key component of STEM in a given aviation career.	Math, computer skills

Notes:

Indicator # STEM 3 Understand the foundation of STEM in relation to Energy

Webb Level	*Sub-indicator*	*Integrated Content*
	STEM 3.1. Identify the application of STEM in the field of energy and/or energy production.	
	Examples:	
One Recall	• Identify multiple types of energy sources and their applications	
One Recall	• List different types of energy and energy sources.	*research*
Two Skill/ Concept	• Compare and contrast renewable and nonrenewable energy	Design process, soft skills (communication), energy
Three Strategic Thinking	• Create a solar cooker to cook an egg	Math
Four extended Thinking	• Generate wind energy by creating a turbine using given materials	Engineering, soft skills (communication)
	STEM 3.2 Explore the career opportunities in the field of energy related to STEM	
	Examples:	
One Recall	• List the type of career options related to energy	
Two Skill/ compact	• Evaluate the career opportunities related to energy and its uses.	
Two Skill/ compact	• Compare and contrast the salaries for different types of energy production careers	

Three Strategic Thinking	• Analyze new/alternative energy sources and the positive and negative aspects of each	Research, soft skills (communication)			

Notes:

Indicator # STEM 4 Understand the foundation of STEM in Engineering.

Webb Level	*Sub-indicator*	*Integrated Content*
	STEM 4.1 Understand how STEM is a part of all aspects of engineering	
	Examples:	
One Recall	• Name the different fields of engineering	
Two Skill/ Concept	• Identify how STEM is applied to different engineering fields	
Three Strategic Thinking	• Create a prototype of a design idea. After testing prototype, follow the revision process to improve the design.	Design process, soft skills (communication, problem solving, teamwork)
Four extended Thinking	• When given a problem, create a design plan, create a course of action and communicate intentions with other.	

	STEM 4.2 Evaluate the career opportunities associated with engineering	Soft skills (Communication), analysis of information, engineering) Career Development
	Examples:	
One Recall	• Identify the types of engineers	Soft skills (Communication), analysis of information, engineering
Two Skill/ Concept	• Evaluate the career opportunities related to different fields of engineering	Career Development
Three Strategic Thinking	• When given a product, research the type of engineering necessary for the product to have been created.	Research, soft skill (communication)

Notes:

Indicator # STEM 5 Understand the foundation of STEM in robotics.

Webb Level	*Sub-indicator*	*Integrated Content*
	STEM 5.1 Explore the relationship between STEM and robotics	
	Examples:	
One Recall	• Identify the uses of robots	Design process, basic coding, soft skills (communication)
Two Skill/ Concept	• Demonstrate understanding of basic components of a robot	Soft skills (Communication) economics
Three Strategic Thinking	• When given a problem, brainstorm potential solutions that could be carried out by a robot	
Four extended Thinking	• Design and/or program a robot to follow a set of commands	
	STEM 5.2 Evaluate the career opportunities associated with the field of robotics.	
	Examples:	
One Recall	• Identify jobs that may be created or enhanced by robots	
Two Skill/ Concept	• Describe how the robotics field may influence the job market	Soft skills (Communication) economics
Three Strategic Thinking	• Compare and contrast career opportunities related to different fields of robotics.	

Notes: