

## Science, Technology, Engineering and Mathematics

Pathway: Science and Mathematics

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
SCPB01.01	Academic Foundations	#7: Science and Mathematics in the Real World	Understand how science and mathematics function as an active component of the real world.	Apply science and mathematics concepts and principles of inquiry.	Describe the inquiry process and apply the skills necessary to engage in inquiry.
					Apply the methods and tools for research and investigation.
					Conduct experiments in a laboratory.
				Use a broad knowledge of science and mathematics to communicate with the global community.	Acquire competency in foundation science and mathematics subjects such as physical science, biological science, chemical science, mathematical science, and social science.
					Write and/or graphically describe the interrelationship of an individual to his/her organization and overall environment.
					Broaden knowledge and skills in science and mathematics through co-op/internship experiences, science fairs, reading publications, job shadowing, and continuing education.
					Interact and communicate with the scientific community.
					Communicate and contribute to broader community and society in a meaningful way.
				Access, share and use data.	Apply techniques for observation and gathering data.
					Apply techniques for creating data.
Apply techniques for processing and interpreting data.					
Apply techniques for sharing data.					
					Explain the advantages and disadvantages of using various technological tools in data management.

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Integrate science, mathematics, technology, and engineering concepts and content.	Write or describe graphically the interdependency of science, mathematics, technology, and engineering concepts and content.
SCPB01.02	Academic Foundations	#8: Advanced Applications of Science and Mathematics	Apply essential concepts and skills for proficiency in science and mathematics in real-world situations.	Apply the scientific method.	Apply data analysis methods.
					Apply basic scientific research.
					Construct a testing model.
					Organize records and files to maintain data.
					Define hypothesis.
				Recognize cause and effect.	Graph a dependent versus independent variable.
					Write a report illustrating cause and effect phenomena in the physical environment.
				Differentiate between science and pseudoscience.	Define science and pseudoscience.
					Compare and contrast science and pseudoscience.
				Draw a conclusion from a series of observations.	Write a report that details how your conclusion is supported by a series of observations.
				Recognize measurable attributes of objects, units, systems and processes.	List examples of measurable attributes for objects, units, systems, and processes.
					Solve a linear set of equations for unknowns.
				Analyze change in various contexts.	List examples of change and its context, in science, and in mathematics.
Research a topic.	Compile research about the topic.				
	Develop research report.				
	Present research report.				

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Organize problems into manageable parts.	Write an outline of an approach to researching a problem, illustrating how to organize the problem into manageable parts.
				Use qualitative and quantitative skills to conduct a simple scientific survey.	Present a summary of the results of a simple scientific survey.
				Predict outcomes of an experiment.	Write a statement describing a null hypothesis.
				Defend opinions using fact.	Write a paragraph in which the topic sentence states an opinion that is supported by three statements of fact.
SCPB01.03	Academic Foundations	#7: Science and Mathematics in the Real World	Assess the impact that science and mathematics has on society.	Evaluate the impact of science on society.	Write an essay describing the impact of science on society.
				Evaluate the impact of mathematics on society.	Write an essay describing the impact of mathematics on society.
				Investigate how science and mathematics influence professions and occupations within the cluster.	Select a profession or an occupation and describe its relationship to science or mathematics.
SCPB03.01	Problem Solving and Critical Thinking	#9: Using Science and Mathematics to Solve Problems	Use scientific and mathematical problem-solving skills to produce viable solutions to problems.	Demonstrate effective problem-solving techniques.	Identify the solution to a specific problem.
					Develop a project plan and timeline.
					Make efficient use of time and resources to complete work.
				Apply appropriate scientific methodology.	Use scientific method to research/investigate a specific scientific or mathematical problem.
					Form a problem statement.
					Construct a solution to a problem.
				Use analytical tools and techniques to solve problems, construct tests, and evaluate data.	Evaluate data.
					Construct an appropriate statistical test.
					Apply scientific and mathematical principles to a qualitative problem.
					Analyze a problem.

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
SCPB03.02	Problem Solving and Critical Thinking	#9: Using Science and Mathematics to Solve Problems	Use critical thinking skills to translate, interpret, and summarize research and statistical data.	Use effective critical thinking skills.	Translate, interpret, and summarize research and statistical data.
					Draw a conclusion based on observations and experimental results.
					Recognize, verify, and implement an appropriate solution to a problem.
					Break down a complex scientific system into basic components.
					Identify weaknesses/defects within a system and propose solutions.
SCPB10.01	Technical Skills	#10: Technical Aspects of Science and Mathematics	Demonstrate knowledge and application of technical skills needed in a chosen scientific and mathematical field.	Design, operate, and maintain technological systems and equipment.	Engage in technical certification and continuous education opportunities in design, operation, and maintenance.
					Collect information, change/modify materials, and conduct experiments, using appropriate tools.
					Write a report describing how to collect information, change/modify materials, conduct experiments, using appropriate tools.
					Use appropriate tools for a given application.
					Calibrate equipment.
Determine appropriate uses of technology.	Provide examples of scientific or mathematical technology and their uses.				
Critically evaluate data.	Summarize data evaluations.				