

Exploring Aeronautics			
2009 Science			
Academic Standards			
Minnesota Science			
Grade 5			
Activity/Lesson	State	Standards	
Fundamentals of Aeronautics (145-176)	MN	SCI.5.5.2.2.1.2	Identify the force that starts something moving or changes its speed or direction of motion.
Fundamentals of Aeronautics (145-176)	MN	SCI.5.5.2.2.1.3	Demonstrate that a greater force on an object can produce a greater change in motion.
Tools of Aeronautics(257-326)	MN	SCI.5.5.1.1.1.4	Understand that different models can be used to represent natural phenomena and these models have limitations about what they can explain.
How an Airplane Flies	MN	SCI.5.5.2.2.1.2	Identify the force that starts something moving or changes its speed or direction of motion.
How an Airplane Flies	MN	SCI.5.5.2.2.1.3	Demonstrate that a greater force on an object can produce a greater change in motion.
The Tools of Aeronautics	MN	SCI.5.5.1.1.1.4	Understand that different models can be used to represent natural phenomena and these models have limitations about what they can explain.
Science of Flight	MN	SCI.5.5.1.1.1.3	Understand that different explanations for the same observations usually lead to making more observations and trying to resolve the differences.
Science of Flight	MN	SCI.5.5.1.1.2.2	Identify and collect relevant evidence, make systematic observations and accurate measurements, and identify variables in a scientific investigation.
Science of Flight	MN	SCI.5.5.1.3.4.1	Use appropriate tools and techniques in gathering, analyzing and interpreting data.
Science of Flight	MN	SCI.5.5.2.2.1.3	Demonstrate that a greater force on an object can produce a greater change in motion.
Scientific Method(124-144)	MN	SCI.5.5.1.1.1.2	Recognize that when scientific investigations are replicated they generally produce the same results, and when results differ significantly, it is important to investigate what may have caused such differences.
Scientific Method(124-144)	MN	SCI.5.5.1.1.2.1	Generate a scientific question and plan an appropriate scientific investigation, such as systematic observations, field studies, open-ended exploration or controlled experiments to answer the question.
Scientific Method(124-144)	MN	SCI.5.5.1.1.2.3	Conduct or critique an experiment, noting when the experiment might not be fair because some of the things that might change the outcome are not kept the same, or that the experiment is not repeated enough times to provide valid results.

Scientific Method(124-144)	MN	SCI.5.5.1.3.4.1	Use appropriate tools and techniques in gathering, analyzing and interpreting data.
Exploring Aeronautics			
2009 Science			
Academic Standards			
Minnesota Science			
Grade 6			
Activity/Lesson	State	Standards	
Fundamentals of Aeronautics (145-176)	MN	SCI.6.6.2.2.2.1	Recognize that when the forces acting on an object are balanced, the object remains at rest or continues to move at a constant speed in a straight line, and that unbalanced forces cause a change in the speed or direction of the motion of an object.
Fundamentals of Aeronautics (145-176)	MN	SCI.6.6.2.2.2.2	Identify the forces acting on an object and describe how the sum of the forces affects the motion of the object.
Tools of Aeronautics(257-326)	MN	SCI.6.6.1.2.1.2	Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.
Tools of Aeronautics(257-326)	MN	SCI.6.6.1.2.1.4	Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.
Tools of Aeronautics(257-326)	MN	SCI.6.6.1.2.2.1	Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and evaluation, and refining the design as needed to construct a product or system that solves a problem.
How an Airplane Flies	MN	SCI.6.6.2.2.2.1	Recognize that when the forces acting on an object are balanced, the object remains at rest or continues to move at a constant speed in a straight line, and that unbalanced forces cause a change in the speed or direction of the motion of an object.
How an Airplane Flies	MN	SCI.6.6.2.2.2.2	Identify the forces acting on an object and describe how the sum of the forces affects the motion of the object.
The Tools of Aeronautics	MN	SCI.6.6.1.2.1.2	Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.
The Tools of Aeronautics	MN	SCI.6.6.1.2.1.4	Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.
The Tools of Aeronautics	MN	SCI.6.6.1.2.2.1	Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and evaluation, and refining the design as needed to construct a product or system that solves a problem.

Science of Flight	MN	SCI.6.6.1.2.1.2	Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.
Science of Flight	MN	SCI.6.6.1.2.1.4	Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.
Science of Flight	MN	SCI.6.6.1.2.2.1	Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and evaluation, and refining the design as needed to construct a product or system that solves a problem.
Science of Flight	MN	SCI.6.6.2.2.2.1	Recognize that when the forces acting on an object are balanced, the object remains at rest or continues to move at a constant speed in a straight line, and that unbalanced forces cause a change in the speed or direction of the motion of an object.
Science of Flight	MN	SCI.6.6.2.2.2.2	Identify the forces acting on an object and describe how the sum of the forces affects the motion of the object.
Integrating with Aeronautics	MN	SCI.6.6.1.3.4.2	Demonstrate the conversion of units within the Systeme International System of Units (SI, or metric) and estimate the magnitude of common objects and quantities using metric units.
Integrating with Aeronautics	MN	SCI.6.6.2.2.1.1	Measure and calculate the speed of an object that is traveling in a straight line.
Integrating with Aeronautics	MN	SCI.6.6.2.2.1.2	For an object traveling in a straight line, graph the object's position as a function of time, and its speed as a function of time. Explain how these graphs describe the object's motion.
Intro to Aeronautics (109-123)	MN	SCI.6.6.1.2.1.2	Recognize that there is no perfect design and that new technologies have consequences that may increase some risks and decrease others.
Intro to Aeronautics (109-123)	MN	SCI.6.6.1.2.1.4	Explain the importance of learning from past failures, in order to inform future designs of similar products or systems.
Scientific Method(124-144)	MN	SCI.6.6.1.2.2.1	Apply and document an engineering design process that includes identifying criteria and constraints, making representations, testing and evaluation, and refining the design as needed to construct a product or system that solves a problem.
Exploring Aeronautics			
2009 Science			
Academic Standards			
Minnesota Science			
Grade 7			
Activity/Lesson	State	Standards	

Science of Flight	MN	SCI.7.7.1.1.2.1	Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.
Science of Flight	MN	SCI.7.7.1.1.2.2	Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).
Science of Flight	MN	SCI.7.7.1.1.2.3	Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).
Scientific Method(124-144)	MN	SCI.7.7.1.1.1.2	Understand that when similar investigations give different results, the challenge is to judge whether the differences are significant, and if further studies are required.
Scientific Method(124-144)	MN	SCI.7.7.1.1.2.1	Generate and refine a variety of scientific questions and match them with appropriate methods of investigation, such as field studies, controlled experiments, reviews of existing work and development of models.
Scientific Method(124-144)	MN	SCI.7.7.1.1.2.2	Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables, ensuring that one variable is systematically manipulated, the other is measured and recorded, and any other variables are kept the same (controlled).
Scientific Method(124-144)	MN	SCI.7.7.1.1.2.3	Generate a scientific conclusion from an investigation, clearly distinguishing between results (evidence) and conclusions (explanation).
Exploring Aeronautics			
2009 Science			
Academic Standards			
Minnesota Science			
Grade 8			
Activity/Lesson	State	Standards	
Science of Flight	MN	SCI.8.8.1.1.1.1	Evaluate the reasoning in arguments in which fact and opinion are intermingled or when conclusions do not follow logically from the evidence given.
Science of Flight	MN	SCI.8.8.1.1.2.1	Use logical reasoning and imagination to develop descriptions, explanations, predictions and models based on evidence.
Science of Flight	MN	SCI.8.8.1.3.2.1	Describe examples of important contributions to the advancement of science, engineering and technology made by individuals representing different groups and cultures at different times in history.

Science of Flight	MN	SCI.8.8.1.3.3.1	Explain how scientific laws and engineering principles, as well as economic, political, social, and ethical expectations, must be taken into account in designing engineering solutions or conducting scientific investigations.
Science of Flight	MN	SCI.8.8.1.3.3.2	Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data.
Scientific Method(124-144)	MN	SCI.8.8.1.1.1.1	Evaluate the reasoning in arguments in which fact and opinion are intermingled or when conclusions do not follow logically from the evidence given.
Scientific Method(124-144)	MN	SCI.8.8.1.3.3.2	Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data.