

Exploring Aeronautics			
2006 Science			
Grade Level and Grade Span Expectations			
New Hampshire Science			
Grades 5-6			
Activity/Lesson	State	Standards	
Fundamentals of Aeronautics (145-176)	NH	SCI.5-6.S:PS2:6:3.3	Recognize that energy, in the form of heat, is usually a by-product when one form of energy is changed to another, such as when machines convert stored energy to motion.
Fundamentals of Aeronautics (145-176)	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
Fundamentals of Aeronautics (145-176)	NH	SCI.5-6.S:PS3:6:1.3	Describe the relationship between the strength of a force on an object and the resulting effect, such as the greater the force, the greater the change in motion.
Fundamentals of Aeronautics (145-176)	NH	SCI.5-6.S:PS3:6:2.2	Explain that an object's motion can be tracked and measured over time and that the data can be used to describe its position.
Fundamentals of Aeronautics (145-176)	NH	SCI.5-6.S:SPS1:6:3.1	Carry out simple student or teacher-developed procedures or experiments.
Wings(177-208)	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
Wings(177-208)	NH	SCI.5-6.ESS4.3.A.S:ESS4:6:3.2	Identify the most appropriate materials for a given design task with requirements for specific properties, such as weight, strength, hardness, and flexibility.
Wings(177-208)	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
Wings(177-208)	NH	SCI.5-6.S:PS4:6:1.1	Understand that scientific principles are used in the design of technology.
Wings(177-208)	NH	SCI.5-6.S:SPS1:6:2.3	Incorporate components of good experimental design, such as controls and multiple trials, into investigations.
Wings(177-208)	NH	SCI.5-6.S:SPS3:6:3.1	Identify problems/issues that can be addressed by design technology.
Airplane Control(209-256)	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
Airplane Control(209-256)	NH	SCI.5-6.ESS4.3.A.S:ESS4:6:3.2	Identify the most appropriate materials for a given design task with requirements for specific properties, such as weight, strength, hardness, and flexibility.
Tools of Aeronautics(257-326)	NH	SCI.5-6.S:SPS1:6:2.3	Incorporate components of good experimental design, such as controls and multiple trials, into investigations.

Tools of Aeronautics(257-326)	NH	SCI.5-6.S:SPS1:6:4.3	Compare and display data in a variety of student or computer generated formats (such as diagrams, flow charts, tables, bar graphs, line graphs, scatter plots, and histograms).
Tools of Aeronautics(257-326)	NH	SCI.5-6.S:SPS3:6:3.1	Identify problems/issues that can be addressed by design technology.
Tools of Aeronautics(257-326)	NH	SCI.5-6.S:SPS3:6:3.2	Identify and describe the procedure for designing a product, including identifying a need, researching, brainstorming, selecting, developing a prototype, testing and evaluating.
How an Airplane Flies	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
How an Airplane Flies	NH	SCI.5-6.S:PS3:6:2.1	Explain the how balanced and unbalanced forces are related to an object's motion.
The Activity Center	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
The Activity Center	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
The Activity Center	NH	SCI.5-6.S:PS3:6:1.3	Describe the relationship between the strength of a force on an object and the resulting effect, such as the greater the force, the greater the change in motion.
The Activity Center	NH	SCI.5-6.S:PS3:6:2.1	Explain the how balanced and unbalanced forces are related to an object's motion.
The Activity Center	NH	SCI.5-6.S:PS4:6:1.1	Understand that scientific principles are used in the design of technology.
The Activity Center	NH	SCI.5-6.S:SPS1:6:2.1	Design and record a simple step-by-step procedure to follow in order to carry out a fair test of a scientific question.
The Resource Center	NH	SCI.5-6.S:ESS2:6:4.1	Explain the historical perspective of planetary exploration and man's achievements in space, beginning with Russia's Sputnik mission in 1957.
The Resource Center	NH	SCI.5-6.S:ESS2:6:4.2	Describe man's perception of the constellations throughout history, and explain how he has used them to his advantage, including navigational purposes and to explain historical events.
Science of Flight	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
Science of Flight	NH	SCI.5-6.ESS4.3.A.S:ESS4:6:3.2	Identify the most appropriate materials for a given design task with requirements for specific properties, such as weight, strength, hardness, and flexibility.

Science of Flight	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
Science of Flight	NH	SCI.5-6.S:PS3:6:2.1	Explain the how balanced and unbalanced forces are related to an object's motion.
Science of Flight	NH	SCI.5-6.S:PS3:6:2.2	Explain that an object's motion can be tracked and measured over time and that the data can be used to describe its position.
Integrating with Aeronautics	NH	SCI.5-6.S:ESS2:6:4.2	Describe man's perception of the constellations throughout history, and explain how he has used them to his advantage, including navigational purposes and to explain historical events.
Integrating with Aeronautics	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
Integrating with Aeronautics	NH	SCI.5-6.S:PS1:6:2.3	Differentiate between weight and mass.
Integrating with Aeronautics	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:ESS1:6:1.1	Describe and make predictions about local and regional weather conditions using observation and data collection methods.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:ESS4:6:1.1	Understand that technology is used to design tools that improve our ability to measure and observe the world.
Intro to Aeronautics (109-123)	NH	SCI.5-6.ESS4.3.A.S:ESS4:6:3.2	Identify the most appropriate materials for a given design task with requirements for specific properties, such as weight, strength, hardness, and flexibility.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:PS3:6:1.2	Explain that when a force is applied to an object, it reacts in one of three ways: the object either speeds up, slows down, or goes in a different direction.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:PS3:6:1.3	Describe the relationship between the strength of a force on an object and the resulting effect, such as the greater the force, the greater the change in motion.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:PS3:6:2.1	Explain the how balanced and unbalanced forces are related to an object's motion.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:PS3:6:2.2	Explain that an object's motion can be tracked and measured over time and that the data can be used to describe its position.
Intro to Aeronautics (109-123)	NH	SCI.5-6.S:PS4:6:1.1	Understand that scientific principles are used in the design of technology.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:1.8	Ask questions about relationships between and among observations.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:2.1	Design and record a simple step-by-step procedure to follow in order to carry out a fair test of a scientific question.

Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:2.2	Identify and utilize appropriate tools/technology for collecting data in designing investigations.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:2.3	Incorporate components of good experimental design, such as controls and multiple trials, into investigations.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:3.1	Carry out simple student or teacher-developed procedures or experiments.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:3.2	Use appropriate tools to collect and record data.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:4.1	Use appropriate tools to organize, represent, analyze and explain data.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:4.3	Compare and display data in a variety of student or computer generated formats (such as diagrams, flow charts, tables, bar graphs, line graphs, scatter plots, and histograms).
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:4.5	Draw appropriate conclusions based on data collected.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:5.1	Determine if the results of an experiment support or fail to support the scientific idea tested.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS1:6:5.2	Explain how a hypothesis is a direct extension of a scientific idea and therefore makes that idea "testable."
Scientific Method(124-144)	NH	SCI.5-6.S:SPS2:6:1.2	Describe how results of similar and repeated investigations may vary and suggest possible explanations for variations.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS2:6:1.3	Explain that sometimes similar investigations get different results because of unexpected differences in the things being investigated, the methods used, or the circumstances in which the investigation is carried out, and sometimes just because of uncertainties of observations.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS2:6:1.4	Realize that if more than one variable changes at the same time in an experiment, the outcome of the experiment may not be clearly attributable to any one of the variables.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS3:6:3.2	Identify and describe the procedure for designing a product, including identifying a need, researching, brainstorming, selecting, developing a prototype, testing and evaluating.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS4:8:1.2	Collect real-time observations and data, synthesizing and building upon existing information (e.g., online databases, NOAA, EPA, USGS) to solve problems.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS4:8:4.1	Formulate a scientific question about phenomena, a problem, or an issue and using a broad range of tools and techniques; and plan and conduct an inquiry to address the question.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS4:8:4.2	Use evidence collected from observations or other sources and use them to create models and explanations.

Scientific Method(124-144)	NH	SCI.5-6.S:SPS4:8:5.1	Use a variety of media tools to make oral and written presentations, which include written notes and descriptions, drawings, photos, and charts to communicate the procedures and results of an investigation.
Scientific Method(124-144)	NH	SCI.5-6.S:SPS4:8:8.1	Develop and execute a plan to collect and record accurate and complete data from various sources to solve a problem or answer a question; and gather and critically analyze data from a variety of sources.
Exploring Aeronautics			
2006 Science			
Grade Level and Grade Span Expectations			
New Hampshire Science			
Grades 7-8			
Activity/Lesson	State	Standards	
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:ESS2:8:1.3	Recognize the relationships between the tides and the phases of the moon; and use tide charts and NOAA information to describe them.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:PS3:8:1.3	Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:PS3:8:2.2	Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS1:8:2.1	Identify the manipulated, responding and controlled variables in an experiment.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS1:8:3.1	Use appropriate laboratory techniques to carry out student- or teacher-developed procedures or experiments.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS1:8:3.3	Follow the teacher's instructions in performing experiments, following all appropriate safety rules and procedures.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS1:8:5.1	Determine if the results of an experiment support or refute the scientific idea tested.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS2:8:1.2	Realize that when similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and this often requires more investigations.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS4:8:2.1	Use a wide range of tools and a variety of oral, written, and graphic formats to share information and results from observations and investigations.
Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS4:8:3.3	Make sketches, graphs, and diagrams to explain ideas and to demonstrate the interconnections between systems.

Fundamentals of Aeronautics (145-176)	NH	SCI.7-8.S:SPS4:8:5.1	Use a variety of media tools to make oral and written presentations, which include written notes and descriptions, drawings, photos, and charts to communicate the procedures and results of an investigation.
Wings(177-208)	NH	SCI.7-8.S:PS4:8:1.1	Understand that design features, such as size shape, weight, and function, must be considered when designing new technology.
Wings(177-208)	NH	SCI.7-8.S:SPS3:8:3.2	Build a product that has been designed in class.
Wings(177-208)	NH	SCI.7-8.S:SPS3:8:3.3	Evaluate student-designed products according to established criteria and recommend improvements or modifications.
Airplane Control(209-256)	NH	SCI.7-8.S:PS3:8:1.3	Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.
Airplane Control(209-256)	NH	SCI.7-8.S:PS3:8:2.2	Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically.
Tools of Aeronautics(257-326)	NH	SCI.7-8.S:ESS4:8:1.2	Recognize the importance of technology as it relates to science, for purposes such as: access to space and other remote locations, sample collection and treatment, measurement, data collection, and storage, computation, and communication of information.
Tools of Aeronautics(257-326)	NH	SCI.7-8.S:SPS2:8:3.2	Know that different models can be used to represent the same thing; what kind of model is used and how complex it should be depends on its purpose; and the usefulness of a model is one of the instances in which intuition and creativity come into play in science, mathematics and engineering.
Tools of Aeronautics(257-326)	NH	SCI.7-8.S:SPS3:8:3.3	Evaluate student-designed products according to established criteria and recommend improvements or modifications.
Tools of Aeronautics(257-326)	NH	SCI.7-8.S:SPS4:8:4.2	Use evidence collected from observations or other sources and use them to create models and explanations.
How an Airplane Flies	NH	SCI.7-8.S:PS1:8:2.1	Differentiate between volume and mass and define density.
How an Airplane Flies	NH	SCI.7-8.S:PS1:8:2.4	Investigate the relationships among mass, volume and density.
How an Airplane Flies	NH	SCI.7-8.S:PS3:8:1.3	Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.
The Activity Center	NH	SCI.7-8.ESS4.3.A.S:E SS4:8:3.2	Explain how to test natural materials to measure and compare their properties.

The Activity Center	NH	SCI.7-8.S:SPS3:8:3.3	Evaluate student-designed products according to established criteria and recommend improvements or modifications.
Science of Flight	NH	SCI.7-8.S:PS3:8:1.3	Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.
Science of Flight	NH	SCI.7-8.S:PS3:8:2.2	Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically.
Science of Flight	NH	SCI.7-8.S:PS4:8:1.1	Understand that design features, such as size shape, weight, and function, must be considered when designing new technology.
Science of Flight	NH	SCI.7-8.S:SPS1:8:1.1	Use appropriate tools to accurately collect and record both qualitative and quantitative data gathered through observations (e.g., temperature probes, electronic balances, spring scales, microscopes, stop watches).
Science of Flight	NH	SCI.7-8.S:SPS1:8:1.3	Investigate similarities and differences noted when making observations.
Science of Flight	NH	SCI.7-8.S:SPS1:8:1.6	Rephrase questions so that they can be tested or investigated using scientific methodologies.
Science of Flight	NH	SCI.7-8.S:SPS1:8:2.1	Identify the manipulated, responding and controlled variables in an experiment.
Science of Flight	NH	SCI.7-8.S:SPS1:8:3.1	Use appropriate laboratory techniques to carry out student- or teacher-developed procedures or experiments.
Science of Flight	NH	SCI.7-8.S:SPS1:8:3.3	Follow the teacher's instructions in performing experiments, following all appropriate safety rules and procedures.
Science of Flight	NH	SCI.7-8.S:SPS1:8:4.3	Draw appropriate conclusions regarding the scientific question under investigation, based on the data collected.
Science of Flight	NH	SCI.7-8.S:SPS2:8:3.1	Demonstrate how mathematical models can be displayed on a computer and then modified to see what happens.
Science of Flight	NH	SCI.7-8.S:SPS2:8:3.2	Know that different models can be used to represent the same thing; what kind of model is used and how complex it should be depends on its purpose; and the usefulness of a model is one of the instances in which intuition and creativity come into play in science, mathematics and engineering.
Science of Flight	NH	SCI.7-8.S:SPS4:8:1.2	Collect real-time observations and data, synthesizing and building upon existing information (e.g., online databases, NOAA, EPA, USGS) to solve problems.

Science of Flight	NH	SCI.7-8.S:SPS4:8:1.3	Use appropriate tools to analyze and synthesize information (e.g., diagrams, flow charts, frequency tables, bar graphs, line graphs, stem-and-leaf plots) to draw conclusions and implications based on investigations of an issue or question.
Science of Flight	NH	SCI.7-8.S:SPS4:8:4.2	Use evidence collected from observations or other sources and use them to create models and explanations.
Integrating with Aeronautics	NH	SCI.7-8.S:ESS3:8:1.2	Explain that special units of measure, such as light years and astronomical units, are used to calculate distances in space.
Integrating with Aeronautics	NH	SCI.7-8.S:ESS4:8:1.2	Recognize the importance of technology as it relates to science, for purposes such as: access to space and other remote locations, sample collection and treatment, measurement, data collection, and storage, computation, and communication of information.
Integrating with Aeronautics	NH	SCI.7-8.S:PS1:8:2.2	Explain how different substances of equal volume usually have different weights.
Integrating with Aeronautics	NH	SCI.7-8.S:PS3:8:1.3	Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.
Integrating with Aeronautics	NH	SCI.7-8.S:PS3:8:2.2	Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically.
Integrating with Aeronautics	NH	SCI.7-8.S:PS4:8:1.1	Understand that design features, such as size shape, weight, and function, must be considered when designing new technology.
Integrating with Aeronautics	NH	SCI.7-8.S:SPS4:8:2.1	Use a wide range of tools and a variety of oral, written, and graphic formats to share information and results from observations and investigations.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:1.6	Rephrase questions so that they can be tested or investigated using scientific methodologies.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:1.7	Ask questions about relationships between and among observable variables.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:2.1	Identify the manipulated, responding and controlled variables in an experiment.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:2.2	Design a controlled experiment, identifying and controlling the major variables.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:2.3	Identify flaws or omissions in the design of simple experiments.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:3.1	Use appropriate laboratory techniques to carry out student- or teacher-developed procedures or experiments.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:3.2	Use appropriate tools to gather data as part of an investigation (e.g., ruler, meter stick, thermometer, spring scale, graduated cylinder, calipers, balance, probes, microscopes).

Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:3.3	Follow the teacher's instructions in performing experiments, following all appropriate safety rules and procedures.
Scientific Method(124-144)	NH	SCI.7-8.S:SPS1:8:4.1	Use appropriate tools (including computer hardware and software) to collect, organize, represent, analyze and explain data.