



Standards Addressed in G3–5

Lesson 1

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.1	Ask a question about objects, organisms, and events
4ASI1.3	Employ simple equipment and tools to gather data
4BPS2.3	Changing position and motion

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
1A/E2**	Science is a process of trying to figure out how the world works by making careful observations and trying to make sense of those observations.
1C/E1	Science is an adventure that people everywhere can take part in, as they have for many centuries.
4F/E1a	Changes in speed or direction of motion are caused by forces.
4F/E1bc	The greater the force is, the greater the change in motion will be. The more massive an object is, the less effect a given force will have.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Describe location and movement using common language and geometric vocabulary
	Identify and draw a two-dimensional representation of a three-dimensional object
	Collect data using observations, surveys, and experiments

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2A/E2	Mathematical ideas can be represented concretely, graphically, or symbolically.
2C/E1*	Quantities and shapes can be used to describe objects and events in the world around us. (2C/E1*)

Technology:

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 2.	<ul style="list-style-type: none"> • Students will develop an understanding of the core concepts of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.

21st-Century Skills:

Code	Standard
<i>Critical Thinking and Problem Solving</i>	Exercising sound reasoning in understanding
	Framing, analyzing, and synthesizing information in order to solve problems and answer questions
<i>Communication and Collaboration</i>	Articulating thoughts and ideas clearly and effectively through speaking and writing
	Demonstrating ability to work effectively with diverse teams
	Assuming shared responsibility for collaborative work
<i>Information Literacy</i>	Accessing information efficiently and effectively, evaluating information critically and competently, and using information accurately and creatively for the issue or problem at hand
<i>Initiative and Self-Direction</i>	Monitoring one's own understanding and learning needs

Lesson 2

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.3	Employ simple equipment and tools to gather data
4ASI1.4	Use data to construct a reasonable explanation
4ASI2.4	Develop explanations using observations (evidence)
4BPS2.3	Changing position and motion
4EST2.5	Tools help scientists do science better

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
1A/E1*	Sometimes similar investigations give different results because of 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 in observations. It is not always easy to tell which.
1B/E2b	One reason for following directions carefully and for keeping records of one's work is to provide information on what might have caused differences in investigations.
4F/E1a	Changes in speed or direction of motion are caused by forces.
4F/E1bc	The greater the force is, the greater the change in motion will be. The more massive an object is, the less effect a given force will have.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Represent and analyze patterns and functions, using words, tables, and graphs.
	Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions
	Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems;
	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;

	Collect data using observations, surveys, and experiments
	Create and use representations to organize, record, and communicate mathematical ideas;

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2A/E1*	Mathematics is the study of quantity and shape and is useful for describing events and solving practical problems.
2A/E2	Mathematical ideas can be represented concretely, graphically, or symbolically.
2C/E1*	Quantities and shapes can be used to describe objects and events in the world around us. (2C/E1*)

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3A/E3	Measuring instruments can be used to gather accurate information for making scientific comparisons of objects and events and for designing and constructing things that will work properly.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 2.	<ul style="list-style-type: none"> • Students will develop an understanding of the core concepts of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.

21st-Century Skills:

Code	Standard
<i>Critical Thinking & Problem Solving</i>	Identifying and asking significant questions that clarify various points of view and lead to better solutions
<i>Communication & Collaboration</i>	Articulating thoughts and ideas clearly and effectively through speaking and writing
	Demonstrating ability to work effectively with diverse teams
	Assuming shared responsibility for collaborative work
<i>Initiative and Self-Direction</i>	Monitoring one's own understanding and learning needs
<i>Social & Cross-Cultural Skills</i>	Working appropriately and productively with others

Lesson 3

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.1	Ask a question about objects, organisms, and events
4ASI1.3	Employ simple equipment and tools to gather data
4ASI1.4	Use data to construct a reasonable explanation
4ASI1.5	Communicate investigations and explanations
4ASI2.4	Develop explanations using observations (evidence)
4ASI2.6	Review and ask questions about results
4BPS2.1	Describing position
4BPS2.2	Describing motion
4EST1.4	Evaluate a product or design

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
1A/E1*	Sometimes similar investigations give different results because of 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 in observations. It is not always easy to tell which.

1A/E2**	Science is a process of trying to figure out how the world works by making careful observations and trying to make sense of those observations.
1B/E2b	One reason for following directions carefully and for keeping records of one's work is to provide information on what might have caused differences in investigations.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Represent and analyze patterns and functions, using words, tables, and graphs.
	Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.
	Investigate how a change in one variable relates to a change in a second variable.
	Describe location and movement using common language and geometric vocabulary
	Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems.
	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.
	Represent data using tables and graphs such as line plots, bar graphs, and line graphs.
	Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2A/E1*	Mathematics is the study of quantity and shape and is useful for describing events and solving practical problems.
2C/E1*	Quantities and shapes can be used to describe objects and events in the world around us. (2C/E1*)

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3A/E3	Measuring instruments can be used to gather accurate information for making scientific comparisons of objects and events and for designing and constructing things that will work properly.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 9.	<ul style="list-style-type: none"> • Students will develop an understanding of engineering design. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that models are used to communicate and test ideas and processes
Standard 13.	<ul style="list-style-type: none"> • Students will develop abilities to assess the impact of products and systems <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that compare, contrast, and classify collected information in order to identify patterns.

21st-Century Skills:

Code	Standard
<i>Critical Thinking & Problem Solving</i>	Identifying and asking significant questions that clarify various points of view and lead to better solutions
	Framing, analyzing, and synthesizing information in order to solve problems and answer questions
<i>Communication & Collaboration</i>	Articulating thoughts and ideas clearly and effectively through speaking and writing
	Demonstrating ability to work effectively with diverse teams
	Assuming shared responsibility for collaborative work

<i>Initiative and Self-Direction</i>	Monitoring one's own understanding and learning needs
<i>Social & Cross-Cultural Skills</i>	Working appropriately and productively with others
	Leveraging the collective intelligence of groups when appropriate

Lesson 4

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.1	Ask a question about objects, organisms, and events
4BPS1.2	Materials and their properties
4BPS2.2	Describing motion
4EST2.1	Science is one way of answering questions people have about the world.
4FSPSP3.2	Some resources are basic materials, some are produced from basic resources, some are nonmaterial.

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
4E/E2b*	When warmer things are put with cooler ones, heat is transferred from the warmer ones to the cooler ones.
4F/E1a	Changes in speed or direction of motion are caused by forces.
8C/E2*	Sunlight is used to run many devices.
11B/E2*	Geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and oral and written descriptions can be used to represent objects, events, and processes in the real world.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Use representations to model and interpret physical, social, and mathematical phenomena.

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3B/E1*	There is no perfect design. Designs that are best in one respect (safety or ease of use, for example) may be inferior in other ways (cost or appearance). Usually some features must be sacrificed to get others.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 16.	<ul style="list-style-type: none"> • Students will develop an understanding of and be able to select and use energy and power technologies. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> - energy comes in different forms. - tools, machines, products, and systems use energy in order to do work.

21st-Century Skills:

Code	Standard
<i>Critical Thinking & Problem Solving</i>	Identifying and asking significant questions that clarify various points of view and lead to better solutions
	Framing, analyzing, and synthesizing information in order to solve problems and answer questions
<i>Initiative and Self-Direction</i>	Monitoring one's own understanding and learning needs
	Working appropriately and productively with others

Lesson 5

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.1	Ask a question about objects, organisms, and events
4ASI1.2	Plan and conduct a simple investigation
4ASI1.4	Use data to construct a reasonable explanation
4ASI2.1	Asking and answering a question
4ASI2.2	Types of investigations and doing a fair test
4ASI2.6	Review and ask questions about results
4BPS2.2	Describing motion

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
1A/E2**	Science is a process of trying to figure out how the world works by making careful observations and trying to make sense of those observations.
1B/E1*	Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.
1B/E2b	One reason for following directions carefully and for keeping records of one's work is to provide information on what might have caused differences in investigations.
4F/E1a	Changes in speed or direction of motion are caused by forces.
11B/E3** (SFAA)	A model of something is similar to, but not exactly like, the thing being modeled. Some models are physically similar to what they are representing, but others are not.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.
	Investigate how a change in one variable relates to a change in a second variable

	Collect data using observations, surveys, and experiments.
	Represent data using tables and graphs such as line plots, bar graphs, and line graphs;
	Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2C/E1*	Quantities and shapes can be used to describe objects and events in the world around us. (2C/E1*)
9A/E3*	Specifying a quantity requires both a number and a unit.
9B/E2	Tables and graphs can show how values of one quantity are related to values of another.

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3A/E2	Technology enables scientists and others to observe things that are too small or too far away to be seen otherwise and to study the motion of objects that are moving very rapidly or are hardly moving at all.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> ● Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 2.	<ul style="list-style-type: none"> ● Students will develop an understanding of the core concepts of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.
Standard 16.	<ul style="list-style-type: none"> ● Students will develop an understanding of and be able to select and use energy and power technologies.

	<ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ energy comes in different forms. ▪ tools, machines, products, and systems use energy in order to do work.
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21st-Century Skills:

Code	Standard
<i>Creativity & Innovation</i>	Developing, implementing, and communicating new ideas to others
<i>Critical Thinking and Problem Solving</i>	Framing, analyzing, and synthesizing information in order to solve problems and answer questions
<i>Communication & Collaboration</i>	Demonstrating ability to work effectively with diverse teams
	Assuming shared responsibility for collaborative work
<i>Information Literacy</i>	Accessing information efficiently and effectively, evaluating information critically and competently, and using information accurately and creatively for the issue or problem at hand
<i>Initiative & Self-Direction</i>	Monitoring one’s own understanding and learning needs
<i>Social & Cross-Cultural Skills</i>	Working appropriately and productively with others
	Leveraging the collective intelligence of groups when appropriate

Lesson 6

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI1.1	Ask a question about objects, organisms, and events
4ASI1.4	Use data to construct a reasonable explanation
4CLS3.1	Food chains

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
1A/E2**	Science is a process of trying to figure out how the world works by making careful observations and trying to make sense of those observations.
4E/E1*	When two objects are rubbed against each other, they both get warmer. In

	addition, many mechanical and electrical devices get warmer when they are used.
8C/E4*	Some people try to reduce the amount of fuels they use in order to conserve resources, reduce pollution, or save money.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers
	Represent and analyze patterns and functions, using words, tables, and graphs
	Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions
	Use the language of mathematics to express mathematical ideas precisely.
	Recognize and apply mathematics in contexts outside of mathematics.

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2A/E2	Mathematical ideas can be represented concretely, graphically, or symbolically.
2C/E1*	Quantities and shapes can be used to describe objects and events in the world around us. (2C/E1*)
9A/E5** (SFAA)	Fractions are numbers used to represent part of something.
9E/E1*	One way to think about something is to compare it to something more familiar.

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3B/E1*	There is no perfect design. Designs that are best in one respect (safety or ease of use, for example) may be inferior in other ways (cost or appearance). Usually some features must be sacrificed to get others.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none"> • Students will develop an understanding of the characteristics and scope of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools, materials, and skills are used to make things and carry out tasks.
Standard 2.	<ul style="list-style-type: none"> • Students will develop an understanding of the core concepts of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.
Standard 16.	<ul style="list-style-type: none"> • Students will develop an understanding of and be able to select and use energy and power technologies. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ energy comes in different forms. ▪ tools, machines, products, and systems use energy in order to do work.

21st-Century Skills:

Code	Standard
<i>Creativity & Innovation</i>	Demonstrating originality and inventiveness in work
	Developing, implementing and communicating new ideas to others
<i>Critical Thinking & Problem Solving</i>	Exercising sound reasoning in understanding
	Understanding the interconnections among systems
	Framing, analyzing, and synthesizing information in order to solve problems and answer questions
<i>Communication & Collaboration</i>	Demonstrating ability to work effectively with diverse teams
<i>Information Literacy</i>	Accessing information efficiently and effectively, evaluating information critically and competently, and using information accurately and creatively for the issue or problem at hand
<i>Initiative & Self-Direction</i>	Monitoring one's own understanding and learning needs
<i>Social & Cross-Cultural Skills</i>	Working appropriately and productively with others

Lesson 7

Science:

<i>NSES Content Standards</i>	
Code	Standard
4ASI2.1	Asking and answering a question.
4EST1.1	Identify a simple problem.
4EST1.4	Evaluate a product or design.
4EST1.5	Communicate a problem, design, and solution.
4EST2.2	People invent tools and techniques to solve problems and avoid new problems.
4FSPSP3.3	The supply of many resources is limited.
4FSPSP4.2	Changes in environments can be natural or influenced by humans.

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
4F/E1a	Changes in speed or direction of motion are caused by forces.
4F/E1bc	The greater the force is, the greater the change in motion will be. The more massive an object is, the less effect a given force will have.
8C/E4*	Some people try to reduce the amount of fuels they use in order to conserve resources, reduce pollution, or save money.
11A/E1	In something that consists of many parts, the parts usually influence one another.
11B/E2*	Geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and oral and written descriptions can be used to represent objects, events, and processes in the real world.
11B/E3** (SFAA)	A model of something is similar to, but not exactly like, the thing being modeled. Some models are physically similar to what they are representing, but others are not.
11B/E4**	Models are very useful for communicating ideas about objects, events, and processes. When using a model to communicate about something, it is important to keep in mind how it is different from the thing being modeled.
12C/E1	Choose appropriate common materials for making simple mechanical constructions and repairing things.

Math:

<i>NCTM Standards</i>	
Code	Standard
	Build and draw geometric objects
	Identify and build a three-dimensional object from two-dimensional representations of that object

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
2A/E1*	Mathematics is the study of quantity and shape and is useful for describing events and solving practical problems.
2B/M1*	Mathematics is helpful in almost every kind of human endeavor—from laying bricks to prescribing medicine or drawing a face.

Technology:

<i>AAAS Project 2061 Benchmarks</i>	
Code	Standard
3A/E4	Technology extends the ability of people to change the world: to cut, shape, or put together materials; to move things from one place to another; and to reach farther with their hands, voices, senses, and minds. The changes may be for survival needs such as food, shelter, and defense; for communication and transportation; or to gain knowledge and express ideas.
3B/E1*	There is no perfect design. Designs that are best in one respect (safety or ease of use, for example) may be inferior in other ways (cost or appearance). Usually some features must be sacrificed to get others.
3B/E3	The solution to one problem may create other problems.
3C/E1c	The technology available to people greatly influences what their lives are like.
3C/E4*	Factors such as cost, safety, appearance, environmental impact, and what will happen if the solution fails must be considered in technological design.

<i>ITEA Standards</i>	
Code	Standard
Standard 1.	<ul style="list-style-type: none">• Students will develop an understanding of the characteristics and scope of technology.

	<ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ tools, materials, and skills are used to make things and carry out tasks. ▪ creative thinking and economic and cultural influences shape technological development.
Standard 2.	<ul style="list-style-type: none"> ● Students will develop an understanding of the core concepts of technology. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing. ▪ requirements are limits to designing or making a product or system.
Standard 8.	<ul style="list-style-type: none"> ● Students will develop an understanding of the attributes of design. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ the design process is a purposeful method of planning practical solutions to problems. ▪ requirements for a design include such factors as the desired elements and features of a product or system or the limits that are placed on the design.
Standard 9.	<ul style="list-style-type: none"> ● Students will develop an understanding of engineering design. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that when designing an object, it is important to be creative and consider all ideas.
Standard 16.	<ul style="list-style-type: none"> ● Students will develop an understanding of and be able to select and use energy and power technologies. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that <ul style="list-style-type: none"> ▪ energy comes in different forms. ▪ tools, machines, products, and systems use energy in order to do work.
Standard 18.	<ul style="list-style-type: none"> ● Students will develop an understanding of and be able to select and use transportation technologies. <ul style="list-style-type: none"> ○ Students in grades 3-5 should learn that the use of transportation allows people and goods to be moved from place to place.

21st-Century Skills:

Code	Standard
<i>Global Awareness</i>	Using 21st century skills to understand and address global issues
<i>Creativity & Innovation</i>	Demonstrating originality and inventiveness in work
	Developing, implementing and communicating new ideas to others
	Acting on creative ideas to make a tangible and useful contribution to the domain in which the innovation occurs
<i>Critical Thinking & Problem Solving</i>	Exercising sound reasoning in understanding
	Understanding the interconnections among systems
<i>Communication & Collaboration</i>	Articulating thoughts and ideas clearly and effectively through speaking and writing
	Demonstrating ability to work effectively with diverse teams
	Assuming shared responsibility for collaborative work
<i>ICT (Information, Communications & Technology) Literacy</i>	Using technology as a tool to research, organize, evaluate and communicate information, and the possession of a fundamental understanding of the ethical/legal issues surrounding the access and use of information
<i>Flexibility & Adaptability</i>	Adapting to varied roles and responsibilities
<i>Initiative and Self-Direction</i>	Monitoring one's own understanding and learning needs
	Utilizing time efficiently and managing workload
<i>Social & Cross-Cultural Skills</i>	Working appropriately and productively with others
	Leveraging the collective intelligence of groups when appropriate
<i>Leadership & Responsibility</i>	Using interpersonal and problem-solving skills to influence and guide others toward a goal
	Acting responsibly with the interests of the larger community in mind