Unit 1: Motion and Matter

Content Area: **Science**
Course(s): **Science**
Time Period: **Generic Time Period**
Length: **10 Weeks**
Status: **Published**

Unit Overview

The Motion and Matter Module provides grade 3 students with physical sciences core ideas dealing with forces and interactions, matter and its interactions, and engineering design. Students engage in science and engineering practices to collect data to answer questions, and to define problems in order to develop solutions. Students reflect on their own use of these practices and find out about how others use these practices in science and engineering careers.

Standards

Disciplinary Core Ideas (DCI's)

3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
3-PS2-2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
3-PS2-3	Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.
3-PS2-4	Define a simple design problem that can be solved by applying scientific ideas about magnets.

Crosscutting Concepts (CC's)

CCC.1.1	students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and to use these patterns to make predictions.
CCC.2.1	students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity might or

	might not signify a cause and effect relationship.
SCI.3-5.3.2	Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
SCI.3-5.4.2	A system can be described in terms of its components and their interactions.
SCI.3-5.5.2	Matter flows and cycles can be tracked in terms of the weight of the substances before and after a process occurs. The total weight of the substances does not change. This is what is meant by conservation of matter. Matter is transported into, out of, and within systems.

Science and Engineering Practices (SEP's)

SEP.1.c	Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
SEP.1.e	Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.
SEP.2.d	Develop and/or use models to describe and/or predict phenomena.
SEP.3.a	Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
SEP.3.c	Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
SEP.4.a	Represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.
SEP.4.b	Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.
SEP.4.d	Analyze data to refine a problem statement or the design of a proposed object, tool, or process.
SEP.5.b	Organize simple data sets to reveal patterns that suggest relationships.
SEP.6.b	Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.
SEP.6.d	Apply scientific ideas to solve design problems.
SEP.6.e	Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.
SEP.7.d	Construct and/or support an argument with evidence, data, and/or a model.
SEP.7.e	Use data to evaluate claims about cause and effect.
SEP.7.f	Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.
SEP.8.d	Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.

Essential Questions

Investigation 1: Soils and Weathering

- What happens when magnets interact with other magnets and with paper clips?

- How is the magnetic field affected when more magnets are added?
- What causes change of motion?

Investigation 2: Patterns of Motion

- How can we change the motion of wheels rolling down ramps?
- What rules help predict where a rolling cup will end up?
- Student-created question, e.g., What happens to the motion of a twirly bird when the wing length changes?
- What is the best design for a top?

Investigation 3: Engineering

- What are some important features of a cart that will roll from here to there?
- How can you improve the design of your cart?
- Student-created questions, e.g., How does start position affect how far a cart rolls?
- How can you use magnets to do cart tricks?

Investigation 4: Mixtures

- What happens when you mix two materials?
- What happens when you mix two materials?
- What is the importance of accurate measurements for a metric field day?

Application of Knowledge: Students will know that…

- Tops exhibit rotational motion (spinning) when torque is applied to the axial shaft. Top performance is affected by variables.
- A mixture is two or more materials distributed evenly throughout one another.
- A special class of mixture, a solution, results when a solid material dissolves (disappears) in a liquid.
- A twirly bird is a simple winged system that spins when it interacts with air. Twirler performance is affected by variables.
- A wheel-and-axle system with two sizes of wheels describes a curved path when rolled down a slope. The system curves toward the smaller wheel.
- Gravity is the force that pulls masses toward the center of Earth
- Magnetic forces between objects does not require that the objects be in contact.
- Mass is neither created nor destroyed during physical and chemical interactions Matter is conserved.
- Possible solutions to a problem are limited by available materials and resources (constraints).
- Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.
- Starting materials change into new materials during chemical reactions

- The interaction between magnets depends on their orientation (sometimes they attract and sometimes they repel).
- The pattern of an object's or a system's motion in various situations can be observed and measured.
- The patterns of an object's motion in various situations can be observed and measured.
- The strength of the magnetic force between objects depends on the properties of the objects and their distance apart.
- The success of a designed solution is determined by considering the desired features of a solution (criteria).
- Unbalanced forces (pushes or pulls) result in change of motion.
- When past motion exhibits a pattern, it can be used to predict future motion.
- When past motion exhibits a regular pattern, future motion can be predicted from it.

Application of Skills: Students will be able to…

- Analyze and interpret data in order to make a prediction about the boundary of the magnetic field
- Apply measurement concepts learned throughout the module to create field events that require measurement
- Ask questions about how changes of system variables affect the system's motion.
- Ask questions while observing the interaction of magnets.
- Communicate observations and comparisons of motion, using precise vocabulary.
- Communicate with peers about proposed design solutions.
- Compare proposals for design solutions on the basis of how well each one meets the criteria for success and how well each takes the constraints into account.
- Develop a model to explain the attraction between magnets and paper clips.
- Make a number of simple mixtures.
- Make observations to produce data to test a design.
- Mix materials to observe solutions and reactions.
- Weigh materials to confirm conservation of matter.

Assessments

Investigation 1: Soils and Weathering

- Formative Assessment: Science notebook entry, Performance assessment, Response sheet
- Benchmark Assessment: Survey, Investigation 1 I-Check

Investigation 2: Patterns of Motion

- Formative Assessment: Science notebook entry, Response sheet, Performance assessment
- Benchmark Assessment: Investigation 2 I-Check

Investigation 3: Engineering

- Formative Assessment: Science notebook entries, Performance assessment

- Benchmark Assessment: Investigation 3 I-Check

Investigation 4: Mixtures

- Formative Assessment: Performance assessment, Science notebook entry
- Benchmark Assessment: Posttest

Suggested Activities

Investigation 1: Soils and Weathering

Part 1 - Two Forces

- Focus questions: What happens when magnets interact with other magnets and with paper clips?
- Introduce magnetic - force activities
- Summarize the forces of magnetism and gravity
- Read “Magnetism and Gravity”
- View online activity
- Share notebook entries

Part 2 - Magnetic-Force Investigation

- Focus question: How is the magnetic field affected when more magnets are added?
- Plan the investigation
- Answer the focus question
- Assess progress: response sheet
- Read “What Scientists Do”
- Share notebook entries

Part 3 - Magnetic-Force Investigation More About Forces

- Focus question: What causes change of motion?
- Introduce a different kind of force
- Read "Change of Motion”
- Review focus questions for Investigation 1
- Assess progress: I-Check

Investigation 2: Patterns of Motion

Part 1 - Wheel-and-Axle Systems

- Focus question: How can we change the motion of wheels rolling down ramps?
- Explore building a variety of systems

- Answer the focus question
- Assess progress: notebook entry
- Share notebook entries

Part 2 - Prediction Motion of New Systems

- Focus question: What rules help predict where a rolling cup will end up?
- Introduce the park-under-the-ramp challenge
- Answer the focus question
- Assess progress: response sheet
- Read “Patterns of Motion”
- View online activity: “Roller Coaster Builder”

Part 3 - Twirly Birds

- Introduce standard and variable
- Demonstrate standard twirly bird construction
- Conduct the first design tests
- Discuss making predictions
- Discuss forces that cause twirly bird motion

Part 4 - Tops

- Discuss tops
- Develop questions for designing an investigation
- Distribute Spinning Designs sheets
- Read “What Goes Around”

Investigation 3: Engineering

Part 1 - From Here to There

- Introduce engineering
- Describe the challenge
- Introduce bearing
- Focus question: What are some important features of a cart that will roll from here to there?
- Read “What Engineers Do”
- Discuss engineering practices

Part 2 - Distance Challenge

- Build new carts

- Introduce meter and centimeter
- Focus question: How can you improve the design of your cart?
- Read “Soap Box Derby” and Read “The Metric System”

Part 3 - Investigating Start Position

- Focus question: student-created question
- Discuss recording data
- Summarize the activity

Part 4 - Cart Tricks

- Focus question: How can you use magnets to do cart tricks?
- Design and test carts

Investigation 4: Mixtures

Part 1 - Mixing Solids and Liquids

- Focus question: What happens when you mix two materials?
- View online activity: “Measuring Mass”
- Conduct investigations

Part 2 - Reactions

- Focus question: What happens when you mix two materials?
- Start the investigation
- Record group results on the board
- Look for patterns in class data

Part 3 - Metric Field Day

- Focus question: What is the importance of accurate measurements for a metric field day?
- Create event posters
- Read “Careers You Can Count On”

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments
    - More time with the active investigations or online activities.
    - More experience building explanations of the science concepts orally or in writing or drawing.
    - Making vocabulary more explicit through new concrete experiences or through reading to students.
    - Scaffolding their thinking through graphic organizers.
    - Designing individual projects or small-group investigations.
    - More opportunities for experiencing science outside the classroom in more natural, outdoor environments.

Differentiation for ELL's:

- General modifications may include:
    - Strategy groups
    - Teacher conferences
    - Graphic organizers
    - Modification plan
    - Collaboration with ELL Teacher
- Content specific vocabulary important for ELL students to understand include:
  Attract, Balanced, Change of motion, Data, Direction, Evidence, Force, Gravity, Magnet, Magnetic field, Magnetic
  force, Magnetism, Model, Motion, Observe, Pattern, Practice, Predict, Prediction, Pull, Push, Repel, Science practices, Strength, Unbalanced, Axis, Axle, Friction, Outcome, Pattern of
  motion, Ramp, Rotate, Shaft, Slope, Standard, System, Top, Twirly
  bird, Variable, Wheel, Bearing, Centimeter (cm), Constraint, Criterion, Engineer, Meter (m), Metric system, Solution, Standard unit, Start position, Baking soda, Calcium carbonate, Carbon dioxide, Chalk, Chemical reaction, Cloudy, Conservation of
  mass, Dissolve, Mixture, Salt, Sand, Solution, Suspend, Transparent, Vinegar

Differentiation to extend learning for gifted students may include:

Investigation 1 - Brainstorm a list, Problem of the week, Make a compass, Conduct more force investigations, Explore different magnets

Investigation 2 - Write poems about rolling, Write or illustrate the travels of a sphere, Compare rollers and spinners, draw pathways, Construct giant wheels, Examine rolling toy, Make drawing tops to take home, Start a top collection, Construct big and little tops

Investigation 3 - Write about racing, Synonyms for "distance", Create a cartoon strip on the design

process, Problem of the week, Soap box derby speaker, Design a mouse trap cart

Investigation 4 - Motion and Matter crossword puzzle, Problem of the week, Demonstrate conservation of matter, Separate a mixture

Integrated/Cross-Disciplinary Instruction

Technology

Investigation 1, Part 1: Two Forces

•"Magnetic Poles" tutorial

Investigation 2, Part 2: Predicting Motion of New Systems

• "Roller Coaster Builder"

Investigation 3, Part 2: Distance Challenge

• "Measuring Length" tutorial

• "Measurement Logic" tutorial

Investigation 4, Part 1: Mixing Solids and Liquids

• **"**Measuring Mass" tutorial

• "Conservation of Mass" tutorial

• "Measuring Volume and Mass" virtual investigation

• "Measuring Volume" tutorial

Investigation 4, Part 2: Reactions

• “Chemical Reactions” tutorial

Investigation 4, Part 3: Metric Field Day

• “Measuring Length” tutorial

• “Measurement Logic” tutorial

• “Metric Mystery”

Interdisciplinary Extensions

Investigation 1:

Language Extension - Brainstorm a list

Mathematics Extension - Problem of the week

Science Extensions - Make a compass, Conduct more force investigations, Explore different magnets

Investigation 2:

Language Extension - Write poems about rolling, Write or illustrate the travels of a sphere

Mathematics Extension - Problem of the week

Science Extensions - Compare rollers and spinners, draw pathways, Construct giant wheels, Examine rolling toy, Make drawing tops to take home, Start a top collection, Construct big and little tops

Investigation 3:

Language Extension - Write about racing, Synonyms for “distance”, Create a cartoon strip on the design process

Mathematics Extension - Problem of the week

Science Extensions - Soap box derby speaker, Design a mouse trap cart

Investigation 4:

Language Extension - Motion and Matter crossword puzzle

Mathematics Extension - Problem of the week

Science Extensions - Demonstrate conservation of matter, Separate a mixture

LA.RL.3.1	Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.
LA.RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
LA.K-12.NJSLSA.W3	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
LA.RI.3.5	Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
LA.RI.3.6	Distinguish their own point of view from that of the author of a text.
LA.RI.3.7	Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
LA.RI.3.10	By the end of the year, read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.
LA.RF.3.4.C	Use context to confirm or self-correct word recognition and understanding, rereading as necessary.
LA.K-12.NJSLSA.L4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
LA.K-12.NJSLSA.L5	Demonstrate understanding of word relationships and nuances in word meanings.
LA.K-12.NJSLSA.L6	Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
LA.SL.3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
LA.SL.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
LA.SL.3.5	Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.

Resources

www.FOSSweb.om - Teacher-user account

Investigation 1:

- **Science Resources Book**
- "Magnetism and Gravity"
- "What Scientists Do"
- "Change of Motion"
- **Videos**
- *All about Motion and Balance*
- *All about Magnets*
- **Online Activity**
- "Magnetic Poles"

Investigation 2:

- **Science Resources Book**
- "Patterns of Motion"
- "What Goes Around"
- **Online Activity**
- "Roller Coaster Builder

Investigation 3:

- **Science Resources Book**
- "What Engineers Do"
- "Science Practices"
- "Engineering Practices"
- "Soap Box Derby"
- "The Metric System"
- "How Engineers and
- Scientists Work Together"
- **Online Activities**
- "Measuring Length"
- "Measurement Logic"

Investigation 4:

- **Science Resources Book**
- "Mixing Solids and Liquids"
- "Reactions"
- "Careers You Can Count On"

- **Online Activities**
- “Measuring Mass”
- “Conservation of Mass”
- “Measuring Volume and Mass”
- “Measuring Volume”
- “Chemical Reactions”
- “Measuring Length”
- “Measurement Logic”
- “Metric Mystery” '

Websites:

Amusement Park Physics
URL: www.learner.orgDescription: What variables and laws of physics affect amusement park ride design? At this website, you'll find out by designing your own roller coaster and experimenting with bumper car collisions. Primary students may need to adult help with this site.

Archkidecture: About Structures
URL: archkidecture.orgDescription: This is a website for students who want to learn more about architecture, including projects you can build yourself.

Arthur Fry
URL: www.ideafinder.comDescription: This site is the Post-it Note story.

Bette Nesmith
URL: web.mit.eduDescription: This site is the story of Bette Nesmith, the woman who invented correction fluid for typing.

Bill Nye's Online Labs
URL: www.billnye.comDescription: This site contains Bill Nye the Science Guy's online labs which contain chemistry experiments.

Cannon Investigation
URL: jersey.uoregon.eduDescription: Experiment with variables that affect the trajectory of a cannonball. You can vary the cannon angle, speed of the cannonball, wind factors, and more. After you shoot off the cannon, you can see the path the cannonball took on a background graph.

Charles Goodyear
URL: www.goodyear.comDescription: This site is the story of how Charles Goodyear invented weatherproof rubber.

CHEM4KIDS
URL: www.chem4kids.comDescription: This site includes a variety of information, activities, and a glossary relating to chemistry.

Cotton Ball Catapult
URL: pbskids.orgDescription: Challenges students to create and use a cotton-ball catapult.

Energy Kids Page
URL: www.eia.doe.govDescription: This site contains activities, games, glossary, energy history and links to other resources.

Gases, Liquids, and Solids
URL: www.chem.purdue.eduDescription: All about the microscopic differences between gases, liquids, and solids.

How Airplanes Work
URL: travel.howstuffworks.comDescription: If you have ever wondered what allows a 747 -- or any airplane for that matter -- to fly, then read on! You will read about the theory of flight and talk about the different parts of a standard airplane, and more. Young students may require adult assistance.

How Does a Catapult Work?
URL: science.howstuffworks.comDescription: Read text and view pictures to find out how a catapult works at this HowStuffWorks website.

How E-Mail Works
URL: computer.howstuffworks.comDescription: Have you ever wondered how e-mail gets from your desktop to a friend halfway around the world? What is a POP3 server, and how does it hold your mail? The answers may surprise you, because it turns out that e-mail is an incredibly simple system at its core! In this article, you will take an in-depth look at e-mail and how it works! Young students may require adult assistance.

How Gliders Work
URL: travel.howstuffworks.comDescription: From paper airplanes to the space shuttle during re-entry, there are many types of gliders. Find about the most common type of glider, often referred to as a sailplane at HowStuffWorks.com. Young students may require adult assistance.

How Rollercoasters Work
URL: science.howstuffworks.comDescription: Examine the principles that keep coaster cars flying around their tracks on this HowStuffWorks website. Also look at the hardware that keeps everything running, as well as the forces that make the ride so much fun. Primary students may need to adult help with this site.

How Tower Cranes Work
URL: science.howstuffworks.comDescription: Tower cranes are a common fixture at any major construction. This site from About.com includes loads of information about tower cranes.

I Know That: Science Lab
URL: www.iknowthat.comDescription: This is a great site for activities, animations, simulations and other resources related to the human body, sounds, matter the solar system, weather and other science topics to supplement sound.

I Was Wondering: Women's Adventures in Science
URL: Description: This project of the National Academy of Sciences showcases the accomplishments of contemporary women in science and highlights the varied and intriguing careers of some of today's most prominent scientists.

Inside a Combination Lock
URL: home.howstuffworks.comDescription: You see combination locks every day, but have you ever stopped to think what is inside? In this edition of How Stuff Works you will unlock the secrets of a combination lock! Young students may require adult assistance.

Invent America!
URL: www.inventamerica.orgDescription: INVENT AMERICA! is a nonprofit K-8 teacher-created program that helps kids learn by inventing.

Invention Convention
URL: www.eduplace.comDescription: The Invention Convention is an event that gives students an opportunity to demonstrate these skills independently as they invent a new product or process. Students may require adult assistance with the reading.

Invention Dimension
URL: web.mit.eduDescription: The Lemelson-MIT Program awards apprenticeships to deserving high school students who show special achievement. Also on the site are links to other Inventions sites and daily facts about different inventions. Students may require adult assistance with the reading.

Inventor Hall of Fame
URL: invent.orgDescription: This site is a list of inventors presented in alphabetical order. You can click on any name and get information about that inventor. Students may require assistance with the reading level.

Inventors Toolbox: The Elements of Machines
URL: www.mos.orgDescription: This site from the Boston Museum of Science includes photographs and information about the various forms of simple machines. After you review the photographs and information, you can travel to the Gadget Anatomy link and try to figure out which simple machines are used in a variety of common tools and gadgets.

It's a Material World
URL: www.mrl.ucsb.eduDescription: Guess different materials based on a set of clues.

Jan Matzelinger
URL: www.blackinventor.comDescription: This site is a short biography of Jan Matzelinger who invented the machine to mass produce shoes.

Kids and Energy
URL: www.kids.esdb.bgDescription: Student-friendly site includes energy definitions, activities and resources.

Leonardo's Inventor Workshop
URL: www.mos.orgDescription: This site is full of interesting information and activities that would be useful for the **Levers and Pulleys** and the **Ideas and Inventions Modules**. The Mysterious Machinery page prompts students to view one of Leonardo's drawings and guess the use. The Visions of the Future page compares modern day machines with the drawings of Leonardo's ideas. Gadget Anatomy allows the student after studying simple machines to analyze the types of that are used to make various tools.

Little Shop of Physics
URL: littleshop.physics.colostate.eduDescription: This site contains online experiments that can be done using household items or using the computer.

Matter and Energy
URL: kidskonnect.comDescription: Student-friendly explorations of matter and energy.

National Institute of Standards and Technology/Metric Program
URL: ts.nist.govDescription: This page sponsored by the National Institute of Standards and Technology is a

good resource for information about transforming the United States into a 'Metric America.'

Physics4Kids.com
URL: www.physics4kids.comDescription: This site includes an overview and information about radiation, visible light, light structure, reflection, refraction, lenses, and lasers.

Private Universe Project in Science
URL: www.learner.orgDescription: This innovative workshop for teachers explores the reasons why teaching science is so difficult and offers practical advice to help you teach more effectively. Each program focuses on one theme and one content area and uses specific examples to show how students' preconceived ideas can create critical barriers to learning. Education experts also review classroom strategies and results and recommend new ways to involve students and approach difficult topics. Nine different videos cover a variety of topics including astronomy, biology, chemistry, physics, and environmental education.

Robotics: Sensing, Thinking, Acting
URL: www.thetech.orgDescription: Information and history about robotics from The Tech Museum

Simple Machines
URL: edheads.orgDescription: A site that helps students understand what is considered simple machines through investigation and animation.

Simple Machines from EdHeads
URL: www.edheads.orgDescription: This site reviews everyday simple machines through interactive games!

To Fly Is Everything!
URL: invention.psychology.msstate.eduDescription: This site is the Virtual Museum of the Invention of the Airplane. It includes a restoration of the movie of the Wright Brothers first flight, plus an interactive simulation of the 1903 Wright Brothers flight, 3-D models of early aircraft, a photo and movie gallery, a digital library, a plane database, and an Inventors Gallery.

Toshiba ExploraVision Awards
URL: www.toshiba.comDescription: A competition for all students in grades K-12, designed to encourage students to combine their imagination with their knowledge of science and technology to explore a vision of the future.

Toshiba NSTA ExploraVision
URL: www.toshiba.comDescription: From the site: "ExploraVision is a competition for all students in grades K–12. It is designed to encourage students to combine their imagination with their knowledge of science and technology to explore a vision of the future. Teams of students select a technology, research how it works and why it was invented, and then project how that technology may change in the future. They must then identify what breakthroughs are required for their vision to become a reality and describe the positive and negative consequences of their technology on society. Winning ideas have focused on things as simple as ball-point pens and as complex as satellite communications."

Tryscience.org Field Trips
URL: www.tryscience.orgDescription: Find out about more than 400 science and technology centers and museums worldwide. Use an interactive map of the world to find and explore a science and technology center or museum near you. You can also find online adventures and field trips, ideas for experiments at home, plus live webcams. TryScience.org is your gateway to experience the excitement of contemporary science and technology through on and offline interactivity with science and technology centers worldwide. TryScience is brought to you through a partnership between IBM Corporation, the New York Hall of Science (NYHOS), the Association of Science-Technology Centers (ASTC), and science centers worldwide.

21st Century Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.