

STEM Education at Montague School

STEM: Science, Technology, Engineering and Mathematics, penetrates every aspect of our daily lives. The implementation of a course which integrates content areas through an exploratory, investigative manner allows people to understand and address real life issues and solve problems and challenges. Students begin, through a hands on manner to not only explore, but to apply the roles and responsibilities of STEM career professions. Students will understand how problems, issues, and challenges are identified, problem solved and solutions implemented, revised and tried again. The STEM classroom is a place in which the word “FAIL” stands for the “First Attempt In Learning”.

During STEM at Montague School, K - 8 students will apply, assimilate and master schemas which include but are not limited to:

- Principles of Engineering
- Engineering Design Process
- Grand Challenges in Engineering,
- Observation, Testing, Evaluation, Recording Data,
Drawing Conclusions from Data, Ethics
- Constraints, Criteria
- Coding
- Exploring natural world
- Exploring man-made world
- Biomimicry
- Properties of materials
- Properties of design
- Forces
- Friction
- Gravity
- Energy
- Renewable Sources, Wind, Solar, Hydro
- Electricity
- Hydraulics
- Gears and Gear Ratios
- Friction & Speed
- Distance & Work
- Making Predictions
- Innovations
- Virtual Reality
- Z-Space
- Green Screen and Media Technology
- Electronic Building Blocks
- Electric Circuits

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Formative, Summative and Benchmark Assessment Philosophy for STEM at Montague School

It is essential that STEM education provides students with the most authentic, real world learning experiences. Assessments for these authentic experiences take place in a variety of formats including observations, discussion and solution based in the form of problem- or project based learning and assessment.

Considerations for assessment include the following as supported by Anne Jolly in a March 2016 Education Week article (<https://www.edweek.org/tm/articles/2016/03/14/designing-useful-stem-classroom-assessments.html>)

Observations and discussions around authentic experiences in which students:

- Focus attention on identifying and solving real problems.
- Apply specific grade-level science and math concepts.
- Observe whether students understand how to apply science and mathematics to solve a problem.
- Do students actually understand how math and science work together to create solutions for problems.
- Use an engineering-design process to guide their thinking and problem-solving.
- Create and test prototypes (technologies) as solutions.

Another essential 21st Century workplace skill for assessment purposes in a STEM classroom is teamwork progress. One element assessment is the consideration of students' progress in working as productive team members.

- Come up with several different possible solutions for a problem.
- Combine materials and ideas in clever and imaginative ways to create a solution.
- Design a prototype and test it to see if this device solves the problem.
- Successfully evaluate their testing results, and analyze and interpret their data.
- Recognize things they can do to change and improve the design of the prototype.
- Communicate ideas in new and innovative ways.
- Feel "safe" in expressing out-of-the-box imaginative ideas.
- Believe that it's safe to fail, and then use failure as an opportunity to improve
- Suggest increasingly creative ideas for solving a problem.
- Show increased persistence in sticking with finding solutions for a problem.
- Take ownership of their projects and learning.
- Express increasing curiosity and ask more questions.
- Transfer STEM practices to other subject areas.

Assessment for STEM may include but are not limited to:

- Observations
- Discussions
- Benchmarks (What is Technology?)
- Gear Ratio Math
- Electrical Circuits
- Pascal's Principle
- "Do Now" Science and Math
- Google Docs
- Google Slides
- Google Classroom

Month September

Pacing Week	1	2	3	4	Materials	Standards https://www.nj.gov/education/cccs/
See Appendix for Modifications and Adaptations						
1st	Introduction to STEM Pre Assessment	Tin Foil Boat Challenge http://sp.mdot.ms.gov/Public%20Affairs/Documents/Sample%20Lesson%20Plan%20(Design%20A%20Boat).pdf Pre Assessment A5 Bar Graph	Tin Foil Boat Challenge http://sp.mdot.ms.gov/Public%20Affairs/Documents/Sample%20Lesson%20Plan%20(Design%20A%20Boat).pdf Assessment A6 Powerpoint	Make a Flinker Discovery Education Assessment Word Processing	Tin foil Metal washer Packing Peanuts Paper clips Clear tank Rectangular pool Tubing	1. Technology : 8.2.2.A.5 8.2.2.A.1 2. Engineering Design: K-2-ETS1-3 K-2 ETS1-2 3. Mathematics: 1.MD.A.2 1.MD.A.1(1-PS4-4) 1.MD.C.4(1-ESS1-2) 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
2nd	Introduction to STEM Pre Assessment	Tin Foil Boat Challenge http://sp.mdot.ms.gov/Public%20Affairs/Documents/Sample%20Lesson%20Plan%20(Design%20A%20Boat).pdf Pre Assessment A5 Bar Graph	Tin Foil Boat Challenge http://sp.mdot.ms.gov/Public%20Affairs/Documents/Sample%20Lesson%20Plan%20(Design%20A%20Boat).pdf Assessment A6 Powerpoint	Make a Flinker Discovery Education Assessment Word Processing	Tin foil Metal washer Packing Peanuts Paper clips Clear tank Rectangular pool Tubing	1. Technology : 8.2.2.A.5 8.2.2.A.1 2. Engineering Design: K-2-ETS1-3 K-2 ETS1-2 3. Mathematics: 2.MD.D.10 2.MD.A.1 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
3rd	Introduction to STEM	Cleaning Oil Spill	Cleaning Oil Spill	Cleaning Oil Spill	Boston Museum kit (double)	Technology

	Pre Assessment	EiE Boston Museum Report 8.1.5.D.1- 8.1.5.D.2 (3-4) 8.1,5,E.1 (3-5) 8.1.5.F.1 (3-5)	Science Unit 6 3-LS2-1 3-LS4-3		(Pre ordered) /curriculum clear plastic tanks storage container	8.1.5.D.1 8.1.5.D.2 8.1.5.D.2 8.1.E.1 8.1.5.E.1 8.2.5.A.1 8.2.5.1.2 8.2.5.A.5 Engineering Design 8.2.5.C.4
4th	Introduction to STEM Pre Assessment	Cleaning Oil Spill	Cleaning Oil Spill	Cleaning Oil Spill	Boston Museum kit (double) (Pre ordered) /curriculum clear plastic tanks storage container	8.2.5.A.2 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
5th	Introduction to STEM Pre Assessment	Little Bits Report - Technologies Change 8.2.5.A.1 - 8.2.5.A.5	Little Bits	Little Bits	Little bits kits (Pre-ordered) Storage with drawers	8.2.5.A.5 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Introduction to STEM Pre Assessment	Solar Cars Report- Cars Change Why? Powerpoint 8.2.8.A.1 8.2.2.A.2 8.2.2.A.3 8.2.2.A.4	Solar Cars VR inside car systems	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams Digital multimeter(10) 9 volt batteries	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3 Social Studies

		8.2.8.A.5 (6-8) 8.1.8.A.1 8.1.8.A.2 8.1.8.A.3 8.1.8.A.4				6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Introduction to STEM Pre Assessment	Solar Cars	Solar Cars	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams Digital multimeter(10) 9 volt batteries	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
8th	Introduction to STEM Pre Assessment	Solar Cars	Solar Cars	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams Digital multimeter(10) 9 volt batteries	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3

Month October

Week	1	2	3	4	Materials	NJ Standards
K	<p>Crystals</p> <p>Write name with crystals</p> <p>Enter name in word processing document</p> <p>8.1.2 A.1 8.1.2 A.2</p>	<p>Shapes-eggs http://www.playdoughtoplato.com/kids-science-experiment-walking-eggs/</p> <p>Jack and the beanstalk/humpty dumpty extension Curved and triangles</p> <p>Make newspaper strong enough to shape</p> <p>8.2.2A.1-8.2.2.A.5</p>	<p>Shapes-strength & purpose</p> <p>Examine protection for seeds</p> <p>file:///C:/Users/User/Downloads/activity_Why%20So%20Yummy.pdf protection</p>	<p>Design a shelter using a strong shape and offers protection (three little pigs extension)</p>	<p>Index cards, tape, clay, plastic, popsicle sticks</p>	<p>8.2.2.A.5</p>
1st	<p>Leaf Scavenger Hunt</p> <p>Science 1 Unit 3 www.Siemensscience.com</p>	<p>Leaf extension</p>	<p>Build Rain Gutters Engineering Design Process</p> <p>8.2.2.A.1 8.2.2.A.2 8.2.2.A.3 8.2.2.A.4 8.2.2.A.5 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5 8.2.2.C.6</p>	<p>Test Rain Gutters</p>	<p>Sugar cubes Popsicle sticks Straight straws Bendy straws Model magic Gallon zip lock bags</p>	<p>Science:1-LS3-1 1-LS1-1 Technology : 8.2.2.A.1 8.2.2.A.2 8.2.2.A.3 8.2.2.A.4 8.2.2.A.5 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5 8.2.2.C.6 Engineering: K-2-ETS1-1 K-2-ETS-2 21st Century: CRP2 CRP4</p>

						CRP5 CRP6 CRP8
2nd	<p>Leaf Scavenger Hunt</p> <p>Science 1 Unit 3 www.Siemensscience.com</p>	Leaf extension	<p>Build Rain Gutters Engineering Design Process</p> <p>8.2.2.A.1- 8.2.2.A.5 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5 8.2.2.C.6</p>	Test Rain Gutters	<p>Sugar cubes Popsicle sticks Straight straws Bendy straws Model magic Gallon zip lock bags</p>	<p>Science:1-LS3-1 1-LS1-1 Technology : 8.2.2.A.1- 8.2.2.A.5 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5 8.2.2.C.6 Engineering: K-2-ETS1-1 K-2-ETS-2 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8</p>
3rd	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Engineering Design Process Problem/Brain-Storm solutions</p> <p>http://sciencenetlinks.com/lessons/ramps-1-let-it-roll/ http://sciencenetlinks.com/lessons/ramps-1-let-it-roll/</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Build & Test</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Evaluate /Improve</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Graph results</p>	<p>Matchbox cars Stop watches meter/yard stick thin, stiff, wooden or plastic board, 8-12 inches wide and 12-16 inches long ping-pong balls, marbles, ball bearings, baseballs carpet samples</p>	<p>Science: 3-PS2-1, 3-PS-2, Engineering: 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3 Technology : 8.2.5.A.4, 8.1.5.A.1 8.1.5.A.3</p>

	mps-2-ramp-builder/				pink foam foam wrap wood plywood rubber treads PVC-white PVC-black brick masking tape gutter	
4th	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Engineering Design Process Problem/Brain-Storm solutions 4-PS3-1 4-PS 3-3 8.2.5.1 8.2.5.2</p> <p>http://sciencenetlinks.com/lessons/ramps-1-let-it-roll/</p> <p>http://sciencenetlinks.com/lessons/ramps-2-ramp-builder/</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Build & Test</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Evaluate /Improve</p>	<p>Design Ramp</p> <p>Overcome gravity, friction, safe - Student design experiment Graph results</p>	<p>Matchbox cars Stop watches meter/yard stick thin, stiff, wooden or plastic board, 8-12 inches wide and 12-16 inches long ping-pong balls, marbles, ball bearings, baseballs carpet samples pink foam foam wrap wood plywood rubber treads PVC-white</p>	<p>Science: 3-PS2-1, 3-PS-2, Engineering: 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3 Technology : 8.2.5.A.4, 8.1.5.A.1 8.1.5.A.3</p>

					PVC-black brick masking tape gutter	
5th	Little Bits Identifying and using Electronic Components 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Little Bits Engineering Design Process	Little Bits Identify problem and begin planning solution	Little Bits Building Prototype	Little bits kits(Pre-ordered) Storage with drawers	Engineering 8.2.5.A.1 8.2.5.A.2. 8.2.5.A.4. 8.2.5.A.5 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Solar Cars 8.2.8.A.1- 8.2.8/A.5 8.1.8.A.2 8.1.8.A.4	Solar Cars	Solar Cars	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics:

						6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
8th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	AA Batteries Solar panels Wheels Scale that weighs in grams	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3

Month November

Week	1	2	3	4	Materials	NJ Standards
1st	<p>Pre assessment Part 2 Biomimicry Tails and Roots Used in Nature 1-LS1-1 K-2-ETS1-2 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5</p>	<p>Use tails and roots principle in engineering for stability - explore nature</p> <p>Build table, coat rack, picture frame, etc.</p>	<p>Use animal tails design to make a connection to invent playground equipment</p>	<p>Use animal tails design to make a connection to invent playground equipment</p>	<p>Popsicle sticks, pipe cleaners, model magic</p>	<p>Science: 1-LS1-1 Engineering Design: K-2-ETS1-3 K-2 ETS1-2 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8</p>
2nd	<p>Pre assessment part 2 Biomimicry Tails and Roots Used in Nature</p> <p>Balancing video PBS kids Design Squad</p>	<p>Use tails and roots principle in engineering for stability - explore nature</p> <p>Build table, coat rack, picture frame, etc.</p>	<p>Use animal tails to make a connection to invent playground equipment</p>	<p>Use animal tails to make a connection to invent playground equipment</p>	<p>Popsicle sticks, pipe cleaners, model magic</p>	<p>Science: 1-LS1-1 Engineering Design: K-2-ETS1-3 K-2 ETS1-2 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8</p>
3rd	<p>Designing Knee Brace Boston Museum</p> <p>8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7</p>	<p>Designing Knee Brace</p>	<p>Designing Knee Brace</p>	<p>Designing Knee Brace</p>	<p>Knee Brace kit from Boston Museum (1)</p>	<p>Technology :</p> <p>8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7</p>
4th	<p>Designing Knee Brace</p>	<p>Designing Knee Brace</p>	<p>Designing Knee Brace</p>	<p>Designing Knee Brace</p>	<p>Knee Brace kit</p>	<p>Technology :</p>

					from Boston Museum (2)	8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7
5th	Globe Protocol 5-ESS2-2 5-ESS#-1 8.1.5.A.1- 8.1.5.A.6	Globe Safety & Practice	Globe Spreadsheet Graphs Powerpoint	Globe Setting the field Globe protocol Flags	IRT thermometers Clipboards Watches 9 Volt Batteries	Engineering 5-ESS2-2 5-ESS3-1 Technology 8.1.5.A.1 8.1.5.A.2 8.1.5.A.3 8.1.5.A.4 8.1.5.A.5 8.1.5.A.6 Math 5.NBT.B.5* 5.NBT.B.7* 5.NF.B.7* Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Globe MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. [Clarification	Globe Safety & Practice	GSpreadsheet Graphs Powerpoint lobe	Globe Setting the field Globe Protocol Tape Measure Flags	IRT thermometers Clipboards Watches 9 Volt Batteries	5-ESS2-2 5-ESS3-1 8.1.5.A.1- 8.1.5.A.6 Math 5.MD.B2 .5.NBT.B.5* 5.NBT.B.7* 5.NF.B.7*

	Statement: Examples of factors include human activities (such as fossil fuel com					6.NS.C.8. 6.SP.A.2 6.SP.A.3 6.SP.B.4 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Kit from Pitsco (pre ordered 10--need 20) Glue Food Coloring	Technology : 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5
8th	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Kit from Pitsco(pre ordered 10--need 20) Glue Food Coloring	Technology : 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5

Month December

Week	1	2	3	4	Materials	NJ Standards
Alternate plan for biomimicry	Shape Design - Purpose - Bird Beaks Siemens - Birds of a Feather file:///C:/Users/User/Downloads/activity_Birds%20of%20a%20Feather.pdf	Research birds in Montague Graph bird species and beaks. https://www.uen.org/lessonplan/view/11402	Design and make a bird feeder for a Montague bird. Graph bird species and beaks. https://www.uen.org/lessonplan/view/11402	No School	Plastic spoons, plastic salad tongs, thin straws. Graph paper, crayons, bird books	K-2-ETS1-1. K-2-ETS1-2.. K-2-ETS1-3.
1st	Code.org Hour of Code 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Shape Design - Purpose - Bird Beaks Siemens - Birds of a Feather file:///C:/Users/User/Downloads/activity_Birds%20of%20a%20Feather.pdf	Research birds in Montague Graph bird species and beaks. https://www.uen.org/lessonplan/view/11402	No School	Plastic spoons, Tongs, ladle,	SCIENCE: 1-LS3-1 ELA: W.1.8 MATH: 1.MD.A.1 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
2nd	Code.org Hour of Code	Coding	Coding	No School	www.code.org	Technology 8.1.2.A.4 8.1.2.A.1 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
3rd	Code.org Hour of Code 8.2.5.E.1	Designing Knee Brace 8.2.5.A.1-	Designing Knee Brace	No School	Purchased kit from Boston Museum	Technology 8.2.5.A.1- 8.2.5.A.5

	8.2.5.E.2 8.2.5.E.3 8.2.5.E.4 (3-5)	8.2.5.A.5 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7 (3-5)				8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7 (3-5)
4th	Globe Gather Data 5-ESS2-2 5-ESS#-1 8.1.5.A.1- 8.1.5.A.6 zSpace clouds	Globe MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. 8.1.5.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding. [Globe Gather Data	No School	IRT thermometers Clipboards Watches 9 Volt Batteries	5-ESS2-2 5-ESS3-1 8.1.5.A.1 8.1.5.A.6 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
5th	Globe	Globe	Globe	No School	IRT	Engineering

	zSpace clouds	Gather data	Gather data		thermometers Clipboards Watches 9 Volt Batteries	5-ESS2-2 5-ESS3-1 Technology 8.1.5.A.1- 8.1.5.A.6 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Globe zSpace clouds	Globe Gather data	Globe Gather data	No School	IRT thermometers Clipboards Watches 9 Volt Batteries	Engineering 5-ESS2-2 5-ESS3-1 Technology 8.1.5.A.1- 8.1.5.A.6 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	Hydraulic Arm 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	No School	Kit from Pitsco (pre ordered 10--need 20) Glue Food Coloring	Technology : 8.2.8.A.2 8.2.8.A.3 8.2.8.C.3 8.2.8.C.5 Math 7.G.B.4 7.G.B.5
8th	Hydraulic Arm 8.2.8.A.2	Hydraulic Arm 8.2.8.A.2	Hydraulic Arm 8.2.8.A.2	No School	Kit from Pitsco (pre ordered	Technology : 8.2.8.A.2

	8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	8.2.8.A.3 8.2.8.C.3 8.2.8.C.5	8.2.8.A.3 8.2.8.C.3 8.2.8.C.5		10--need 20) Glue Food Coloring	8.2.8.A.3 8.2.8.C.3 8.2.8.C.5
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Month January

Week	1	2	3	4	Materials	NJ Standards
K	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Assessment	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Ipad/kindle/or samsung tablet (24 tablets) For control	8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)
1st	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5(K-2)	Assessment	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Ipad/kindle/or samsung tablet (24 tablets) For control	8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2) 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8

2nd	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Assessment	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)	Coding Spheros 8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5(K-2)	Ipad/kindle/or samsung tablet (24 tablets) For control	8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5(K-2) 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
3rd	Designing Model Knee Brace EiE Boston Museum 8.2.5.A.1- 8.2.5.A.4	Assessment	Designing Model Knee Brace	Designing Model Knee Brace	Boston Museum Teacher's Guide, Consumable Kit	3-5-ETS1-1. 3-5-ETS1-2. 3-5-ETS1-3.
4th	Globe Surface Temp. Globe.gov 8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8.E.1 Asking questions about data Forming hypothesis	Assessment	Globe Surface Temp. Globe.gov 8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8E.1 Designing Model Membranes EiE Boston Museum	Globe Surface Temp. Globe.gov 8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8E.1 Designing Model Membranes	Globe website data, student data sheets, Google sheets	8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8E.1 Social Studies: 6.3.4.A.4 6.3.4.B.1
5th	Globe Surface Temp. Globe.gov 8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8E.1 Asking questions about data	Assessment	Globe Visualizing data	Globe Present data and hypothesis support	Globe website data, student data sheets, Google sheets	8.1.5.A.4- 8.1.5.A.6 8.1.5.C.1 8.1.8.E.1 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12

	Forming hypothesis					6.1.4.C.13 6.1.4.C.16
6th	Globe Asking questions about data Forming hypothesis	Globe Evaluating data and analyzing data worldwide	Globe Visualizing data	Globe Present data and hypothesis support	IRT thermometers Clipboards Watches 9 Volt Batteries	5-ESS2-2 5-ESS3-1 8.1.5.A.1- 8.1.5.A.6 Social Studies: 6.3.4.A.4 6.3.4.B.1 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Catapults Ball Launcher Challenge sciencebuddies.org Engineering Design Process, Criteria, Constraints Build	Catapults Test Graph Data 8.1.8.A.4	Catapults Research history and problems/ethics of weaponry 8.1.2.C.1- 8.1.8.C.1 8.1.8.D.3	Catapults Research history and problems/ethics of weaponry 8.1.2.C.1- 8.1.8.C.1 8.1.8.D.3	Cardboard, cardstock, popsicle sticks, wooden ruler, printer paper, wooden pencils, rubber bands, paper clips(large) Clear tape, tin foil	Science MS-PS2-2 MS-ETS1-1 Technology 8.1.2.C.1 8.1.8.C.1 8.1.8.D.3
8th	Catapults Ball Launcher Challenge sciencebuddies.org Engineering Design Process, Criteria, Constraints Build 8th Grade choice -	Catapults Test Graph Data 8.1.8.A.4 8th Grade choice	Catapults Research history and problems/ethics of weaponry 8.1.2.C.1- 8.1.8.C.1 8.1.8.D.3	Catapults Research history and problems/ethics of weaponry 8.1.2.C.1- 8.1.8.C.1 8.1.8.D.3	Cardboard, cardstock, popsicle sticks, wooden ruler, printer paper, wooden pencils, rubber bands, paper clips(large) Clear tape, tin foil	MS-PS2-2 MS-ETS1-1 8.1.2.C.1- 8.1.8.C.1 8.1.8.D.3

	Design own T-Shirts	- Design own T-Shirts	8th Grade choice - Design own T-Shirts	8th Grade choice - Design own T-Shirts	Design shirts online at website.	
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Month February

Week	1	2	3	4	Materials	Standards
K	Engineering Week Discovery Ed					8.2.2.B.1 8.2.2.B.4
1st	Rapunzel's Tower	Rapunzel's Tower - Design #2 Compare designs	Engineering Week Discovery Ed	Rapunzel's Tower - act out with their tower and present why the design is improved	Index cards, tape, toothpicks, paper, Rapunzel story, puppet template, popsicle sticks	8.2.2.D.1 8.2.2.D.2 8.2.2.D.3 8.2.2.D.4 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
2nd	Jack and the Beanstalk Structure of Eggs	Plant Beans	Engineering Week Discovery Ed	Egg Drop	Beans, recyclables, Cotton, paper, cups, soil, ziplock bags.	8.2.2.D.1 8.2.2.D.2 8.2.2.D.3 8.2.2.D.4 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8
3rd	Designing Model Membranes	Designing Model Membranes	Engineering Week Discovery Ed	Designing Model Membranes	Pre ordered kits	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3.
4th	Designing Model Membranes	Designing Model Membranes	Engineering Week Discovery Ed	Designing Model Membranes	Pre ordered kits	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3.
5th	Leaking Greenhouse Real World Problem Solving	Leaking Greenhouse Real World Problem Solving http://tryengineering.org/sites/default/files/	Leaking Greenhouse Real World Problem Solving	Leaking Greenhouse Real World Problem Solving	Popsicle sticks, straws, plastic, wire, poster board, shingle, recyclables, soil, - sugar cubes	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3. Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16

		lessons/irrigationideas.pdf				
6th	Spheros 8.2.8.E.1 8.2.8.E.2 8.2.8.E.3 8.2.8.E.4 (6-8)	Spheros	Engineering Week Discovery Ed	Spheros	Ipad/kindle/or samsung tablet (24 tablets)	8.2.5.E.3 8.2.5.E.4 8.2.8.E.3 8.2.8.E.4 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16.
7th	Spheros	Spheros	Engineering Week Discovery Ed	Spheros	Ipad/kindle/or samsung tablet (24 tablets)	8.2.5.E.3 8.2.5.E.4 8.2.8.E.3 8.2.8.E.4
8th	Spheros	Spheros	Engineering Week Discovery Ed	Spheros	Ipad/kindle/or samsung tablet (24 tablets)	8.2.5.E.3 8.2.5.E.4 8.2.8.E.3 8.2.8.E.4

Month March

Week	1	2	3	4	Materials	Standards
K	<p>Wind Create windsock Record Data K-ESS2-1 K-ESS3-2 K-2ETS1-1 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5</p>	<p>Identify problems with wind -</p>	<p>Design solutions to a wind problem. Ex. picnic table items</p>	<p>How can wind help us - Make sail boats & race</p>	<p>Construction paper, streamers, crayons, glue, Stapler, stickers, fan Wind sailboats purchased from Pitsco</p>	<p>K-ESS2-1 K-ESS3-2 K-2ETS1-1 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5</p>
1st	<p>Wind Create Windsock Record Data K-ESS2-1 K-ESS3-2 K-2ETS1-1 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5</p>	<p>Identify problems with wind - https://web.wpi.edu/Images/CMS/PIEE/1b1.pdf</p>	<p>Design solutions to a wind problem. Ex. picnic table items</p>	<p>How can wind help us - Make sail boats & race</p>	<p>Construction paper, streamers, crayons, glue, Stapler, stickers, fan Wind sailboats purchased from Pitsco</p>	<p>K-ESS2-1 K-ESS3-2 K-2ETS1-1 Technology 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5 21st Century: CRP2 CRP4 CRP5 CRP6 CRP8</p>
2nd	<p>Wind as an energy source PBS lesson</p>	<p>Challenge: Students design and build, and test a windmill</p>	<p>Challenge: Students design and build, and test a windmill</p>	<p>Challenge: Students design and build, and test a windmill</p>	<p>https://nj.pbslearningmedia.org/resource/phy03.sci.en.gin.design.lp_windmill/windmills-putting-wind-energy-to-work/</p>	<p>K-2ETS1-1 Technology 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5</p>

					<p>Template, cup, straw, paper, rubber bands, string, hole punch</p> <p>Windmill kits for demo</p>	<p>21st Century: CRP2 CRP4 CRP5 CRP6 CRP8</p>
3rd	Disaster relief buildings	Disaster relief buildings	Disaster relief buildings	Disaster relief buildings	<p>Current event resources, Engineering Design Process worksheets, recyclables, craft resources</p>	<p>3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3.</p>
4th	TREPS\$ Create your own invention	TREPS\$ Create your own invention	TREPS\$ Create your own invention	TREPS\$ Create your own invention	<p>Teacher manual & student manual Materials for creation of student products</p>	<p>21st Century Skills - creativity and entrepreneurship</p>
5th	Leaking Greenhouse problem solving Presentation development	Leaking Greenhouse problem solving Presentation development	Leaking Greenhouse problem solving Presentation development	Leaking Greenhouse problem solving presentation	<p>Recyclables, soil samples, hose, craft supplies, glue guns</p>	<p>3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3. Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16</p>
6th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	<p>Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables</p>	<p>Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology :</p>

						8.1.8.A.1 8.2.8.A.2 8.2.8.A.3 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
8th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3

Link

Wind Energy

https://nj.pbslearningmedia.org/resource/phy03.sci.engin.design.lp_windmill/windmills-putting-wind-energy-to-work/?#.W3HiJNJKi00

Month April

Week	1	2	3	4	Materials	Standards
K	Weather - Data Rain Observation Collect and pictograph K-ESS2-1 K-ESS3-2 K-2ETS1-1 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5	Identify problems - roads, shelters, outside activities Engineer solutions	No School	Test solutions Evaluate solutions	Various craft supplies	K-ESS2-1 K-ESS3-2 K-2ETS1-1 8.2.2.C.1 8.2.2.C.2 8.2.2.C.3 8.2.2.C.4 8.2.2.C.5
1st	Assessment	Experimenting with sound, making musical instruments	No School	Experimenting with sound, making musical instruments	Recyclables, string, rubber bands, straws, paper	Science 1PS4-1 1PS4-4
2nd	Assessment	Experimenting with sound, making musical instruments	No School	Experimenting with sound, making musical instruments	Recyclables, string, rubber bands, straws, paper	Science 1PS4-1 1PS4-4
3rd	Assessment	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	No School	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Recyclables, string, rubber bands, straws, paper	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3.

4th	Assessment	Asteroid https://www.teachengineering.org/activities/view/csm_asteroid_lesson1_activity1_tg	No School	Asteroid https://www.teachengineering.org/activities/view/csm_asteroid_lesson1_activity1_tg	Various sized balls, sand or flour, handouts, videos from Teach Engineering website	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3.
5th	Assessment	Asteroid https://www.teachengineering.org/activities/view/csm_asteroid_lesson1_activity1_tg	No School	Asteroid https://www.teachengineering.org/activities/view/csm_asteroid_lesson1_activity1_tg	Various sized balls, sand or flour, handouts, videos from Teach Engineering website	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3. Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Assessment	Solar Cars	No School	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Assessment	Solar Cars	No School	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
8th	Assessment	Solar Cars	No School	Solar Cars	Little Bits, Edublog, <u>Black Star</u> , <u>Bright Dawn</u>	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1

						8.2.8.A.2 8.2.8.A.3
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Month May

Week	1	2	3	4	Materials	Standards
K	<p>Growing things What do plants need to grow? Jack & Beanstalk - Plant Beans K-LS1-1 K-ESS3-1 K-ESS2-2</p>	<p>Design a tool to help in gardening 8.2.2.C.1- 8.2.2.C.3</p>	<p>Record height of bean plants Evaluate data what can we improve? 8.1.2.A.7</p>	<p>With pictures and words create a digital story about their bean plant 8.1.2.A.1 8.1.2.A.2 8.1.2.A.3</p>	<p>Rulers, bean seeds, soil, cups, craft items for designing tool, graph paper, Google Slides</p>	<p>K-LS1-1 K-ESS3-1 K-ESS2-2 8.2.2.C.1- 8.2.2.C. 38.1.2.A.1 8.1.2.A.2 8.1.2.A.3 8.1.2.A.7</p>
1st	<p>Growing things What do plants need to grow? Jack & Beanstalk - Plant Beans K-LS1-1 K-ESS3-1 K-ESS2-2</p>	<p>Design a tool to help in gardening 8.2.2.C.1- 8.2.2.C.3</p>	<p>Record height of bean plants Evaluate data what can we improve? 8.1.2.A.7</p>	<p>With pictures and words create a digital story about their bean plant 8.1.2.A.1 8.1.2.A.2 8.1.2.A.3</p>	<p>Rulers, bean seeds, soil, cups, craft items for designing tool, graph paper, Google Slides</p>	<p>K-LS1-1 K-ESS3-1 K-ESS2-2 8.2.2.C.1- 8.2.2.C. 38.1.2.A.1 8.1.2.A.2 8.1.2.A.3 8.1.2.A.7</p>
2nd	<p>Growing things What do plants need to grow? Jack & Beanstalk - Plant Beans K-LS1-1 K-ESS3-1</p>	<p>Design a tool to help in gardening 8.2.2.C.1- 8.2.2.C.3</p>	<p>Record height of bean plants Evaluate data what can we improve?</p>	<p>With pictures and words create a digital story about their bean plant 8.1.2.A.1 8.1.2.A.2 8.1.2.A.3</p>	<p>Rulers, bean seeds, soil, cups, craft items for designing tool, graph paper, Google Slides</p>	<p>K-LS1-1 K-ESS3-1 K-ESS2-2 8.2.2.C.1- 8.2.2.C. 38.1.2.A.1</p>

	K-ESS2-2		8.1.2.A.7			8.1.2.A.2 8.1.2.A.3 8.1.2.A.7
3rd	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Materials in Boston Museum EiE Engineering Adventures	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3. 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7
4th	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6	Designing a frog trap Boston Museum EiE Engineering Adventures 3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7	Materials in Boston Museum EiE Engineering Adventures	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3 .3-LS2-1 3-LS4-3 8.2.5.C.1 8.2.5.C.2 8.2.5.C.3 8.2.5.C.4 8.2.5.C.5 8.2.5.C.6 8.2.5.C.7

			8.2.5.C.7			
5th	Design a lunchbox https://betterlesson.com/lesson/638440/lunch-box-design-challenge	Design a lunchbox https://betterlesson.com/lesson/638440/lunch-box-design-challenge	Design a lunchbox https://betterlesson.com/lesson/638440/lunch-box-design-challenge	Design a lunchbox https://betterlesson.com/lesson/638440/lunch-box-design-challenge	Styrofoam, cups, frozen water bottle, warm water, metal cups, glass cups, thermometers, mylar insulation, plastic cups, cotton balls, zip lock bags, recyclable, newspapers	3-5-ETS1-1 3-5-ETS1-2. 3-5-ETS1-3. Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3 Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5 Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
8th	Solar Cars	Solar Cars	Solar Cars	Solar Cars	Solar car kits, slides, solar panels, simple tools, multimeters. Electrical tape recyclables	Science: MS-PS3-3 Engineering: MS-ETS1-1 Mathematics: 6.SP.B.5

						Technology : 8.1.8.A.1 8.2.8.A.2 8.2.8.A.3
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Month June

Week	1	2	3	4	Materials	Standards
K	Needs of Humans https://www.state.nj.us/education/modelcurriculum/sci/ku5.pdf Explore Water					
1st	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash robots Wonder Curriculum	8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5 (K-2)
2nd	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash Coding	Dot and Dash robots Wonder Curriculum	8.2.2.E.1 8.2.2.E.2 8.2.2.E.3 8.2.2.E.4 8.2.2.E.5(K-2)
3rd	Stomp Rockets VR	Stomp Rockets	Stomp Rockets	Stomp Rockets	Kit from Boston Museum	
4th	Stomp Rockets VR	Stomp Rockets	Stomp Rockets	Stomp Rockets	Kit From Boston Museum	Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16

5th	Gamestar Mechanic	Gamestar Mechanic	Gamestar Mechanic	Gamestar Mechanic	Gamestar Mechanic	Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
6th	Stock Market VR Field Trip https://www.state.nj.us/education/aps/cccs/tech/assessment/Newark.pdf 8.1.8.A.1 8.8.1.A.4 8.1.8.F	Stock Market VR Field Trip https://www.state.nj.us/education/aps/cccs/tech/assessment/Newark.pdf	Stock Market VR Field Trip https://www.state.nj.us/education/aps/cccs/tech/assessment/Newark.pdf	Stock Market VR Field Trip https://www.state.nj.us/education/aps/cccs/tech/assessment/Newark.pdf	Research materials, websites, google sheets, publishing application	8.1.8.A.1 8.8.1.A.4 8.1.8.F Social Studies 6.1.4.C.12 6.1.4.C.13 6.1.4.C.16
7th	Dream Car Research 8.1.8.A.1 8.8.1.A.4 8.1.8.F.1	Dream Car compare models with graphing	Total cost with insurance, interest, gas, etc.	Brochure	Research materials, websites, google sheets, publishing application	MS-ETS1-1.
8th	Dream Car Research 8.1.8.A.1 8.8.1.A.4 8.1.8.F.1	Dream Car compare models with graphing	Total cost with insurance, interest, gas, etc.	Brochure	Research materials, websites, google sheets, publishing application	MS-ETS1-1.

Appendix A Modifications and Accommodations for IEP & 504 Students, LEP Students and G & T Students

Note** Modifications and accommodations listed in curriculum guides are suggested for all types of learners. Specific student accommodations and modifications listed in an IEP will take priority for each individual student instruction.

Table of Contents

1. Modifications and Accommodations for IEP & 504 Students
2. Modifications and Accommodations for LEP Students
3. Modifications and Accommodations for G & T Students

Modifications and Accommodations for IEP & 504 Students

Textbooks and Curriculum

- Books: Accommodations
- Provide audio books or text to speech alternatives
- Provide summaries of chapters
- Use peer readers
- Use marker to highlight important textbook sections
- Provide the student with a list of discussion questions before reading the material

Books: Modifications

- Provide alternative books with similar concepts but at an independent reading level
- Give page numbers to help the student find answers

Curriculum: Accommodations

- Provide a vocabulary list
- Provide alternatives to reading aloud in front of the class

Curriculum: Modifications

- Shorten assignments to focus on mastery of key concepts
- Shorten spelling tests to focus on mastering the most functional words

Instructions and Assignments

Directions: Accommodations

- Use both oral and printed directions

- Highlight keywords in directions
- directions in small steps using as few words as possible, number and sequence steps in a task
- Provide visual aides
- Show a model of the end product

Time/Transitions: Accommodations

- Alert student several minutes before a transition from one activity to another
- Provide additional time to complete a task
- Increase wait time for responses
- Provide a visual timer

Handwriting: Accommodations

- Use fill-in questions with space for a brief response rather than a short essay
- Provide a "designated note taker" or photocopy of another student's or teacher's notes
- Provide outlines for video
- Provide a print copy of any assignments or directions written on the blackboard or smartboard/Activboard
- Provide photocopy materials rather than requiring students to copy from the board or textbook
- Provide access to a word processor, alpha smart, or similar device
- Allow use of voice-activated software for long written assignments
- Allow students to dictate a writing assignment for a teacher or teacher's aide to scribe

Grading: Accommodations

- Mark the correct answers rather than incorrect ones

Grading: Modifications

- Provide partial grade based on individual progress or effort
- Permit a student to rework assignments for a grade to reflect mastery

Tests: Accommodations

- Go over directions orally
- Permit extended time to complete tests
- Have materials read to the student and allow oral responses (for tests that don't measure reading or writing)
- Divide tests into small sections of similar questions and problems
- Allow the student to complete an independent project as an alternative test
- Provide study guides and study questions that directly relate to tests
- Provide a sample or practice test

Tests: Modifications

- Grade spelling separately from the content
- Allow take-home or open-book tests Provide a vocabulary list with definitions
- Provide possible answers for fill-in-the-blank sections

Math: Accommodations

- Allow the student to use a calculator without penalty
- Provide fewer problems on a worksheet (such as 4 to 6 problems on a page)
- Use enlarged graph paper to help the student keep numbers in columns
- Provide a table of math facts for reference (unless testing math facts)
- Tape a number line to student's desk
- Read and explain story problems or break problems into smaller steps
- Use pictures or graphics

Other Accommodations

- Check progress and provide feedback often in the first few minutes of each assignment
- Provide structured assignments with lists for the student to cross off when finished
- Break long-term assignments into small, sequential steps with daily monitoring and frequent grading
- Allow use of sensory tools for those with sensory needs
- Use color-coded materials for each class

Motivation

- Activity choice
- Hands-on, multimodal activities
- Doable tasks
- Foster independence
- Student involvement in goal setting and assessment activities
- Choice to work with others or alone

Instructional Presentation

- Relate to personal experiences
- Establish purpose or goals of lesson
- Activate prior knowledge
- Advanced organizers
- Build background knowledge of content or strategy
- Preteach vocabulary and review strategy

- Visual demonstrations, illustrations, models

Modifications and Accommodations for LEP Students

- provide many visual cues, such as pictures, videos, field trips, picture books, and demonstration lessons, to aid understanding.
- Learn the backgrounds of LEP students and plan a lesson that is both culturally and linguistically appropriate.
- Group students flexibly, in small groups based on individual or group interests as well as instructional need or ability.
- Give clear, simple directions to LEP students. Ask them to retell, in their own words, what you are asking them to do before they attempt a task.
- Provide background information and examples that support the content for each lesson..
- Paraphrase information and main ideas.
- Reorganize and reinforce information.
- Build background information through brainstorming; semantic webbing; use of maps, photos, and illustrations; and use of the KWL strategy.
- Simplify language for presentation. Teachers can use “sheltered English,” in which they make content-specific language more comprehensible for LEP students by using short, simple syntactic structures; introducing one concept persentence; limiting structures to one tense; using the active
- Develop content area vocabulary. Vocabulary specific to the content area may be developed through various activities, including the following:
 - starting a picture dictionary or word bank;
 - teaching the vocabulary appropriate to a given subject before introducing the content;
 - reviewing and reinforcing the vocabulary during the content activities;
 - labeling objects in the classroom;
 - taping vocabulary words in context so that students learn to recognize the words;
 - using realia (actual objects, such as a variety of foods or textures) as tools for teaching so that vocabulary becomes real and tangible; and
 - encouraging students to use a dictionary to learn or confirm word meanings.
- Close-captioned video or TV
- Computer programs
- Teacher-made adaptations, outlines, and study guides
- High interest/low-reading-level content materials
- Books with audio tapes

Modifications and Accommodations for G & T Students

Adaptive strategies for the exceptionally able student. These include:

- Interdisciplinary and problem-based assignments
- Advanced, accelerated, or compacted content
- Abstract and advanced higher level thinking
- Allowance for individual student interests
- Assignments geared to development in areas of affect, creativity, cognition, and research skills
- Complex, in-depth assignments

- Diverse enrichment that broadens learning
- Variety in types of resources
- Community involvement
- Internship, mentorship, and apprenticeship

3 types of program modifications:

- Accelerated movement through the instructional program
 - Flexible pacing may allow students to participate based on their ability to be challenged as well as their ability to handle the work assignments
 - Content acceleration allows a student to participate at a higher grade level
 - via compacting (also known as telescoping) which allows a student to cover the curriculum in a shorter period of time. Previously mastered content is pre evaluated and eliminated from coursework
 - Multi-age classrooms allow a student to accelerate through self-pacing.
- Enrichment
 - Well articulated assignments that require cognitive processing, in-depth content, well-defined skills, and alternate modes of communication can be effective and stimulating.
 - Can include alternate learning activities. Alternate assignments provide students with opportunities to engage in new learning and avoid the boredom of repetitive practice.
 - Students can be encouraged to pursue independent study, self-directed research projects carefully monitored by the teacher. Research can be conducted using materials from a more advanced level or from college libraries, businesses, laboratories, and community agencies. Every student should be challenged to think intuitively, using higher order thinking skills such as analysis, synthesis, and evaluation.
- Grouping students of like-ability together in homogeneous arrangements (e.g., special classes, clustering in the same classroom) allows for more appropriate, rapid, and advanced instruction without isolating the exceptionally able student.
 - Flexible grouping in the regular classroom enables the exceptionally able student to develop advanced skills and provides the student with time for advanced work and independent study.
 - Students may be grouped in self-contained classes with other exceptionally able students

Advocacy and Service

Physical Education Standard 2.2 Advocacy and Service

Social Studies Standard 6.3 Active citizens in the 21st century

Advocacy and Service projects provide an opportunity for the students of Montague School District to have a positive impact on the lives of self and others. The Social Studies and Physical Education curriculums include standards to address advocacy and service and active citizenship. School service projects are completed throughout the school year through interdisciplinary activities such as food drives, nursing home visits, coat drives, veteran activities, etc....

Homeroom Activities

The following standards from Physical Education and Health Curriculum

By the end of Grade 2 2.2.2.D.1: Determine the benefit for oneself and others of participating in a class or school service activity

By the end of Grade 4 2.2.4.D.1: Explain the impact of participation in different kinds of service projects on community wellness.

By the end of Grade 6 2.2.6.D Advocacy and Service: Participation in social and health or service organization initiatives have a positive social impact.

By the end of Grade 6 2.2.6.D.1: Appraise the goals of various community or service organization initiatives to determine opportunities for volunteer service

By the end of Grade 6 2.2.6.D.2: Develop a position about a health issue in order to inform their peers

2.2.D.8 Advocacy and Service: Effective Advocacy for a health or social issue is based on communicating accurate and reliable research about the issue and developing and implementing strategies to motivate others to address the issue.

2.2.8.D.1: Plan and implement volunteer activities to benefit a local, state, national, or world health initiative.

2.2.8.D.2: Defend a position on a health or service issue to activate community awareness and responsiveness.

Interdisciplinary Content Standards for Advocacy

The following standards from the Social Studies Curriculum are addressed through various activities.

Social Studies

6.3.4.B.1 Active citizens in the 21st century:

- Recognize that people have different perspectives based on their beliefs, values, traditions, culture, and experiences.
- Identify stereotyping, bias, prejudice, and discrimination in their lives and communities.
- Are aware of their relationships to people, places, and resources in the local community and beyond.

6.3.4.B.1 Plan and participate in an advocacy project to inform others about environmental issues at the local or state level and propose possible solutions.

Holocaust Education

The Montague Township School District addresses the act regarding genocide education in the public schools, supplementing chapter 35 of Title 18A of the New Jersey Statutes. Utilizing resources provided by the New Jersey Commission on Holocaust Education, Character Education Curriculum, Anti-Bullying Programs, Health and Physical Education Curriculum, School Guidance programs, English Language Arts, Social Studies Curriculum, as well as through the daily modeling and discussion of good character, ethics, and moral behavior.

2a. Every Board of Education shall include instruction of all elementary and secondary school pupils on the Holocaust and genocides in an appropriate place in the curriculum.

2b. The instruction shall enable pupils to identify and analyze applicable theories concerning human nature and behavior; to understand that genocide is a consequence of prejudice and discrimination; and, to understand that issues of moral dilemma and conscience have a profound impact on life. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Resources are provided to all educators through open source resources, purchased programs and materials, assemblies for students, and professional development for educators. The New Jersey Commission on Holocaust Education, to promote Holocaust education in the State of New Jersey, can be accessed through the following links: <http://www.state.nj.us/education/holocaust/>

- **K-4 Curriculum Guide:**
 - [Caring Makes a Difference](#)

- **5-8 Curriculum Guide:**
 - [To Honor All Children, part one](#)
(1.81 MB, PDF)
 - [To Honor All Children, part two](#)
(5.82 MB, PDF)
 - [To Honor All Children, part three](#)
(2.34 MB, PDF)
 - [To Honor All Children, part four](#)
(6.15 MB, PDF)

Amistad Commission Mandate

Goals of the Commission are supported by Montague Township School District through the infusion of the history of Africans and African-Americans into the social studies curriculum to provide an accurate, complete and inclusive history.

“In presenting the sweeping narrative of American history, African Americans have for too long, been cast in minor roles far from events, personalities and themes that become engrained in every student’s memory.

In New Jersey, that is all changing ... ” (Stephanie James Wilson, 2008).

Background:

Under legislation sponsored by Assemblymen William D. Payne and Craig A. Stanley, Schools in the Garden State are moving to recognize the integral part African-Americans have played at every turn in this nation’s history. The Amistad Bill (A1301), which became law in 2002, calls on New Jersey schools to incorporate African-American history into their social studies curriculum. This legislation also created the Amistad Commission, a 23-member body charged with ensuring that African-American history, contributions and experiences are adequately taught in the state’s classrooms.

Purpose:

The Amistad Commission ensures that the Department of Education and public schools of New Jersey implement materials and texts which integrate the history and contributions of African-Americans and the descendants of the African Diaspora.

To ensure that Frankford Township School District teachers are equipped to effectively teach the revised social studies core curriculum content standards. The following resources, but not limited to are available through the Amistad Commission:

<https://www.nj.gov/education/amistad/resources/literacy.pdf>

<http://www.njamistadcurriculum.net/>