



Stafford Township School District

STEAM Curriculum Grade 3

Adopted: 08/06/2017
Updated: 10/17/2018

Philosophy

The Stafford Township Public Schools has integrated STEAM (Science, Technology, Engineering, Arts, and Math) into its elementary and intermediate school core curriculum. All Stafford students are exposed to STEAM concepts starting as early as Kindergarten and continuing throughout intermediate.

STEAM refers to the areas of Science, Technology, Engineering, Arts and Mathematics. However, STEAM initiatives are not these disciplines in isolation. Rather, STEAM is the integration of courses, programs or linked learning opportunities using an interdisciplinary approach through exploration, discovery and problem solving.

Learning by doing is inviting and exciting so students learn and remember more. Successful, hands-on experiences exploring engineering can have a major influence on motivation and confidence in learning. Ultimately, we hope to inspire students to challenge themselves and consider careers in STEAM fields. Students need STEAM project-based learning to build 21st century skills. Science and engineering jobs are growing 70 percent faster than other occupations. This means our students will be at an advantage when competing for the high-tech, high-wage jobs of the future.

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| Unit 1: Introduction to the STEAM Lab | | Duration: 4 days (September) |
| Standards | | |
| 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. | |
| Interdisciplinary Connections | | |
| ELA Standards | | |
| W.3.10 | Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. | |
| SL.3.1.B | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). | |
| SL.3.1.C | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. | |
| SL.3.1.D | Explain their own ideas and understanding in light of the discussion. | |
| Technology Standards | | |
| 8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. | |
| 21st Century Life and Careers | | |
| <p>Century Life and Career Skills: 21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace. http://www.state.nj.us/education/aps/cccs/career/</p> <p>9.1 Personal Financial Literacy This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.</p> <p>9.2 Career Awareness, Exploration, and Preparation This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p> | | |

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| <p>9.3 Career and Technical Education This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.</p> <p style="text-align: center;">Career Ready Practices</p> <p>CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.</p> | |
| Essential Understandings | Essential Questions |
| <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Following established STEAM Lab rules and procedures ensures that students and faculty remain safe and increases the likelihood that challenges are met successfully. ● Engineers take on specific responsibilities in order to contribute to the success of the overall challenge. ● The Engineering Design Process involves asking questions, imagining possible solutions, planning a course of action, creating and testing a process or prototype, and analyzing results in order to make design improvements. | <ul style="list-style-type: none"> ● How do we use the STEAM Lab flexible seating and equipment safely? ● How do we work together to meet our goals? ● What are the steps of the engineering process? |
| Evidence of Student Learning | |
| Formative Assessments | Summative Assessments |
| <ul style="list-style-type: none"> ● Teacher Observation ● Conferencing ● Lab Journals | <ul style="list-style-type: none"> ● Engineering projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Scientific Notebook Check with Scoring Rubric |

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| <ul style="list-style-type: none"> • Questioning • Turn and Talk | <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Student Notebook Check with Teacher Scoring Rubric • Stop and Jot Activities with possible Sentence Starters • Teacher Observation Checklist based on Student Performance and Project Creation • Student Participation Rubric • Mystery Science Activities • Student Created Project with Teacher Scoring Rubric |
| Vocabulary | |
| Engineering Design Process, Ask, Imagine, Plan, Create, Improve, Communicate | |
| Knowledge and Skills | |
| Content | Skills |
| <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • How to safely use all equipment, materials, and furniture in the STEAM Lab. • Expectations of the STEAM Lab. • Steps of the engineering process. • Strategies for working together as a team. | <p><i>Students will be able to....</i></p> <ul style="list-style-type: none"> • safely use the equipment, materials, and furniture in the STEAM Lab. • work with a small group to solve a problem. • apply the engineering process to solve problems and complete engineering challenges. • identify the constraints of a challenge. |
| Instructional Plan | |
| Suggested Activities | Resources |
| <p>Discussion of Safety Rules and Lab Procedures: Using materials appropriately and following established routines ensures student safety in the lab.</p> | <ul style="list-style-type: none"> • Flexible seating expectation chart • GROUPS poster |
| <p>Help Harry Engineering Challenge Teamwork and the engineering design process is used to build a safe and sturdy perch for a pom pom ball.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet • http://www.theteacherstudio.com/2015/09/engineering-inquiry-and-cooperative.html |
| <p>Build a Bridge Engineering Challenge Teamwork and the engineering design process is used to build a bridge using a single index card that will hold weight.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet • A Bridge for the Gingerbread Man- More Than a Worksheet |

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| <p>Pencil Holder Design Challenge The engineering design process is used to design a pencil holder to attach to a STEAM notebook.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student activity sheet |
| Literature | |
| <ul style="list-style-type: none"> ● <i>Rosie Revere, Engineer</i> by Andrea Beaty ● <i>Ada Twist, Scientist</i> by Andrea Beaty ● <i>Iggly Peck, Architect</i> by Andrea Beaty ● <i>How Engineers Find Solutions</i> by Reagan Miller | |
| Websites | |
| PBS Kids Design Squad | http://pbskids.org/designsquad/games/ |
| Accommodations & Modifications | |
| <p>English Language Learners</p> <ul style="list-style-type: none"> ● Shorten or simplify directions ● Alternative assessment ● Flexible/cooperative grouping ● Graphic organizers ● Native Language Support and Resources ● Modified classwork and homework assignments | |
| <p>Special Education/504 Plans</p> <ul style="list-style-type: none"> ● Provide differentiated instruction as needed ● Follow all IEP modifications/504 plan ● Provide manipulatives or the opportunity to draw solution strategies ● Modify for varying proficiency levels, multiple intelligences, and grade levels ● Use visuals and gestures ● Use sentence starters ● Build background knowledge ● Highlight key words ● Graphic organizers ● Basic Skills- Pre-teach vocabulary, Preview lesson, Accountable Talk stems, Chunk text, Provide extra time | |
| <p>Basic Skills</p> <ul style="list-style-type: none"> ● Modified Assignment | |

- Teacher Modeling
- Partner Work
- Teacher Prompts

Economically Disadvantaged

- Extra set of materials for home
- Study guides
- Modified Assignment

Gifted and Talented

- Higher Level Text
- Provide Multisyllabic Words
- Choice Board to extend learning
- Integrate a variety of activities to meet all types of multiple intelligences

Students at Risk of School Failure

- Alternative assessment
- Flexible/cooperative grouping
- Graphic organizers
- Parent-teacher communication
- Integrate a variety of activities to meet all types of multiple intelligences
- Modified classwork and homework assignments

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| Unit 2: Weather and Climate | | Duration: 5 days (October) |
| Standards | | |
| 3-ESS2-2 | Represent data in tables and graphical displays to describe typical weather patterns expected during a particular season. | |
| 3-5-ETS1-1 | Make a claim about the merit of a design solution that reduces the impacts of a weather related hazard. | |
| Interdisciplinary Connections | | |
| Technology Standards | | |
| 8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. | |
| 8.1.5.F.1 | Applying digital tools to collect, organize, and analyze data that support a scientific finding. | |
| ELA Standards | | |
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| SL.3.1.B | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). | |
| SL.3.1.C | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. | |
| SL.3.1.D | Explain their own ideas and understanding in light of the discussion. | |
| 21st Century Life and Careers | | |
| <p>Century Life and Career Skills: 21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace. http://www.state.nj.us/education/aps/cccs/career/</p> <p>9.1 Personal Financial Literacy This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.</p> <p>9.2 Career Awareness, Exploration, and Preparation This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p> <p>9.3 Career and Technical Education This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.</p> | | |

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| Career Ready Practices | |
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| Essential Understandings | Essential Questions |
| <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Meteorologists measure the weather using a variety of scientific tools, collecting data, and analyzing patterns. • Severe weather is weather that is more intense than average and has the ability to cause damage. Examples include hurricanes, tornados, flooding, drought, blizzards, and lightening. • Engineers and scientists work together to develop structures to withstand the effects of severe weather events. | <ul style="list-style-type: none"> • How do meteorologists measure and predict the weather? • What is severe weather? • How can we lessen the impact of severe weather? |
| Evidence of Student Learning | |
| Formative Assessments | Summative Assessments |
| <ul style="list-style-type: none"> • Teacher Observation • Conferencing • Lab Journals • Questioning • Turn and Talk | <ul style="list-style-type: none"> • Engineering projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • Scientific Notebook Check with Scoring Rubric <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Student Notebook Check with Teacher Scoring Rubric • Stop and Jot Activities with possible Sentence Starters • Teacher Observation Checklist based on Student |

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| | <ul style="list-style-type: none"> Performance and Project Creation • Student Participation Rubric • Mystery Science Activities • Student Created Project with Teacher ScoringRubric |
| Vocabulary | |
| meteorologist, severe weather, barometer, anemometer, air pressure, free-standing | |
| Knowledge and Skills | |
| Content | Skills |
| <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Ways severe weather affects people. • How severe weather differs from normal weather. • Examples of tools that are used to predict the weather. • Strategies engineers use to help buildings withstand severe weather conditions. | <p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Work with a small group to solve a problem. • Apply the engineering process to solve problems and meet engineering challenges. • Identify the constraints of a challenge. • Define weather and severe weather. • Describe methods and tools used to measure the weather. • Students will graph weather data over time. • Explain strategies people use to weatherproof their homes. |
| Instructional Plan | |
| Suggested Activities | Resources |
| <p>Measuring Weather Students will construct a weather instrument to accurately collect weather related data.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet • https://www.youtube.com/watch?v=QZVtgOK8uTw |
| <p>What is Severe Weather? Students will explore different types of severe weather with a focus on hurricanes. Teams will work together to plan a tower that will hold a tennis ball and withstand hurricane winds with a budget of \$20 for supplies.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet • Building for Hurricanes- gpm.nasa.gov • Tennis Ball Towers- Teachers are Terrific |
| <p>Hurricane Tower Challenge Teams use the engineering design process to build a free-standing tower that is able to hold the weight of a tennis ball,</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint presentation. • Criterion referenced student activity sheet • Building for Hurricanes- gpm.nasa.gov • Tennis Ball Towers- Teachers are Terrific |

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| withstand the force of a fan, and stay within the constraints of a \$20 budget. | |
| Preventing Flooding Challenge The engineering design process is used to design a barrier that would prevent damage to a home during a flood. | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet |
| Literature | |
| <ul style="list-style-type: none"> • <i>Forces of Nature</i> by Jack Gablonscy • <i>What is Precipitation?</i> By Robin Johnson • <i>Tell Me Why We Have Hurricanes</i> by Tamra B. Orr • <i>Weather</i> by Anita Ganeri • <i>Weather Infographics</i> by Chris Oxlade | |
| Websites | |
| Weatherproof Your Home | http://weather.thinkport.org/weatherproof-your-home.html#a_hint1 |
| Disaster Master Game | https://www.ready.gov/kids/games/data/dm-english/index.html |
| BrainPop | http://www.brainpop.com |
| Accommodations & Modifications | |
| English Language Learners | |
| <ul style="list-style-type: none"> • Shorten or simplify directions • Alternative assessment • Flexible/cooperative grouping • Graphic organizers • Native Language Support and Resources • Modified classwork and homework assignments | |
| Special Education/504 Plans | |
| <ul style="list-style-type: none"> • Provide differentiated instruction as needed • Follow all IEP modifications/504 plan • Provide manipulatives or the opportunity to draw solution strategies • Modify for varying proficiency levels, multiple intelligences, and grade levels • Use visuals and gestures • Use sentence starters • Build background knowledge • Highlight key words | |

- Graphic organizers
- Basic Skills- Pre-teach vocabulary, Preview lesson, Accountable Talk stems, Chunk text, Provide extra time

Basic Skills

- Modified Assignment
- Teacher Modeling
- Partner Work
- Teacher Prompts

Economically Disadvantaged

- Extra set of materials for home
- Study guides
- Modified Assignment

Gifted and Talented

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- Provide Multisyllabic Words
- Choice Board to extend learning
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| Unit 3: Forces and Interactions | | Duration: 16 days (November – February) |
| Standards | | |
| 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. | |
| 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. | |
| 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. | |
| Interdisciplinary Connections | | |
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| W.3.10 | Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. | |
| SL.3.1.B | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). | |
| SL.3.1.C | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. | |
| SL.3.1.D | Explain their own ideas and understanding in light of the discussion. | |
| Math Standards | | |
| 3.MD.B.4 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. | |
| Technology Standards | | |
| 8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. | |

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| 21st Century Life and Careers | |
| <p>Century Life and Career Skills: 21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace. http://www.state.nj.us/education/aps/cccs/career/</p> <p>9.1 Personal Financial Literacy This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.</p> <p>9.2 Career Awareness, Exploration, and Preparation This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p> <p>9.3 Career and Technical Education This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.</p> <p style="text-align: center;">Career Ready Practices</p> <p>CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.</p> | |
| Essential Understandings | Essential Questions |
| <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● A force is a push or a pull on an object. ● A simple machines help make work easier by reducing the amount of force needed to push or pull an object. ● A lever balances on a fulcrum and reduces the amount of force needed to lift an object. | <ul style="list-style-type: none"> ● What is a force? ● What is a simple machine? ● How does a lever make work easier? ● How does the height of an inclined plane affect its function? ● What is drag? |

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| <ul style="list-style-type: none"> • When the height of an inclined plane is increased, the speed of an object will increase. • Drag is a force that slows you down by an opposing force pushing against an object. • Wheels and axles rotate together to reduce the amount of force needed to move an object. • Magnets with opposite poles will attract, while magnets with similar poles will repel. | <ul style="list-style-type: none"> • How do wheels and axles work together? • Why do some magnets stick together and some push apart? • How can magnets be used to solve a real world problem? |
| Evidence of Student Learning | |
| Formative Assessments | Summative Assessments |
| <ul style="list-style-type: none"> • Teacher Observation • Conferencing • Lab Journals • Questioning • Turn and Talk | <ul style="list-style-type: none"> • Engineering project <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • Scientific Notebook Check with Scoring Rubric <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Student Notebook Check with Teacher Scoring Rubric • Stop and Jot Activities with possible Sentence Starters • Teacher Observation Checklist based on Student Performance and Project Creation • Student Participation Rubric • Mystery Science Activities • Student Created Project with Teacher Scoring Rubric |
| Vocabulary | |
| force, push, pull, drag, simple machine, attract, repel | |
| Knowledge and Skills | |
| Content | Skills |
| <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • What a force is. • How to change the amount of force applied to an object. • Why simple machines are important. • How levers make work easier. | <p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Work with a small group to solve a problem. • Apply the engineering process to solve problems and meet engineering challenges. • Change the amount of force applied to an object. • Build a functioning lever. |

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| <ul style="list-style-type: none"> ● Changing the height of an inclined plane or the weight of an object will affect the distance an object travels. ● Drag helps to slow down moving objects. ● A car needs a wheel and an axle to function. ● A magnet is attracted to objects made of iron or steel. ● A magnet has a North and South pole and these poles react to each other in different ways. | <ul style="list-style-type: none"> ● Apply what they observed about inclined planes to complete challenges. ● Build a parachute, applying what they know about gravity and drag. ● Experiment with many wheels and axles to see how they change the function of a car. ● Design and build a wind powered car. ● Explain why a set of magnets is attracted to or repelling each other. ● Use a magnet to help solve a design challenge. |
| Instructional Plan | |
| Suggested Activities | Resources |
| <p>Balanced and Unbalanced Forces Students observe the difference between balanced and unbalanced forces through a game of tug-of-war. Partners improve a hopper popper which uses opposing forces to jump in the air.</p> | <ul style="list-style-type: none"> ● Criterion referenced Active Inspire Presentation ● Mystery Science- How Could You Win Tug of War Against a Bunch of Adults? ● Criterion referenced student activity sheet |
| <p>How Do Levers Function? Partners work together to improve a catapult design. They will explain how changing the fulcrum changes the result of the launch.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Simple Machines BrainPop ● Criterion referenced student activity sheet |
| <p>Inclined Plane Investigation Groups will work together to determine how the height of an inclined plane affects the distance a hot wheel car will travel.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student activity sheet |
| <p>Inclined Planes and Sleds Teams construct a sledding hill and a sled to help their Lego person travel the farthest distance. They will think about how friction will affect the result of their test.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student activity sheet |
| <p>Design a Roller Coaster Teams use their knowledge of inclined plane to design a roller coaster with at least one hill and one loop.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation |
| <p>The Parachute Problem Partners design and construct a parachute that creates drag so their Lego person will reach the ground safely.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● https://www.youtube.com/watch?v=Ab_g5sLoXoY |

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| <p>Screws and Paper Helicopters Students improve a simple helicopter model to make it perform in different ways.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student activity sheet ● https://www.youtube.com/watch?v=idOvWcL2dyk |
| <p>How Wheels Work (2 weeks) Students will tinker with Legos, K'Nex, and recycled materials to gain a better understanding of how wheels and axles work together. Partners design a plan for a wind powered car that uses drag to move.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student activity sheet ● Planning Wind Powered Cars Poster |
| <p>Wind Powered Cars (2 weeks) Partners use the engineering design process to build and test a car with functioning wheels and axles and a sail to create drag. Students will aim to make their car travel the farthest distance.</p> | <ul style="list-style-type: none"> ● Criterion referenced student activity sheet ● Planning Wind Powered Cars Poster |
| <p>Exploring Magnets Students will explore the properties of magnets by having the opportunity to tinker with a variety of different shapes, sizes, and strengths of magnets.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation ● Criterion referenced student KWL chart |
| <p>Latch Magnet Challenge Students will use their knowledge of magnets to create a device that someone in a wheelchair would be able to use to unlatch and release a gate latch that is out of reach.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation |
| <p>Magnetic Parade Students will use their knowledge of magnets to design and build a themed parade force that will move only with the invisible force of magnetism.</p> | <ul style="list-style-type: none"> ● Criterion referenced PowerPoint Presentation |
| <p>Literature</p> | |
| <ul style="list-style-type: none"> ● <i>Why Do Moving Objects Slow Down?: A Look at Friction</i> by Jennifer Boothroyd ● <i>Pull It, Push It</i> by Buffy Silverman ● <i>Balance and Motion: Toying with Gravity</i> by Emily Sohn and Joseph Brennan ● <i>Balanced and Unbalanced Forces</i> by Jenna Winterberg ● <i>Simple Machines in the Great Outdoors</i> by Gillian Gosman | |
| <p>Websites</p> | |
| <p>Museum of Science and Industry: Simple Machines Game</p> | <p>https://www.msichicago.org/play/simplemachines/</p> |

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| Simple Machines: Label It | http://www.learninggamesforkids.com/simple-machines-games/label-it.html |
| Facts About Simple Machines for Kids | http://easyscienceforkids.com/all-about-simple-machines/ |
| Accommodations & Modifications | |
| English Language Learners | |
| <ul style="list-style-type: none"> • Shorten or simplify directions • Alternative assessment • Flexible/cooperative grouping • Graphic organizers • Native Language Support and Resources • Modified classwork and homework assignments | |
| Special Education/504 Plans | |
| <ul style="list-style-type: none"> • Provide differentiated instruction as needed • Follow all IEP modifications/504 plan • Provide manipulatives or the opportunity to draw solution strategies • Modify for varying proficiency levels, multiple intelligences, and grade levels • Use visuals and gestures • Use sentence starters • Build background knowledge • Highlight key words • Graphic organizers • Basic Skills- Pre-teach vocabulary, Preview lesson, Accountable Talk stems, Chunk text, Provide extra time | |
| Basic Skills | |
| <ul style="list-style-type: none"> • Modified Assignment • Teacher Modeling • Partner Work • Teacher Prompts | |
| Economically Disadvantaged | |
| <ul style="list-style-type: none"> • Extra set of materials for home • Study guides • Modified Assignment | |
| Gifted and Talented | |
| <ul style="list-style-type: none"> • Higher Level Text • Provide Multisyllabic Words | |

- Choice Board to extend learning
- Integrate a variety of activities to meet all types of multiple intelligences

Students at Risk of School Failure

- Alternative assessment
- Flexible/cooperative grouping
- Graphic organizers
- Parent-teacher communication
- Integrate a variety of activities to meet all types of multiple intelligences
- Modified classwork and homework assignments

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| Unit 4: Fossils | | Duration: 7 days (March – April) |
| Standards | | |
| 3-LS4-1 | Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. | |
| Interdisciplinary Connections | | |
| Technology Standards | | |
| 8.1.5. A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. | |
| ELA Standards | | |
| W.3.10 | Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. | |
| SL.3.1.B | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). | |
| SL.3.1.C | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. | |
| SL.3.1.D | Explain their own ideas and understanding in light of the discussion. | |
| 21st Century Life and Careers | | |
| <p>Century Life and Career Skills: 21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace. http://www.state.nj.us/education/aps/cccs/career/</p> | | |
| 9.1 Personal Financial Literacy | | |
| This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers. | | |
| 9.2 Career Awareness, Exploration, and Preparation | | |
| This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements. | | |
| 9.3 Career and Technical Education | | |
| This standard outlines what students should know and be able to do upon completion of a CTE Program of Study. | | |
| Career Ready Practices | | |
| CRP1. Act as a responsible and contributing citizen and employee. | | |

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| | <p>CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.</p> |
| <p>Essential Understandings</p> | <p>Essential Questions</p> |
| <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Fossils can give paleontologists clues about what habitats existed in certain areas long ago. ● Fossils are formed when a dead plant or animal is covered by mud and silt. Soft tissues quickly decompose leaving hard bones or shells behind. Over time, sediment builds over the top and hardens into rock. ● There are four main types of fossils: cast, mold, trace, and true form fossils. ● Paleontologists study fossil remains and make predictions about the structure of the organism as well as the habitat it lived in. | <ul style="list-style-type: none"> ● How do fossils provide evidence of the organisms and the environments in which they lived long ago? ● How are fossils formed? ● Are there different types of fossils? ● What do paleontologists do? |
| <p style="text-align: center;">Evidence of Student Learning</p> | |
| <p>Formative Assessments</p> | <p>Summative Assessments</p> |
| <ul style="list-style-type: none"> ● Teacher Observation ● Conferencing ● Lab Journals ● Questioning | <ul style="list-style-type: none"> ● Engineering project <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Scientific Notebook Check with Scoring Rubric <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Student Notebook Check with Teacher Scoring Rubric ● Stop and Jot Activities with possible Sentence |

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| | <p>Starters</p> <ul style="list-style-type: none"> • Teacher Observation Checklist based on Student Performance and Project Creation • Student Participation Rubric • Mystery Science Activities • Student Created Project with Teacher Scoring Rubric |
| Vocabulary | |
| fossils, sediments, decompose, cast, mold, trace, paleontologist | |
| Knowledge and Skills | |
| Content | Skills |
| <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Some kinds of plants and animals that once lived on Earth are no longer found anywhere • Fossils are evidence from the past that organisms existed in certain places and at a certain time. | <p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Examine a fossil and describe where this fossil might have been found. • Use critical thinking skills to take on the role of a paleontologist and attempt to identify a partial animal skeleton. |
| Instructional Plan | |
| Suggested Activities | Resources |
| <p>Understanding Fossils Students will understand how fossils are created. They will make predictions about a fossil's prior habitat, create cast and mold fossils, examine real fossils, and engineer a dinosaur that can survive in its environment.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • BrainPop Jr. fossils video • https://www.brainpop.com/games/constructasaurus/ • Mystery Science-Where Can You Find Whales in the Desert? |
| <p>The Great Fossil Find Students will play the role of paleontologist and attempt to identify an animal based on its fossil remains.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • http://www.indiana.edu/~ensiweb/lessons/gff.pdf.html |
| Literature | |
| <ul style="list-style-type: none"> • <i>Fossils</i> by John Lockyer • <i>Fossils</i> by Ann O. Squire • <i>Structures of Life: What is This Fossil?</i> By Emily Sohn and Joseph Brennan • <i>Fossils and Rocks</i> by Kimberly Hutmacher | |

| Websites | |
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| Construct-a-Saurus | https://jr.brainpop.com/games/constructasaurus/ |
| American Museum of Natural History: Paleontology | http://www.amnh.org/explore/ology/paleontology#all |
| Accommodations & Modifications | |
| English Language Learners | |
| <ul style="list-style-type: none"> • Shorten or simplify directions • Alternative assessment • Flexible/cooperative grouping • Graphic organizers • Native Language Support and Resources • Modified classwork and homework assignments | |
| Special Education/504 Plans | |
| <ul style="list-style-type: none"> • Provide differentiated instruction as needed • Follow all IEP modifications/504 plan • Provide manipulatives or the opportunity to draw solution strategies • Modify for varying proficiency levels, multiple intelligences, and grade levels • Use visuals and gestures • Use sentence starters • Build background knowledge • Highlight key words • Graphic organizers • Basic Skills- Pre-teach vocabulary, Preview lesson, Accountable Talk stems, Chunk text, Provide extra time | |
| Basic Skills | |
| <ul style="list-style-type: none"> • Modified Assignment • Teacher Modeling • Partner Work • Teacher Prompts | |
| Economically Disadvantaged | |
| <ul style="list-style-type: none"> • Extra set of materials for home • Study guides • Modified Assignment | |
| Gifted and Talented | |
| <ul style="list-style-type: none"> • Higher Level Text | |

- Provide Multisyllabic Words
- Choice Board to extend learning
- Integrate a variety of activities to meet all types of multiple intelligences

Students at Risk of School Failure

- Alternative assessment
- Flexible/cooperative grouping
- Graphic organizers
- Parent-teacher communication
- Integrate a variety of activities to meet all types of multiple intelligences
- Modified classwork and homework assignments

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| Unit 5: Adaptations | Duration: 8 days (May – June) |
| Standards | |
| 3-LS4-2 | Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. |
| 3-LS4-3 | Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all |
| Interdisciplinary Connections | |
| ELA Standards | |
| W.3.10 | Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| SL.3.1.B | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). |
| SL.3.1.C | Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. |
| SL.3.1.D | Explain their own ideas and understanding in light of the discussion. |
| Technology Standards | |
| 8.1.5.A.1 | Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. |
| 21st Century Life and Careers | |
| <p>Century Life and Career Skills: 21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace. http://www.state.nj.us/education/aps/cccs/career/</p> <p>9.1 Personal Financial Literacy This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.</p> <p>9.2 Career Awareness, Exploration, and Preparation This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.</p> <p>9.3 Career and Technical Education This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.</p> | |

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| Career Ready Practices | |
| <p>CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.</p> | |
| Essential Understandings | Essential Questions |
| <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Camouflage is an adaptation that allows a plant or animal to blend in with their environment to hide from predators or prey. ● If a living thing's environment suddenly changes it will need to move to a new environment, adapt to their environment in a different way, or die. ● Animals living in an arctic environment will utilize thick fur or feathers, blubber, and white camouflage to help them survive. Animals in a desert would not be able to survive with these adaptations. | <ul style="list-style-type: none"> ● What are examples of adaptations that help an animal to survive? ● What is camouflage? ● What will happen to an animal if it's environment changes suddenly? ● How are adaptations different for animals depending on where they live? |
| Evidence of Student Learning | |
| Formative Assessments | Summative Assessments |
| <ul style="list-style-type: none"> ● Teacher Observation ● Conferencing ● Lab Journals ● Questioning ● Turn and Talk | <ul style="list-style-type: none"> ● Engineering project <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Scientific Notebook Check with Scoring Rubric <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Student Notebook Check with Teacher Scoring Rubric ● Stop and Jot Activities with possible Sentence Starters |

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| | <ul style="list-style-type: none"> • Teacher Observation Checklist based on Student Performance and Project Creation • Student Participation Rubric • Mystery Science Activities • Student Created Project with Teacher Scoring Rubric |
| Vocabulary | |
| Adaptation, Camouflage, Habitat | |
| Knowledge and Skills | |
| Content | Skills |
| <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • When the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. • Particular organisms can only survive in particular environments. • Populations of organisms live in a variety of habitats. Change in those habitats affects the organisms living there. • Camouflage is an important adaptation that many animals use in order to survive. | <p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Examine a variety of ecosystems and settings and compare how the organisms must adapt to live in these places. • Identify the factors that are necessary for an animal to survive in a particular environment. • Show how the changes in the environment will affect the lifestyle of an organism. |
| Instructional Plan | |
| Suggested Activities | Resources |
| <p>Camouflage Students will complete two camouflage simulations to understand that camouflage helps an organism to remain hidden. Students will camouflage a fish to help it survive and hide in the classroom.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • https://www.youtube.com/watch?v=GFUiCsUSzyw&t • https://www.youtube.com/watch?v=JJ4S9khZKjk • Hidden Fish Poster |
| <p>Bird Beak Buffet Students understand birds have adapted different beaks to allow them to eat different types of food. They will use models</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet |

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| of different beaks to determine which type of food is easiest to eat and which is most difficult. | |
| <p>Engineering Animals: Planning</p> <p>Students will plan an animal that is able to adapt to a specific habitat.</p> <p>Students will have the opportunity to observe animal jaws, footprints, and blubber to gain ideas for their animal.</p> | <ul style="list-style-type: none"> • Criterion referenced student activity sheet • Adaptation posters |
| <p>Engineering Animals: Creating</p> <p>Partners work together to build an animal that has adaptations to survive in a specific habitat.</p> | <ul style="list-style-type: none"> • Criterion referenced student activity sheet |
| <p>Plankton Races</p> <p>Students create a plankton model that will not float to the surface or sink to the bottom of a container.</p> | <ul style="list-style-type: none"> • Criterion referenced PowerPoint Presentation • Criterion referenced student activity sheet |
| Literature | |
| <ul style="list-style-type: none"> • <i>How and Why Do Animals Adapt?</i> By Bobbie Kalman • <i>Claws, Coats, and Camouflage</i> by Susan E. Goodman • <i>What If You Had Animal Teeth?</i> By Sandra Markle | |
| Websites | |
| Build Your Wild Self- Adaptations | http://www.buildyourwildself.com/ |
| Mission Adaptations | http://www.planet-science.com/flash/1831/deploy/missionAdaptationNew.swf |
| Accommodations & Modifications | |

Stafford Township School District
STEAM
Pacing Guide
Grade 3

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| Unit 1 Introduction to the STEAM Lab | 4 Days September |
| Unit 2 Weather and Climate | 5 Days October |
| Unit 3 Forces and Interactions | 16 Days November –February |
| Unit 4 Fossils | 7 Days March-April |
| Unit 5 Adaptations | 8 Days May-June |