Green Ninja is a NGSS-aligned middle school science curriculum that demonstrates the real-world relevance of scientific concepts, utilising a project-based approach that enhances students’ scientific knowledge and environmental literacy.

What to expect from our curriculum:

- Six project-based units per grade
- Hands-on activities in all lessons
- Engaging, real-world investigative phenomena
- Three-dimensional lesson & unit assessments

Questions? Reach us at contact@greenninja.org
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<tr>
<th><strong>Unit 1</strong></th>
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<tr>
<td><strong>Energy and Climate</strong></td>
<td><strong>Home Energy</strong></td>
<td><strong>Weather and Climate</strong></td>
</tr>
<tr>
<td><strong>Green Ninja Storyline</strong></td>
<td>Use energy concepts to understand heat transfer in homes and on Earth.</td>
<td>Use engineering design concepts to design, create, and test a home energy conservation plan.</td>
</tr>
</tbody>
</table>
| **Science Topics** | • Thermal Energy Transfer  
• Greenhouse Effect  
• Earth Systems | • Engineering Design Cycle  
• Energy Conservation  
• Thermal Mass | • Cyclones  
• Cloud Formation  
• Ocean Currents and Temperatures |
| **Culminating Project** | Students design, create, and test a climate-friendly home. | Students present ideas for a more energy efficient home. | Students complete and present their Cli-Fi stories. |
| **Performance Expectation(s)** | MS-ESS3-5: Earth and Human Activity  
MS-PS3-3: Energy  
MS-ETS1-1: Engineering Design  
MS-ETS1-2: Engineering Design  
MS-ETS1-3: Engineering Design  
MS-ETS1-4: Engineering Design | MS-ESS3-3: Earth and Human Activity  
MS-PS3-4: Energy  
MS-PS3-5: Energy  
MS-ETS1-1: Engineering Design  
MS-ETS1-2: Engineering Design  
MS-ETS1-3: Engineering Design  
MS-ETS1-4: Engineering Design | MS-ESS2-5: Earth’s Systems  
MS-ESS2-6: Earth’s Systems |
| **Science and Engineering Practice(s)** | SEP-1: Asking Questions and Defining Problems  
SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence | SEP-1: Asking Questions and Defining Problems  
SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence | SEP-2: Developing and Using Models  
SEP-3: Planning and Carrying Out Investigations  
SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence |
| **Disciplinary Core Idea(s)** | ESS3.D: Global Climate Change  
ETS1.A: Defining and Delimiting an Engineering Problem  
ETS1.B: Developing Possible Solutions  
ETS1.C: Optimizing the Design Solution  
PS3.A: Definitions of Energy  
ESS3.D: Global Climate Change  
ETS1.A: Defining and Delimiting an Engineering Problem  
ETS1.B: Developing Possible Solutions  
ETS1.C: Optimizing the Design Solution  
PS3.A: Definitions of Energy  
ESS3.D: Global Climate Change |
| **Crosscutting Concept(s)** | CCC-5: Energy and Matter  
CCC-7: Stability and Change | CCC-2: Cause and Effect  
CCC-3: Scale, Proportion, and Quantity  
CCC-5: Energy and Matter  
CCC-7: Stability and Change | CCC-2: Cause and Effect  
CCC-4: Systems and System Models |
<table>
<thead>
<tr>
<th>Green Ninja Storyline</th>
<th>Unit 4 Protecting Plants and Animals</th>
<th>Unit 5 Reducing Pollution and Waste</th>
<th>Unit 6 Scientific Storytelling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use patterns and observations of plants and animals to learn about how they adapt to the environment.</td>
<td>Develop models of the water cycle and cells.</td>
<td>Create effective ways to communicate a science message.</td>
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<tr>
<td><strong>Science Topics</strong></td>
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<tr>
<td></td>
<td>• Reproductive Strategies</td>
<td>• Water Cycle</td>
<td>• Responses to Stimuli</td>
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<td></td>
<td>• Plant Structures and Functions</td>
<td>• Cell Theory</td>
<td>• Effective Survey Tools</td>
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<tr>
<td><strong>Culminating Project</strong></td>
<td>Students design and share a method for protecting their chosen species in a poster presentation.</td>
<td>Students create four-square posters highlighting their action plans to reduce pollution and waste.</td>
<td>Students present their short films to the classroom film festival.</td>
</tr>
<tr>
<td><strong>Performance Expectation(s)</strong></td>
<td>MS-LS1-4: From Molecules to Organisms MS-LS1-5: From Molecules to Organisms MS-LS3-2: Hereditary: Inheritance and Variations of Traits</td>
<td>MS-LS1-1: From Molecules to Organisms MS-LS1-2: From Molecules to Organisms MS-LS1-3: From Molecules to Organisms MS-ESS2-4: Earth’s Systems</td>
<td>MS-LS1-8: From Molecules to Organisms</td>
</tr>
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</table>

For more information on our NGSS alignment, register for a demo account: app.greenninja.org/user/signup
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<thead>
<tr>
<th>Unit 1</th>
<th>Minerals</th>
<th>Unit 2</th>
<th>Petroleum</th>
<th>Unit 3</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green Ninja Storyline</strong></td>
<td>Analyze and interpret evidence of tectonic movements. Develop models of how Earth's processes produce chemical and physical changes in Earth's materials.</td>
<td>Develop and use models of how fossil fuels form and are distributed globally. Use Earth science principles to explain current mineral distributions.</td>
<td>Expand on concepts of energy to estimate the environmental impact of different foods. Study chemical reactions.</td>
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<td></td>
</tr>
</tbody>
</table>
| **Science Topics** | • Minerals  
• Continental Drift  
• Rock Cycle | • Petroleum Formation  
• Polymer Structures  
• Air Quality | • Photosynthesis  
• Cellular Respiration  
• Food Life Cycle |
| **Culminating Project** | Students share their sustainable smartphone pamphlets in a gallery walk. | Students write and produce a PSA encouraging changes in transportation habits to improve air quality. | Students create a classroom cookbook of low-carbon recipes. |
| **Performance Expectation(s)** | MS-ESS2-1: Earth's Systems  
MS-ESS2-3: Earth's Systems | MS-ETS1-1: Engineering Design  
MS-ETS1-2: Engineering Design  
MS-ETS1-3: Engineering Design  
MS-ETS1-4: Engineering Design  
MS-ESS3-1: Earth and Human Activity  
MS-PS1-1: Matter and its Interactions  
MS-PS1-3: Matter and its Interactions | MS-ETS1-1: Engineering Design  
MS-ETS1-2: Engineering Design  
MS-ETS1-3: Engineering Design  
MS-ETS1-4: Engineering Design  
MS-LS1-6: From Molecules to Organisms  
MS-LS1-7: From Molecules to Organisms  
MS-PS1-2: Matter and its Interactions  
MS-PS1-6: Matter and its Interactions |
| **Science and Engineering Practice(s)** | SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data | SEP-1: Asking Questions and Defining Problems  
SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence  
SEP-8: Obtaining, Evaluating, and Communicating Information | SEP-1: Asking Questions and Defining Problems  
SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence |
| **Disciplinary Core Idea(s)** | ESS1.C: The History of Planet Earth  
ESS2.A: Earth's Materials and Systems  
ESS2.B: Plate Tectonics and Large-Scale System Interactions | ETS1.A: Natural Resources  
ETS1.B: Defining and Delimiting an Engineering Problem  
ETS1.C: Optimizing the Design Solution  
PS1.B: Chemical Reactions | ETS1.A: Defining and Delimiting an Engineering Problem  
ETS1.B: Developing Possible Solutions  
ETS1.C: Optimizing the Design Solution  
PS1.B: Chemical Reactions  
PS3.D: Energy in Chemical Processes and Everyday Life |
| **Crosscutting Concept(s)** | CCC-1: Patterns  
CCC-7: Stability and Change | CCC-2: Cause and Effect  
CCC-3: Scale, Proportion, and Quantity  
CCC-6: Structure and Function | CCC-1: Patterns  
CCC-5: Energy and Matter |
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<tr>
<th>Unit 4</th>
<th>Unit 5</th>
<th>Unit 6</th>
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</thead>
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<tr>
<td>Soil</td>
<td>Water: Life and Danger</td>
<td>Ecosystems</td>
</tr>
<tr>
<td><strong>Green Ninja Storyline</strong></td>
<td>Develop a model of producers/consumers/decomposers and describe the cycling of matter and energy.</td>
<td>Apply heat transfer concepts to forecast atmospheric changes. Use technologies to mitigate impacts of natural hazards.</td>
</tr>
</tbody>
</table>
| **Science Topics** | • Soil Ecosystems  
• Conservation of Matter  
• Biodiversity | • Water Cycle  
• Thermal Expansion | • Scientific Observation  
• Systems Thinking |
| **Culminating Project** | Students design solutions to restore a soil ecosystem and evaluate competing designs. | Students participate in a multi-day role-playing simulation to design resilient cities. | Students write letters of thanks and support to the owners or managers of their ecosystem location areas. |
| **Performance Expectation(s)** | MS-ETS1-1: Engineering Design  
MS-ETS1-2: Engineering Design  
MS-ETS1-3: Engineering Design  
MS-LS2-3: Ecosystems: Interactions, Energy, and Dynamics  
MS-LS2-5: Ecosystems: Interactions, Energy, and Dynamics  
MS-PS1-5: Matter and its Interactions | MS-ESS3-2: Earth and Human Activity  
MS-PS1-4: Matter and its Interactions | MS-LS2-1: Ecosystems: Interactions, Energy, and Dynamics  
MS-LS2-2: Ecosystems: Interactions, Energy, and Dynamics  
MS-LS2-4: Ecosystems: Interactions, Energy, and Dynamics  
MS-ESS2-2: Earth’s Systems |
| **Science and Engineering Practice(s)** | SEP-1: Asking Questions and Defining Problems  
SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data  
SEP-7: Engaging in Argument from Evidence | SEP-2: Developing and Using Models  
SEP-4: Analyzing and Interpreting Data | SEP-4: Analyzing and Interpreting Data  
SEP-6: Constructing Explanations and Designing Solutions  
SEP-7: Engaging in Argument from Evidence |
| **Disciplinary Core Idea(s)** | ETS1.A: Defining and Delimiting an Engineering Problem  
ETS1.B: Developing Possible Solutions  
ETS1.C: Optimizing the Design Solution  
LS2.B: Cycle of Matter and Energy Transfer in Ecosystems  
LS2.C: Ecosystem Dynamics, Functioning, and Resilience  
LS4.D: Biodiversity and Humans  
PS1.B: Chemical Reactions | ESS3.B: Natural Hazards  
ESS2.C: The Roles of Water in Earth’s Surface Processes  
LS2.A: Interdependent Relationships in Ecosystems  
LS2.C: Ecosystem Dynamics, Functioning, and Resilience |
| **Crosscutting Concept(s)** | CCC-5: Energy and Matter  
CCC-7: Stability and Change | CCC-1: Patterns  
CCC-2: Cause and Effect | CCC-1: Patterns  
CCC-2: Cause and Effect  
CCC-3: Scale, Proportion, and Quantity  
CCC-7: Stability and Change |
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<td><strong>Exploring Early Earth</strong></td>
<td><strong>Evolving Life on Earth</strong></td>
<td><strong>Earth from Space</strong></td>
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<tr>
<td><strong>Green Ninja Storyline</strong></td>
<td><strong>Science Topics</strong></td>
<td><strong>Culminating Project</strong></td>
</tr>
<tr>
<td>Analyze data to establish</td>
<td>Use pictorial evidence and multiple</td>
<td>Use math and computational thinking</td>
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<tr>
<td>a geologic time scale.</td>
<td>lines of evidence to construct an</td>
<td>together with models of wave behavior</td>
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<tr>
<td>Create and use models to</td>
<td>understanding of evolution.</td>
<td>to understand how satellites</td>
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<tr>
<td>explore the Laws of</td>
<td></td>
<td>transmit, receive, and collect data.</td>
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<tr>
<td>Motion and Gravity.</td>
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<td><strong>Science Topics</strong></td>
<td><strong>Science Topics</strong></td>
<td><strong>Science Topics</strong></td>
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<tr>
<td>• Universe Systems</td>
<td>• Extinction Events</td>
<td>• Wave Properties and Behaviors</td>
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<tr>
<td>• Fossils</td>
<td>• Patterns in Evolution</td>
<td>• Analog vs. Digital</td>
</tr>
<tr>
<td>• Newton’s Laws of Motion</td>
<td>• Embryo Development</td>
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<tr>
<td><strong>Culminating Project</strong></td>
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<tr>
<td>Students create an animated</td>
<td>Students develop a visual story on</td>
<td>Students create infographics to</td>
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<tr>
<td>animated story about</td>
<td>solutions to the human causes of the</td>
<td>inspire people to reduce humanity’s</td>
</tr>
<tr>
<td>protecting the Earth.</td>
<td>next mass extinction.</td>
<td>ecological footprint.</td>
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<td><strong>Performance Expectation(s)</strong></td>
<td><strong>Science and Engineering</strong></td>
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<td>MS-ESS1-2: Earth’s Place in</td>
<td>SEP-2: Developing and Using Models</td>
<td>SEP-2: Developing and Using Models</td>
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<td>the Universe</td>
<td>SEP-4: Analyzing and Interpreting</td>
<td>SEP-5: Using Mathematics and</td>
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<td>MS-ESS1-3: Earth’s Place in</td>
<td>Data</td>
<td>Computational Thinking</td>
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<tr>
<td>the Universe</td>
<td>SEP-6: Constructing Explanations and</td>
<td>SEP-7: Engaging in Argument from</td>
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<td>MS-ESS1-4: Earth’s Place in</td>
<td>Designing Solutions</td>
<td>Evidence</td>
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<tr>
<td>the Universe</td>
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<td>SEP-8: Obtaining, Evaluating, and</td>
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<td>MS-PS2-1: Motion and Stability: Forces and</td>
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<td>Communicating Information</td>
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<tr>
<td>Interactions</td>
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<tr>
<td><strong>Science and Engineering</strong></td>
<td><strong>Disciplinary Core Idea(s)</strong></td>
<td><strong>Disciplinary Core Idea(s)</strong></td>
</tr>
<tr>
<td>SEP-6: Constructing Explanations and Designing Solutions</td>
<td>ESS1.C: The History of Planet Earth</td>
<td>Electromagnetic Radiation</td>
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<td>PS4.B: Electromagnetic Radiation</td>
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<td>PS4.C: Information Technologies and</td>
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<td>Instrumentation</td>
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<td><strong>Crosscutting Concept(s)</strong></td>
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<td>CCC-3: Scale, Proportion,</td>
<td>CCC-1: Patterns</td>
<td>CCC-1: Patterns</td>
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<tr>
<td>Quantity</td>
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<td>CCC-2: Cause and Effect</td>
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<td>CCC-4: Systems and System Models</td>
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<td>CCC-6: Structure and Function</td>
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<td><strong>Unit 4</strong></td>
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<tr>
<td><strong>Humans and Life</strong></td>
<td><strong>Transportation</strong></td>
<td><strong>Future Energy</strong></td>
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<tr>
<td><strong>Green Ninja Storyline</strong></td>
<td>Use models to describe why mutations can result in changes to an organism and how humans influence the inheritance of desired traits in organisms.</td>
<td>Conduct investigations into forces, motion, and energy transfer. Combine science analysis and math skills to compare the efficiency of different modes of transport.</td>
</tr>
</tbody>
</table>
| **Science Topics** | • Chromosomes  
• Natural Selection  
• Genetic Mutations | • Forces and Acceleration  
• Electricity and Current | • Generating Electricity  
• Seasons on Earth  
• Energy Storage |
| **Culminating Project** | Students create a documentary highlighting the need to increase genetic diversity. | Students develop sustainable transportation proposals that they may share with community leaders. | Students wrap up the year by presenting their designs for a sustainable community. |
| **Performance Expectation(s)** | **MS-LS3-1:** Heredity: Inheritance and Variation of Traits  
**MS-LS4-4:** Biological Evolution: Unity and Diversity  
**MS-LS4-5:** Biological Evolution: Unity and Diversity  
**MS-LS4-6:** Biological Evolution: Unity and Diversity | **MS-ETS1-1:** Engineering Design  
**MS-ETS1-2:** Engineering Design  
**MS-ETS1-3:** Engineering Design  
**MS-ETS1-4:** Engineering Design  
**MS-PS2-2:** Motion and Stability: Forces and Interactions  
**MS-PS2-3:** Motion and Stability: Forces and Interactions  
**MS-PS2-5:** Motion and Stability: Forces and Interactions  
**MS-PS3-1:** Energy | **MS-ESS1-1:** Earth’s Place in the Universe  
**MS-PS2-4:** Motion and Stability: Forces and Interactions  
**MS-PS3-2:** Energy  
**MS-PS3-3:** Relationship Between Energy and Forces |
| **Science and Engineering Practice(s)** | **SEP-2:** Developing and Using Models  
**SEP-5:** Using Mathematics and Computational Thinking  
**SEP-6:** Constructing Explanations and Designing Solutions  
**SEP-8:** Obtaining, Evaluating, and Communicating Information | **SEP-1:** Asking Questions and Defining Problems  
**SEP-2:** Developing and Using Models  
**SEP-3:** Planning and Carrying Out Investigations  
**SEP-4:** Analyzing and Interpreting Data  
**SEP-7:** Engaging in Argument from Evidence | **SEP-2:** Developing and Using Models  
**SEP-7:** Engaging in Argument from Evidence |
| **Disciplinary Core Idea(s)** | **LS3.A:** Inheritance of Traits  
**LS3.B:** Variation of Traits  
**LS4.B:** Natural Selection  
**LS4.C:** Adaptation | **ETS1.A:** Defining and Delimiting an Engineering Problem  
**ETS1.B:** Developing Possible Solutions  
**ETS1.C:** Optimizing the Design Solution  
**PS2.A:** Forces and Motion  
**PS2.B:** Types of Interactions  
**PS3.A:** Definitions of Energy | **ESS1.A:** The Universe and Its Stars  
**ESS1.B:** Earth and the Solar System  
**PS2.B:** Types of Interactions  
**PS2.C:** Relationship Between Energy and Forces |
| **Crosscutting Concept(s)** | **CCC-2:** Cause and Effect  
**CCC-6:** Structure and Function | **CCC-2:** Cause and Effect  
**CCC-3:** Scale, Proportion, and Quantity  
**CCC-7:** Stability and Change | **CCC-1:** Patterns  
**CCC-4:** Systems and System Models |