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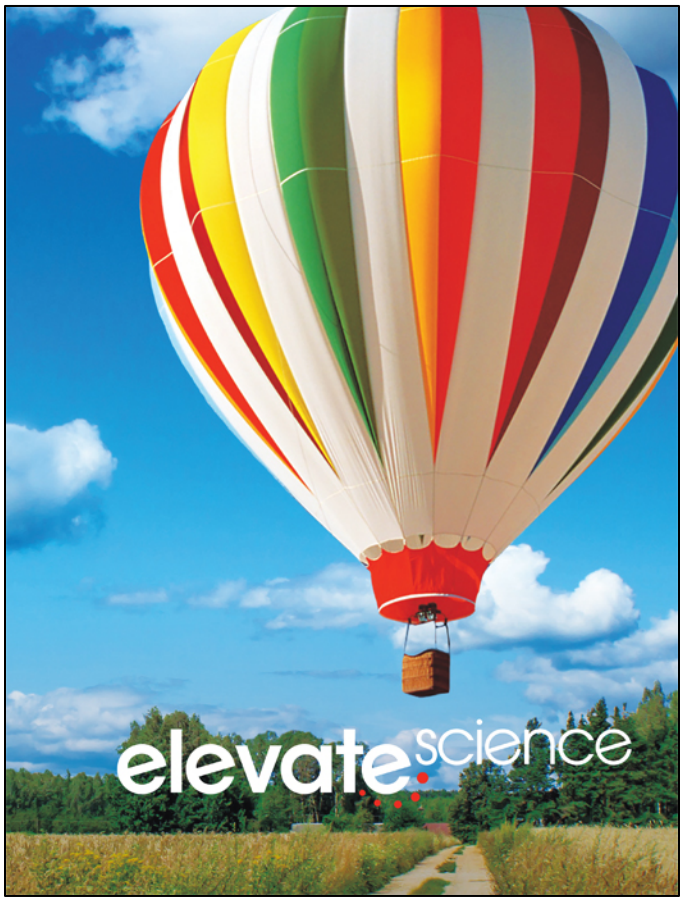

To the

Montgomery County, Maryland
Next Generation Science Curriculum
Grade 5

Prepared by Savvas Learning Company, formerly Pearson K12 Learning

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To the
Montgomery County Next Generation Science Curriculum for Grade 5

Introduction

The following document demonstrates how the ***Elevate Science ©2019*** program supports Montgomery County's Next Generation Science Curriculum. Correlation references include the Student Edition, Teacher Edition, and online Realize™ digital resources.

Elevate Science is a comprehensive K-5 science program that focuses on active, student-centered learning. It builds students' critical thinking, questioning, and collaboration skills, and fuels interest in STEM and creative problem solving while supporting literacy development for elementary-age learners. Developed to support Next Generation Science Standards (NGSS), ***Elevate Science*** integrates three-dimensional learning of the Scientific and Engineering Practices, Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCIs).

The ***Elevate Science*** blended **print** and **digital** curriculum engages students in phenomena-based inquiry and hands-on investigations.

- Problem–based learning Quests put students on a journey of discovery
- Engineering-focused features infuse STEM learning
- Coding and innovation engage students and build 21st century skills

The Teacher's Edition of ***Elevate Science*** helps elementary educators teach science with confidence: Scaffolding, ELD, differentiated instruction, and an instructional organization based upon the 5E learning model, (Engage, Explore, Explain, Extend/Elaborate, Evaluate), provide all the support needed for successful teaching practices. Professional development offers point-of-use support. A full-view approach to inquiry and testing provides new options for a variety of hands-on labs and assessments for three-dimensional learning.

Elevate Science prepares students for the challenges of tomorrow, building strong reasoning skills and critical thinking strategies as they engage in explorations, formulate claims, and gather and analyze data that promote evidence-based argument. Designed for today's classroom, preparing students for tomorrow's world. ***Elevate Science*** promises to:

- Elevate thinking.
- Elevate learning.
- Elevate teaching.

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To the
Montgomery County Next Generation Science Curriculum for Grade 5

Table of Contents

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Unit 1: Our Neighborhood, Our Watershed	
Performance Expectation 5-ESS2-1	
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	**SE/TE:** uInvestigate Lab: How does water move through soil?, 103 uInvestigate Lab: How does a greenhouse work?, 111 Quest Connection, 114 Quest Check-In Lab: Where are Earth's spheres?, 116-117 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Quest Findings: Connect the Spheres, 130 Evidence-Based Assessment, 134-135 uDemonstrate Lab: How are the spheres represented in a terrarium?, 136-137 **Realize™ Digital Resources**: **Earth's Systems** >Lesson 3, Interactions Among Earth's Systems>Virtual Lab: Build Your Dream Park
Disciplinary Core Ideas	
ESS2.A: Earth Materials and Systems Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	**SE/TE:** Earth's Systems, 104 Geosphere and Biosphere, 105 Visual Literacy Connection: What are parts of Earth's geosphere and biosphere?, 106-107 Lithosphere, 108 uBe a Scientist, 108 uInvestigate Lab: How does a greenhouse work?, 111 Visual Literacy Connection: What are parts of Earth's hydrosphere?, 112-113 Atmosphere, 114 Quest Connection, 114 Hydrosphere and Atmosphere Together, 115 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Interdependence of Earth's Systems, 122 Biosphere, 122 Crosscutting Concepts Toolbox: Systems and System Models, 122 Geosphere and Atmosphere, 123 Visual Literacy Connection: How does the ocean affect other systems on Earth?, 124-125 Quest Check-In: Earth's Interactions, 128 Quest Findings: Connect the Spheres, 130 Topic Assessment, 132-133 Evidence-Based Assessment, 134-135 uDemonstrate Lab: How are the spheres represented in a terrarium?, 136-137

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Continued:	Continued: **Realize™ Digital Resources**: **Earth's Systems** >Lesson 1, Geosphere and Biosphere>Video: Geosphere and Biosphere;>Quiz: Geosphere and Biosphere >Lesson 2, Hydrosphere and Atmosphere>Video: Hydrosphere and Atmosphere;>Interactivity: Earth's Four Spheres;>Quiz: Hydrosphere and Atmosphere >Lesson 3, Interactions Among Earth's Systems>Video: Interactions Among Earth's Systems;>Interactivity: Interactions Among Earth's Spheres;>Quiz: Interactions Among Earth's Systems
Science and Engineering Practices	
Developing and Using Models Develop a model using an example to describe a scientific principle.	**SE/TE:** uInvestigate Lab: How does water move through soil?, 103 uInvestigate Lab: How does a greenhouse work?, 111 Quest Connection, 114 Quest Check-In Lab: Where are Earth's spheres?, 116-117 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Quest Findings: Connect the Spheres, 130 Evidence-Based Assessment, 134-135 uDemonstrate Lab: How are the spheres represented in a terrarium?, 136-137 **Realize™ Digital Resources**: **Earth's Systems** >Lesson 3, Interactions Among Earth's Systems>Virtual Lab: Build Your Dream Park

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Crosscutting Concepts	
Systems and System Models A system can be described in terms of its components and their interactions.	**SE/TE:** uConnect Lab: How can you model Earth?, 100 uInvestigate Lab: How does water move through soil?, 103 Earth's Systems, 104 Geosphere and Biosphere, 105 Visual Literacy Connection: What are parts of Earth's geosphere and biosphere?, 106-107 Lithosphere, 108 uInvestigate Lab: How does a greenhouse work?, 111 Visual Literacy Connection: What are parts of Earth's hydrosphere?, 112-113 Atmosphere, 114 Quest Connection, 114 Hydrosphere and Atmosphere Together, 115 Quest Check-In Lab: Where are Earth's spheres?, 116-117 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Interdependence of Earth's Systems, 122 Biosphere, 122 Crosscutting Concepts Toolbox: Systems and System Models, 122 Geosphere and Atmosphere, 123 Visual Literacy Connection: How does the ocean affect other systems on Earth?, 124-125 Quest Check-In: Earth's Interactions, 128 Quest Findings: Connect the Spheres, 130 Topic Assessment, 132-133 Evidence-Based Assessment, 134-135 uDemonstrate Lab: How are the spheres represented in a terrarium?, 136-137 **Realize™ Digital Resources**: **Earth's Systems** >Lesson 1, Geosphere and Biosphere>Video: Geosphere and Biosphere;>Interactivity: The Organic Geosphere;>Quiz: Geosphere and Biosphere >Lesson 2, Hydrosphere and Atmosphere>Video: Hydrosphere and Atmosphere;>Interactivity: Earth's Four Spheres;>Quiz: Hydrosphere and Atmosphere >Lesson 3, Interactions Among Earth's Systems>Video: Interactions Among Earth's Systems;>Interactivity: Interactions Among Earth's Spheres;>Quiz: Interactions Among Earth's Systems

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Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Performance Expectation 5-ESS2-2	
Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	**SE/TE:** Visual Literacy Connection: How is freshwater distributed across Earth?, 156-157 uBe a Scientist: Modeling Water Distribution, 158 Where is Water?, 164 Topic Assessment, 175 Evidence-Based Assessment, 176-177 **Realize™ Digital Resources**: **Earth's Water** >Lesson 3, Earth's Ocean>Interactivity: Earth's Waters
Disciplinary Core Ideas	
ESS2.C: The Roles of Water in Earth's Surface Processes Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.	**SE/TE:** Water on Earth, 146 Visual Literacy Connection: How does water cycle on Earth?, 148-149 STEM uInvestigate Lab: How can you find water underground?, 155 Visual Literacy Connection: How is freshwater distributed across Earth?, 156-157 uBe a Scientist: Modeling Water Distribution, 158 Where is Water, 164 Evidence-Based Assessment, 176-177 **Realize™ Digital Resources**: **Earth's Water** >Lesson 2, Earth's Freshwater>Video: Earth's Freshwater;>Interactivity: Earth's Underground Water;>Quiz: Earth's Freshwater >Lesson 3, Earth's Ocean>Interactivity: Earth's Waters;>Quiz: Earth's Ocean
Science and Engineering Practices	
Using Mathematics and Computational Thinking Describe and graph quantities such as area and volume to address scientific questions.	**SE/TE:** Visual Literacy Connection: How is freshwater distributed across Earth?, 156-157 uBe a Scientist: Modeling Water Distribution, 158 Model It!, 159 Where is Water?, 164 Evidence-Based Assessment, 176-177 Science Practices: Using Math, EM5 **Realize™ Digital Resources**: **Earth's Water** >Lesson 3, Earth's Ocean>Interactivity: Earth's Waters

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Crosscutting Concepts	
Scale, Proportion, and Quantity Standard units are used to measure and describe physical quantities such as weight and volume.	**SE/TE:** Model It!, 159
Performance Expectation 5-ESS3-1	
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	**SE/TE:** STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uInvestigate Lab: How can you separate salt from water?, 163 Threats to the Shoreline, 169 uBe a Scientist: Oil Spill in a Bottle, 169 Quest Findings: Water, Water Everywhere!, 172 Career Connection: Water Quality Specialist, 173 STEM uConnect Lab: How can we reuse materials to design new products?, 184 Quest Check-In: Efficient or Wasteful, 193 uBe a Scientist: Find Your Impact, 202 Quest Check-In: Save Energy!, 203 Reduce Human Impacts, 209 STEM Quest Check-In Lab: How do building materials affect energy efficiency?, 210-211 STEM uInvestigate Lab: How can you collect rainwater?, 213 Resource Protection, 214 Environmental Conservation, 215 Visual Literacy Connection: How do people recycle?, 216-217 Reduce and Reuse, 218 Quest Connection, 218 Resource Use, 219 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 **Realize™ Digital Resources**: **Earth's Water** >Lesson 3, Earth's Ocean>Video: Earth's Ocean **Human Impacts on Earth's Systems** >Lesson 4, Protection of Earth's Resources and Environments>Video: Protection of Earth's Resources and Environments;>Interactivity: Go Green;>Quiz: Protection of Earth's Resources and Environments

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Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Disciplinary Core Ideas	
ESS3.C: Human Impacts on Earth Systems Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.	**SE/TE:** Quest Kickoff: Take Care of Earth—It's Our Home!, 182-183 STEM uConnect Lab: How can we reuse materials to design new products?, 184 Land and Forest Resources, 189 Minerals and Rocks, 190 Water Resources, 191 Air Resources, 192 Quest Check-In: Efficient or Wasteful, 193 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 uInvestigate Lab: Which color is best at capturing solar energy?, 197 Human Uses of Energy, 198 Impacts of Energy Production, 202 Quest Check-In: Save Energy!, 203 STEM Connection, 204 Visual Literacy Connection: How can human activities change Earth's systems?, 206-207 Human Resource Use and Pollution, 208 Reduce Human Impacts, 209 Resource Protection, 214 Environmental Conservation, 215 Visual Literacy Connection: How do people recycle?, 216-217 Reduce and Reuse, 218 Resource Use, 219 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 **Realize™ Digital Resources**: **Human Impacts on Earth's Systems** >Lesson 1, Earth's Natural Resources>Video: Earth's Natural Resources;>Interactivity: Drinkable Water;>Quiz: Earth's Natural Resources >Lesson 2, Earth's Energy Resources>Video: Earth's Energy Resources;>Interactivity": How We Use Earth's Resources;>Quiz: Earth's Energy resources >Lesson 3, Human Activity and Earth's Systems>Video: Human Activity and Earth's Systems;>Interactivity: Causes of Environmental Damage;>Quiz: Human Activity and Earth's Systems >Lesson 4, Protection of Earth's Resources and Environments>Video: Protection of Earth's Resources and Environments;>Interactivity: Go Green;>Quiz: Protection of Earth's Resources and Environments

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Science and Engineering Practices	
Obtaining, Evaluating, and Communicating Information Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	**SE/TE:** STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uInvestigate Lab: How can you separate salt from water?, 163 Threats to the Shoreline, 169 uBe a Scientist: Oil Spill in a Bottle, 169 Quest Findings: Water, Water Everywhere!, 172 Career Connection: Water Quality Specialist, 173 STEM uConnect Lab: How can we reuse materials to design new products?, 184 Quest Check-In: Efficient or Wasteful, 193 uBe a Scientist: Find Your Impact, 202 Quest Check-In: Save Energy!, 203 Reduce Human Impacts, 209 STEM Quest Check-In Lab: How do building materials affect energy efficiency?, 210-211 STEM uInvestigate Lab: How can you collect rainwater?, 213 Environmental Conservation, 215 Visual Literacy Connection: How do people recycle?, 216-217 Reduce and Reuse, 218 Quest Connection, 218 Resource Use, 219 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 STEM uDemonstrate Lab: How can you use the energy of water?, 228-229 **Realize™ Digital Resources**: **Earth's Water** >Lesson 3, Earth's Ocean>Video: Earth's Ocean **Human Impacts on Earth's Systems** >Lesson 4, Protection of Earth's Resources and Environments>Video: Protection of Earth's Resources and Environments;>Interactivity: Go Green;>Quiz: Protection of Earth's Resources and Environments

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Crosscutting Concepts	
Systems and System Models A system can be described in terms of its components and their interactions.	**SE/TE:** uConnect Lab: How can you model Earth?, 100 uInvestigate Lab: How does water move through soil?, 103 Earth's Systems, 104 Geosphere and Biosphere, 105 Visual Literacy Connection: What are parts of Earth's geosphere and biosphere?, 106-107 Lithosphere, 108 uInvestigate Lab: How does a greenhouse work?, 111 Visual Literacy Connection: What are parts of Earth's hydrosphere?, 112-113 Atmosphere, 114 Quest Connection, 114 Hydrosphere and Atmosphere Together, 115 Quest Check-In Lab: Where are Earth's spheres?, 116-117 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Interdependence of Earth's Systems, 122 Biosphere, 122 Crosscutting Concepts Toolbox: Systems and System Models, 122 Geosphere and Atmosphere, 123 Visual Literacy Connection: How does the ocean affect other systems on Earth?, 124-125 Quest Check-In: Earth's Interactions, 128 Quest Findings: Connect the Spheres, 130 Topic Assessment, 132-133 Evidence-Based Assessment, 134-135 uDemonstrate Lab: How are the spheres represented in a terrarium?, 136-137 **Realize™ Digital Resources**: **Earth's Systems** >Lesson 1, Geosphere and Biosphere>Video: Geosphere and Biosphere;>Interactivity: The Organic Geosphere;>Quiz: Geosphere and Biosphere >Lesson 2, Hydrosphere and Atmosphere>Video: Hydrosphere and Atmosphere;>Interactivity: Earth's Four Spheres;>Quiz: Hydrosphere and Atmosphere >Lesson 3, Interactions Among Earth's Systems>Video: Interactions Among Earth's Systems;>Interactivity: Interactions Among Earth's Spheres;>Quiz: Interactions Among Earth's Systems

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Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Science Addresses Questions About the Natural and Material World. Science findings are limited to questions that can be answered with empirical evidence.	**SE/TE:** STEM uConnect Lab: Where does water flow…and; how fast?, 142 STEM uDemonstrate Lab: How can water move upward?, 178-179 uInvestigate Lab: Which color is best at capturing solar energy?, 197 Science Practices: Ask Questions,404 Science Practices: Analyzing and Interpreting Data, EM4
Performance Expectation 5-PS1-1	
Develop a model to describe that matter is made of particles too small to be seen.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter
Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.	**SE/TE:** Engineering Connection, 16 uInvestigate Lab: How can you detect matter without seeing it? 17 Atoms, 18 uBe a Scientist: Disappearance of Particles, 18 Visual Literacy Connection: What is the matter?, 20-21 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 uBe a Scientist: Food Coloring in Water, 28 Model It!, 28 uBe a Scientist, 52 Gas, 54 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Science and Engineering Practices	
Developing and Using Models Develop a model to describe phenomena.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 Model It!, 28 STEM uInvestigate Lab: How can you separate salt from water?, 163 Science Practices: Developing and Using Models, EM6
Crosscutting Concepts	
Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large.	**SE/TE:** Observing Properties, 8 Measuring Properties, 9 Atoms, 18 Visual Literacy Connection: What is the matter?, 20-21 uConnect Lab: How big is the sun?, 234 Visual Literacy Connection: Who eats whom?, 372-373 Food Chains, 374 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter> >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Performance Expectation 5-PS2-1	
Support an argument that the gravitational force exerted by Earth on an object is directed down.	**SE/TE:** uInvestigate Lab: How long do objects take to fall?, 279 Gravitational Force, 280 Gravity on Earth, 281 uBe a Scientist: Explore Gravity 281 Science Practice Toolbox: Engage in Argument from Evidence, 282 Quest Check-In Lab: How does gravity affect matter?, 283 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 1, Earth's Gravitational Forces> Interactivity: The Force of Gravity;>Virtual lab: Gravity Here and There
Disciplinary Core Ideas	
PS2.B: Types of Interactions The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.	**SE/TE:** uInvestigate Lab: How long do objects take to fall?, 279 Gravitational Force, 280 Gravity on Earth, 281 uBe a Scientist: Explore Gravity 281 Science Practice Toolbox: Engage in Argument from Evidence, 282 Quest Check-In Lab: How does gravity affect matter?, 283 Topic Assessment, 308-309 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 1, Earth's Gravitational Forces>Video: Earth's Gravitational Forces;>Interactivity: The Force of Gravity;>Virtual lab: Gravity Here and There;>Quiz: Earth's Gravitational Forces

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Science and Engineering Practices	
Engage in Argument from Evidence Support an argument with evidence, data, or a model.	**SE/TE:** uInvestigate Lab: How long do objects take to fall?, 279 uBe a Scientist: Explore Gravity 281 Science Practice Toolbox: Engage in Argument from Evidence, 282 Quest Check-In Lab: How does gravity affect matter?, 283 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 1, Earth's Gravitational Forces> Interactivity: The Force of Gravity;>Virtual lab: Gravity Here and There
Crosscutting Concepts	
Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	**SE/TE:** Literacy Connection: Cause and Effect, 101 Reading Check: Cause and Effect, 105 Reading Check: Cause and Effect, 114 uInvestigate Lab: How does the geosphere affect the hydrosphere?, 121 Geosphere and Atmosphere, 123 Visual Literacy Connection: How does the ocean affect other systems on Earth?, 124-125 Impacts of Energy Production, 202 Visual Literacy Connection: How can human activities change Earth's systems?, 206-207 Human Resource Use and Pollution, 208 Reduce Human Impacts, 209 Resource Use, 219 **Realize™ Digital Resources**: **Human Impacts on Earth's Systems** >Lesson 3, Human Activity and Earth's Systems>Video: Human Activity and Earth's Systems;>Interactivity: Causes of Environmental Damage;>Quiz: Human Activity and Earth's Systems

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Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Performance Expectation 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.	**SE/TE:** uEngineer It! Define STEM: It's Melting!, 152-153 STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uConnect Lab: How can we reuse materials to design new products?, 184 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 STEM Quest Check-In Lab: How do building materials affect energy efficiency?, 210-211 STEM uInvestigate Lab: How can you collect rainwater?, 213 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 STEM uDemonstrate Lab: How can you use the energy of water?, 228-229 **Realize™ Digital Resources**: **Earth's Water** >Lesson 2, Earth's Freshwater>Virtual Lab: Where Has All the Water Gone?
Disciplinary Core Ideas	
ETS1.B: Developing Possible Solutions Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions	**SE/TE:** uEngineer It! Define STEM: It's Melting!, 152-153 STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uConnect Lab: How can we reuse materials to design new products?, 184 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 STEM uInvestigate Lab: How can you collect rainwater?, 213 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 STEM uDemonstrate Lab: How can you use the energy of water?, 228-229 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Earth's Water** >Lesson 2, Earth's Freshwater>Virtual Lab: Where Has All the Water Gone?

SE = Student Edition **TE = Teacher Edition**

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Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.	**SE/TE:** uEngineer It! Define STEM: It's Melting!, 152-153 STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uConnect Lab: How can we reuse materials to design new products?, 184 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 STEM uInvestigate Lab: How can you collect rainwater?, 213 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 STEM uDemonstrate Lab: How can you use the energy of water?, 228-229 Science Practices: Communicate Information, EM9 **Realize™ Digital Resources**: **Earth's Water** >Lesson 2, Earth's Freshwater>Virtual Lab: Where Has All the Water Gone?
Science and Engineering Practices	
Constructing Explanations and Designing Solutions Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	**SE/TE:** uEngineer It! Define STEM: It's Melting!, 152-153 STEM Quest Check-In Lab: How do we filter water?, 160-161 STEM uConnect Lab: How can we reuse materials to design new products?, 184 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 STEM Quest Check-In Lab: How do building materials affect energy efficiency?, 210-211 STEM uInvestigate Lab: How can you collect rainwater?, 213 Quest Check-In: Increase Conservation, 220 Quest Findings: Take Care of Earth—It's Our Home!, 222 STEM uDemonstrate Lab: How can you use the energy of water?, 228-229 **Realize™ Digital Resources**: **Earth's Water** >Lesson 2, Earth's Freshwater>Virtual Lab: Where Has All the Water Gone?

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Crosscutting Concepts	
Influence of Engineering, Technology, and Science on Society and the Natural World Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	**SE/TE:** 144, 172, 221, 244–245, 368 uEngineer It! Improve STEM: A New Home, 118-119 Sports Connection, 144 Solve it with Science: Can people live on Mars?, 171 uEngineer It! Design STEM: Make Energy the Solar Way, 194-195 Extreme Science: 3, 2, 1 Touchdown!, 221
Unit 2: Properties of Matter	
Performance Expectation 5-PS1-1	
Develop a model to describe that matter is made of particles too small to be seen.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter
Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.	**SE/TE:** Engineering Connection, 16 uInvestigate Lab: How can you detect matter without seeing it? 17 Atoms, 18 uBe a Scientist: Disappearance of Particles, 18 Visual Literacy Connection: What is the matter?, 20-21 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 uBe a Scientist: Food Coloring in Water, 28 Model It!, 28 uBe a Scientist, 52 Gas, 54 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Science and Engineering Practices	
Developing and Using Models Develop a model to describe phenomena.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 Model It!, 28 STEM uInvestigate Lab: How can you separate salt from water?, 163 Science Practices: Developing and Using Models, EM6
Crosscutting Concepts	
Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large.	**SE/TE:** Observing Properties, 8 Measuring Properties, 9 Atoms, 18 Visual Literacy Connection: What is the matter?, 20-21 uConnect Lab: How big is the sun?, 234 Visual Literacy Connection: Who eats whom?, 372-373 Food Chains, 374 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter> >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Performance Expectation 5-PS1-2	
Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.	**SE/TE:** STEM uConnect Lab: What happens to mass when objects are mixed?, 46 uBe a Scientist: Mass and Plant Growth, 72 uDemonstrate Lab: How does mass change when you make glop?, 94-95
Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.	**SE/TE:** STEM uConnect Lab: What happens to mass when objects are mixed?, 46 Changes in Shape, 58 Conservation of Matter, 68-69 Model It!, 68 Literacy Toolbox: Use Evidence from Text, 68 Quest Connection, 69 Visual Literacy Connection: Is matter conserved?, 70-71 uBe a Scientist: Mass and Plant Growth, 72 Lesson 3 Check, 73 Evidence-Based Assessment, 92 uDemonstrate Lab: How does mass change when you make glop?, 94-95 **Realize™ Digital Resources**: **Changes in Matter** >Lesson 3, Chemical Changes>Interactivity: Chemical Changes
PS1.B: Chemical Reactions No matter what reaction or change in properties occurs, the total weight of the substances does not change.	**SE/TE:** STEM uConnect Lab: What happens to mass when objects are mixed?, 46 Changes in Shape, 58 Conservation of Matter, 68-69 Model It!, 68 Literacy Toolbox: Use Evidence from Text, 68 Quest Connection, 69 Visual Literacy Connection: Is matter conserved?, 70-71 uBe a Scientist: Mass and Plant Growth, 72 Lesson 3 Check, 73 Evidence-Based Assessment, 92 uDemonstrate Lab: How does mass change when you make glop?, 94-95 **Realize™ Digital Resources**: **Changes in Matter** >Lesson 3, Chemical Changes>Interactivity: Chemical Changes

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Science and Engineering Practices	
Using Mathematical and Computational Thinking Measure and graph quantities such as weight to address scientific and engineering questions and problems.	**SE/TE:** STEM uConnect Lab: What happens to mass when objects are mixed?, 46 uBe a Scientist: Mass and Plant Growth, 72 uDemonstrate Lab: How does mass change when you make glop?, 94-95 Science Practices: Using Math, EM5
Crosscutting Concepts	
Scale, Proportion, and Quantity Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.	**SE/TE:** uInvestigate Lab: How do we describe materials?, 7 Measuring Properties, 9 Temperature, 29 Mass and Volume, 29 STEM uConnect Lab: What happens to mass when objects are mixed?, 46 uBe a Scientist: Mass and Plant Growth, 72 uDemonstrate Lab: How does mass change when you make glop?, 94-95 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 3, Properties of Matter>Interactivity: Measuring Matter;>Interactivity: Matter and Its Properties
Connecting to Nature of Science: **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** Science assumes consistent patterns in natural systems.	**SE/TE:** States of Matter, 28 A Change in Physical State, 60 Particle Changes, 61 Particles and Chemical Changes, 67 Conservation of matter, 68-69 Examples of Chemical Changes, 72-73 **Realize™ Digital Resources**: **Changes in Matter** >Lesson 3, Chemical Changes>Interactivity: Chemical Changes

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Performance Expectation 5-PS1-3	
Make observations and measurements to identify materials based on their properties.	**SE/TE:** uConnect Lab: What's in the box?, 4 uInvestigate Lab: How do we describe materials?, 7 Observing Properties, 8 uBe a Scientist: Identify Properties, 8 Measuring Properties, 9 Visual Literacy Connection: Can you tell them apart?, 10-11 Conductors of Heat and Electricity, 12 Magnetic Materials, 12 Solubility, 13 Quest Check-In Lab: How can you observe matter?, 14 uInvestigate Lab: How can you use properties to identify solids?, 27 Color, 30 Texture and Hardness, 31 Quest Check-In Lab: How can you compare the properties of matter?, 32-33 Quest Findings: Identify the Mystery Material, 34 Evidence-Based Assessment, 38-39 uDemonstrate Lab: How do you know what it is?, 40-41 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 1, Observe Matter>Video: Observe Matter;>Interactivity: Measuring Matter;>Quiz: Observe Matter >Lesson 3, Properties of Matter>Video: Properties of Matter;>Interactivity: Matter and Its Properties;>Quiz: Properties of Matter
Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)	**SE/TE:** uInvestigate Lab: How do we describe materials?, 7 uBe a Scientist: Identify Properties, 8 Measuring Properties, 9 Visual Literacy Connection: Can you tell them apart?, 10-11 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 1, Observe Matter>Interactivity: Measuring Matter >Lesson 3, Properties of Matter>Interactivity: Matter and Its Properties

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Science and Engineering Practices	
Planning and Carrying Out Investigations Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	**SE/TE:** uConnect Lab: What's in the box?, 4 uInvestigate Lab: How do we describe materials?, 7 Observing Properties, 8 uBe a Scientist: Identify Properties, 8 Measuring Properties, 9 Visual Literacy Connection: Can you tell them apart?, 10-11 Conductors of Heat and Electricity, 12 Magnetic Materials, 12 Solubility, 13 Quest Check-In Lab: How can you observe matter?, 14 uInvestigate Lab: How can you use properties to identify solids?, 27 Color, 30 Texture and Hardness, 31 Quest Check-In Lab: How can you compare the properties of matter?, 32-33 Quest Findings: Identify the Mystery Material, 34 Evidence-Based Assessment, 38-39 uDemonstrate Lab: How do you know what it is?, 40-41 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 1, Observe Matter>Video: Observe Matter;>Interactivity: Measuring Matter;>Quiz: Observe Matter >Lesson 3, Properties of Matter>Video: Properties of Matter;>Interactivity: Matter and Its Properties;>Quiz: Properties of Matter

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Crosscutting Concepts	
Scale, Proportion, and Quantity Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.	**SE/TE:** uInvestigate Lab: How do we describe materials?, 7 Measuring Properties, 9 Temperature, 29 Mass and Volume, 29 STEM uConnect Lab: What happens to mass when objects are mixed?, 46 uBe a Scientist: Mass and Plant Growth, 72 uDemonstrate Lab: How does mass change when you make glop?, 94-95 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 3, Properties of Matter>Interactivity: Measuring Matter;>Interactivity: Matter and Its Properties
Performance Expectation 5-PS1-4	
Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	**SE/TE:** uInvestigate Lab: How can you identify chemical changes?, 65 uBe a Scientist: Kitchen Science, 85
Disciplinary Core Ideas	
PS1.B: Chemical Reactions When two or more different substances are mixed, a new substance with different properties may be formed.	**SE/TE:** New Substances, 66 Examples of Chemical Changes, 72-73 Solutions, 81 **Realize™ Digital Resources**: **Changes in Matter** >Lesson 3, Chemical Changes>Video: Chemical Changes;>Interactivity: Chemical Changes
Science and Engineering Practices	
Planning and Carrying Out Investigations Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	**SE/TE:** uInvestigate Lab: How can you identify chemical changes?, 65 uBe a Scientist: Kitchen Science, 85

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Crosscutting Concepts	
Cause and Effect Cause and effect relationships are routinely identified and used to explain change.	**SE/TE:** uInvestigate Lab: Which properties are affected by temperature?, 57 Changes in Temperature, 59 uInvestigate Lab: How can you identify chemical changes?, 65 New Substances, 66 Examples of Chemical Changes, 72-73 Mixtures, 80 Solutions, 81 Quest Check-In Lab: How can you make a new and improved formula?, 86-87 Evidence-Based Assessment, 92-93 **Realize™ Digital Resources**: **Changes in Matter** >Lesson 2, Physical Changes>Interactivity: Changing States;>Interactivity: Physical Changes in Matter >Lesson 3, Chemical Changes;>Interactivity: Chemical Changes >Lesson 4, Mixtures and Solutions>Interactivity: Mixtures and Solutions
Performance Expectation 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.	**SE/TE:** uInvestigate Lab: How can you identify chemical changes?, 65 uBe a Scientist: Kitchen Science, 85 Quest Check-In Lab: How can you make a new and improved formula?, 86-87
Disciplinary Core Ideas	
ETS1.B: Developing Possible Solutions Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. **ETS1.C: Optimizing the Design Solution** Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	**SE/TE:** Quest Check-In Lab: How can you make a new and improved formula?, 86-87 Engineering Practices: Designing Solutions, EM11 Engineering Practices: Optimizing Solutions, EM13

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Science and Engineering Practices	
Planning and Carrying Out Investigations Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	**SE/TE:** uInvestigate Lab: How can you identify chemical changes?, 65 uBe a Scientist: Kitchen Science, 85
Unit 3: Earth, Sun, Moon, and Stars	
Performance Expectation 5-ESS1-1	
Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.	**SE/TE:** uInvestigate Lab: How are distance and brightness related?, 237 Plan It!, 241 Evidence-Based Assessment, 268-269
Disciplinary Core Ideas	
ESS1.A: The Universe and its Stars The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.	**SE/TE:** Local-to-Global Connection, 236 uInvestigate Lab: How are distance and brightness related?, 237 Earth's Sun, 238 Distances of Stars/Brightness of Stars, 240 Plan It!, 241 Size of Stars, 241 Evidence-Based Assessment, 268-269 Stars and Constellations, 297 **Realize™ Digital Resources**: **Solar System** >Lesson 1, Brightness of the Sun and Other Stars>Video: Brightness of the Sun and Other Stars;>Interactivity: The Sun and Other Stars;>Quiz: Brightness of the Sun and Other Stars

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Science and Engineering Practices	
Engaging in Argument from Evidence Support an argument with evidence, data, or a model.	**SE/TE:** uConnect Lab: How big is the sun?, 234 uInvestigate Lab: How are distance and brightness related?, 237 Quest Connection, 239 Plan It!, 241 uInvestigate Lab: How does a planet's distance from the sun affect its path?, 247 Quest Check-In Lab: What's inside the solar system?, 252 Evidence-Based Assessment, 268-269 uDemonstrate Lab: How can you compare the sizes of objects in space?, 270-271 **Realize™ Digital Resources**: **Solar System** >Lesson 1, Brightness of the Sun and Other Stars>Video: Brightness of the Sun and Other Stars;>Interactivity: The Sun and Other Stars
Crosscutting Concepts	
Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large.	**SE/TE:** 302 **TE Only:** 236a, 246a, 254a uConnect Lab: How big is the sun?, 234 Size of Stars, 241 Visual Literacy Connection: What is in our solar system?, 248-249 Quest Connection, 250 Moons, 251 Jupiter: Gas Giant with Many Moons/Saturn: A Planet with "Handles," 257 Uranus/Neptune, 260 uBe a Scientist: Scale and Proportion, 260 STEM Math Connection: How many Earths can line up across the sun?, 263 uDemonstrate Lab: How can you compare the sizes of objects in space?, 270-271 **Realize™ Digital Resources**: **Solar System** >Lesson 1, Brightness of the Sun and Other Stars>Video: Brightness of the Sun and Other Stars;>Interactivity: The Sun and Other Stars

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Performance Expectation 5-ESS1-2	
Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	**SE/TE:** uConnect Lab: How can spinning affect a planet's shape?, 276 uBe a Scientist: Shadow Play, 296 Quest Findings: Plan a Trip Around the World of Patterns, 306 Evidence-Based Assessment, 310-311 uDemonstrate Lab: What can we tell from shadows?, 312-313
Disciplinary Core Ideas	
ESS1.B: Earth and the Solar System The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.	**SE/TE:** Planetary Orbit, 250 Local-to-Global Connection, 284 uInvestigate Lab: How are we spinning?, 285 Earth's Rotation, 286 Earth's Revolution, 287 Visual Literacy Connection: What is the movement of Earth's moon in space?, 288-289 Seasons, 290-291Quest Check-In: Sun U-p, Sun Down, 292 uInvestigate Lab: What star patterns can you see?, 295 Shadow Patterns, 296 Model It!, 296 uBe a Scientist: Shadow Play, 296 Moon Phases, 300-301 Crosscutting Concepts Toolbox: Patterns, 300 Quest Check-In: Moon Sightings, 303 Topic Assessment, 308-309 Evidence-Based Assessment, 310-311 uDemonstrate Lab: What can we tell from shadows?, 312-313 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 2, Earth's Movements in Space>Video: Earth's Movements in Space;>Interactivity: Earth's Rotation: Day and Night;>Quiz: Earth's Movements in Space >Lesson 3, Patterns Over Time>Video: Patterns Over Time;>Interactivity: Phases of the Moon;>Quiz: Patterns Over Time

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Science and Engineering Practices	
Analyzing and Interpreting Data Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.	**SE/TE:** uConnect Lab: How can spinning affect a planet's shape?, 276 Quest Findings: Plan a Trip Around the World of Patterns, 306 Evidence-Based Assessment, 310-311 uDemonstrate Lab: What can we tell from shadows?, 312-313
Crosscutting Concepts	
Patterns Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.	**SE/TE:** Literacy Connection: Sequence, 277 Local-to-Global Connection, 284 Earth's Rotation, 286 Quest Connection, 287 Quest Check-In: Sun Up, Sun Down, 292 uInvestigate Lab: What star patterns can you see?, 295 Shadow Patterns, 296 uBe a Scientist: Shadow Play, 296 Moon Phases, 300-301 Crosscutting Concepts Toolbox: Patterns, 300 Keeping Track of Time, 302 uEngineer It! Design STEM: Coding Moon Phases, 304-305 Quest Findings: Plan a Trip Around the World of Patterns, 306 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 2, Earth's Movements in Space>Video: Earth's Movements in Space;>Interactivity: Earth's Rotation: Day and Night;>Quiz: Earth's Movements in Space >Lesson 3, Patterns Over Time>Video: Patterns Over Time;>Interactivity: Phases of the Moon;>Quiz: Patterns Over Time

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Performance Expectation 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.	**SE/TE:** Quest Kickoff: Keeping the Planets in Order, 232-233 Quest Check-In Lab: What's inside the solar system?, 252-253 Quest Check-In Lab: What planets are way out there?, 262 Quest Findings: Keeping the Planets in Order, 264 Quest Kickoff: Plan a Trip Around the World of Patterns, 274-275 uEngineer It! Design STEM: Coding Moon Phases, 304-305 Quest Findings: Plan a Trip Around the World of Patterns, 306 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 3, Patterns Over Time>uEngineer It! Interactivity: Coding the Moon Phases
Disciplinary Core Ideas	
ETS1.B: Developing Possible Solutions Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions	**SE/TE:** Quest Check-In Lab: What's inside the solar system?, 252-253 Quest Check-In Lab: What planets are way out there?, 262 uEngineer It! Design STEM: Coding Moon Phases, 304-305 **Realize™ Digital Resources**: **Solar System** >Lesson 3, Outer Solar System>Virtual Lab: Up Close with the Solar System **Patterns in Space** >Lesson 3, Patterns Over Time>uEngineer It! Interactivity: Coding the Moon Phases
At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.	**SE/TE:** Quest Findings: Keeping the Planets in Order, 264 uEngineer It! Design STEM: Coding Moon Phases, 304-305 Quest Findings: Plan a Trip Around the World of Patterns, 306 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 3, Patterns Over Time>uEngineer It! Interactivity: Coding the Moon Phases

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Science and Engineering Practices	
Constructing Explanations and Designing Solutions Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	**SE/TE:** Quest Kickoff: Keeping the Planets in Order, 232-233 Quest Check-In Lab: What's inside the solar system?, 252-253 Quest Check-In Lab: What planets are way out there?, 262 Quest Findings: Keeping the Planets in Order, 264 Quest Kickoff: Plan a Trip Around the World of Patterns, 274-275 uEngineer It! Design STEM: Coding Moon Phases, 304-305 Quest Findings: Plan a Trip Around the World of Patterns, 306 Engineering Practices: Optimizing Solutions, EM13 **Realize™ Digital Resources**: **Patterns in Space** >Lesson 3, Patterns Over Time>uEngineer It! Interactivity: Coding the Moon Phases
Crosscutting Concepts	
Influence of Engineering, Technology, and Science on Society and the Natural World Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	**SE/TE:** uEngineer It! Model STEM: What's with the dust?, 244-245 STEM Connection, 278 **Realize™ Digital Resources**: **Solar System** >Lesson 1, Brightness of the Sun and Other Stars>uEngineer It! Video: What's with the dust?

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Unit 4: Ecosystems	
Performance Expectation 5-LS1-1	
Support an argument that plants get the materials they need for growth chiefly from air and water.	**SE/TE:** uInvestigate Lab: What matter do plants need to make food?, 329 Crosscutting Concepts Toolbox: Energy and Matter, 330 How Plants Gain Mass, 331 Quest Check-In Lab, 334-335 **TE Only:** Focus on Mastery!
Disciplinary Core Ideas	
LS1.C: Organization for Matter and Energy Flow in Organisms Plants acquire their material for growth chiefly from air and water.	**SE/TE:** uInvestigate Lab: What matter do plants need to make food?, 329 Photosynthesis, 330 Crosscutting Concepts Toolbox: Energy and Matter, 330 Model It!, 330 How Plants Gain Mass, 331 Topic Assessment, 348-349 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food
Science and Engineering Practices	
Engaging in Argument from Evidence Support an argument with evidence, data, or a model.	**SE/TE:** uInvestigate Lab: What matter do plants need to make food?, 329 Crosscutting Concepts Toolbox: Energy and Matter, 330 Model It!, 330 How Plants Gain Mass, 331 Science Practices: Engaging in Arguments from Evidence, EM7

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Crosscutting Concepts	
Energy and Matter Matter is transported into, out of, and within systems.	**SE/TE:** uInvestigate Lab: What matter do plants need to make food?, 329 Photosynthesis, 330 Nutrients from Soil, 333 uInvestigate Lab: How do animals get energy from the sun?, 339 Topic Assessment, 348-349 Evidence-Based Assessment, 350-351 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353 Ecosystems, 362 uInvestigate Lab: How can matter change in an ecosystem?, 369 Producers, 370 Decomposers, 371 uInvestigate Lab: How does matter move through an ecosystem?, 387 Flow of Matter in Ecosystems, 388 Visual Literacy Connection: How does carbon move through ecosystems?, 390-391 Topic Assessment, 398-399 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food **Matter and Energy in Ecosystems** >Lesson 2, Organisms Within Ecosystems>Video: Organisms Within Ecosystems;>Interactivity: Producers, Consumers, and Decomposers;>Quiz: Organisms Within Ecosystems >Lesson 4, Matter and Energy Transfer Within Ecosystems>Video: Matter and Energy Transfer Within Ecosystems;>Interactivity: Matter and Energy Transfer;>Quiz: Matter and Energy Transfer Within Ecosystems

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Performance Expectation 5-LS2-1	
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	**SE/TE:** uInvestigate Lab: How does matter move through an ecosystem?, 387 Plan It!, 388 uEngineer It! Model STEM: Ecosystems in a Box, 394-395 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 **Realize™ Digital Resources**: **Matter and Energy in Ecosystems** >Lesson 4, Matter and Energy Transfer Within Ecosystems>uEngineer It! Interactivity: Plan an Ecosystem
Disciplinary Core Ideas	
LS2.A: Interdependent Relationships in Ecosystems The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.	**SE/TE:** , 212 Animals and Energy, 323 Visual Literacy Connection: What is a trophic level?, 324-325 uInvestigate Lab: How do animals get energy from the sun?, 339 Evidence-Based Assessment, 350-351 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353 STEM Connection, 368 uInvestigate Lab: How can matter change in an ecosystem?, 369 Producers, 370 Decomposers, 371 Visual Literacy Connection: Who eats whom?, 372-373 Food Chains, 374 Food Webs, 375 Stable Ecosystems, 382 Threats to Ecosystems, 383 Engineering Connection, 386 Flow of Matter in Ecosystems, 388 Topic Assessment, 398-399 Evidence-Based Assessment, 400-401 **Realize™ Digital Resources**: **Energy and Food** >Lesson 3, How Animals Use Food>Video: How Animals Use Food

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Continued:	**Realize™ continued:** **Matter and Energy in Ecosystems** >Lesson 1, Ecosystems>Video: Ecosystems;>Interactivity: Interactions in an Ecosystem;>Quiz: Ecosystems >Lesson 2, Organisms Within Ecosystems>Video: Organisms Within Ecosystems;>Interactivity: Producers, Consumers, and Decomposers;>Quiz: Organisms Within Ecosystems >Lesson 4, Matter and Energy Transfer Within Ecosystems>Video: Matter and Energy Transfer Within Ecosystems;>Interactivity: Matter and Energy Transfer;>Quiz: Matter and Energy Transfer Within Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.	**SE/TE:** uInvestigate Lab: What matter do plants need to make food?, 329 Photosynthesis, 330 Nutrients from Soil, 333 uInvestigate Lab: How do animals get energy from the sun?, 339 Topic Assessment, 348-349 Evidence-Based Assessment, 350-351 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353 uInvestigate Lab: How can matter change in an ecosystem?, 369 Producers, 370 Decomposers, 371 Visual Literacy Connection: Who eats whom?, 372-373 uInvestigate Lab: How does matter move through an ecosystem?, 387 Flow of Matter in Ecosystems, 388 Visual Literacy Connection: How does carbon move through ecosystems?, 390-391 Cycles of Matter, 392 Topic Assessment, 398-399 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food

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Continued:	**Realize™ continued:** **Matter and Energy in Ecosystems** >Lesson 2, Organisms Within Ecosystems>Video: Organisms Within Ecosystems;>Interactivity: Producers, Consumers, and Decomposers;>Quiz: Organisms Within Ecosystems >Lesson 4, Matter and Energy Transfer Within Ecosystems>Video: Matter and Energy Transfer Within Ecosystems;>Interactivity: Matter and Energy Transfer;>Quiz: Matter and Energy Transfer Within Ecosystems
Science and Engineering Practices	
Developing and Using Models Develop a model to describe phenomena.	**SE/TE:** uInvestigate Lab: How does matter move through an ecosystem?, 387 Plan It!, 388 uEngineer It! Model STEM: Ecosystems in a Box, 394-395 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 Science Practices: Developing and Using Models, EM6 **Realize™ Digital Resources**: **Matter and Energy in Ecosystems** >Lesson 4, Matter and Energy Transfer Within Ecosystems>uEngineer It! Interactivity: Plan an Ecosystem

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Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena Science explanations describe the mechanisms for natural events.	**SE/TE:** Energy Paths to the Sun, 326 How Plants Gain Mass, 331 uInvestigate Lab: How do animals get energy from the sun?, 339 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353 Producers, 370 Decomposers, 371 Visual Literacy Connection: Who eats whom?, 372-373 Visual Literacy Connection: What happens to a forest ecosystem after a fire?, 380-381 uInvestigate Lab: How does matter move through an ecosystem?, 387 Energy Flow in Ecosystems, 389 Visual Literacy Connection: How does carbon move through ecosystems?, 390-391 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food **Matter and Energy in Ecosystems** >Lesson 1, Ecosystems>Video: Ecosystems;>Interactivity: Interactions in an Ecosystem;>Quiz: Ecosystems >Lesson 2, Organisms Within Ecosystems>Video: Organisms Within Ecosystems;>Interactivity: Producers, Consumers, and Decomposers;>Quiz: Organisms Within Ecosystems >Lesson 4, Matter and Energy Transfer Within Ecosystems>Video: Matter and Energy Transfer Within Ecosystems;>Interactivity: Matter and Energy Transfer;>Quiz: Matter and Energy Transfer Within Ecosystems

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Crosscutting Concepts	
Systems and System Models A system can be described in terms of its components and their interactions.	**SE/TE:** Visual Literacy Connection: What is a trophic level?, 324-325 STEM uConnect Lab: How do the parts in a fish tank make up a system?, 358 uInvestigate Lab: How do the parts of an ecosystem work together?, 361 Ecosystems, 362 Parts of an Ecosystem, 363 Visual Literacy Connection: How do factors interact in a forest ecosystem?, 364-365 Crosscutting Concepts Toolbox: Systems, 370 **Realize™ Digital Resources**: **Matter and Energy in Ecosystems** >Lesson 1, Ecosystems>Video: Ecosystems;>Interactivity: Interactions in an Ecosystem;>Quiz: Ecosystems
Performance Expectation 5-PS1-1	
Develop a model to describe that matter is made of particles too small to be seen.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter

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Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.	**SE/TE:** Engineering Connection, 16 uInvestigate Lab: How can you detect matter without seeing it? 17 Atoms, 18 uBe a Scientist: Disappearance of Particles, 18 Visual Literacy Connection: What is the matter?, 20-21 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 uBe a Scientist: Food Coloring in Water, 28 Model It!, 28 uBe a Scientist, 52 Gas, 54 STEM uInvestigate Lab: How can you separate salt from water?, 163 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter
Science and Engineering Practices	
Developing and Using Models Develop a model to describe phenomena.	**SE/TE:** uInvestigate Lab: How can you detect matter without seeing it? 17 uBe a Scientist: Disappearance of Particles, 18 STEM Quest Check-In Lab: How do you know that matter is still there?, 23 Model It!, 28 STEM uInvestigate Lab: How can you separate salt from water?, 163 Science Practices: Developing and Using Models, EM6

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Crosscutting Concepts	
Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large.	**SE/TE:** Observing Properties, 8 Measuring Properties, 9 Atoms, 18 Visual Literacy Connection: What is the matter?, 20-21 uConnect Lab: How big is the sun?, 234 Visual Literacy Connection: Who eats whom?, 372-373 Food Chains, 374 **Realize™ Digital Resources**: **Properties of Matter** >Lesson 2, Model Matter> >Lesson 2, Model Matter>Video: Model Matter;>Quiz: Model Matter
Performance Expectation 5-PS3-1	
Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	**SE/TE:** uConnect Lab: How much food do you need?, 318 uInvestigate Lab: How do animals get energy from the sun?, 339 Crosscutting Concepts Toolbox: Energy and Matter, 340 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353
Disciplinary Core Ideas	
PS3.D: Energy in Chemical Processes and Everyday Life The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water).	**SE/TE:** uInvestigate Lab: How is the sun involved in your meals?, 321 Plants and Energy, 322 Animals and Energy, 323 Visual Literacy Connection: What is a trophic level?, 324-325 Energy Paths to the Sun, 326 uBe a Scientist: Foods Made with Plants, 326 Quest Check-In: Sorting Foods, 327 uInvestigate Lab: What matter do plants need to make food?, 329 Photosynthesis, 330 Nutrients from Soil, 333 uInvestigate Lab: How do animals get energy from the sun?, 339 Topic Assessment, 348-349 Evidence-Based Assessment, 350-351 Energy Flow in Ecosystems, 389

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Continued:	Continued: **Realize™ Digital Resources**: **Energy and Food** >Lesson 1, Energy in Food>Video: Energy in Food;>Interactivity: Energy in Food Chains;>Quiz: Energy in Food >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food
LS1.C: Organization for Matter and Energy Flow in Organisms Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion.	**SE/TE:** uConnect Lab: How much food do you need?, 318 Animals and Energy, 323 uInvestigate Lab: How do animals get energy from the sun?, 339 Energy and Body Heat, 340 Crosscutting Concepts Toolbox: Energy and Matter, 340 Energy and Metabolism, 341 Energy and Movement, 342 uBe a Scientist: Energy Tracker, 342 Internal Uses of Energy, 343 Quest Check-In: Animals Using Energy, 344 Topic Assessment, 348-349 Energy Flow in Ecosystems, 389 **Realize™ Digital Resources**: **Energy and Food** >Lesson 3, How Animals Use Food>Video: How Animals Use Food;>Interactivity: Ectotherms and Endotherms;>Quiz: How Animals Use Food
Science and Engineering Practices	
Developing and Using Models Use models to describe phenomena.	**SE/TE:** uConnect Lab: How much food do you need?, 318 uInvestigate Lab: How do animals get energy from the sun?, 339 Crosscutting Concepts Toolbox: Energy and Matter, 340 uDemonstrate Lab: How does matter move through an ecosystem?, 352-353 uInvestigate Lab: How does change affect organisms in an ecosystem?, 379 uInvestigate Lab: How does matter move through an ecosystem?, 387 STEM uDemonstrate Lab: How can you model matter cycles in the Earth system?, 402-403 Science Practices: Developing and Using Models, EM6

SE = Student Edition **TE = Teacher Edition**

Digital Resources: The symbol > indicates a click to reach each digital asset on the Realize platform.

Montgomery County Next Generation Science Curriculum for Grade 5	Elevate Science ©2019 Grade 5
Crosscutting Concepts	
Energy and Matter Energy can be transferred in various ways between objects.	**SE/TE:** uInvestigate Lab: How is the sun involved in your meals?, 321 Plants and Energy, 322 Animals and Energy, 323 Visual Literacy Connection: What is a trophic level?, 324-325 Energy Paths to the Sun, 326 Photosynthesis, 330 uInvestigate Lab: How do animals get energy from the sun?, 339 Topic Assessment, 348-349 Evidence-Based Assessment, 350-351 Energy Flow in Ecosystems, 389 **Realize™ Digital Resources**: **Energy and Food** >Lesson 1, Energy in Food>Video: Energy in Food;>Interactivity: Energy in Food Chains;>Quiz: Energy in Food >Lesson 2, How Plants Make Food>Video: How Plants Make Food;>Interactivity: Photosynthesis;>Quiz: How Plants Make Food

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Performance Expectation 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.	**SE/TE:** Quest Kickoff: Plan Your Plate!, 316-317 Quest Findings: Plan Your Plate!, 346 Quest Kickoff: STEM Public Relations Gone Wild!, 356-357 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Virtual Lab: Solving Crop Problems
Disciplinary Core Ideas	
ETS1.B: Developing Possible Solutions Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions	**SE/TE:** Quest Kickoff: Plan Your Plate!, 316-317 Quest Check-In: Sorting Foods, 327 Quest Check-In Lab: What plant foods provide the most energy and nutrients?, 334-335 Quest Check-In: Animals Using Energy, 344 Quest Findings: Plan Your Plate!, 346 Quest Kickoff: STEM Public Relations Gone Wild!, 356-357 uInvestigate Lab: How do the parts of an ecosystem work together?, 361 Quest Check-In: Unwelcome Inhabitants, 367 Quest Check-In: Connections to Others, 376 Quest Check-In Lab: How does change affect organisms in an ecosystem?, 384-385 Quest Check-In: Moving Matter and Energy, 393 Quest Findings: STEM Public Relations Gone Wild!,396 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Virtual Lab: Solving Crop Problems **Matter and Energy in Ecosystems** >Lesson 4, Matter and Energy Transfer Within Ecosystems>uEngineer It! Interactivity: Plan an Ecosystem

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At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.	**SE/TE:** Quest Findings: Plan Your Plate!, 346 Quest Check-In: Unwelcome Inhabitants, 367 Quest Check-In: Connections to Others, 376 Quest Check-In Lab: How does change affect organisms in an ecosystem?, 384-385 Quest Check-In: Moving Matter and Energy, 393 Quest Findings: STEM Public Relations Gone Wild!, 396 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Virtual Lab: Solving Crop Problems
Science and Engineering Practices	
Constructing Explanations and Designing Solutions Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	**SE/TE:** Quest Kickoff: Plan Your Plate!, 316-317 Quest Findings: Plan Your Plate!, 346 Quest Kickoff: STEM Public Relations Gone Wild!, 356-357 Engineering Practices: Designing Solutions, EM11 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Virtual Lab: Solving Crop Problems
Crosscutting Concepts	
Influence of Engineering, Technology, and Science on Society and the Natural World Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	**SE/TE:** STEM Connection, 328 Engineering Toolbox: Growing Plants in Space, 333 STEM Connection, 368 Engineering Connection, 386 **Realize™ Digital Resources**: **Energy and Food** >Lesson 2, How Plants Make Food>Virtual Lab: Solving Crop Problems