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|  | 2021-2022  Elementary Science  Quick Guide  Grade 5 |

<http://elementary.dmschools.org>

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Grade 5: Year at a Glance

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| **Aug-Oct** | | **Oct-Jan** | | **Jan-March** | | **March-May** | |
| **Unit 1** | **Unit 2** | **Unit 3** | **Unit 4** | **Unit 5** | **Unit 6** | **Unit 7** | **Unit 8** |
| **SS** | **SS** | **Science** | **Science** | **SS** | **SS** | **Science** | **Science** |
| **EL Module 1: Stories of Human Rights** | | **EL Module 2: Biodiversity in the Rainforest** | | **EL Module 3: Athlete Leaders of Social Change** | | **EL Module 4: The Impact of Natural Disasters** | |
| Founding Documents  **** | Westward Migration | Matter and Energy in Living Systems  **** | Nature of Matter,  Properties of Matter | Creating a Nation | Financial Literacy | Patterns in the Sky,  Gravity | Water in Earth's Atmosphere,  Environmental Stewardship |

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| FOSS Kits  Topic Scales | **Earth and Sun Foss Kit** | **Living Systems Foss kit** | **Mixtures and Solutions** |
| **Patterns in the Sky** | Investigations 1 and 2 |  |  |
| **Gravity** | Investigation 2 |  |  |
| **Water in Earth’s Atmosphere** | Investigation 3, 4, and 5 |  |  |
| **Environmental Stewardship** | Investigation 5 |  |  |
| **Matter and Energy in Living Systems** |  | Investigations 2, 3, and 4 |  |
| **Nature of Matter** |  |  | Investigations 1, 2, and 4 |
| **Properties and Interactions of Matter** |  |  | Investigations 3, and 5 |

Below you will find a list resources to support the DMPS Science scales for your grade level. Each includes the scale (state standards) to be addressed.

The scale should always be your starting point for deciding what you will be offering for a learning experience. Think “what will I see students doing to show me they “get" this standard?” As a reminder the standards are written as “performance expectations” and include a Science Practice, a Core Idea, and a Crosscutting Concept, so it should be something the student does (is engaged in) and not merely a recall of information.

Below the scale is a “Big idea” statement to try to capture the essence of the scale. If this does not help you stick with the scale. The scale is the expected learning.

After the big idea you will find the specific FOSS materials that should give you a chance to capture evidence of the scale. FOSS is a very comprehensive program and it would be very challenging to do all parts of all of the investigations. That said, keep the scale in mind “which parts will best help my students learn this scale?”

The listed FOSS items in this guide have a tight alignment to the scale but you will need to know where your students are and what Investigations will best help them learn the scale. It may be necessary to build some additional knowledge by doing additional investigations and parts. You as the teacher always have the freedom to do this. The goal of this document is to help you more quickly identify the elements in FOSS that tightly align to the scale. You have the power and responsibility to add and subtract to best meet the needs of your students.

We have also included links to Heartland AEA resources (all are free) that align with the scale being taught.

First is a link to “[Mystery Science](https://mysteryscience.com/start?code=3728dj2s&allow_skip=true)” this is a fairly comprehensive program built to support the new standards and can provide a number of ways and ideas to help engage your students in the scale. [To login you will need to set up an account with your DMPS email and select your building.](https://mysteryscience.com/start?code=3728dj2s&allow_skip=true)

Next listed is a link to “[Pebble Go](https://www.pebblego.com/)”. This is a resource to help support access for those that are early or struggling readers. Finally for grades 3-5 is [Discovery Education](http://www.discoveryeducation.com/) a bank of resources around the scale content materials. To access these or any other AEA resources you will need to use your DMPS login (username 1737----- and password haea11), if you do not know your building username we can help you.

The final link is to the list of [Heartland online resources](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) in general that you may find helpful (True Flix, Book Flix, netTrekker, etc.)**5th Grade Science**

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| Matter and Energy in Living Systems  SEP- Using Models, Arguing from Evidence CCC- Energy and Matter, Systems and System Models | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Support an argument that plants get the materials they need for growth chiefly from air and water. [(5-LS1-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-LS1-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) 2. 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. [(5-PS3-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS3-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) 3. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [(5-LS2-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-LS2-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Describe given evidence, data, and/or models that address plant growth over time, changes in the weight of water and soil in a closed system, and a plants inability to grow without air or water.   2. Determine whether the evidence (provided/researched/investigated) supports the claim that air and water are the primary contributors to plant growth and weight.  3. Use reasoning to connect evidence with the claim.   1. 1. Using a given model; identify and describe the components of a system that includes energy, the Sun, animals and plants.   2. Describe the relationships between energy, the sun, plants and animals.  3. Describe how energy from the sun is transferred through a chain of events.   1. 1. Use a model to describe the movement of matter within an ecosystem.   2. Describe connections of relevant parts in a model (animals eating other animals, animals eating plants, organisms that consume dead plants and animals, movement of matter in system).  3. Describe how changes impact the system (new predator, change in the habitat, etc.)    Students will recognize or recall specific vocabulary, such as:  Energy, system, consumers, decomposer, decomposition, food web |
| 1 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| **Matter and Energy in Living Systems** | |
| **“Big Idea”**  **Be able to support an argument that plants primarily need air and water to grow. Use a model to express thinking about how energy moves through living systems.** | |
| FOSS Living Systems | Additional Resources |
| Investigation 2 Teacher Guide pg 167  Part 2 Plant Nutrition, 3 Animal Nutrition  Investigation 3 Teacher Guide pg 213  Part 1 Plant Vascular Systems  Investigation 4 Teacher Guide pg 309  Part 5 Ecosystems | [Mystery Science Web of Life](https://mysteryscience.com/ecosystems/ecosystems-the-food-chain)  [Pebble Go- Plants](https://www.pebblego.com/modules/2/categories/2986)  [Pebble Go-Food Chains and Webs](https://www.pebblego.com/modules/2/categories/2997/articles/2184)  [Discovery Science- How Plants Grow](https://app.discoveryeducation.com/scienceelementary/concept?id=Life&guid=AF6B6FEC-94AF-4CCC-B317-56A2E46F4ABC#INTRO%2C4%2CAF6B6FEC-94AF-4CCC-B317-56A2E46F4ABC%2C4A36591F-361B-49C0-91D1-C68432D19F66%2Cfalse)  [Discovery Education Food Chains and Webs](https://app.discoveryeducation.com/scienceelementary/concept?id=Life&guid=87291710-A832-4CAF-8C45-0C062AB1CE98#INTRO%2C4%2C87291710-A832-4CAF-8C45-0C062AB1CE98%2C1B65DA65-10E7-4578-8174-C896F070EE51%2Cfalse)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Nature of Matter  SEP- Developing and Using Models, Using computational thinking CCC- Scale and proportion | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Develop a model to describe that matter is made of particles too small to be seen. [(5-PS 1-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS1-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) 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. [(5-PS 1-2)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS1-2%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Represent matter as particle too small to be seen with the unaided eye.   2. Describe the relationship between a substances “bulk matter” and tiny particles that cannot be seen.  3. Describe how particles too small to be seen can account for observable phenomena (inflating a basketball)   1. 1. Measure and graph the weight of substances before and after they are heated, cooled, or mixed.   2. Use computation to determine if the weight of a substance has changed during heating, cooling, or mixing.  3. Use patterns from data to describe the conservation of matter/mass as a concept.    *Students will recognize or recall specific vocabulary, such as*:  Matter, conservation of mass, scale, particles, proportion, properties |
| 1 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| **Nature of Matter** | |
| **“Big Idea”**  **Can use a model to represent thinking that objects are made of smaller particles (to small to be seen with the unaided eye). Collect and analyze data to show that regardless of the change that occurs when a substance is heated, cooled, or mixed, the total mass is kept the same (conserved).** | |
| FOSS Mixtures and Solutions | Additional Resources |
| Investigation 1 Teacher Guide pg 113  Part 2 Separating a Slat Solution  Investigation 2 Teacher Guide pg 161  Part 1 Black Boxes, 3 Model for changes in properties  Investigation 4 Teacher Guide pg 275  Part 2 Epsom Salt Saturation | [Mystery Science- Chemical Magic](https://mysteryscience.com/chemistry/chemical-reactions-properties-of-matter) Mystery’s 1, 2, and 5  [Pebble Go-Matter](https://www.pebblego.com/modules/2/categories/2988)  [Discovery Education- Matter](https://app.discoveryeducation.com/scienceelementary/concept?id=Physical&guid=95FC1BCE-3157-454B-97C9-455B10194FF9)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Properties and Interactions of Matter  SEP- Plan and Conduct investigations, DCI- Matter CCC- Scale and proportion, cause and effect | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Make observations and measurements to identify materials based on their properties. [(5-PS1-3)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS1-3%20Evidence%20Statements%20June%202015%20asterisks.pdf) 2. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.( [5-PS1-4)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS1-4%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Identify observable and measurable properties of materials.   2. Describe properties of materials that can be used to identify those materials.  3. Define what and how data will be collected to help identify materials.  4. Collect and organize data from investigation so it can be used identify other materials   1. 1. Identify the qualitative and quantitative properties of substances before and after they are mixed.   2. Describe the indicators of a chemical reaction  3. Use data collected from a “mixing” investigation to determine if a chemical reaction has occurred.    *Students will recognize or recall specific vocabulary, such as:*  Matter, properties, reaction, cause, effect, scale, proportion |
| 1 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| **Properties and Interactions of Matter** | |
| **“Big Idea”**  **Can conduct and investigation and use observation to identify and group materials based on properties. Can conduct and investigation and determine if a new substance has been formed when 2 or more substances are combined based on the new properties.** | |
| FOSS Mixtures and Solutions | Additional Resources |
| Investigation 3 Teacher Guide pg 205  Part 1 Soft Drink Recipes, 2 Salt Concentration, 4 Liquid Layers  Investigation 5 teacher guide pg 319  Part 1 Chemical reactions, 2 Reaction products | [Mystery Science- Chemical Magic](https://mysteryscience.com/chemistry/chemical-reactions-properties-of-matter) Mystery’s 3, 4  [Pebble Go-Matter](https://www.pebblego.com/modules/2/categories/2988)  [Discovery Education- Changing Matter](https://app.discoveryeducation.com/scienceelementary/concept?id=Physical&guid=4735B75B-E177-4356-A68D-AFB1CE15CCFD)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Patterns in the Sky  SEP- Arguing from Evidence, Analyze data CCC-Scale and Proportion, Patterns | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth. [(5-ESS1-1](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS1-1%20Evidence%20Statements%20June%202015%20asterisks.pdf)) 2. Graph data 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. [(5-ESS1-2)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS1-2%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Describe how a star’s relative brightness is due in part to it’s distance from Earth.   2. List evidence relevant to relationships between star brightness and distance from Earth.  3. Account for the appearance of stars in the sky by using the brightness/size/distance relationship.   1. 1. Organize data (graphs, tables, charts) of daily and seasonal changes due to Earth rotation and revolution(orbit)   2. Use data to account for daily and seasonal patterns observed in the sky.    Students will recognize or recall specific vocabulary, such as:  Apparent Brightness, Axis, Orbit, Revolution, Rotation, Shadow, Sunrise, Sunset |
| 1 | Student’s learning reflects insufficient progress towards foundational skills and knowledge. |

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| **Patterns in the Sky** | |
| **“Big Idea”**  **Use evidence to support the idea that the way we see a stars brightness is impacted by its distance from us, and be able to collect and graph data to show daily and seasonal changes in Earth patterns (shadows, day length, star location, etc.)** | |
| FOSS Earth and Sun | Additional Resources |
| Investigation 1 Teacher Guide pg 105  Part 1 Shadow Shifting, 2 Sun tracking, 3 Day and Night  Investigation 2 Teacher Guide pg 173  Part 1 Night Observation, 3 Phases of the Moon, 5 Stars | [Mystery Science Space Ship Earth](file:////Users/rkleinow/Downloads/I%20was%20wondering%20if%20as%20a%20district%20we%20have%20access%20to%20the%20AACT%20(American%20Association%20of%20Chemistry%20Teacher)%3f%20They%20have%20a%20lot%20of%20great%20resources.%20I%20was%20thinking%20about%20joining,%20but%20I%20figured%20I'd%20check%20if%20the%20district/AEA%20already%20had%20a%20membership%20first.)  [Pebble Go-Space Science](https://www.pebblego.com/modules/2/categories/2992)  [Discovery Education Sun Moon Earth](https://app.discoveryeducation.com/scienceelementary/concept?id=Earth&guid=9C74CB03-8A67-446D-B84E-0F83B0D57AAB)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Gravity  SEP- Arguing from Evidence CCC- Cause and Effect | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Support an argument that the gravitational force exerted by Earth on objects is directed down. [(5-PS2-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS2-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Describe gravity as a force that acts on objects and makes them fall towards the center of Earth.   2. Uses observations to collect evidence that objects fall “down” toward the center of Earth.    Students will recognize or recall specific vocabulary, such as:  Gravity, claim, cause, effect |
| 1 | Student’s learning reflects insufficient progress towards foundational skills and knowledge. |

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| **Gravity** | |
| **“Big Idea”**  **Gravity is a force that pulls things down (toward the center).** | |
| FOSS Earth and Sun | Additional Resources |
| Investigation 2 Teacher Guide pg 207  Part 4 The Solar System | [Pebble Go-Gravity](https://www.pebblego.com/modules/2/categories/2991/articles/2097)  [Discovery Education- Gravity](https://app.discoveryeducation.com/scienceelementary/concept?id=Physical&guid=EA4D7862-CB55-4DDA-B8B8-7ECB6980A1E4#INTRO%2C4%2CEA4D7862-CB55-4DDA-B8B8-7ECB6980A1E4%2CAEDD7AF4-A4C6-48FE-AA45-3839100FE520%2Cfalse%2C93DB2D0C-0502-4797-A1E4-A36F580542C3%2C5)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Water in Earth’s Atmosphere  SEP- Developing and Using Models, Computational Thinking, Obtaining, Evaluating, and Communicating Information CCC- Systems, Scale and Proportion, | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [(5-ESS2-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS2-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) 2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [(5-ESS2-2)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS2-2%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Identify and describe relationships (interactions) between the geosphere, biosphere, hydrosphere, and atmosphere.   2. Describe how the water cycle connects at least two different Earth systems/spheres.   1. 1. Graph the given data about the amount of salt and fresh water found in each of the following reservoirs. (oceans, lakes, rivers, glaciers, ground water, and polar ice caps)   2. Use a graph to describe relative location and amounts of fresh and salt water reservoirs  Students will recognize or recall specific vocabulary, such as:  Geosphere, atmosphere, hydrosphere, biosphere, precipitation, glacier, water cycle |
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| **Water in Earth’s Atmosphere** | |
| **“Big Idea”**  **Use models to express thinking of how the different “spheres”(air, living, water, earth) of the planet behave and interact. Also collect and organize data about the distribution of earth’s freshwater sources.** | |
| FOSS Earth and Sun | Additional Resources |
| Investigation 3 Techer Guide pg 265  Part 2 The Atmosphere  Investigation 4 Teacher Guide pg 309  Part 1 Heating Earth materials, 3 Convection  Investigation 5 Teacher Guide pg 397  Part 3 Water cycle | [Mystery Science Watery Planet](https://mysteryscience.com/earth/water-cycle-resources-systems)  [Pebble Go-All About Water](https://www.pebblego.com/modules/2/categories/2969)  [Discovery Education- Freshwater](https://app.discoveryeducation.com/scienceelementary/concept?id=Earth&guid=5B43C9B7-5DB7-4923-8B5E-FE0BF99FEAF7#INTRO%2C4%2C5B43C9B7-5DB7-4923-8B5E-FE0BF99FEAF7%2C5E73ADB8-3ABC-42F2-842D-D796E4E7CD76%2Cfalse%2C3CE7E495-8100-4BD5-9E7C-1A89B3CE4471%2C5)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |

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| Environmental Stewardship  SEP- Obtaining, Evaluating, and Communicating Information DCI- Earth and Human Activity CCC- Systems and Systems Models | |
| 4 | The student demonstrates in-depth inferences and applications that go beyond the goal. |
| 3  Learning Goal | Students will:   1. Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment. [(5-ESS3-1)](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS3-1%20Evidence%20Statements%20June%202015%20asterisks.pdf) |
| 2 | Students will:   1. 1. Use books and other reliable media to gain reliable information about effect of human activity on Earth resources and efforts to reduce that impact.   2. Use gathered information from 2 or more sources to provide evidence of positive and negative effects of human activity on Earth resources or environments.  3. Describe how scientific ideas/understandings can be used to protect the environment.  Students will recognize or recall specific vocabulary, such as:  Climate, Greenhouse gases, Fresh water, Recycle, Severe Weather |
| 1 | Student’s learning reflects insufficient progress towards foundational skills and knowledge. |

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| **Environmental Stewardship** | |
| **“Big Idea”**  **Through a variety of resources identify ways Science (through identifying patterns, or causes and effects etc.) can help protect Earth resources and the environment.** | |
| FOSS Earth and Sun | Additional Resources |
| Investigation 5 Teacher Guide pg 413  Part 4 Climate | [Mystery Science Watery Planet](https://mysteryscience.com/earth/water-cycle-resources-systems) Mystery 2  [Pebble Go-Humans and Earth](https://www.pebblego.com/modules/2/categories/2949/articles/2194)  [Discovery Education- Earths Natural Resources](https://app.discoveryeducation.com/scienceelementary/concept?id=Earth&guid=5B43C9B7-5DB7-4923-8B5E-FE0BF99FEAF7#null)  [Heartland AEA](http://www.heartlandaea.org/library-and-digital-resources/online-resources/k-5th-grade/) |