

Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Kindergarten

Students will be able to predict and justify the cause and effect relationships in/on a system and connect these concepts to other phenomena.

Criteria	Extending	Proficient	In Progress	Beginning
Design an Investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can identify the parts of a scientific investigation. I can manipulate a guided simple investigation to answer a question or explore a phenomena.	I can carry out a simple, guided scientific investigation.	I am acquiring the skills needed to carry out a simple guided scientific investigation.
Predict		I can use data or observations to make predictions about scientific relationships.	I am acquiring the skills to use data or observations to make predictions about scientific relationships.	I am acquiring the skills needed to make a prediction about scientific relationships.
Justify		I can justify my claim (verbally or with a physical model) about a cause and effect relationship.	I can make a claim about a cause and effect relationship and I am in the process of acquiring the skills to justify my claim (verbally or with a physical model).	I am acquiring the skills to make a claim about a cause and effect relationship.

MDE grade level benchmarks embedded explicitly in the rubric

Kindergarten

0P.3.2.2.1 Design and build a structure to reduce the warming effect of sunlight on Earth's surface.

0P.4.1.1.1 Construct an argument supported by evidence for whether a design solution works as intended to change the speed or direction of an object with a push or a pull.

0P.4.2.1.1 Communicate design ideas for a structure that reduces the warming effect of sunlight on Earth's surface

Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Grades 1-2				
Students will be able to predict and justify the cause and effect relationships in/on a system and connect these concepts to other phenomena.				
Criteria	Extending	Proficient	In Progress	Beginning
Design an Investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can identify the parts of a scientific investigation. I can manipulate a guided simple investigation to answer a question or explore a phenomena. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I can carry out a simple, guided scientific investigation. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am acquiring the skills needed to carry out a simple guided scientific investigation. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2
Predict		I can use data or observations to make predictions about scientific relationships. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am acquiring the skills to use data or observations to make predictions about scientific relationships. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am acquiring the skills needed to make a prediction about scientific relationships. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2
Justify		I can justify my claim (verbally or with a physical model) about a cause and effect relationship. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I can make a claim about a cause and effect relationship and I am in the process of acquiring the skills to justify my claim (verbally or with a physical model). <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am acquiring the skills to make a claim about a cause and effect relationship. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2



Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Grades 3-4

Students will be able to predict and justify the cause and effect relationships in/on a system and connect these concepts to other phenomena.

Criteria	Extending	Proficient	In Progress	Beginning
Design an Investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can design parts of an investigation to explore phenomena (in the natural world or an engineered system). <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can use a guided investigation to explore phenomena (in the natural world or an engineered system). <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I am acquiring the skills to use a guided investigation to explore phenomena (in the natural world or an engineered system). <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4
Predict		I can use data and observations to make predictions about scientific relationships (including novel situations). <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can use data or observations to make predictions about scientific relationships. <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I am acquiring the skills needed to make an accurate prediction. <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4
Justify		I can justify my claim about a cause and effect relationship using specific scientific terminology. NOTE: Claim can be verbal or a physical model <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can justify my claim (verbally or with a physical model) about a cause and effect relationship. <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I am acquiring the skills to make a claim about a cause and effect relationship. <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4



Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Grades 5-6:

Students will be able to analyze, predict, model, and justify claims about the cause and effect relationships in/ on a system and connect these concepts to other phenomena. Students will design investigations to observe and analyze cause and effect relationships.

Criteria	Extending	Proficient	In Progress	Beginning
Design an Investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	<p>I can design an investigation to explore cause and effect phenomena (in the natural world or an engineered system).</p> <p><input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6</p>	<p>I can design parts of an investigation to explore cause and effect phenomena (in the natural world or an engineered system).</p> <p><input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6</p>	<p>I can use an investigation to explore cause and effect phenomena (in the natural world or an engineered system).</p> <p><input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6</p>
Analyze and Justify		<p>I can support my claim or model about a complex cause and effect relationship with multiple pieces of evidence (including novel situations).</p> <p>Note: Evidence can be observations, readings, models, data, etc.</p> <p><input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6</p>	<p>I can support my claim or model about a cause and effect relationship with a piece of evidence.</p> <p><input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6</p>	<p>I can make a claim about a cause and effect relationship and attempt to support my claim with evidence.</p> <p><input type="checkbox"/> Grade 5 <input checked="" type="checkbox"/> Grade 6</p>



Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Grades 7-8				
Students will be able to analyze, predict, model, and justify claims about the cause and effect relationships in/ on a system and connect these concepts to other phenomena. Students will design investigations to observe and analyze cause and effect relationships.				
Criteria	Extending	Proficient	In Progress	Beginning
Design an investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	<p>I can design an investigation to explore and collect evidence about cause and effect relationships.</p> <p>Note: Phenomena can be from the natural world or an engineered system</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can design parts of an investigation to explore and collect evidence about relationships.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can use an investigation to explore and collect evidence about relationships.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>
Design Model		<p>I can design a complete and accurate conceptual model to represent cause and effect relationships based on scientific evidence. I can explain the major components or connections and revise the model to include new information.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can create an incomplete, but accurate model based on scientific evidence. I can explain the major components or connections in the model.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I am acquiring the knowledge and skills necessary to create an accurate model.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>
Analyze and Justify		<p>I can analyze cause and effect in a novel situation to make a claim supported by scientifically-reliable evidence and justify it using science concepts.</p> <p>Note: Evidence can be observations, readings, models, data, etc.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can identify, and collect relevant evidence to support a claim or model about cause and effect relationships.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I am acquiring the knowledge and skills necessary to analyze a situation.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>



Science: Cause and Effect

Competency: Analyzing cause and effect relationships, including how systems remain the same and change, to generate explanations.

Grade Level Competency: Grades 9-12

Students will be able to analyze, evaluate, predict, model and justify claims about the cause and effect relationship in /on known and novel systems and phenomena. Students will design investigations to verify a cause and effect relationship.

Criteria	Extending	Proficient	In Progress	Beginning
Design an investigation	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can design a repeatable and verifiable investigation to explore phenomena (in the natural world or an engineered system) to test the cause and effect claim.	I can design an investigation to explore phenomena (in the natural world or an engineered system) to test the cause and effect claim.	I can use an investigation to explore phenomena (in the natural world or an engineered system) to test the cause and effect claim.
Design Model		I can design comprehensive models (physical, mathematical, or computer) to simulate cause and effect in the natural or designed world, and use them to predict the behavior of the system. Note: Models may be physical, mathematical, computer, etc.	I can design models (physical, mathematical, or computer) to simulate cause and effect in the natural or designed world, and use them to predict the behavior of the system. Note: Models may be physical, mathematical, computer, etc.	I can use models (physical, mathematical, computer models) to simulate cause and effect in the natural or designed world, and use them to predict the behavior of the system. Note: Models may be physical, mathematical, computer, etc.
Analyze and Justify		I can identify, and analyze collected evidence (observations, readings, models, data) to support claims about multiple cause and effect relationships with connections to other ideas in science and justify using scientific concepts.	I can identify, and analyze collected evidence (observations, readings, models, data) and use it to support claims about cause and effect relationships.	I can identify and analyze collected evidence (observations, readings, models, data) about cause and effect relationships.