



Indiana Department of Education

Grade 3 Science Content Connectors



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Third Grade Science Standards

Science and Engineering Process Standards (SEPS)		Content Connector
SEPS.1 Posing questions (for science) and defining problems (for engineering)	A practice of science is posing and refining questions that lead to descriptions and explanations of how the natural and designed world(s) work and these questions can be scientifically tested. Engineering questions clarify problems to determine criteria for possible solutions and identify constraints to solve problems about the designed world.	A practice of science is posing and refining questions that lead to descriptions and explanations of how the natural and designed world(s) work and these questions can be scientifically tested. Engineering questions clarify problems to determine criteria for possible solutions and identify constraints to solve problems about the designed world.



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<p>SEPS.2 Developing and using models and tools</p>	<p>A practice of both science and engineering is to use and construct conceptual models that illustrate ideas and explanations. Models are used to develop questions, predictions and explanations; analyze and identify flaws in systems; build and revise scientific explanations and proposed engineered systems; and communicate ideas. Measurements and observations are used to revise and improve models and designs. Models include, but are not limited to: diagrams, drawings, physical replicas, mathematical representations, analogies, and other technological models.</p> <p>Another practice of both science and engineering is to identify and correctly use tools to construct, obtain, and evaluate questions and problems. Utilize appropriate tools while identifying their limitations. Tools include, but are not limited to: pencil and paper, models, ruler, a protractor,</p>	<p>A practice of both science and engineering is to use and construct conceptual models that illustrate ideas and explanations. Models are used to develop questions, predictions and explanations; analyze and identify flaws in systems; build and revise scientific explanations and proposed engineered systems; and communicate ideas. Measurements and observations are used to revise and improve models and designs. Models include, but are not limited to: diagrams, drawings, physical replicas, mathematical representations, analogies, and other technological models.</p> <p>Another practice of both science and engineering is to identify and correctly use tools to construct, obtain, and evaluate questions and problems. Utilize appropriate tools while identifying their limitations. Tools include, but are not limited to: pencil and paper, models, ruler, a protractor,</p>
		<p>a calculator, laboratory equipment, safety gear, a spreadsheet, experiment data collection software, and other technological tools.</p>



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<p>SEPS.3 Constructing and performing investigations</p>	<p>Scientists and engineers are constructing and performing investigations in the field or laboratory, working collaboratively as well as individually. Researching analogous problems in order to gain insight into possible solutions allows them to make conjectures about the form and meaning of the solution. A plan to a solution pathway is developed prior to constructing and performing investigations. Constructing investigations systematically encompasses identified variables and parameters generating quality data. While performing, scientists and engineers monitor and record progress. After performing, they evaluate to make changes to modify and repeat the investigation if necessary.</p>	<p>Scientists and engineers are constructing and performing investigations in the field or laboratory, working collaboratively as well as individually. Researching analogous problems in order to gain insight into possible solutions allows them to make conjectures about the form and meaning of the solution. A plan to a solution pathway is developed prior to constructing and performing investigations. Constructing investigations systematically encompasses identified variables and parameters generating quality data. While performing, scientists and engineers monitor and record progress. After performing, they evaluate to make changes to modify and repeat the investigation if necessary.</p>
<p>SEPS.4 Analyzing and interpreting data</p>	<p>Investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists and engineers use a range of tools to identify the significant features in the data. They identify sources of error in the investigations and calculate the degree of certainty in the results. Advances in science and engineering makes analysis of proposed solutions more efficient and effective. They analyze their results by continually asking themselves questions; possible questions may be, but are not limited to: "Does this make sense?" "Could my results be duplicated?" and/or "Does the design solve the problem with the given constraints?"</p>	<p>Investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists and engineers use a range of tools to identify the significant features in the data. They identify sources of error in the investigations and calculate the degree of certainty in the results. Advances in science and engineering makes analysis of proposed solutions more efficient and effective. They analyze their results by continually asking themselves questions; possible questions may be, but are not limited to: "Does this make sense?" "Could my results be duplicated?" and/or "Does the design solve the problem with the given constraints?"</p>



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<p>SEPS.5 Using mathematics and computational thinking</p>	<p>In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing,</p>	<p>In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing,</p>
	<p>expressing, and applying quantitative relationships. Mathematical and computational approaches enable scientists and engineers to predict the behavior of systems and test the validity of such predictions. Scientists and engineers understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	<p>expressing, and applying quantitative relationships. Mathematical and computational approaches enable scientists and engineers to predict the behavior of systems and test the validity of such predictions. Scientists and engineers understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>
<p>SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)</p>	<p>Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.</p>	<p>Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.</p>



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SEPS.7 Engaging in argument from evidence	Scientists and engineers use reasoning and argument based on evidence to identify the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation, the process by which evidence-based conclusions and solutions are reached, to listen to, compare, and evaluate competing ideas and methods based on merits. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims.	Scientists and engineers use reasoning and argument based on evidence to identify the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation, the process by which evidence-based conclusions and solutions are reached, to listen to, compare, and evaluate competing ideas and methods based on merits. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims.



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	<p>Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.</p>	<p>Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.</p>
<p>SEPS.8 Obtaining, evaluating, and communicating information</p>	<p>Scientists and engineers need to be communicating clearly and articulating the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as, orally, in writing, and through extended discussions.</p>	<p>Scientists and engineers need to be communicating clearly and articulating the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as, orally, in writing, and through extended discussions.</p>



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Physical Science (PS)	Content Connector
<p>3.PS.1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</p>	<p>3.PS.1.a.1 Plan an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</p>
	<p>3.PS.1.a.2 Conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</p>
<p>3.PS.2 Identify types of simple machines and their uses. Investigate and build simple machines to understand how they are used.</p>	<p>3.PS.2.a.1 Identify types of simple machines and their uses.</p>
	<p>3.PS.2.a.2 Investigate and build simple machines to understand how they are used.</p>
<p>3.PS.3 Generate sound energy using a variety of materials and techniques, and recognize that it passes through solids, liquids, and gases (i.e. air).</p>	<p>3.PS.3.a.1 Generate sound energy using a variety of materials and techniques, and recognize that it passes through solids, liquids, and gases (i.e. air).</p>
<p>3.PS.4 Investigate and recognize properties of sound that include pitch, loudness (amplitude), and vibration as determined by the physical properties of the object making the sound.</p>	<p>3.PS.4.a.1 Investigate and recognize loudness (amplitude) of sound, as determined by the physical properties of the object making the sound.</p>
	<p>3.PS.4.a.2 Investigate and recognize properties of sound including pitch and vibration, as determined by the physical properties of the object making the sound.</p>



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Earth and Space Science (ESS)	Content Connector
<p>3.ESS.1 Obtain and combine information to determine seasonal weather patterns across the different regions of the United States.</p>	<p>3.ESS.1.a.1 Obtain information to determine seasonal weather patterns across the different regions of the United States.</p>
	<p>3.ESS.1.a.2 Combine information to determine seasonal weather patterns across the different regions of the United States.</p>
<p>3.ESS.2 Develop solutions that could be implemented to reduce the impact of weather related hazards.</p>	<p>3.ESS.2.a.1 Develop solutions that could be implemented to reduce the impact of weather related hazards.</p>
<p>3.ESS.3 Observe the detailed characteristics of rocks and minerals. Identify and classify rocks as being composed of different combinations of minerals.</p>	<p>3.ESS.3.a.1 Observe the detailed characteristics of rocks and minerals.</p>
	<p>3.ESS.3.a.2 Identify and classify rocks as being composed of different combinations of minerals.</p>
<p>3.ESS.4 Determine how fossils are formed, discovered, layered over time, and used to provide evidence of the organisms and the environments in which they lived long ago.</p>	<p>3.ESS.4.a.1 Determine how fossils are formed and layered over time.</p>
	<p>3.ESS.4.a.2 Determine how fossils are discovered and used to provide evidence of the organisms and the environments in which they lived long ago.</p>



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Life Science (LS)	Content Connector
<p>3.LS.1 Analyze evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.</p>	<p>3.LS.1.a.1 Analyze evidence that plants and animals have traits inherited from parents.</p>
	<p>3.LS.1.a.2 Analyze evidence that variation of traits exists in a group of similar organisms.</p>
<p>3.LS.2 Plan and conduct an investigation to determine the basic needs of plants to grow, develop, and reproduce.</p>	<p>3.LS.2.a.1 Plan an investigation to determine the basic needs of plants to grow, develop, and reproduce.</p>
	<p>3.LS.2.a.2 Conduct an investigation to determine the basic needs of plants to grow, develop, and reproduce.</p>
<p>3.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>	<p>3.LS.3.a.1 Construct an argument that plants have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>
	<p>3.SL.3.a.2 Construct an argument that animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>
<p>3.LS.4 Construct an argument that some animals form groups that help members survive.</p>	<p>3.LS.4.a.1 Construct an argument that some animals form groups that help members survive.</p>



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Engineering (E)	Content Connector
<p>3-5.E.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost.</p>	<p>3-5.E.1.a.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost.</p>
<p>3-5.E.2 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>	<p>3-5.E.2.a.1 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p>
<p>3-5.E.3 Construct and perform fair investigations in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>	<p>3-5.E.3.a.1 Construct and perform fair investigations in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>