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LONG BEACH ISLAND CONSOLIDATED SCHOOL DISTRICT SCIENCE CURRICULUM	
Content Area: Science	
Course Title: Elementary	Grade Level: K
Unit 1: Weather and Climate	September, October, November, December
Unit 2: Motion and Stability: Forces and Interactions	January, February, March
Unit 3: Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment	April, May, June
Unit 4: Engineering and Design	Ongoing

2015 Long Beach Island Consolidated School District Science Curriculum

Grade K

Unit: Weather and Climate

How does the Sun affect weather on Earth?
 In what ways does weather affect our daily lives?
 When might you observe water disappearing (evaporating) or collecting (condensing)?

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Kindergarten performance expectations include PS2, PS3, LS1, ESS2, ESS3, and ETS1 Disciplinary Core Ideas from the NRC Framework. Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The [Grades k -2 Storyline](#) provides a summary of the understandings that students developed by the end of 2nd grade.

#	STUDENT LEARNING OBJECTIVES (SLOs)	Corresponding PEs and DCIs
1	Make observations to determine the effect of sunlight on Earth’s surface. <i>[Clarification Statement: Examples of Earth’s surface could include sand, soil, rocks, and water.] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]</i>	K-PS3-1
2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.* <i>[Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]</i>	K-PS3-2

3	<p>Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]</p>	K-ESS2-1
4	<p>Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* [Clarification Statement: Emphasis is on local forms of severe weather.]</p>	K-ESS3-2

The SLOs were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center;">Science and Engineering Practices</p> <p>Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the designed world. (K-ESS3-2) <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p>	<p style="text-align: center;">Disciplinary Core Ideas</p> <p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none"> Sunlight warms Earth’s surface. (K-PS3-1),(K-PS3-2) <p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2) <p>ETS1.A: Defining and Delimiting an Engineering Problem</p>	<p style="text-align: center;">Crosscutting Concepts</p> <p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1) <p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2),(K-ESS3-2) <p>-----</p> <p style="text-align: center;"><i>Connections to Engineering, Technology, and Applications of Science</i></p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> People encounter questions about the natural world every day. (K-ESS3-2) <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p>

<ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) <p>-----</p> <p>Connections to Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Scientists use different ways to study the world. (K-PS3-1) <p>Science Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (K-ESS2-1) 	<ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (secondary to K-ESS3-2) 	<ul style="list-style-type: none"> People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)
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<p>Connections to other DCIs in kindergarten: K.ETS1.A (K-PS3-2),(K-ESS3-2); K.ETS1.B (K-PS3-2)</p>
<p>Articulation of DCIs across grade-levels: 1.PS4.B (K-PS3-1),(K-PS3-2); 2.ESS1.C (K-ESS3-2); 2.ESS2.A (K-ESS2-1); 2.ETS1.B (K-PS3-2); 3.ESS2.D (K-ESS2-1),(K-PS3-1); 3.ESS3.B (K-ESS3-2); 4.ESS2.A (K-ESS2-1); 4.ESS2.E (K-ESS2-2); 4.ESS3.B (K-ESS3-2); 4.ETS1.A (K-PS3-2)</p>
<p>21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the</p>

designed world, as they relate to the individual, global society and the universe.

Common Core State Standards Connections:

ELA/Literacy -

- RI.K.1** With prompting and support, ask and answer questions about key details in a text. (K-ESS3- 2)
- W.K.7** Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2),(K-ESS2-1)
- SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)

Mathematics -

- MP.2** Reason abstractly and quantitatively. (K-ESS2-1)
- MP.4** Model with mathematics. (K-ESS2-1),(K-ESS3-2)
- K.CC** Counting and Cardinality (K-ESS3-2)
- K.CC.A** Know number names and the count sequence. (K-ESS2-1)
- K.MD.A.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)
- K.MD.A.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K- PS3-1),(K-PS3-2)
- K.MD.B.3** Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

Grade Level: K	Title of Unit: Weather and Climate
Stage 1 - Desired Results	
<p>Understandings:</p> <p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. Patterns in the natural world can be observed, used to describe, phenomena, and used as evidence. 2. Events have causes that generate observable patterns. 	<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. What predictable, observable patterns occur as a result of the effects of rain, sun, wind, and clouds? 2. What is the purpose of weather forecasting?
<p>Knowledge:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● sunlight warms Earth’s surface ● weather is the combination of sunlight, wind, snow or rain and temperature in a particular time. ● people measure weather conditions to describe and record the weather and to notice patterns over time.. ● some kinds of severe weather are more likely than others in a given region. ● weather Scientists forecast severe weather so that the communities can prepare for and respond to these events. 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the designed world. (K-ESS3-2) ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) ● Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) ● Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) ● use different ways to study the world. (K-PS3-1) ● Look for patterns and order when making observations about the world. (K-ESS2-1)
Stage 2- Assessment Evidence	
<p>Performance Tasks and other evidence:</p> <ul style="list-style-type: none"> ● Summative Assessments <ul style="list-style-type: none"> ○ RST- Research Simulation Task ○ Associated Unit tests, quizzes ○ labs and engineering based projects 	

- Formative Assessments
 - Graphic Organizers & Guided Note Taking
 - Directed Reading
 - Cooperative Group Learning
 - Homework
 - Journal Entries

Stage 3 – Learning Plan

Digital information and technology integration: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

- <http://thehappyscientist.com/next-generation-science-standards-grade-k>
- <http://www.sciencecourseware.org/eec/GlobalWarming/Tutorials/Seasons/> (seasons)
- <http://spaceplace.nasa.gov/science-fair/en/> (science method fair ideas)
- http://pbs.panda-prod.cdn.s3.amazonaws.com/media/assets/wgbh/ess05/ess05_int_seasonsgame/index.html (seasons)
- <http://www.hookedonscience.org/nextgenerationsciencestandards.html>
- <http://www.ssec.si.edu/games/students>
- <http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>
- <http://moodle.tbaisd.org/course/view.php?id=1021>
- <https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf>
- <http://www.exploringnature.org/db/detail.php?dbID=93&detID=3738>
- <http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten>
- <http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade>
- <http://climatekids.nasa.gov/menu/big-questions/>

Modifications: (ELLs, Special Education, Gifted and Talented)

- * Follow all IEP modifications/504 plan
- * Teacher tutoring
- * Peer tutoring
- * Cooperative learning groups
- * Modified assignments
- * Differentiated instruction

Presentation accommodations allow a student to:

- * Listen to audio recordings instead of reading text
- * Learn content from audiobooks, movies, videos and digital media instead of reading print versions
- * Work with fewer items per page or line and/or materials in a larger print size
- * Have a designated reader
- * Hear instructions orally
- * Record a lesson, instead of taking notes
- * Have another student share class notes with him
- * Be given an outline of a lesson
- * Use visual presentations of verbal material, such as word webs and visual organizers
- * Be given a written list of instructions

Response accommodations allow a student to:

- * Give responses in a form (oral or written) that's easier for him
- * Dictate answers to a scribe
- * Capture responses on an audio recorder
- * Use a word processor to type notes or give responses in class
- * Use a calculator or table of "math facts"

Setting accommodations allow a student to:

- * Work or take a test in a different setting, such as a quiet room with few distractions
- * Sit where he learns best (for example, near the teacher)
- * Use special lighting or acoustics
- * Take a test in small group setting
- * Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- * Take more time to complete a task or a test
- * Have extra time to process oral information and directions
- * Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- * Take more time to complete a project
- * Take a test in several timed sessions or over several days
- * Take sections of a test in a different order
- * Take a test at a specific time of day

Organization skills accommodations allow a student to:

- * Mark texts with a highlighter

- * Have help coordinating assignments in a book or planner
- * Receive study skills instruction

Assignment modifications allow a student to:

- * Complete fewer or different homework problems than peers
- * Write shorter papers
- * Answer fewer or different test questions
- * Create alternate projects or assignments

Curriculum modifications allow a student to:

- * Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- * Get graded or assessed using a different standard than the one for classmates

2015 Long Beach Island Consolidated School District Science Curriculum

Grade K

Unit: Forces and Interactions: Pushes and Pulls

How does friction affect movement?
What kinds of forces act by touching?
What kinds of forces act without touching?
How can a force act upon an object without touching it?

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Kindergarten performance expectations include PS2, PS3, LS1, ESS2, ESS3, and ETS1 Disciplinary Core Ideas from the NRC Framework. Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The [Grades k -2 Storyline](#) provides a summary of the understandings that students developed by the end of 2nd grade.

#	STUDENT LEARNING OBJECTIVES (SLOs)	Corresponding PEs and DCIs
1	<p>Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.]</p>	K-PS2-1

2	<p>Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.* [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.]</p>	K-PS2-
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The SLOs were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

<p style="text-align: center;">Science and Engineering Practices</p> <p style="text-align: center;">Planning and Carrying Out Investigations</p> <p>Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1) <p>Analyzing and Interpreting Data</p> <p>Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2) <p style="text-align: center;">-----</p> <p style="text-align: center;">Connections to the Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Scientists use different ways to study the world. (K-PS2-1) 	<p style="text-align: center;">Disciplinary Core Ideas</p> <p>PS2.A: Forces and Motion</p> <ul style="list-style-type: none"> Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2) Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2) <p>PS2.B: Types of Interactions</p> <ul style="list-style-type: none"> When objects touch or collide, they push on one another and can change motion. (K-PS2-1) <p>PS3.C: Relationship Between Energy and Forces</p> <ul style="list-style-type: none"> A bigger push or pull makes things speed up or slow down more quickly. (<i>secondary to K-PS2-1</i>) <p>ETS1.A: Defining Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (<i>secondary to K-PS2-2</i>) 	<p style="text-align: center;">Crosscutting Concepts</p> <p>Cause and Effect</p> <ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2)
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Connections to other DCIs in kindergarten:
K.ETS1.A (K-PS2-2); K.ETS1.B (K-PS2-2)

Articulation of DCIs across grade-levels:

2.ETS1.B (K-PS2-2); **3.PS2.A** (K-PS2-1),(K-PS2-2); **3.PS2.B** (K-PS2-1); **4.PS3.A** (K-PS2-2); **4.EST1.A** (K-PS2-2)

21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

Common Core State Standards Connections:

ELA/Literacy -

- RI.K.1** With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)
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Mathematics -

- MP.2** Reason abstractly and quantitatively. (K-PS2-1)
- K.MD.A.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)
- K.MD.A.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-PS2-1)

Grade Level: K	Title of Unit: Forces and Interactions: Pushes and Pulls
Stage 1 - Desired Results	
<p>Understandings:</p> <p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. Pushes and pulls can have different strengths and directions 2. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. 3. When objects touch or collide, they push on one another and can change motion. 4. A bigger push or pull makes things speed up or slow down more quickly. 5. A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. 	<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. How does friction affect movement? 2. What kinds of forces act by touching? 3. What kinds of forces act without touching? 4. How can a force act upon an object without touching it?
<p>Knowledge:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Simple tests can be designed to gather evidence to support or refute student ideas about causes ● Scientists use different ways to study the world. 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● With guidance, plan and conduct an investigation in collaboration with peers. ● Analyze data from tests of an object or tool to determine if it works as intended ● Use different ways to study the world
Stage 2- Assessment Evidence	
<p>Performance Tasks and other evidence:</p> <ul style="list-style-type: none"> ● Summative Assessments <ul style="list-style-type: none"> ○ RST- Research Simulation Task ○ Associated Unit tests, quizzes ○ labs and engineering based projects ● Formative Assessments <ul style="list-style-type: none"> ○ Graphic Organizers & Guided Note Taking ○ Directed Reading ○ Cooperative Group Learning ○ Homework 	

Stage 3 – Learning Plan

Digital information and technology integration: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

- http://www.sciencebuddies.org/science-activities?gclid=CjwKEAjwiZitBRCy0pb3rIbG9XwSJACmuvvziKHHQaFENLZpQDpWc9hEI0M1iXg3QHGKiIQ2G8W0FhoCRbTw_wcB
- http://www.goorulearning.org/?gclid=CjwKEAjwiZitBRCy0pb3rIbG9XwSJACmuvvzqgodQ5WRpB9ve2OFICWiwZY72fRgEI_1j4TEIfqPChoCeuHw_wcB#home
- <http://thehappyscientist.com/next-generation-science-standards-grade-k>
- http://www.bbc.co.uk/bitesize/ks3/science/energy_electricity_forces/forces/activity/ (forces)
- <http://www.hookedonscience.org/nextgenerationsciencestandards.html>
- <http://www.ssec.si.edu/games/students>
- <http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>
- <http://moodle.tbaisd.org/course/view.php?id=1021>
- <https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf>
- <http://www.mccracken.kyschools.us/Downloads/PUSHES%20and%20PULLS%20-K.pdf>
- <http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten>
- <http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade>
- <http://climatekids.nasa.gov/menu/big-questions/>

Modifications: (ELLs, Special Education, Gifted and Talented)

- * Follow all IEP modifications/504 plan
- * Teacher tutoring
- * Peer tutoring
- * Cooperative learning groups
- * Modified assignments
- * Differentiated instruction

Presentation accommodations allow a student to:

- * Listen to audio recordings instead of reading text
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- * Hear instructions orally
- * Record a lesson, instead of taking notes
- * Have another student share class notes with him
- * Be given an outline of a lesson
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- * Be given a written list of instructions

Response accommodations allow a student to:

- * Give responses in a form (oral or written) that's easier for him
- * Dictate answers to a scribe
- * Capture responses on an audio recorder
- * Use a word processor to type notes or give responses in class
- * Use a calculator or table of "math facts"

Setting accommodations allow a student to:

- * Work or take a test in a different setting, such as a quiet room with few distractions
- * Sit where he learns best (for example, near the teacher)
- * Use special lighting or acoustics
- * Take a test in small group setting
- * Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- * Take more time to complete a task or a test
- * Have extra time to process oral information and directions
- * Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- * Take more time to complete a project
- * Take a test in several timed sessions or over several days
- * Take sections of a test in a different order
- * Take a test at a specific time of day

Organization skills accommodations allow a student to:

- * **Mark texts with a highlighter**
- * **Have help coordinating assignments in a book or planner**
- * **Receive study skills instruction**

Assignment modifications allow a student to:

- * **Complete fewer or different homework problems than peers**
- * **Write shorter papers**
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Curriculum modifications allow a student to:

- * **Learn different material (such as continuing to work on multiplication while classmates move on to fractions)**
- * **Get graded or assessed using a different standard than the one for classmates**

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Grade K

Unit: Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

What do plants and animals need to survive?
What impact do animals and humans have on the environment?
How are the needs of plants and animals alike or different?
How can humans reduce the impact on the land, water and air?

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Kindergarten performance expectations include PS2, PS3, LS1, ESS2, ESS3, and ETS1 Disciplinary Core Ideas from the NRC Framework. Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The [Grades k -2 Storyline](#) provides a summary of the understandings that students developed by the end of 2nd grade.

#	STUDENT LEARNING OBJECTIVES (SLOs)	Corresponding PEs and DCIs
1	Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]	K-LS1-1

2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]	K-ESS2-2
3	Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]	K-ESS3-1
4	Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.* [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]	K-ESS3-3

The SLOs were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Use a model to represent relationships in the natural world. (K-ESS3-1) <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) <p>Engaging in Argument from Evidence</p>	<p>LS1.C: Organization for Matter and Energy Flow in Organisms</p> <ul style="list-style-type: none"> All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1) <p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> Plants and animals can change their environment. (K-ESS2-2) <p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1) <p>ESS3.C: Human Impacts on Earth Systems</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) <p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-ESS3-3) <p>Systems and System Models</p> <ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. (K-ESS2-2),(K-ESS3-1)

<p>Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).</p> <ul style="list-style-type: none"> Construct an argument with evidence to support a claim. (K-ESS2-2) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) <p>-----</p> <p style="text-align: center;"><i>Connections to Nature of Science</i></p> <p>Scientific Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (K-LS1-1) 	<ul style="list-style-type: none"> Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3) <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3) 	
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<p><i>Connections to other DCIs in kindergarten:</i> K.ETS1.A(K-ESS3-3)</p>
<p><i>Articulation of DCIs across grade-levels:</i> 1.LS1.A (K-LS1-1),(K-ESS3-1); 2.LS2.A (K-LS1-1); 2.ETS1.B (K-ESS3-3); 3.LS2.C (K-LS1-1); 3.LS4.B (K-LS1-1);4.ESS2.E (K-ESS2-2); 4.ESS3.A (K-ESS3-3); 5.LS1.C (K-LS1-1); 5.LS2.A (K-LS1-1),(K-ESS3-1); 5.ESS2.A (K-ESS2-2),(K-ESS3-1); 5.ESS3.C (K-ESS3-3)</p>
<p>21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.</p>
<p><i>Common Core State Standards Connections:</i> <i>ELA/Literacy -</i> R.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)</p>

W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)

W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2),(K-ESS3-3)

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)

SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)

Mathematics -

MP.2 Reason abstractly and quantitatively. (K-ESS3-1)

MP.4 Model with mathematics. (K-ESS3-1)

K.CC Counting and Cardinality (K-ESS3-1)

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-LS1-1)

Grade Level: K	Title of Unit: Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
Stage 1 - Desired Results	
<p>Understandings:</p> <p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. 2. Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do 3. Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. 4. Plants and animals can change their environment 5. Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. 	<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. What do plants and animals need to survive? 2. What impact do animals and humans have on the environment? 3. How are the needs of plants and animals alike or different? 4. How can humans reduce the impact on the land, water and air?
<p>Knowledge:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Patterns in the natural and human designed world can be observed and used as evidence ● Events have causes that generate observable patterns. ● Systems in the natural and designed world have parts that work together. 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Construct an argument with evidence to support a claim ● Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas ● Scientists look for patterns and order when making observations about the world
Stage 2- Assessment Evidence	
<p>Performance Tasks and other evidence:</p> <ul style="list-style-type: none"> ● Summative Assessments <ul style="list-style-type: none"> ○ RST- Research Simulation Task 	

- o Associated Unit tests, quizzes
- o labs and engineering based projects
- Formative Assessments
 - o Graphic Organizers & Guided Note Taking
 - o Directed Reading
 - o Cooperative Group Learning
 - o Homework
 - o Journal Entries

Stage 3 – Learning Plan

Digital information and technology integration: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

- <http://spaceplace.nasa.gov/science-fair/en/> (science method fair ideas)
- <http://thehappyscientist.com/next-generation-science-standards-grade-k>
- <http://www.hookedonscience.org/nextgenerationsciencestandards.html>
- <http://www.ssec.si.edu/games/students>
- <http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>
- <http://moodle.tbaisd.org/course/view.php?id=1021>
- <https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf>
- <http://www.schoolofdragons.com/hiccups-science-workshop/ngss/kindergarten>
- <http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade>
- <http://climatekids.nasa.gov/menu/big-questions/>

Modifications: (ELLs, Special Education, Gifted and Talented)

- * Follow all IEP modifications/504 plan
- * Teacher tutoring
- * Peer tutoring
- * Cooperative learning groups
- * Modified assignments
- * Differentiated instruction

Presentation accommodations allow a student to:

- * Listen to audio recordings instead of reading text
- * Learn content from audiobooks, movies, videos and digital media instead of reading print versions
- * Work with fewer items per page or line and/or materials in a larger print size
- * Have a designated reader
- * Hear instructions orally
- * Record a lesson, instead of taking notes
- * Have another student share class notes with him/her
- * Be given an outline of a lesson
- * Use visual presentations of verbal material, such as word webs and visual organizers
- * Be given a written list of instructions

Response accommodations allow a student to:

- * Give responses in a form (oral or written) that's easier for him
- * Dictate answers to a scribe
- * Capture responses on an audio recorder
- * Use a word processor to type notes or give responses in class
- * Use a calculator or table of "math facts"

Setting accommodations allow a student to:

- * Work or take a test in a different setting, such as a quiet room with few distractions
- * Sit where he/she learns best (for example, near the teacher)
- * Use special lighting or acoustics
- * Take a test in small group setting
- * Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- * Take more time to complete a task or a test
- * Have extra time to process oral information and directions
- * Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- * Take more time to complete a project
- * Take a test in several timed sessions or over several days
- * Take sections of a test in a different order
- * Take a test at a specific time of day

Organization skills accommodations allow a student to:

- * Mark texts with a highlighter

- * Have help coordinating assignments in a book or planner
- * Receive study skills instruction

Assignment modifications allow a student to:

- * Complete fewer or different homework problems than peers
- * Write shorter papers
- * Answer fewer or different test questions
- * Create alternate projects or assignments

Curriculum modifications allow a student to:

- * Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- * Get graded or assessed using a different standard than the one for classmates

2015 Long Beach Island Consolidated School District Science Curriculum

Grade K

Unit: Engineering and Design

How are asking questions, gathering information, and making observation helpful when thinking about problems?

How does sketching or creating a model to illustrate its shape help solve a given problem?

How does testing a model determine its strengths and weaknesses in solving a given problem?

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Kindergarten performance expectations include PS2, PS3, LS1, ESS2, ESS3, and ETS1 Disciplinary Core Ideas from the NRC Framework. Students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

The [Grades k -2 Storyline](#) provides a summary of the understandings that students developed by the end of 2nd grade.

#	STUDENT LEARNING OBJECTIVES (SLOs)	Corresponding PEs and DCIs
1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	K-2-ETS-1-1
2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	K-2-ETS1-2

3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	K-2-ETS1-3
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The SLOs were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) <p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3) 	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2) <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3) 	<p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:

Kindergarten: K-PS2-2, K-ESS3-2

Connections to K-2-ETS1.B: Developing Possible Solutions to Problems include:

Kindergarten: K-ESS3-3

Articulation of DCIs across grade-levels:

3-5.ETS1.A (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3); 3-5.ETS1.B (K-2-ETS1-2),(K-2-ETS1-3); 3-5.ETS1.C (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3)

21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

Common Core State Standards Connections:

ELA/Literacy —

RI.2.1 Ask and answer such questions as *who, what, where, when, why, and how* to demonstrate understanding of key details in a text. (K-2-ETS1-1)

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

Mathematics —

MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3)

MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3)

MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3)

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3)

Grade Level: K	Title of Unit: Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
Stage 1 - Desired Results	
<p>Understandings:</p> <p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. The shape and stability of structures of natural and designed objects are related to their function(s). 	<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. How does sketching or creating a model to illustrate its shape help solve a given problem? 2. How does testing a model determine its strengths and weaknesses in solving a given problem? 3. How are asking questions, gathering information, and making observation helpful when thinking about problems?
<p>Knowledge:</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● how to solve a problem through engineering ● to use questioning, observing, and gathering information to help solve problems ● a clear understanding of the problem is the first step ● designs can be conveyed through sketches, drawings, or physical models and will aid in communicating with others ● comparing and testing designs is a useful way to determine the best solution to a problem 	<p>Skills:</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the natural and/or designed world(s). ● Define a simple problem that can be solved through the development of a new or improved object or tool. ● Develop a simple model based on evidence to represent a proposed object or tool. ● Analyze data from tests of an object or tool to determine if it works as intended.

Stage 2- Assessment Evidence

Performance Tasks and other evidence:

- Summative Assessments
 - RST- Research Simulation Task
 - Associated Unit tests, quizzes
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 - Journal Entries

Stage 3 – Learning Plan

Digital information and technology integration: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

- http://betterlesson.com/common_core/browse/2105/ngss-k-2-ets1-1-ask-questions-make-observations-and-gather-information-about-a-situation-people-want-to-change-to-define-a-simpl
- http://betterlesson.com/next_gen_science/browse/2107/ngss-k-2-ets1-3-analyze-data-from-tests-of-two-objects-designed-to-solve-the-same-problem-to-compare-the-strengths-and-weaknesse
- <http://www.asee.org/documents/conferences/k12/2011/07/17-Ready-for-Primary-Time.pdf>
- <http://teachers.egfi-k12.org/>
- <http://www.maryville-schools.org/site/Default.aspx?PageID=4713>
- <https://www.teachengineering.org/>
- <http://app15c.aws.livebinders.com/play/play?id=137603>
- <http://www.hookedonscience.org/nextgenerationsciencestandards.html>
- <http://www.propertiesofmatter.si.edu/>
- <http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/>
- <http://moodle.tbaisd.org/course/view.php?id=1021>
- <https://www.sciencea-z.com/scienceweb/nationalstandards.do>
- <http://www.science4us.com/k-2-science-lesson-plans/>

- <http://www.calacademy.org/educators/science-lesson-plans-for-kindergarten-and-1st-grade>
- <http://climatekids.nasa.gov/science-standards/>

Modifications: (ELLs, Special Education, Gifted and Talented)

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- * Teacher tutoring
- * Peer tutoring
- * Cooperative learning groups
- * Modified assignments
- * Differentiated instruction

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- * Work or take a test in a different setting, such as a quiet room with few distractions
- * Sit where he learns best (for example, near the teacher)
- * Use special lighting or acoustics
- * Take a test in small group setting
- * Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)

Timing accommodations allow a student to:

- * Take more time to complete a task or a test
- * Have extra time to process oral information and directions
- * Take frequent breaks, such as after completing a task

Scheduling accommodations allow a student to:

- * Take more time to complete a project
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- * Take sections of a test in a different order
- * Take a test at a specific time of day

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- * Mark texts with a highlighter
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- * Complete fewer or different homework problems than peers
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- * Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- * Get graded or assessed using a different standard than the one for classmates