

Grade 2 Science Course Overview

Content Area: **Science**
Course(s): **SCIENCE-2**
Time Period:
Length: **Year**
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Cover

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Science Grade 2

Course Number: 4102

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Course Overview

The K-12 science curriculum in all schools in New Jersey must be aligned with the Core Curriculum Content Standards. These standards focus on the processes of science as well as content in three major areas: earth, life and physical science. Each of these areas of science needs to be addressed at every grade level in order to foster a strong science knowledge base for students as well as an appreciation and understanding of how science works to help people solve problems.

One of the strong points of the East Brunswick Schools' science curriculum is the emphasis on hands-on investigations of the natural world. Our science program emphasizes doing science, not reading about it in a book. The second grade science curriculum consists of three modules that were selected from two nationally-recognized programs – *Full Option Science System (FOSS)* and *Science and Technology for Children (STC)*. The life science unit is *The Life Cycle of Butterflies (STC)* which examines the observable changes in an animal as it moves through its life. The physical science units are *Balance and Motion (FOSS)* and *Solids and Liquids (FOSS)* which allows students to study elementary ideas in both physics and chemistry.

Standards

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
SCI.2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
SCI.2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.
SCI.2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
SCI.2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
SCI.2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
SCI.2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
SCI.3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
SCI.3-PS2-2	Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
SCI.K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
SCI.K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an

SCI.K-2-ETS1-1	object helps it function as needed to solve a given problem.
TECH.8.1.2	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.
TECH.8.1.2.A.4	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e., games, museums).

Grade 2 Science Planning Guide

Grade 2 Science Planning Guide			
Instructional Objectives	Instructional Activities/ Methods/ Assignments	Materials / Resources	Formative and Summative Assessment Strategies
Balance and Motion Investigation 1 Lesson 1 Day 1: Students will be able to discover numerous ways to balance a tagboard (two-dimensional) shape (crayfish). Communicate observations of balanced objects, using precise vocabulary. Day 2 :	Balance and Motion Investigation 1 Lesson 1 Day 1: <ul style="list-style-type: none"> • Introduce the crayfish (a freshwater shellfish). Tell students it can do balancing tricks. Balance on finger. • Distribute crayfish—students practice balancing on their finger on its side, tail, and nose. • Introduce clothespins as a useful way for getting crayfish to balance in different positions. • Provide direction: Explain that in order to get the crayfish to balance on its side, you need to move the clothespins to new positions. 	Balance and Motion Investigation 1 Lesson 1 Unit letter for parents For each student in ziplock bag: 1 Tagboard Crayfish, 2 clothespins Word Bank Chart “What We Learned” Chart	Balance and Motion Investigation 1 Lesson 1 Formative: Anecdotal notes, class discussion, teacher observation Summative: End of Unit assessment

<p>Communicate observations of balanced objects, using precise vocabulary.</p> <p>Students will be able to discover numerous ways to balance a tagboard (two-dimensional) shape (crayfish).</p>	<p>Day 2:</p> <ul style="list-style-type: none"> • Review balancing activity from previous lesson. • Discuss Balance: Ask: What did you do to get the crayfish to balance on its nose? Does it matter where you put the clothespins? • Introduce the term “counterweight” when you put a weight, like a clothespin, on the crayfish to make it balance on its nose • Challenge the students to use counterweights to find new ways to balance their crayfish. • Discussion questions • Add to “What We Learned” and “Word Bank” charts 	<p>Unit letter for parents</p> <p>For each student in ziplock bag: 1 Tagboard Crayfish, 2 clothespins</p> <p>Word Bank Chart</p> <p>“What We Learned” Chart</p>	<p>Exit Slip Day 2</p> <p>Display crayfish with counterweights. Students will determine if it balances and explain why or why not</p>
<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>Day 1 and 2:</p> <p>Students will be able to explore the concepts of balance, counterbalance, counterweight, and stability by balancing tagboard shapes.</p> <p>Students will be able to discover that a stable position is one</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>Day 1:</p> <ul style="list-style-type: none"> • Review the term “stable position” from last lesson and model using the crayfish. • Introduce the new shapes: arch and triangle. Explain that today students will investigate the two shapes and find out how many ways they can balance them on a craft stick. Model for students. • Distribute materials. Students begin investigations. • Monitor progress and test/challenge student creations while visiting groups. Encourage students to continue investigating by using the following discussion questions: 	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>For each student in Ziplock bag: 1 tagboard triangle, 1 tagboard arch, 2 clothespins, 1 craft stick</p> <p>Copies of Student Sheet No. 2 “Stable Positions”</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>Formative: Assessment sheet nos. 2 (1st time through without materials) and called “Assessment Checklist,” teacher observation, class discussion</p> <p>Summative: Er</p>

<p>that is steady (the object is not falling over).</p> <p>Students will be able to understand that counterweights should be placed low on an object in relation to the balance point.</p> <p>Students will be able to communicate observations and comparisons of balanced objects, using precise vocabulary.</p>	<ul style="list-style-type: none"> ○ How many ways can you make a stable position using only one clothespin for a counterweight? ○ Can you balance both objects at the same time? 	<p>1 Tagboard crayfish (for teacher to model with)</p> <p>Masking Tape</p> <p>Word Bank Chart</p> <p>“What We Learned” Chart</p>	Unit assessment
<p>Balance and Motion Investigation 1</p> <p>Lesson 2</p> <p>Day 1 and 2:</p> <p>Students will be able to explore the concepts of balance, counterbalance, counterweight, and stability by balancing tagboard shapes.</p> <p>Students will be able to discover that a stable position is one that is steady (the object is not falling over).</p> <p>Students will be able to understand that counterweights should</p>	<p>Balance and Motion Investigation 1</p> <p>Lesson 2</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review previous days lesson. • Based upon what was learned in the previous lesson, students will complete Stable Positions Sheet. Point out the small black rectangle which represents the end of the craft stick on which the shape is balanced. The part of the shape resting on the stick is the balance point. • Students work independently deciding if each picture is showing a stable position. • Have students work in partnerships to test their answers using their materials. • Regroup – Ask: How can you tell by looking at a picture if it is a stable system? • Add to “What We Learned” and “Word Bank” charts 	<p>Balance and Motion Investigation 1</p> <p>Lesson 2</p> <p>For each student in Ziplock bag: 1 tagboard triangle, 1 tagboard arch, 2 clothespins, 1 craft stick</p> <p>Copies of Student Sheet No. 2 “Stable Positions”</p> <p>1 Tagboard crayfish (for teacher to model</p>	<p>Balance and Motion Investigation 1</p> <p>Lesson 2</p> <p>Formative: Assessment sheet nos. 2(1st time through without materials) and called “Assessn Checklist,” teacher observation, class discussion</p> <p>Summative: End of Unit assessment</p>

<p>be placed low on an object in relation to the balance point.</p> <p>Students will be able to communicate observations and comparisons of balanced objects, using precise vocabulary.</p>		<p>with)</p> <p>Masking Tape</p> <p>Word Bank Chart</p> <p>“What We Learned” Chart</p>	
<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 1 & 2:</p> <p>Students will be able to find ways to balance a pencil on its point, in stable positions.</p> <p>Students will be able to discover that counterweights should be placed low on an object in relation to the balance point.</p> <p>Students will be able to understand that the position of an object can be described by relating its location to another object.</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 1:</p> <ul style="list-style-type: none"> • Review investigations with the triangle and the arch. Have students recall where they put the clothespins to make a stable system. • Hold up a copy of the tagboard hand and pencil picture. Point out the pencil point on the picture. Challenge students to position the picture on the end of a craft stick taped to their desk so that the picture balances on the pencil point. • While students are completing the investigation, remind them to test the stability of their system by giving the balanced picture a gentle push. • Return to rug for discussion – Review what the students did and where they placed the clothespin to produce a stable system. Ask discussion questions. • Exit Slip: Where did you put the clothespins to get a stable system? Students can draw or explain response. 	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>For each student: 1 Tagboard hand and pencil picture, 1 piece of aluminum wire (18 inches), 2 clothespins, 1 craft stick, and 1 pencil</p> <p>Masking Tape</p> <p>Word Bank Chart</p> <p>“What We Learned” Chart</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teac observation, Cl discussion</p> <p>Day 1 Exit Slip</p> <p>Summative: Er Unit Assessmer</p>

<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 1 & 2:</p> <p>Students will be able to find ways to balance a pencil on its point, in stable positions.</p> <p>Students will be able to discover that counterweights should be placed low on an object in relation to the balance point.</p> <p>Students will be able to understand that the position of an object can be described by relating its location to another object.</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Give the “Real-Pencil Challenge.” Hold up a piece of aluminum wire. Tell students that they will each get a piece of wire to try and balance a sharpened pencil on its point on the craft stick. The wire can be attached to the pencil, but it cannot be used to tie or bind the pencil to the stick • Students investigate with wire. • Share successes, return materials, and reflect on balancing as a class. • Read FOSS Science Story <i>Make It Balance!</i> • Add to “What We Learned” and “Word Bank” charts 	<p>FOSS Science Stories</p> <p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>For each student: 1 Tagboard hand and pencil picture, 1 piece of aluminum wire (18 inches), 2 clothespins, 1 craft stick, and 1 pencil</p> <p>Masking Tape</p> <p>Word Bank Chart</p> <p>“What We Learned” Chart</p> <p>FOSS Science Stories</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teacher observation, Class discussion</p> <p>Day 1 Exit Slip</p> <p>Summative: End of Unit Assessment</p>
<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p>

<p>Day 1 & 2</p> <p>Students will be able to understand that a mobile is a system of balanced beams and objects.</p>	<p>Day 1:</p> <ul style="list-style-type: none"> • Introduce the mobile. Discuss that mobiles have interesting shapes and pictures hanging from balanced rods. When the wind blows, the pieces move around. Show sample mobile. • Discuss building mobiles. Show students all the materials and how they will be used. • Have students work in small groups to construct mobiles. • Circulate and hand out mobile poster for guidance. • Before adding index card pieces, have students draw a picture on the cards for design. • Help students display finished mobiles on a clothesline. • Regroup and Ask: <ul style="list-style-type: none"> ○ What do you have to do to get a mobile to balance? ○ What kinds of things could you use besides picture to make a mobile? • Add to “What We Learned” and “Word Bank” charts 	<p>For each student: 3x5 index card, 1 jumbo straw, 1 half jumbo straw (mobile 2 only), 7 paper clips, 3 rubber bands</p> <p>For each pair of students: 1 pushpin, 1 small piece of cardboard</p> <p>For each group: 1 Zip bag, 4-liter, Student Sheet No. 3 or No. 4 (depending on which mobile is used).</p> <p><u>Mirette on the High Wire</u> by Emily Arnold McCully</p>	<p>Formative: Anecdotal Note Teacher observation, Cl: discussion</p> <p>Summative: Er Unit Assessmer</p>
<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p> <p>Day 1 & 2</p> <p>Students will be able to understand that a mobile is a system of balanced beams and objects.</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review previous day’s lesson. • Read the book <u>Mirette on the High Wire</u>. Stop at the part when Bellini, sitting in his room and admits he is afraid. Discuss Bellini’s difficulties. Talk about what we know about balance that could help him 	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p> <p>For each student: 3x5 index card, 1 jumbo straw, 1 half jumbo straw (mobile 2 only), 7 paper clips, 3 rubber bands</p>	<p>Balance and Motion</p> <p>Investigation 1</p> <p>Lesson 4</p> <p>Formative: Anecdotal Note Teacher observation, Cl: discussion</p>

<p>Balance and Motion</p> <p>Investigation 1 Assessment</p>	<p>feel more comfortable on the high wire.</p> <ul style="list-style-type: none"> • If extra time/ at another time: Have students write a letter to Bellini giving or blurb of advice on how to balance on the high wire –share. • Discuss advice for Bellini and connect what they have learned for balance 	<p>For each pair of students: 1 pushpin, 1 small piece of cardboard</p> <p>For each group: 1 Zip bag, 4-liter, Student Sheet No. 3 or No. 4 (depending on which mobile is used).</p> <p><u>Mirette on the High Wire</u> by Emily Arnold McCully</p>	<p>Summative: Er Unit Assessmer</p>
<p>Students will be able to demonstrate their understanding of counterweights, balance points, and stable positions to complete the end of investigation 1 assessment.</p>	<p>Balance and Motion</p> <p>Investigation 1 Assessment.</p> <ul style="list-style-type: none"> • Remind students of how much they have learned so far about balance and motion by referring to class anchor charts. • Explain to students that they will show off how much they know but completing investigation 1 assessment. • Introduce and explain directions for assessment. • Students will complete assessments at their own pace. • When all students have completed 	<p>Balance and Motion</p> <p>Investigation 1 Assessment</p> <p>Investigation 1 assessment for each student</p> <p>Crayfish, triangle, arch, and pencil tagboard</p> <p>real pencils, wire, tape, and clothespins</p>	<p>Balance and Motion</p> <p>Investigation 1 Assessment</p> <p>Summative: Investigation 1 assessment</p> <p>End of unit assessment</p>

	assessment, students can reinvestigate their favorite balance activities.		
Balance and Motion Investigation 2 Lesson 1 Days 1-3 Students will be able to build an effective spinner with given materials. Students will be able to discover different ways to produce rotational motion. Students will be able to understand that objects and systems that turn on a central axis exhibit rotational motion.	Balance and Motion Investigation 2 Lesson 1 Day 1: <ul style="list-style-type: none"> • Call students to rug and tell them they are now experts in balance and stability, so today they will move on to the subject of motion and build something that moves. • Ask students what they know about tops. Tell students that today they will build tops and use them to observe motion. • Show Zip Lock bag and describe each material inside. Tell students that their challenge is to use the materials to create a good top. • Have getters distribute Material bag (Zip Lock). Have students begin challenge once they receive materials. Circulate to make sure the disks are snug on the shafts. • After 10 Minutes – Stop and discuss. 	Balance and Motion Investigation 2 Lesson 1 For each student: 2 large plastic disks (red), 2 small plastic disks (yellow), 1 slim shaft, 1 paper clip, Student Sheet no. 5 called <i>Spinning Designs</i> 4 Drawing Tops Cardboard Disks Transparent tape	Balance and Motion Investigation 2 Lesson 1 Formative: Assessment Checklist, Teacher observation, Class discussion Day 2 Exit slip Summative: End of Unit Assessment

		Pens/ Chart Paper	
		FOSS Science Stories	
Balance and Motion	Balance and Motion	Balance and Motion	Balance and Motion
Investigation 2	Investigation 2	Investigation 2	Investigation 2
Lesson 1	Lesson 1	Lesson 1	Lesson 1
Days 1-3	Day 2:		
Students will be able to build an effective spinner with given materials.	<ul style="list-style-type: none"> • Review previous day's lesson • Explain that students will now add colorful designs to their tops. Show the Spinning Design sheet. • Demonstrate: <ol style="list-style-type: none"> 1. Cut out design and color it. 2. Poke a hole in the center of the design with a pencil. 3. Slide the design on the top. 4. Use tape underneath to hold in place or put small disk on top to hold it. 5. Use a paper clip to hold the top upright for slow rotation • Distribute the design sheets. Have students recreate tops from previous lesson. Then, using the Spinning Design Sheet, students will create a colorful spinner. • Exit slip: Show students 2 tops, one made with two large disks and one with 2 small disks. Ask students: <i>Which of these will be a more stable spinner and why do you think so?</i> 	For each student: 2 large plastic disks (red), 2 small plastic disks (yellow), 1 slim shaft, 1 paper clip, Student Sheet no. 5 called <i>Spinning Designs</i>	Formative: Assessment Checklist, Teac observation, Cl discussion
Students will be able to discover different ways to produce rotational motion.		4 Drawing Tops	Day 2 Exit slip
Students will be able to understand that objects and systems that turn on a central axis exhibit rotational motion.		Cardboard Disks	Summative: Er Unit Assessmer
		Transparent tape	
		Pens/ Chart Paper	
		FOSS Science Stories	
Balance and Motion	Balance and Motion	Balance and Motion	Balance and Motion
		Investigation 2	Investigation 2
		Lesson 1	Investigation 2

Investigation 2 Lesson 1 Days 1-3 Students will be able to build an effective spinner with given materials. Students will be able to discover different ways to produce rotational motion. Students will be able to understand that objects and systems that turn on a central axis exhibit rotational motion.	Investigation 2 Lesson 1 Day 3: <ul style="list-style-type: none"> • Review previous day’s lesson and exit slip. • Call students to rug and introduce the drawing top with a large piece of white paper. • Challenge students to determine the path traveled by a spinning top. • Add to “What We Learned” and “Word Bank” content charts. • Read from Science Stories: <i>Push or Pull?</i> 	For each student: 2 large plastic disks (red), 2 small plastic disks (yellow), 1 slim shaft, 1 paper clip, Student Sheet no. 5 called <i>Spinning Designs</i> 4 Drawing Tops Cardboard Disks Transparent tape Pens/ Chart Paper FOSS Science Stories	Lesson 1 Formative: Assessment Checklist, Teac observation, Cl discussion Day 2 Exit slip Summative: Er Unit Assessmer
Balance and Motion Investigation 2 Lesson 2 Students will be able to identify various	Balance and Motion Investigation 2 Lesson 2 <ul style="list-style-type: none"> • Review Spinning: Ask students what kind of motion tops make. Confirm that tops 	Balance and Motion Investigation 2 Lesson 2	Balance and Motion Investigation 2 Lesson 2 Formative:

<p>ways to initiate rotational motion.</p> <p>Students will be able to explain that the motion of an object can be changed by pushing or pulling.</p> <p>Students will be able to compare and contrast the motion of tops and zoomers.</p>	<p>spin or rotate whey they are in motion.</p> <ul style="list-style-type: none"> • Introduce Zoomers – Hold up a zoomer and point out that is made with a string that runs through the two holes in a large disk. Demonstrate how to twirl the large disk and bring the zoomer into action. • Demonstrate how to tie a knot. Students practice with jump rope. • Students get a zip lock bag and assemble a zoomer. • Explain the process of twirling the disk, pulling on the string to get the disk spinning and releasing the tension to let the disk wind up again. Demonstrate how your hands go apart and together, apart and together. • If time: use cardboard disks to make additional zoomers. • Regroup and ask discussion questions. • Add to “What We Learned” and “Word Bank” content chart • Read Science Stories: <i>Tools and Machines</i> and <i>Move it, but Don’t Touch it.</i> 	<p>For each student: 1 large plastic disk, 1 string (100 cm long)</p> <p>For each group: 1 Student Sheet no. 6 called <i>Zoomer</i></p> <p>FOSS Science Stories</p>	<p>Anecdotal Note Teacher observation, Cl discussion</p> <p>Summative: Er Unit Assessmer</p>
<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>Lesson 3</p> <p>Days 1 & 2</p> <p>Students will be able to discover how air resistance can act as the force that initiates rotational motion.</p> <p>Students will be able to describe how variations in rotational design can influence the rotational motion of spinning objects.</p>	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <ul style="list-style-type: none"> • Review spinning motions of tops and zoomers. Point out that in both cases students had to start the tops and zoomers spinning by applying force. Today they will make a new kind of spinner. • Set the challenge: Hold up the straw and tell students that their job is to make the straw spin. • Have getters distribute materials. • Tell students that wings may help the straw spin. Distribute the Twirler Wings sheets. Explain how to cut them. • Tell students to use the slit at the end of the straw to attach wings. Students assemble their twirlers. • Students go off and practice testing their 	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>For each student: 1 jumbo straw, 1 paper clip, scissors</p> <p>Copies of Student Sheets no. 7 and 8 (<i>Twirler Wings and Twirly Bird</i>)</p> <p><i>Transparent tape</i></p>	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teac observation, Cl discussion</p> <p>Summative: Er Unit Assessmer</p>

	<p>twirlers.</p> <ul style="list-style-type: none"> • Rotate around and assess progress through use of discussion questions. • Regroup in a large circle: have students share their twirlers and discuss the different kinds and how they work. 	FOSS Science Stories— <i>Things That Spin</i>	
<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>Days 1 & 2</p> <p>Students will be able to discover how air resistance can act as the force that initiates rotational motion.</p> <p>Students will be able to describe how variations in rotational design can influence the rotational motion of spinning objects</p>	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review previous day lesson. • Introduce the Twirly Bird show pattern for a different kind of flying spinner, a Twirly bird. • Explain to students that they should cut on the solid lines and fold on the dashed lines. • Give each student a Twirly Bird pattern and paperclip. • Students make and fly Twirly Bird. • Ask volunteers to show how their Twirly Birds fly. • Add to “What We Learned” and “Word Bank” content charts. • Read Foss story: <i>Things That Spin</i>. 	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>For each student: 1 jumbo straw, 1 paper clip, scissors</p> <p>Copies of Student Sheets no. 7 and 8 (<i>Twirler Wings and Twirly Bird</i>)</p> <p><i>Transparent tape</i></p> <p>FOSS Science Stories—<i>Things That Spin</i></p>	<p>Balance and Motion Investigation 2</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teacher observation, Class discussion</p> <p>Summative: End of Unit Assessment</p>

<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Day 1:</p> <p>Students will be able to communicate observations and comparisons of rolling motion, using precise vocabulary.</p>	<p>Balance and Motion Investigation 3</p> <p>Lesson 1</p> <p>Day 1:</p> <ul style="list-style-type: none"> • Call students to the rug. Tell them that they have had several experiences with one kind of motion (spinning or rotating). Ask: How do we know when something is spinning or rotating? (It goes around on an axis) • Introduce wheels – Tell students that they will use the large disks as wheels. • Show students how to assemble a ramp using clothespins. • Distribute ramps and large disks only • Students work in small groups to assemble ramps and practice rolling their wheels. Introduce the term: rolling – when wheels go around on their edge. • Discuss how the wheels are rolling 	<p>Balance and Motion Investigation 3</p> <p>Lesson 1</p> <p>For each student: 2 large plastic disks, 2 small plastic disks, 1 slim shaft</p> <p>For each pair of students: 1 cardboard ramp, 4 clothespins</p> <p>Transparent tape</p>	<p>Balance and Motion Investigation 3</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Day 1 Exit Slip</p> <p>Day 2 Performance Assessment</p> <p>Summative: End of Unit Assessment</p>

<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Day 2:</p> <p>Students will be able to observe and compare rolling systems with different-sized wheels.</p> <p>Students will be able to communicate observations and comparisons of rolling motion, using precise vocabulary.</p>	<ul style="list-style-type: none"> • Distribute axles – Review meaning of axle (a rod or shaft to which wheels can be attached). • Exit Slip: How did the wheels move differently when given an axle? <p>Balance and Motion Investigation 3</p> <p>Lesson 1</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review content learned from previous day’s lesson. • Distribute large wheels and axels have them try to change their rolling system to do tricks. • Provide small disks (wheels) have students test whether the smaller wheels roll differently than the big ones. • Discuss results – Then have students pair up and make new wheel systems together. • Regroup and ask discussion questions to check for understanding. • Add to “What We Learned Chart” and “Word Bank” • Performance assessment: Students create and show a wheel and axle system that would go straight, zigzag, and curve. 	<p>Extra slim shafts</p> <p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>For each student: 2 large plastic disks, 2 small plastic disks, 1 slim shaft</p> <p>For each pair of students: 1 cardboard ramp, 4 clothespins</p> <p>Transparent tape</p> <p>Extra slim shafts</p>	<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Cl discussion</p> <p>Day 1 Exit Slip</p> <p>Day 2 Performance Assessment</p> <p>Summative: End of Unit Assessment</p>
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Balance and Motion Investigation 3 Lesson 2 Day 1: Students will be able to observe rolling systems with different-sized wheels and with weight attached to the wheels.	Balance and Motion Investigation 3 Lesson 2 Day 1: <ul style="list-style-type: none"> • Call students to the rug. Review that wheels roll when they are in motion. • Introduce cups: Tell students that wheels are not the only things that roll. Cups also roll. Explain that they will each get one large cup and one small cup to investigate how they roll. • Distribute materials. After a few minutes of student investigation, ask students how cups roll and why they rolled in that way. • Propose the “Park-The-Car-Problem” (TG Investigation 3 p.15) • Propose the “Fall on your face problem” (TG Investigation 3 p.16) • Ask students what can be done to get the cups to roll straight. Create a class list to refer to in next lesson. 	Balance and Motion Investigation 3 Lesson 2 For each student: 1 large paper cup, 1 small paper cup, 1 penny For each pair of students: 1 cardboard ramp, 4 clothespins 4 rolls of transparent tape FOSS Science Stories	Balance and Motion Investigation 3 Lesson 2 Formative: Assessment Checklist, Teacher observation, Class discussion Day 2 Exit Slip Summative: End of Unit Assessment
Balance and Motion	Balance and Motion		

Investigation 3 Lesson 2 Day 2: Students will be able to explain and describe how cups can roll straight and what happens when weight is added to rolling cups.	Investigation 3 Lesson 2 Day 2: <ul style="list-style-type: none"> • Review previous lesson by going over the class list about what can be done to get the cups to roll straight. • Have students put their ideas into action. • Working with partners, have them tape two cups together and try to roll them straight. • Once students' cups have rolled straight, suggest adding weight to see what happens. Hand out two pennies for each group. Have them decide where to attach them and see what happens. • Show and tell. Regroup in a circle. Have groups discuss what they did and demonstrate how their cups roll. Discuss the addition of weight and what happened when the rolled their cups with the pennies inside. • Ask discussion questions: What happens when you put a cup on a slope? How can you tell which direction a cup will roll? How can you make a cup go straight? How do weights change the motion of a rolling cup? • Add to "What We Learned" and "Word Bank" content chart. • Read Foss <i>Rolling, Rolling, Rolling!</i> • Exit Slip: How can you tell which direction a cup will roll? 	Balance and Motion Investigation 3 Lesson 2 For each student: 1 large paper cup, 1 small paper cup, 1 penny For each pair of students: 1 cardboard ramp, 4 clothespins 4 rolls of transparent tape FOSS Science Stories	Balance and Motion Investigation 3 Lesson 2 Formative: Assessment Checklist, Teacher observation, Class discussion Day 2 Exit Slip Summative: End of Unit Assessment
Balance and Motion Investigation 3 Lesson 3	Balance and Motion Investigation 3, Lesson 3 Day 1: <ul style="list-style-type: none"> • Review the rolling motions of the wheels and cups. Tell students that today they will investigate another rolling object: a 	Balance and Motion Investigation 3 Lesson 3	Balance and Motion Investigation 3 Lesson 3

<p>Students will be able to create runways to get marbles to perform tricks.</p> <p>Students will be able to define a sphere.</p> <p>Students will be able to explain that a runway must be high at the start and low at the finish for a sphere to roll the complete length of the runway.</p>	<p>sphere. Recall properties of a sphere (round on all sides). Tell them that the marbles will be kept in a cup when they are not being used to control them from rolling away.</p> <ul style="list-style-type: none"> • Each student gets a cup, marble and lid. Have students investigate how to roll marbles inside the cup. • Show students the foam runway. Working with a partner to plan how they will use a cup/tape to keep the marble from escaping. • Use masking tape to help build runways. Caution students to be careful with the tape on the runways. • After a few minutes of exploration, challenge students to set up runways so their marble can: <i>Go down a hill, back up, then down again; go down, then around in a circle; go in a loop-the-loop, & go in a spiral</i> • Challenge teams to work together & put two or more runways together. (TG Inv3, pg. 23) • Regroup/Show and tell. Students share what they did. • Play Foss Rollercoaster game found on Foss website. • Exit Slip: Students will draw a picture of a runway that would roll from beginning to end. 	<p>Foreach pair of students: 2 marbles, 2 plastic cups and 2 lids, 1 runway (plastic foam)</p> <p>Masking tape</p> <p>FOSS Science Stories</p> <p>Copies of Student Sheet no. 10 called <i>Marble Runways</i></p> <p>Foss Website: Rollercoaster Builder</p> <p>Send Home: Home/School Connection – Student Sheet No. 21</p>	<p>Formative: Student Sheet no. 10 called <i>Marble Runway</i> Assessment Checklist, Teacher observation, Class discussion</p> <p>Day 1 Exit Slip</p> <p>Summative: End of Unit Assessment</p>
<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 3</p>	<p>Balance and Motion</p> <p>Investigation 3, Lesson 3</p>	<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 3</p>	<p>Balance and Motion</p> <p>Investigation 3</p> <p>Lesson 3</p>
<p>Students will be able to create runways to get marbles to perform tricks.</p> <p>Students will be able</p>	<p>Day 2:</p>	<p>Foreach pair of students: 2 marbles, 2 plastic cups and 2 lids, 1 runway (plastic foam)</p>	<p>Formative: Student Sheet no. 10 called <i>Marble Runway</i> Assessment Checklist, Teacher observation, Class discussion</p>

<p>to define a sphere.</p> <p>Students will be able to explain that a runway must be high at the start and low at the finish for a sphere to roll the complete length of the runway.</p>	<ul style="list-style-type: none"> • Demonstrate how to connect 2 runways. • Challenge teams to work together and put two or more runways together. (TG Investigation 3, pg. 23) • Propose making a single long marble run using all of the runway sections. Use a big circle around the room as an example. • Hand out materials and let students create a long runway. • Troubleshoot: Have students station themselves along the length of the run. Let a student start a marble and see how far it goes before it jumps out of the runway or stops. Work on that point and then have another test run. • Assess progress: Student Sheet No. 10 Marble Runways. Have runways set up prior to lesson, so that students can test their predictions. • Regroup and ask discussion questions. • Add to “What We Learned” and “Word Bank” content charts. • Read Foss story <i>Strings in Motion</i> 	<p>Masking tape</p> <p>FOSS Science Stories</p> <p>Copies of Student Sheet no. 10 called <i>Marble Runways</i></p> <p>Foss Website: Rollercoaster Builder</p> <p>Send Home: Home/School Connection – Student Sheet No. 21</p>	<p>Day 1 Exit Slip</p> <p>Summative: End of Unit Assessment</p>
<p>Balance and Motion</p> <p>Investigation 3 Assessment</p>		<p>Balance and Motion</p> <p>Investigation 3 Assessment</p>	<p>Balance and Motion</p> <p>Investigation 3 Assessment</p>
<p>Students will be able to demonstrate their understanding of how objects roll with different size wheels and weights and how to get them to roll from beginning to end.</p>	<p>Balance and Motion</p> <p>Investigation 3 Assessment</p>	<p>Investigation 3 Assessment</p> <p>Marbles, cups, runways, ramps, clothespins, wheels, and shafts</p>	<p>Summative: End of Investigation 3 Assessment</p> <p>End of Unit Assessment</p>
	<ul style="list-style-type: none"> • Remind students of how much they have learned so far about how objects roll by referring to class anchor chart. 		

	<ul style="list-style-type: none"> • Explain to students that they will show off how much they know about rolling by completing the Investigation 3 Assessment. • Introduce and explain directions for assessment. • Students will complete assessment at their own pace. • When assessment is complete students reinvestigate their favorite rolling activity. 		
Solids and Liquids Investigation 1 Lesson 1 Days 1 & 2: Students will be able to explore a number of different solid materials. Students will be able to describe the properties of solid materials and develop vocabulary to communicate those properties. Students will be able to recognize solids as	Solids and Liquids Investigation 1 Lesson 1 Day 1: <ul style="list-style-type: none"> • Introduce solids, liquids, and gases by showing student Brain Pop Jr. <i>Solids, Liquids, and Gases</i> • Introduce solid, liquid, gas: Use 3 Zip bags 1 with a solid, 1 with water, and 1 with air. Have students report what they see inside. • Propose finding out about solids today. Introduce the solid-object investigation. • Distribute 4 objects. Tell students their job today is to observe solids and note how they look, feel, etc. Have students share their observations with their neighbors. • Discuss and list properties as a class. Day 2: <ul style="list-style-type: none"> • Review solids, liquids, and gases from previous lesson. Review properties. • Distribute three new objects, have students observe, and record properties in the class word bank/list as a class. • Develop vocabulary: Identify at least two 	Solids and Liquids Investigation 1 Lesson 1 For each student: 1 plastic triangle, 1 cloth square, 1 plastic tube, 1 wood cylinder, 1 craft stick, 1 screw, 1 wire with plastic insulation, 1 Zip bag (1 quart), Student sheet no. 2 called <i>Properties of Solid Objects</i> Brain Pop Jr – Solids, Liquids, and Gases 4 Zip bags (1 qt.) 4 basins 11 containers	Solids and Liquids Investigation 1 Lesson 1 Formative: Anecdotal Note Student Sheet n Teacher observation, Cl discussion Day 2 Exit Slip Summative: Er Unit Assessment

different from other states of matter.	<p>new important vocabulary words, discuss, and add to word bank.</p> <ul style="list-style-type: none"> • Students record properties of their solids on Student Sheet no. 2. • Summarize what was learned on the class content chart. • Exit Slip: Hold up one object. Have the students record properties for that object. 	<p>1 solid object (rock, wood block, etc.)</p> <p>Water</p> <p>1 paper bag or box</p> <p>1 marking pen</p> <p>Chart paper</p> <p>Parent letter</p>	
<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>Students will be able to identify, compare, and contrast properties of solids.</p> <p>Students will be able to sort solids according to their properties.</p>	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 2</p> <ul style="list-style-type: none"> • Review solid materials. • Recall vocabulary of properties. • Demonstrate the sorting game: placing two different solids that share a common property in the circle. Partner guesses the shared property. • Students start the sorting game with their <i>Sorting Circle sheet</i> and bag of solids. • Expand the sorting: Have students come up to teacher's bag of solids and display one of their sorts to the class. Discuss with class. • Assess progress: Have students complete the sheet. Then have them turn the sheet over, draw two large circles, and find solids that have different properties and label each circle with those properties. • Add new concepts to the content chart as a class. <p>Optional extension: Have students bring 3 solid objects in from home in a brown bag. Have one partner close their eyes while the other partner places a solid in their hand. Have the partner with their eyes closed state 3 properties of the</p>	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>For each student: 1 bag of solid objects, Student Sheet no. 3 called <i>Sorting Circle</i></p> <p>1 bag solid objects for the class</p> <p>Paper strips</p>	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 2</p> <p>Formative: Responses on Student Sheet n teacher observation class discussion</p> <p>Summative: End of unit assessment</p>

	object. After students have stated the properties, have them guess what object is in their hand. Have partners switch roles.		
Solids and Liquids	Solids and Liquids	Solids and Liquids	Solids and Liquids
Investigation 1	Investigation 1	Investigation 1	Investigation 1
Lesson 3	Lesson 3	Lesson 3	Lesson 3
Day 1:	Day 1:		Formative:
Students will be able to describe how the properties of solid materials can have specific uses in construction.	<ul style="list-style-type: none"> Propose becoming engineers for the day: Explain the term engineers and tell students that they will use what they know about solids to construct/build things today. Set the tower challenge: Students will build a tower that can be either the tallest, most beautiful, strongest, or any other “best.” Reassure that the challenge is not a competition. Expand the set of objects and distribute additional materials. Assess progress: Teacher observes and conducts short interviews with students as they construct their towers. Take anecdotal notes of students’ abilities to describe properties and use of solid material. Explain to students that engineer’s use something called a blue print which is detailed drawing of their structure. Students will draw their tower (creating a blueprint) by labeling parts of their tower. *This blue print will be used in day 2 of lesson. Discuss towers: Have students describe their towers using some of the new vocabulary. Clean-up. 	<p>For each student: 1 bag of solid objects, 1 straw, 1 rubber band, 1 craft stick, 1 piece of aluminum foil (8”x12”), 2 cardboard squares, 2 paper cups</p> <p>8 ½-liter containers</p> <p>5 basins</p> <p>FOSS Science Stories</p> <p>White construction paper</p>	Anecdotal Note Teacher observation, Class discussion
			Accuracy of blueprint (labeling)
			Summative: End of Unit Assessment

<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 2:</p> <p>Students will be able to build a tower based on a blueprint.</p>	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review construction of towers and blueprints. • Explain to students that today they will be following someone else's blueprint to build a tower. • Students then will build a tower using blueprint. Have partners check to see how accurate the tower was built. • Discuss the importance of labeling diagrams and accuracy when creating/following a blueprint. • Make word bank and/or content chart entries as a class. • When/if extra time, read science story <i>Everything Matters</i> 	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>For each student: 1 bag of solid objects, 1 straw, 1 rubber band, 1 craft stick, 1 piece of aluminum foil (8"x12"), 2 cardboard squares, 2 paper cups</p> <p>8 ½-liter containers</p> <p>5 basins</p> <p>FOSS Science Stories</p> <p>White construction paper</p>	<p>Solids and Liquids</p> <p>Investigation 1</p> <p>Lesson 3</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Accuracy of blueprint (labeling)</p> <p>Summative: End of Unit Assessment</p>
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Solids and Liquids	Solids and Liquids	Solids and Liquids	Solids and Liquids
Investigation 2	Investigation 2	Investigation 2	Investigation 2
Lesson 1	Lesson 1	Lesson 1	Lesson 1
Days 1 & 2:	Day 1:		
Students will be able to observe the properties of a variety of liquid materials.	<ul style="list-style-type: none"> • Review small solids and properties of those solids. • Describe the center: Tell students they will be investigating liquids with a partner today. Show them the materials and explain that their challenge is to find out as much as they can about the liquids in the bottles (without opening them). • Direct half of the class to the center and then start review activities with the other half of the class. Possible activity for students to do: have students take large construction paper and fold it in half. On one side have students write Solids and on the other half have them write Liquids. Using old magazines have students cut out pictures of solids and liquids and glue them in the appropriate columns. • Observe students at the center and ask guiding questions. • Clean-up materials in the center. • Students who worked with liquids write one thing that they observed on an exit slip. Students who worked making a collage, students write how solids and liquids are different. 	<p>For each student: 1 basin, 1 set of liquids (plain water, colored water, corn syrup, cooking oil, liquid detergent, liquid hand soap, fabric softener or starch), clipboard</p> <p>1 set of food coloring</p> <p>5 large Zip bags</p> <p>Teacher sheet no. 5 called <i>Center Instruction Card- Liquids in Bottles</i></p> <p>White construction paper, scissors, glue, old magazines</p>	<p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Exit Slips Day 1 & 2</p> <p>Summative: End of Unit Assessment</p>

<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 1</p> <p>Days 1 & 2:</p> <p>Students will be able to observe the properties of a variety of liquid materials.</p> <p>Students will be able to investigate the appearance and behavior of liquids in containers.</p> <p>Students will be able to differentiate between pictures of solids and liquids</p>	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 1</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Have students switch groups and repeat activities as listed above in day 1. • Students who worked with liquids write one thing that they observed on an exit slip. Students who worked making a collage, students write how solids and liquids are different. • Make word bank/content chart entries. 	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 1</p> <p>For each student: 1 basin, 1 set of liquids (plain water, colored water, corn syrup, cooking oil, liquid detergent, liquid hand soap, fabric softener or starch), clipboard</p> <p>1 set of food coloring</p> <p>5 large Zip bags</p> <p>Teacher sheet no. 5 called <i>Center Instruction Card- Liquids in Bottles</i></p> <p>White construction paper, scissors, glue, old magazines</p>	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Exit Slips Day 1 & 2</p> <p>Summative: End of Unit Assessment</p>
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Solids and Liquids Investigation 2 Lesson 2 Students will be able to record information about properties of liquid materials. Students will be able to play games to practice vocabulary associated with liquids.	Solids and Liquids, Investigation 2 Lesson 2 Day 1: <ul style="list-style-type: none"> • Develop the word <i>transparent</i> by having students describe a bottle of plain water. Hold up a picture behind the bottle to show that the liquid is transparent. • Introduce the first liquid-properties poster (transparent one). Compare the poster to other bottles of liquids. • Compare transparent and translucent liquids. • Develop the liquids vocabulary. Continue the process for all words on the liquid-properties posters. Hang the posters, say the words, highlight the first letter of each word, and have students give examples of each. • As a class, sort liquids by properties. Play a few rounds of the liquid-property game as a whole class. • Add vocabulary to word bank. • In science notebooks, students illustrate and label bottles depicting the 6 properties of liquids. 	Solids and Liquids Investigation 2 Lesson 2 Copies of Student sheet no. 8 called <i>Properties of Liquids</i> 1 set of liquids 1 set of six liquid-properties posters 5 decks of 12 cards to play Memory 5 decks of 24 cards to play Go Fish 10 Zip bags Transparent tape Scissors 1 Teacher sheet no. 6 called <i>Labels for Card Decks</i> 5 Student sheets no. 15 called <i>Memory Tally Sheet</i>	Solids and Liquids Investigation 2 Lesson 2 Formative: Anecdotal Note Teacher observation, Class discussion Summative: End of Unit Assessment

<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 2</p> <p>Students will be able to record information about properties of liquid materials.</p> <p>Students will be able to play games to practice vocabulary associated with liquids.</p>	<p>Solids and Liquids, Investigation 2</p> <p>Lesson 2</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Review properties of liquids in bottles. • Explain and model Go Fish and Memory. Split the class in half and have them play in groups of 4 for Go Fish and pairs for Memory. Switch groups so that students may play both games. • Have students fill out properties on Student Sheet no. 8. 	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 2</p> <p>Copies of Student sheet no. 8 called <i>Properties of Liquids</i></p> <p>1 set of liquids</p> <p>1 set of six liquid-properties posters</p> <p>5 decks of 12 cards to play Memory</p> <p>5 decks of 24 cards to play Go Fish</p> <p>10 Zip bags</p> <p>Transparent tape</p> <p>Scissors</p> <p>1 Teacher sheet no. 6 called <i>Labels for Card Decks</i></p> <p>5 Student sheets no. 15 called <i>Memory</i></p>	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 2</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Summative: End of Unit Assessment</p>
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		<i>Tally Sheet</i>	
Solids and Liquids Investigation 2 Lesson 3 Days 1-3: Students will be able to investigate and record the level nature of liquid as it flows from one stable position to another. Students will be able to investigate the appearance and behavior of liquids in containers. Students will be able to develop definitions of solids and liquids based on their	Solids and Liquids Investigation 2 Lesson 3 Day 1: <ul style="list-style-type: none"> • Introduce the term <i>level</i> liquids. Have students imagine what a glass of water looks like when someone is tipping it over onto its side. • Introduce the Liquid Level Sheet and bottles. • Explain to students that they will use a pencil to draw what they see when the bottle is held in each position. • Model how to tip the bottle slightly, leaving one end on the table. • One partner tips the bottle while the other partner draws what they see. Partner switch roles. • Discuss student's drawings. Introduce the term <i>level</i>. Add to content charts and word bank. Day 2: <ul style="list-style-type: none"> • Review the term <i>level</i> and show with example of bottle. 	Solids and Liquids Investigation 2 Lesson 3 Copies of Student sheets no. 17, 18, and 19 For each pair of students: 1 bus tray 1 container (1 qt.), 1 small vial, 1 plastic bottle, 1 container, 1 large vial, 1 plastic cup, 1 bottle of colored water 1 bottle of colored water Food coloring Paper towels Colored pencils,	Solids and Liquids Investigation 2 Lesson 3 Formative: Anecdotal Note Student sheets 17-19, Teacher observation, Class discussion Day 3 Exit Slip Summative: End of Unit Assessment

<p>observations and comparisons.</p>	<ul style="list-style-type: none"> • Explain the falling bottle puzzle. Cut the 6 pieces apart and put the pieces in order from standing up to lying on its side. • Students will line up pictures then glue down. • Show video/ play appropriate follow up game from resources. • Read the science story <i>Solids and Liquids</i> 	<p>scissors, glue</p> <p>Teacher sheet no. 16 called <i>Center Instruction Card—Liquids in Containers</i></p> <p>FOSS Science Stories called <i>Solids and Liquids</i></p>	
<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 3</p> <p>Days 1-3:</p> <p>Students will be able to investigate and record the level nature of liquid as it flows from one stable position to another.</p> <p>Students will be able to investigate the appearance and behavior of liquids in containers.</p> <p>Students will be able to develop definitions of solids and liquids based on their observations and</p>	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 3</p> <p>Day 3:</p> <ul style="list-style-type: none"> • Review the term level. • Introduce the water-in-containers center. • Assess student progress while questioning and listening to their predictions. • Introduce the Student sheet no. 17 and have students complete independently. • Review the definition of a solid from Inv. 1. See if students can now improve their definition based on what they now know about liquids. • Exit slip: How are liquids different then solids? 	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 3</p> <p>Copies of Student sheets no. 17, 18, and 19</p> <p>For each pair of students: 1 bus tray 1 container (1 qt.), 1 small vial, 1 plastic bottle, 1 container, 1 large vial, 1 plastic cup, 1 bottle of colored water</p> <p>1 bottle of colored water</p> <p>Food coloring</p>	<p>Solids and Liquids</p> <p>Investigation 2</p> <p>Lesson 3</p> <p>Formative: Anecdotal Note Student sheets 17-19, Teacher observation, Class discussion</p> <p>Day 3 Exit Slip</p> <p>Summative: Exit Unit Assessment</p>

comparisons.		<p>Paper towels</p> <p>Colored pencils, scissors, glue</p> <p>Teacher sheet no. 16 called <i>Center Instruction Card—Liquids in Containers</i></p> <p>FOSS Science Stories called <i>Solids and Liquids</i></p>	
<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Day 1:</p> <p>Students will be able to experience solid materials as pieces, grains, and particles.</p> <p>Students will be able to observe the behavior of small solids in various settings.</p> <p>Day 2:</p> <p>Students will be able to experience solid materials as pieces, grains, and particles.</p> <p>Students will be able to observe the behavior of small</p>	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Day 1:</p> <ul style="list-style-type: none"> • Introduce the new materials (solids in containers) and discuss prior knowledge of these materials. • Describe work at the center: show students what they will be using. • Describe the center challenge: tell students that their job is to find out as much as they can about each of the five materials by transferring them from one container to another. • Have half of the class start working in pairs at the center investigation while the other half can engage in liquid card games. • Observe students at the center and prompt discussion through questioning. • Switch groups. • Clean-up. • Exit Slip: How are these materials like liquids? How are these materials like solids? 	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>For each pair of students at the station: 1 bus tray, 2 plastic cups, 2 bottles with caps, 2 large vials with caps, 2 small vials with caps, 1 beaker, 1 funnel, 1 scoop, 1 wood cylinder, 1 screw</p> <p>5 containers—one with lima beans, one with pinto beans, one with mung beans, one with rice, and one with cornmeal</p> <p>Teacher sheet no. 21 called <i>Center</i></p>	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Day 1 Exit Slip</p> <p>Summative: Exit Slip Unit Assessment</p>

solids in various settings.		<i>Instruction Card— Solids in Containers</i>	
Students will be able to differentiate between solids and liquids.		1 container	
Solids and Liquids	Solids and Liquids	Paper towels	
Investigation 3	Investigation 3		
Lesson 1	Lesson 1	Solids and Liquids	
		Investigation 3	
		Lesson 1	
Day 1:			
Students will be able to experience solid materials as pieces, grains, and particles.	Day 2:		Solids and Liquids
	<ul style="list-style-type: none"> • Ask for volunteers to describe each of the solids from the previous day. • Discuss how each piled and poured/ relate to yesterday's closure question. • Conduct a demonstration to determine if cornmeal and water is solid or liquid. • Have a volunteer hold a piece of paper towel over a container. Ask students if a small vial of water will go through the paper towel and why? • Pour water on paper towel. Have a second volunteer hold a 2nd paper towel and ask if a solid would go through the paper towel and why? • Carry out procedure. When they see cornmeal doesn't go through they should see that the materials from yesterday are solids. • Make entries to word bank/content chart. 	For each pair of students at the station: 1 bus tray, 2 plastic cups, 2 bottles with caps, 2 large vials with caps, 2 small vials with caps, 1 beaker, 1 funnel, 1 scoop, 1 wood cylinder, 1 screw	Investigation 3
Students will be able to observe the behavior of small solids in various settings.			Lesson 1
Day 2:			Formative: Anecdotal Note Teacher observation, Class discussion
Students will be able to experience solid materials as pieces, grains, and particles.		5 containers—one with lima beans, one with pinto beans, one with mung beans, one with rice, and one with cornmeal	Day 1 Exit Slip
Students will be able to observe the behavior of small solids in various settings.			Summative: End of Unit Assessment
Students will be able to differentiate		Teacher sheet no. 21 called <i>Center Instruction Card—Solids in Containers</i>	

between solids and liquids.		1 container Paper towels	
Solids and Liquids Investigation 3 Lesson 2 Students will be able to combine and separate solid materials of different particle sizes.	Solids and Liquids Investigation 3 Lesson 2 Day 1: <ul style="list-style-type: none"> • Review small solids with class using the 5 bottles • Discuss the size of the pieces and order the bottles according to piece-size. • Review vocabulary of properties and introduce the word <i>powders</i>. • Describe the separating of the soup mix center: Tell students it is their job to separate the mix into containers to find out how many kinds of material are in the mixture. • Half the class begins the center investigation while the other half of the class can engage in soup-mix art. • Monitor the station and prompt discussion through use of questioning. • Have the separating soup group answer the following question: How can mixtures of solid particles be separated? • Discuss with the art group how the different properties of the materials used. 	Solids and Liquids Investigation 3 Lesson 2 For each pair of students at the station: 1 bus tray, 1 container of soup mix, 4 containers, 1 scoop, 1 screen (small mesh), one screen (medium mesh), one screen (large mesh) 5 bottles with caps of the following solids: cornmeal, rice, mung beans, pinto beans, and lima beans 1 funnel Teacher sheet no. 22 called <i>Center Instruction Card—Separating Soup Mix</i>	Solids and Liquids Investigation 3 Lesson 2 Formative: Anecdotal Note Teacher observation, Class discussion Summative: End of Unit Assessment

<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 2</p> <p>Students will be able to combine and separate solid materials of different particle sizes.</p>	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 2</p> <p>Day 2:</p> <ul style="list-style-type: none"> Follow same procedures for day 1 and have groups switch. <p>Day 3:</p> <ul style="list-style-type: none"> Discuss the separation activity. Have students share art projects. Show video/ play appropriate follow up game from resources. (Optional book: <u>What is the World Made of?</u> By: Kathleen Weidner Zoehfeld) Make word bank/content chart entries. 	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 2</p> <p>For each pair of students at the station: 1 bus tray, 1 container of soup mix, 4 containers, 1 scoop, 1 screen (small mesh), one screen (medium mesh), one screen (large mesh)</p> <p>5 bottles with caps of the following solids: cornmeal, rice, mung beans, pinto beans, and lima beans</p> <p>1 funnel</p> <p>Teacher sheet no. 22 called <i>Center Instruction Card</i>—</p>	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 2</p> <p>Formative: Anecdotal Note Teacher observation, Class discussion</p> <p>Summative: End of Unit Assessment</p>
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		<i>Separating Soup Mix</i>	
Solids and Liquids	Solids and Liquids	Solids and Liquids	Solids and Liquids
Investigation 3	Investigation 3	Investigation 3	Investigation 3
Lesson 3	Lesson 3	Lesson 3	Lesson 3
<p>Students will be able to compare and contrast behavior of solids and liquids in similar settings.</p> <p>Students will be able to sort solids and create a graph to represent data</p>	<p>Day 1:</p> <ul style="list-style-type: none"> • Hold up an empty bottle and explain to students that one can use a bottle to observe the movement of certain solids. • Describe filling the bottles: Tell students that they will work in pairs to transfer material from one of the containers to the empty bottle, put on the cap, and roll, shake, spin, turn, and tip the bottle to observe movement of material. • Half the class will begin the investigation at the center while the other half of the class may conduct one of the math extensions (sort and graph edible pieces). • Assess progress—Conduct 30-second interviews with students at the center to see if they can describe a difference between a solid and a liquid. • If time allows have the students answer math related questions about their graph (maximum, minimum, range, median, etc). • Have students compare graphs with partner • Exit Slip for Solids in Bottle Group: How are the solids in bottles different then liquids in bottles? How are they the same? 	<p>For each pair of students at the station: 1 bus tray, 1 scoop, 1 funnel, 4 bottles with caps, 1 container of cornmeal, 1 container of rice, 1 container of mung beans, 1 container of lima beans, 1 clipboard</p> <p>Teacher sheet no. 23 called <i>Center Instruction Card—Solids in Bottles</i></p> <p>Student sheet No. 35</p> <p>Trail Mix/ Bean mixture to graph</p>	<p>Formative: Assessment Checklist, Teacher observation, Class discussion</p> <p>Exit Slips</p> <p>Summative: End of Unit Assessment</p>
Solids and Liquids			Solids and Liquids
			Investigation 3

<p>Investigation 3</p> <p>Lesson 3</p> <p>Students will be able to compare and contrast behavior of solids and liquids in similar settings.</p> <p>Students will be able to sort solids and create a graph to represent data</p>	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 3</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Have students repeat same procedures in day 1 (switch groups) • Summary discussion on rug—have students describe how particulate materials behave when in motion. • Make word bank entries/content chart entries. 	<p>Solids and Liquids</p> <p>Investigation 3</p> <p>Lesson 3</p> <p>For each pair of students at the station: 1 bus tray, 1 scoop, 1 funnel, 4 bottles with caps, 1 container of cornmeal, 1 container of rice, 1 container of mung beans, 1 container of lima beans, 1 clipboard</p> <p>Teacher sheet no. 23 called <i>Center Instruction Card—Solids in Bottles</i></p> <p>Student sheet No. 35</p> <p>Trail Mix/ Bean mixture to graph</p>	<p>Lesson 3</p> <p>Formative: Assessment Checklist, Teacher observation, Class discussion</p> <p>Exit Slips</p> <p>Summative: End of Unit Assessment</p>
Solids and Liquids	Solids and Liquids	Solids and Liquids	Solids and Liquids

Investigation 3 Lesson 4 Students will be able to determine which small solids pass through various screens. Students will be able to define a solid and a liquid.	Investigation 3 Lesson 4 <ul style="list-style-type: none"> • Introduce Bead-Mix Sheets: Give each student a copy of student sheet <i>Bead Mix A</i> or <i>Bead Mix B</i>. Point out that there are bead of different sizes in the containers drawn on the sheet. • Introduce the representation of screens: Distribute a copy of the <i>Screens</i> transparency to each student. Ask which screen is large, which is medium, and which is small. • Lead students through completion of student sheets. • Have GETTERS collect materials. • Make content chart entries—revisit and revise definitions of solids and liquids. • Read science story <i>Solids to Liquids and Back Again</i>. 	Investigation 3 Lesson 4 For each student: 1 Student sheet no. 24 called <i>Bead Mix A</i> or Student sheet no. 25 called <i>Bead Mix B</i> , 1 transparency called <i>Screens</i> 3 Zip bags (optional) 1 Student sheet no. 26 called <i>Screens</i> (optional) FOSS Science Stories	Investigation 3 Lesson 4 Formative: Assessment Checklist, Teacher observation, Class discussion Summative: End of Unit Assessment
Solids and Liquids Investigation 4 Lesson 1 Students will be able to observe what	Solids and Liquids Investigation 4 Lesson 1 Day 1: <ul style="list-style-type: none"> • Review solids and liquids. • Introduce mixtures: Tell students today their job is to find out what happens when solids and liquids are mixed together. • Introduce the bag and label: Tell students that everyone will get a bag and to put their name on the bag when they receive it. 	Solids and Liquids Investigation 4 Lesson 1 For each student: 1 Zip bag, 1 Student	Solids and Liquids Investigation 4 Lesson 1 Formative: Anecdotal Notes, Teacher observation, Class

happens when solids and water are mixed.	<ul style="list-style-type: none"> • Preview all solid materials in the bags. Tell students they are going to see what happens to these solids when they mix with water. Be sure to tell them to save a dry version of the piece on the side to compare. • Record solids on the student sheet: Tell students to write the name of their solid on the sheet, draw what the solid looks like, add some descriptive words. Collect sheets. • Have GETTERS bring empty ½-liter containers to their desk group. Have each student place a piece of each of their solids in the container. • GETTERS bring beaker of water to each group. Each student should pour one full beaker of water into their bags and seal. • Students observe and share observations of their wet mixtures. • Place each groups' bags into separate basins and label. Leave overnight. • Wrap up with a guessing game using descriptive vocabulary of solid objects. 	<p>sheet no. 28 called <i>Solid Materials in Water</i></p> <p>For each group: 1 liter container, 1 beaker, 1 basin, and 1 ½-liter container</p> <p>2 bus trays</p> <p>11-12 ¼-liter containers</p> <p>Plastic spoons</p> <p>Extra liter Zip bags</p> <p>6 pieces aluminum foil (4" squares)</p> <p>6 pieces cloth</p> <p>6 pieces candy</p> <p>6 spoons of pinto beans</p> <p>6 spoons of rice</p>	<p>discussion</p> <p>Summative: Er Unit Assessmer</p>
<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p> <p>Students will be able to observe what happens when solids</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p> <p>Day 2:</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Cl</p>

and water are mixed.	<ul style="list-style-type: none"> • Review activities from previous lesson. • Observe the solid/liquid mixtures and discuss change. Make predictions on how their solid would change. • Have students record these changes on their <i>Solids in Water</i> student sheet. • Organize the changes—make a bar graph by having students place their labels above categories: soft, dark, disappeared, and bigger. Ask discussion questions about changes based on the graph's results. • Propose separating mixtures: Ask students if they think materials will return to their starting condition if they dry out. Form teams based on common solids and have teams figure out how to separate their mixture. • Once separated, clean-up and wrap-up with the guessing game. 	<p>For each student: 1 Zip bag, 1 Student sheet no. 28 called <i>Solid Materials in Water</i></p> <p>For each group: 1 liter container, 1 beaker, 1 basin, and 1 ½-liter container</p> <p>2 bus trays</p> <p>11-12 ¼-liter containers</p> <p>Plastic spoons</p> <p>Extra liter Zip bags</p> <p>6 pieces aluminum foil (4" squares)</p> <p>6 pieces cloth</p> <p>6 pieces candy</p> <p>6 spoons of pinto beans</p> <p>6 spoons of rice</p>	<p>discussion</p> <p>Summative: Er Unit Assessmer</p>
<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 1</p> <p>Formative: Anecdotal Note Teacher observation, Cl: discussion</p>
Students will be able to observe what			

happens when solids and water are mixed. Students will be able to organize observations of mixtures.	<p>Day 3:</p> <ul style="list-style-type: none"> • Review activities from previous lesson. • Predict what their solids will look like after 3-4 days. • Observe the dry solids after 3-4 days. • Compare the solids to the starting conditions. • Discuss the term <i>evaporation</i>. • Observe the crystals. • Redistribute student sheets <i>Solid Materials in Water</i> and have students fill in third section. • Clean-up. • Make entries to word bank/ content chart. 	<p>For each student: 1 Zip bag, 1 Student sheet no. 28 called <i>Solid Materials in Water</i></p> <p>For each group: 1 liter container, 1 beaker, 1 basin, and 1 ½-liter container</p> <p>2 bus trays</p> <p>11-12 ¼-liter containers</p> <p>Plastic spoons</p> <p>Extra liter Zip bags</p> <p>6 pieces aluminum foil (4" squares)</p> <p>6 pieces cloth</p> <p>6 pieces candy</p> <p>6 spoons of pinto beans</p> <p>6 spoons of rice</p>	<p>Summative: Er Unit Assessmer</p>
<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 2</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 2</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 2</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 2</p> <p>Formative:</p>

<p>Day 1 & 2:</p> <p>Students will be able to observe what happens when liquids and water are mixed.</p>	<p>Day 1:</p> <ul style="list-style-type: none"> • Review solid and liquid mixtures • Identify the liquids • Introduce the investigation: Have students guess what might happen if you put water into a bottle of liquid. • Describe adding water and recording: Tell students they will add water to their own bottles and make 3 observations—one before shaking, one soon after shaking, and one tomorrow. • GETTERS get materials and pairs start the investigation. Students record their observations on the <i>Liquid with Water</i> sheet. • Put bottles aside to settle and clean-up. • Have students share discoveries. <p>Day 2:</p> <ul style="list-style-type: none"> • Review what students observed. Make a prediction what their liquids will look like when they remained untouched for a day. • Distribute settled bottles. Have students observe and record. • Clean-up. • Make word bank/content chart entries. • Read science story <i>Mix It Up!</i> 	<p>For each pair of students: 1 bottle with cap, 2 student sheets no. 29 called <i>Liquid with Water</i></p> <p>For each group: 1-liter container, 1 beaker, 1 basin</p> <p>1 bottle brush</p> <p>1 bottle with cap</p> <p>1 basin</p> <p>Food coloring</p> <p>Corn syrup</p> <p>Cooking oil</p> <p>Liquid detergent</p> <p>Liquid hand soap</p> <p>Fabric softener</p> <p>Paper towels</p> <p>Water</p> <p>FOSS Science Stories</p>	<p>Assessment Checklist, Teacher observation, Class discussion</p> <p>Summative: End of Unit Assessment</p>
<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Students will be able</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Day 1:</p> <ul style="list-style-type: none"> • Introduce the toothpaste question—is 	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Copies of student</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teacher</p>

to conduct an investigation to determine if toothpaste is a solid or a liquid.	<p>toothpaste a solid or a liquid? Field student responses.</p> <ul style="list-style-type: none"> • Design an investigation: gather ideas from students on how to figure out the toothpaste question. Propose putting a bit of toothpaste into a beaker of water and observing. • GETTERS collect materials needed. • Distribute the toothpaste to each groups' bottle of water. • Students record observations on student sheets <i>Investigating Toothpaste</i>. • Have students shake the toothpaste bottle and record observations. • Clean-up and have bottles sit overnight. • Have students share their thoughts on whether or not the toothpaste is a solid or liquid at this point in the investigation. Have students provide evidence. 	<p>sheet no. 30 called <i>Investigating Toothpaste</i></p> <p>For each pair of students: 1 bottle with cap</p> <p>For each group: 1-liter container, 1 beaker, 1 ¼-liter container</p> <p>For the class: 1 tube of toothpaste, bottle with cap, 1 bottle brush, water, chart paper, 1 marking pen, paper towels, 1 piece writing paper</p>	<p>observation, Cl discussion</p> <p>Summative: Er Unit Assessmer</p>
<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Students will be able to conduct an investigation to determine if toothpaste is a solid or a liquid.</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Day 2:</p> <ul style="list-style-type: none"> • Briefly review the activities of the previous days. Tell students they will now observe their toothpaste in water bottles after a day. • Observe and record results of toothpaste bottles. • Chart students' opinions: Make a t-chart with headings "Solid" and "Liquid" and have students support their opinions with 	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Copies of student sheet no. 30 called <i>Investigating Toothpaste</i></p> <p>For each pair of students: 1 bottle with</p>	<p>Solids and Liquids</p> <p>Investigation 4</p> <p>Lesson 3</p> <p>Formative: Assessment Checklist, Teacher observation, Cl discussion</p> <p>Summative: Er Unit Assessmer</p>

	<p>evidence.</p> <ul style="list-style-type: none"> • Challenge students to think of a way to prove that toothpaste is mixture of a solid and a liquid. Try separating the mixture and setting it aside to evaporate over the next few days. Have students make conclusions over the next few days. • Make content chart entries. 	<p>cap</p> <p>For each group: 1-liter container, 1 beaker, 1 ¼-liter container</p> <p>For the class: 1 tube of toothpaste, bottle with cap, 1 bottle brush, water, chart paper, 1 marking pen, paper towels, 1 piece writing paper</p>	
<p>Solids and Liquids</p> <p>End of Unit Assessment</p>			<p>Solids and Liquids</p> <p>End of Unit Assessment</p>
<p>Students will be able to demonstrate knowledge of content vocabulary and basic understanding of concepts learned throughout the solids and liquids module</p> <p>Students will be able to determine if a material is a solid or a liquid and provide a reason.</p>	<p>Solids and Liquids</p> <p>End of Unit Assessment</p> <ul style="list-style-type: none"> • As a quick review, play a few minutes of I Spy • Explain to students that they have become experts on solids and liquids and today they will answer some questions to show how much they have learned in this unit. • Explain directions and have student's individually complete assessment. 	<p>Solids and Liquids</p> <p>End of Unit Assessment</p> <p>9 plastic cups</p> <p>4 trays</p> <p>3 solid</p> <p>3 liquid</p> <p>3 solid (bits) (one that hasn't been seen by the students)</p> <p>Cup labels (paper, tape, marking pen) --</p>	<p>Solids and Liquids</p> <p>Summative: End of Unit Assessment</p>

		<p>Label the cups 1, 2 and 3</p> <p>Assessment sheet no. 4 called Performance Assessment for each student</p>	
<p>The Life Cycle of Butterflies</p> <p>Lesson 1</p> <p>Students will be able to look forward to the arrival of the caterpillars.</p> <p>Students will be able to express in words and drawings what they already know about caterpillars and butterflies.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 1</p> <ul style="list-style-type: none"> • Announce to class that caterpillars are coming to live in the classroom and that the class will watch them grow and change. • Conduct brainstorming to fill out the first two columns of a KWL chart on caterpillars. • Keep or hang both charts. • Have students draw a picture of what they think a caterpillar looks like. Then, have students show in drawings how a caterpillar changes during its life. Collect drawings and keep them. 	<p>The Life Cycle of Butterflies</p> <p>Lesson 1</p> <p>For each student: 1 sheet drawing paper, 1 sheet lined paper</p> <p>For the teacher: 2 large sheets of newsprint and markers OR 2 overhead transparencies and markers with a projector</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 1</p> <p>Formative: Student drawings, class discussion, teacher observation</p> <p>Summative: End Unit Assessment</p>

The Life Cycle of Butterflies Lesson 2 Students will be able to prepare the food cups and learn how to care for the caterpillars. Students will be able to use a magnifier. Students will be able to make and record their first observations of the caterpillars.	The Life Cycle of Butterflies Lesson 2 <ul style="list-style-type: none"> • Introduce lesson by discussing caterpillars' food with the class. • Distribute materials. Students will prepare the food by pushing food firmly down into the bottoms of the cups. As students work, tell them to use their senses (besides taste) to observe the properties of the food. • Show students two ways to use the hand lens to observe the food in the cups. Have students practice. • Distribute the caterpillar using a paintbrush. Students will place a tissue over the cups, snap on the top, and rip off excess tissue. Allow time for observation through using the hand lens. • Students complete Activity Sheet 1. • Collect caterpillar cups and put into egg cartons. • Have students share their observations and record on the class calendar. Draw a box around that date. • Have students predict what the caterpillars will look like tomorrow. 	The Life Cycle of Butterflies Lesson 2 For each student: 1 1-ounce cup with lid and tissue, 1 teaspoon of caterpillar food, 1 Activity Sheet 1 called <i>Caterpillar Food</i> , 1 hand lens Class calendar For the teacher: 1 paintbrush, 1 spoon, 3 egg cartons or storage trays 1 8-oz. container of caterpillar food 1 container of caterpillars 1 terrarium and lid	The Life Cycle of Butterflies Lesson 2 Formative: Student Activity Sheet 1 student discussion teacher observation of hand lens use Summative: End of Unit Assessment

[illegible]

<p>to observe the structures and activities of caterpillars more closely.</p> <p>Students will be able to predict what changes may occur next.</p>	<ul style="list-style-type: none"> • Have students observe the caterpillars closely with hand lens. Tell them today they will learn about a caterpillar's body parts. • Circulate and ask questions about the anatomy of the caterpillar. • Use pg. 106 as a transparency or on the bulletin board as you focus discussion about a caterpillar's body. Return to the list of questions students generated in Lesson 1. • Have students complete Activity Sheet 3. • Have students dictate statements to go onto the class calendar. Then have students make predictions about how caterpillars will look tomorrow. • Students will complete worksheet 1.2 as an exit slip. 	<p>caterpillar in a cup, 1 hand lens, 1 Activity Sheet 3 called <i>Observing the Caterpillar</i></p> <p>For the class: Photocopy or overhead of illustration of caterpillar from pg. 106, newsprint pad or overhead transparency from Lesson 1, Class calendar, Art materials for constructing caterpillar models (optional)</p> <p>Copy of Exit Slip 1.2</p>	<p>Activity Sheet 3 student discussion</p> <p>Exit Slip (worksheet 1.2)</p> <p>Summative: End of Unit Assessment</p>
<p>The Life Cycle of Butterflies</p> <p>Lesson 5</p> <p>Students will be able to observe growth and change in the caterpillars and relate this to changes in their own bodies.</p> <p>Students will be able to notice evidence of changes, such as shed skin, the shed capsule, or increases in frass</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 5</p> <ul style="list-style-type: none"> • Spark discussion on how caterpillars grow and change by asking how the students have changed or grown since kindergarten. • Students reflect on how they have changed or grown since they were babies. • Discuss the relationship between food and growth. • Have students observe how their caterpillar is growing or changing. • Hold class discussion on the molting process. 	<p>The Life Cycle of Butterflies</p> <p>Lesson 5</p> <p>For each student: 1 caterpillar in a cup, 1 hand lens, 1 Activity Sheet 4 called <i>My Caterpillar and Me</i></p> <p>For the class: Class Calendar, Caterpillar molting</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 5</p> <p>Formative: Student discussion, teacher observation</p> <p>Exit Slip</p> <p>Summative: End of Unit Assessment</p>

<p>(insect excrement) and decreases in food.</p>	<ul style="list-style-type: none"> • Students complete Activity Sheet 4. Add these to the portfolio. • Record observations on class calendar. • Play game “What If?” comparing the way a caterpillar changes to a human changing. • Exit Slip: Tell why the caterpillar must molt in order to grow. Then tell how molting happens. 		
<p>The Life Cycle of Butterflies</p> <p>Lesson 6</p> <p>Students will be able to observe and draw the silk threads spun by a caterpillar.</p> <p>Students will be able to understand how a caterpillar uses silk.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 6</p> <ul style="list-style-type: none"> • Allow time for students to observe the silk threads with their hand lens. Tell them to concentrate on the amount of silk and the crisscross patterns. Also point out the typical head swaying motion of the caterpillar while spinning. • Have students complete Activity Sheet 5. • Conduct discussion about student observations. Record on class calendar. • Have students predict what their caterpillars will look like next time. • Exit Slip: What are some reasons caterpillars spin silk? (to make a bridge or pathway for crawling, to protect itself, to prepare for molting, to make a place for rest) 	<p>The Life Cycle of Butterflies</p> <p>Lesson 6</p> <p>For each student: 1 caterpillar in cup, 1 hand lens, 1 Activity Sheet 5 called <i>A Caterpillar and Its Silk</i></p> <p>Class calendar</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 6</p> <p>Formative: Student Activity Sheet 5, student discussion, teacher observation</p> <p>Exit Slip</p> <p>Summative: End of Unit Assessment</p>

<p>The Life Cycle of Butterflies</p> <p>Lesson 7</p> <p>Students will be able to observe the J-shape that precedes the caterpillar's transformation into a chrysalis.</p> <p>Students will be able to witness the final molt that results in the chrysalis.</p> <p>Students will be able to describe the anatomy of the caterpillar and share their prior knowledge of butterfly anatomy.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 7</p> <ul style="list-style-type: none"> • Have students observe caterpillars with hand lens focusing on the changing caterpillar and its J-shape. • Students complete Activity Sheet 6. • Hold a brief class discussion on observations and record on class calendar. • Draw a box on calendar indicating when first chrysalises form. • Continue discussion about why some caterpillars have not yet become chrysalises. • Students make predictions about what their caterpillars will look like tomorrow. • Have students draw a picture of a caterpillar again and compare it to their picture from Lesson 1. • Discuss students' prior knowledge of butterfly anatomy. • When ready, move chrysalises to flight cages. • Exit Slip: worksheet 2.1 	<p>The Life Cycle of Butterflies</p> <p>Lesson 7</p> <p>For each student: 1 caterpillar or chrysalis in cup, 1 hand lens, 1 Activity Sheet 6 called <i>What Happens to the Caterpillar?</i></p> <p>For the class: 2 butterfly flight ages, twigs, paper towels, class calendar</p> <p>Worksheet 2.1</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 7</p> <p>Formative: Student Activity Sheet 6 (drawing of caterpillar, student discussion, teacher observation)</p> <p>Exit Slip (worksheet 2.1)</p> <p>Summative: End of Unit Assessment</p>

The Life Cycle of Butterflies Lesson 8 Students will be able to work on their observational skills. Students will be able to realize that even at this apparently inactive stage, important changes are taking place within the chrysalis. Students will be able to make predictions about what will emerge from the chrysalis.	The Life Cycle of Butterflies Lesson 8 <ul style="list-style-type: none"> • Review what students observed when the chrysalises formed. • Cluster students around butterfly cages and have them observe the chrysalises and try to identify body parts. • Use illustration on pg. 108 as transparency or on bulletin board to lead discussion. • Students complete Activity Sheet 7. • Add observations to class calendar. • Exit Slip: worksheet 2.2 	The Life Cycle of Butterflies Lesson 8 For each student: 1 Activity Sheet 7 called <i>Observing the Chrysalis</i> For the class: Butterfly flight cages, illustration of the chrysalis from pg. 108 to be used as an overhead transparency or a bulletin board display, class calendar Worksheet 2.2	The Life Cycle of Butterflies Lesson 8 Formative: Student Activity Sheet 7, student discussion, teacher observation Exit Slip (worksheet 2.2) Summative: End of Unit Assessment

<p>Students will be able to compare the way a butterfly eats with the way a caterpillar eats.</p> <p>Students will be able to observe how the butterfly uses the proboscis to eat.</p>	<ul style="list-style-type: none"> • Have students identify different ways people eat. • Review how caterpillar ate. Ask students for predictions on how butterflies eat. • Students observe butterflies eating sugar water. • Discuss the uncoiling of the proboscis and compare it to humans drinking out of straws. • Discuss students' prior observations of butterflies feeding outside. Encourage students to bring in food for butterflies to try. • Students complete Activity Sheet 9. • Record observations on class calendar. • Exit Slip: How is the caterpillar's way of eating different then the way the butterfly eats? 	<p>For each student: 1 Activity Sheet 9 called <i>Butterflies Need Food</i></p> <p>For the class: 4 Feeding stations (2 for each cage) consisting of: sugar, water, sponge pieces, Petri dishes or shallow jar lids; paper cups, 1 spoon, class calendar</p>	<p>Formative: Student Activity Sheet 9 Student discussion Exit Slip</p> <p>Summative: End of Unit Assessment</p>
<p>The Life Cycle of Butterflies</p> <p>Lesson 11</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 11</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 11</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 11</p>

<p>Students will be able to observe the physical characteristics and behavior of their butterflies.</p> <p>Students will be able to compare the butterflies to themselves.</p> <p>Students will be able to recognize how butterflies are equipped to survive in the natural world.</p>	<ul style="list-style-type: none"> • Students observe butterflies. • Hold class discussion on observed butterfly body parts and how they are used. Use illustration on pg. 109 as transparency or bulletin board. • Students complete Activity Sheet 10. • Have students compare butterfly bodies to their own bodies. Complete Venn diagram as class, if time permits. • Record observations on class calendar. • Exit Slip: Worksheet 3.3 	<p>For each student: 1 Activity Sheet 10 called <i>My Butterfly and Me</i></p> <p>For the class: Butterfly flight cages, class calendar, overhead projector or bulletin board display</p> <p>Worksheet 3.3</p>	<p>Formative: Student Activity Sheet 1 student discussion</p> <p>Exit Slip (Worksheet 3.3)</p> <p>Summative: End Unit Assessment</p>
<p>The Life Cycle of Butterflies</p> <p>Lesson 12</p> <p>Students will be able to realize that butterflies have their place in the environment.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 12</p> <ul style="list-style-type: none"> • Hold brief discussion on why butterflies should be released. • Take cages outside. Have students sit around. • Read a butterfly poem or story (see Bibliography in section 7). • Open the cages and wait patiently. 	<p>The Life Cycle of Butterflies</p> <p>Lesson 12</p> <p>For each student: 1 headband or necklace made in Lesson 9 (optional), writing paper</p> <p>For the class:</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 12</p> <p>Formative: Student discussion, written reflections</p> <p>Summative: End Unit Assessment</p>

	<p>Observe the behavior and appearance of butterflies in nature.</p> <ul style="list-style-type: none"> • Return to the classroom and talk/write about the experience. Have students imagine how the butterfly's life is different now. • Record today's release ceremony on the class calendar. • Inspect the butterfly cages for eggs. 	Butterfly flight cages, class calendar	
<p>The Life Cycle of Butterflies</p> <p>Lesson 13</p> <p>Students will be able to use their collected data to answer questions about their butterflies.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 13</p> <ul style="list-style-type: none"> • Distribute all collected student work from unit to students. Tell students to pay attention to the different stages of the butterfly's life that they have recorded. • Congratulate students on working like scientists. Tell students they will now use their class collection to answer questions 	<p>The Life Cycle of Butterflies</p> <p>Lesson 13</p> <p>For each student: All of their written products from this unit (except for Unit 7 drawings), 1 Activity Sheet 11 called <i>From Caterpillar to</i></p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 13</p> <p>Formative: Student Activity Sheet 1 student discussion</p> <p>Summative: End of Unit Assessment</p>

	<p>about the life of a butterfly.</p> <ul style="list-style-type: none"> • Complete Activity Sheet 11 together, section-by-section. • Work with the class calendar and have a summary discussion. 	<p><i>Butterfly</i></p> <p>Class calendar</p>	
<p>The Life Cycle of Butterflies</p> <p>Lesson 14</p> <p>Students will be able to recognize that the butterfly is an animal called an insect.</p> <p>Students will be able</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 14</p> <ul style="list-style-type: none"> • Review butterfly anatomy. Use butterfly illustration as transparency or on bulletin board. • Tell students that butterflies belong to a large group on animals called insects. • Discuss traits of insects. • Ask students to identify other insects. 	<p>The Life Cycle of Butterflies</p> <p>Lesson 14</p> <p>For each student: 1 Activity Sheet 12 called <i>Are Butterflies Insects?</i></p> <p>For the teacher:</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 14</p> <p>Formative: Student Activity Sheet 1 student discussion</p> <p>Exit Slip</p> <p>Summative: En</p>

to discover the characteristics that all insects have In common.	<ul style="list-style-type: none"> • Students complete Activity Sheet 12. • Ask students why a spider cannot be an insect. Ask for other creatures that may be mistaken for insects. • Exit slip: How do you know a spider is not an insect? 	Butterfly illustrations, overhead projector or bulletin board display	Unit Assessment
The Life Cycle of Butterflies Lesson 15 Students will be able to apply a concept they have learned in this unit to new situations. Students will be able to expand their knowledge of the life	The Life Cycle of Butterflies Lesson 15 <ul style="list-style-type: none"> • Create atmosphere for the discussion of other life cycles by displaying trade books, posters, etc. • Explain that since students are experts on the life cycle of one insect, it might be interesting to find out about life cycles of other life forms. • Discuss the life cycles of other creatures that students are familiar with. • Have students draw and label the life 	The Life Cycle of Butterflies Lesson 15 Trade books, pictures, and/or posters of living creatures or life cycles of creatures.	The Life Cycle of Butterflies Lesson 15 Formative: Student discussion, student diagram of life cycle Summative: End of Unit Assessment

<p>cycles of other plants and animals.</p> <p>Students will be able to realize that cycles are regenerative: life begets life.</p>	<p>cycle of a creature of their choice. Have them list what that creature needs to live.</p>		
<p>The Life Cycle of Butterflies</p> <p>Lesson 16</p> <p>Students will be able to take a post-unit assessment to show what they have learned about the life cycle of a butterfly.</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 16</p> <ul style="list-style-type: none"> • Revisit questions from the beginning of the unit. • Display two class lists. Have students provide evidence of what they have learned and experienced to confirm certain statements and/or answer certain questions. Have students identify and correct statements that need improvement. • Have students record what they have learned about butterflies. • Discuss additional questions that students still have about butterflies. • Have students draw a caterpillar and label its parts. Have them illustrate how a caterpillar changes throughout its life. • Distribute the activity sheets from Lesson 	<p>The Life Cycle of Butterflies</p> <p>Lesson 16</p> <p>For each student: 1 student notebook, 1 copy of the activity sheet from Lesson 1</p> <p>For the class: Two class lists or transparencies from Lesson 1 “What We Know about Caterpillars” and “What We Would Like to Find Out about Caterpillars”</p>	<p>The Life Cycle of Butterflies</p> <p>Lesson 16</p> <p>Formative: Student discussion, student drawing</p> <p>Summative: End Unit Assessment</p>

	<ol style="list-style-type: none"> 1. Have students compare their drawings. <ul style="list-style-type: none"> • Have student's individually complete worksheet 4.4. Go over as a class. 	Worksheet 4.4	
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Grading and Evaluation Guidelines

Grade level common assessments are used throughout this unit.

Textbooks and other resources

Delta FOSS Balance & Motion, 2nd Edition, Copyright 2005

TG Foss Balance & Motion

Delta FOSS Solids & Liquids, Copyright 2005

Carolina STC The Life Cycle of Butterflies, 3rd Edition, Copyright 2013

Other Details

SCED

53232 Science (Grade 2)

Science (Grade 2) courses continue to introduce students to basic scientific processes and principles. Course content may include identification of patterns, classification and sequencing, or manipulation of systems to observe interactions between parts and record the effects of change. Specific content depends upon state standards for grade 2.

