

## Unit 2—Forces and Motion (FOSS® Balance and Motion) *Physical Science*

### Essential Question: What causes objects to move?

**Major Understandings:** *Quoted from New York State Performance Indicators*

**(Note: Correlation is provided at the level of FOSS® “Investigation & Part.” All “Steps” of an investigation must be completed to meet the standard.)**

**PS 5.1 Describe the effects of common forces (pushes and pulls) of objects, such as those caused by gravity, magnetism, and mechanical forces.**

- 5.1a The position of an object can be described by locating it relative to another object or the background (e.g., on top of, next to, over, under, etc.).
- 5.1b The position or direction of motion of an object can be changed by pushing or pulling.
- 5.1c The force of gravity pulls objects toward the center of the Earth.

**PS 5.2 Describe how forces can operate across distances.**

- 5.2a The forces of gravity and magnetism can affect objects through gases, liquids, and solids.

### Consult the FOSS® Balance and Motion Teacher Guide:

Overview: Science Background, pp. 3-4. The concepts of balance and linear and rotational motion are explored in this unit. This module is best undertaken with opportunities for free exploration and sharing of ideas. This perspective is addressed in the Overview: Science for Young Children, and Organizing the Classroom sections.

**Materials, Review “Materials Supplied by the Teacher” (items not included in your kit) and “Preparing the Kit for Your Classroom,” pp. 4-7.**

- **View the FOSS Balance and Motion Module Introduction and Before You Begin segments of the FOSS Teacher Preparation Video / DVD (also available online at <http://www.fossweb.com/modulesK-2/BalanceandMotion/index.html> .**
- **Collect the “Materials Supplied by the Teacher” needed to prepare a new kit.** Most items will be gathered from your classroom.
  - Pliers are used once to bend the ends of the aluminum wires to produce round ends.
  - Cardboard (cereal/cracker/cookie) boxes are used for making balancing shapes.
  - Pennies are used to add weight to rolling cups.

**Grade 2**

**Lesson 23 “Investigate Force With Rolling Magnets” addresses Standard PS 5.2a:** “The forces of gravity and magnetism can affect objects through gases, liquids, and solids.”

This lesson is taken from Investigation 3: Rollers: Interdisciplinary Extensions, Science Extensions, p.28 and IDM Teacher Sheet No. 11. Donut magnets are not included in the kit, but may be borrowed from Grade 4 teachers who use FOSS Magnetism and Electricity in Unit 2.

The donut magnets are also available from Delta Education: Part #: 130-3422. The magnets may be ordered as a set of 36 or individually.

**Consider Recording Observations:**

Download the Science Notebook Folio on the Teacher Resources page at [www.fossweb.com/NYC](http://www.fossweb.com/NYC) for more information. Focus/Inquiry questions are found in the “At A Glance” Chart for each Investigation. Use of a student notebook will reinforce the standards addressed in Unit 2 which ask students to “DESCRIBE” their observations of forces.

Attention should be paid to using vocabulary to describe relative position of objects: over, under, next to, on top of, etc...

**Plan for space:**

- Review Investigation 2, Part 3, “Twirlers” to plan the appropriate space for flying your “Twirlers.”
- Review Investigation 3, Part 3, “Rolling Spheres,” Step 9. Make a Long Runway to plan space in or outside of your classroom.

**Consider “Interdisciplinary Extensions” in Language Arts, Math, Art and Science to accompany this module.**

Review suggestions for fiction and nonfiction student reading in the Resources section of the Balance and Motion Teacher Guide including:

*Mirette on the High Wire* by Emily Arnold McCully. G.P. Putnam’s Son’s, New York, 1997.

*Mirette and Bellini Cross Niagra Falls* by Emily Arnold McCully. G.P. Putnam’s Son’s, New York, 2000.

## Grade 2

<b>WEEK 1</b>	<p><b>Lesson 1 (45 min)</b></p> <p><b>Objective(s):</b> Pre-assessment.</p>	<p><b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b, c; PS 5.2a</p>	
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Note: Administration of the Pre-Test should be a few days BEFORE the start of the unit.</li> <li>– Teacher Guide, Assessment Folio, pp. 1-12</li> <li>– Kit preparation: See Teacher Guide, Materials, pp. 1-7 and Teacher Preparation Video or DVD (or view at <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a>).</li> <li>– Note: See Teacher Guide, Materials, p. 4 for Materials Supplied by the Teacher.</li> <li>– <b>Gather materials as noted above for Investigations 1, 2, and 3.</b></li> <li>– Review the <b>Overview</b> folio of the Teacher Guide taking special note of pp. 3-4: Science Background: pp. 6-7: Science for Young Children pp. 8-9: Organizing the Classroom; p. 15: Safety in the Classroom; p.18: Balance and Motion Module Matrix.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– End-of-Module Assessment, Written Assessment may be administered as a Pre-Test. Use Assessment Duplication Masters Nos. 5, 6 (Questions 1-6)</li> <li>– Letter to Parents, Teacher Sheet No. 1</li> </ul> <p><b>Note:</b> The Letter to Parents in your Teacher Guide informs parents and caregivers about upcoming experiences for students. Two resources found on Fossweb.com will help you connect parents and caregivers to student learning.</p> <p><i>Log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a> : Go to Grade 2, click on Balance and Motion. Click on “Teacher/Parent Info”: Click on “Home School Connection.” Download the “FOSS® at Home” Folio.</i></p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Send Home Letter to Parents.</p>

## Grade 2

<b>WEEK 1 (continued)</b>	<p><b>Lesson 2 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Objects can be balanced in many ways.</li> <li>• Counterweights can help balance an object.</li> <li>• The way an object balances can be changed by counterweighting.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, c</p>	
	<p><b>Advanced Planning/ Notes to Teacher</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>– Teacher Guide Inv. 1: Balance, Part 1: Trick Crayfish, Materials and Getting Ready pp. 8-10</li> <li>– Consider Science Notebooks: Download the FOSS Science Notebooks folio at <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>.</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 1: Balance Part 1: Trick Crayfish, pp. 11-13, Steps 1-6</li> <li>– Investigation Duplication Master: Teacher Sheet No. 1</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul>	<p style="text-align: center;"><b>Homework/ Extra Practice</b></p>

## Grade 2

<b>WEEK 1 (continued)</b>	<b>Lesson 3 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Objects can be balanced in many ways.</li> <li>• Counterweights can help balance an object.</li> <li>• The way an object balances can be changed by counterweighting.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, c
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>– Teacher Guide Inv. 1: Balance, Part 1: Trick Crayfish, Materials and Getting Ready pp. 8-10</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: Balance Part 1: Trick Crayfish, pp. 11-13, Steps 7-12</li> <li>– Investigation Duplication Master: Teacher Sheet No. 1</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How many ways can a shape be balanced?” may be used for student journal entries.</p>	<b>Homework/ Extra Practice</b>

## Grade 2

<b>WEEK 2</b>	<b>Lesson 4 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• A stable position is one that is steady; the object is not falling over.</li> <li>• The place on which an object balances is called the balancing point.</li> <li>• Counterweights should be placed low on an object in relation to the balance point.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, c
	<b>Advanced Planning/ Notes to Teacher</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>– Teacher Guide Inv. 1: Balance, Part 2: Triangle and Arch, Materials and Getting Ready pp. 14-15</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion.</b></li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: Balance Part 2: Triangle and Arch, pp. 16-18, Steps 1-7</li> <li>– Investigation Duplication Master: Student Sheet No. 2</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can counterweights help us balance other shapes?” may be used for student journal entries.</p>	<b>Homework/Extra Practice</b>

## Grade 2

<b>WEEK 2 (continued)</b>	<b>Lesson 5 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• A stable position is one that is steady; the object is not falling over.</li> <li>• The place on which an object balances is called the balancing point.</li> <li>• Counterweights should be placed low on an object in relation to the balance point.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, c
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>– Teacher Guide Inv. 1: Balance, Part 2: Triangle and Arch, Materials and Getting Ready pp. 14-15</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: Balance Part 2: Triangle and Arch, pp. 16-18, Steps 8-11</li> <li>– Investigation Duplication Master: Student Sheet No. 2</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can counterweights help us balance other shapes?” may be used for student journal entries.</p>	<b>Homework/Extra Practice</b>

## Grade 2

<p><b>Lesson 6 (45 min)</b>  <b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Counterweights should be placed low on or below an object in relation to the balance point.</li> <li>The position of an object can be described by relating its location to another object.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b>  PS 5.1a, c</p>	
<p><b>Advanced Planning/  Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>Teacher Guide Inv. 1: Balance, Part 3: The Pencil Trick, Materials and Getting Ready, pp. 19-20</li> <li>Teacher Guide Science Stories folio, pp. 2-3</li> <li><a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching</li> </ul> <p><b>Balance and Motion.</b></p>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Investigation 1: Balance  Part 3: The Pencil Trick, pp. 21-23, Steps 1-11</li> <li>Assessment Duplication Masters Nos. 1, 2, 3:  Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can a pencil be balanced on its point?” may be used for student journal entries.</p>	<p><b>Homework/Extra Practice</b></p>

## Grade 2

	<p><b>Lesson 7 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Counterweights should be placed low on or below an object in relation to the balance point.</li> <li>The position of an object can be described by relating its location to another object.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, c</p>	
<b>WEEK 3</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>Teacher Guide Inv. 1: Balance, Part 3: The Pencil Trick, Materials and Getting Ready pp. 19-20</li> <li>Teacher Guide Science Stories folio, pp. 2-3</li> <li><a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Investigation 1: Balance Part 3: The Pencil Trick, pp. 21-23, Steps 12-15</li> <li>Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can a pencil be balanced on its point?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 3-9, <i>Make It Balance!</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p> <p style="text-align: right;"><b>Homework/Extra Practice</b></p> <p>Home/School Connection – Student Sheet No. 19</p>	

## Grade 2

<b>WEEK 3 (continued)</b>	<b>Lesson 8 (45 min)</b> <b>Objective(s):</b> A mobile is a system of balanced beams and objects.		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, c; PS 5.2a
	<b>Advanced Planning/ Notes to Teachers</b> – Teacher Guide Inv. 1: Balance pp. 1-7 – Teacher Guide Inv. 1: Balance, Part 4: Mobiles, Materials and Getting Ready pp. 24-26 – <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b> .	<b>Investigation/Activity</b> – Investigation 1: Balance Part 4: Mobiles, pp. 21-23, Steps 1-5 – Investigation Duplication Master: Student Sheet No. 3 or 4 – Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist  <b>Note:</b> The Focus Question, “How do the parts of a mobile stay in a stable position?” may be used for student journal entries.	<b>Homework/Extra Practice</b>

## Grade 2

<p><b>Lesson 9 (45 min)</b>  <b>Objective(s):</b>  A mobile is a system of balanced beams and objects.</p>	<p><b>Alignment with NYS Core Curriculum:</b>  PS 5.1a, c; PS 5.2a</p>		
<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: Balance pp. 1-7</li> <li>– Teacher Guide Inv. 1: Balance, Part 4: Mobiles, Materials and Getting Ready pp. 24-26</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 1: Balance Part 4: Mobiles, pp. 21-23, Steps 6-8</li> <li>– Investigation Duplication Master: Student Sheet No. 3 or 4</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How do the parts of a mobile stay in a stable position?” may be used for student journal entries.</p> <p>Read: <i>Mirette on the High Wire</i> by Emily Arnold McCully</p> <ul style="list-style-type: none"> <li>– See Interdisciplinary Extensions, Language Extensions for guiding questions.</li> </ul>		<p style="text-align: center;"><b>Homework/ Extra Practice</b></p> <p>Math Extension A or B – Student Sheet No. 12 or 13</p>

## Grade 2

<b>WEEK 4</b>	<b>Lesson 10 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Objects and systems that turn on a central axis exhibit rotational motion.</li> <li>• You need a force to start a top spinning.</li> <li>• The amount and position of mass affect how the object rotates.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b, c
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: Spinners pp. 1-7</li> <li>– Teacher Guide Inv. 2: Spinners, Part 1: Tops, Materials and Getting Ready, pp. 8-10</li> <li>– Teacher Guide Science Stories folio, pp. 4-5</li> <li>– Consider Science Notebooks: Download the FOSS Science Notebooks folio at <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a></li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 2: Spinners Part 1: Tops, pp. 11-13, Steps 1-6</li> <li>– Investigation Duplication Master: Student Sheet No. 5</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can spinning tops be changed?” may be used for student journal entries.</p>	<b>Homework/Extra Practice</b>

## Grade 2

<p><b>Lesson 11 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Objects and systems that turn on a central axis exhibit rotational motion.</li> <li>• You need a force to start a top spinning.</li> <li>• The amount and position of mass affect how the object rotates.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b, c</p>	
<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: Spinners pp. 1-7</li> <li>– Teacher Guide Inv. 2: Spinners, Part 1: Tops, Materials and Getting Ready, pp. 8-10</li> <li>– Teacher Guide Science Stories folio, pp. 4-5</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 2: Spinners Part 1: Tops, pp. 11-13, Steps 7-12</li> <li>– Investigation Duplication Master: Student Sheet No. 5</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can spinning tops be changed?” may be used for student journal entries.</p>	<p><b>Homework/Extra Practice</b></p>

## Grade 2

<b>WEEK 4 (continued)</b>	<p><b>Lesson 12 (45 min)</b>  <b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Objects and systems that turn on a central axis exhibit rotational motion.</li> <li>• You need a force to start a top spinning.</li> <li>• The amount and position of mass affect how the object rotates.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b>  PS 5.1a, b, c</p>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: Spinners, pp. 1-7</li> <li>– Teacher Guide Inv. 2: Spinners, Part 1: Tops, Materials and Getting Ready, pp. 8-10</li> <li>– Teacher Guide Science Stories folio, pp. 4-5</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 2: Spinners Part 1: Tops, pp. 11-13, Steps 13-15</li> <li>– Investigation Duplication Master: Student Sheet No. 5</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can spinning tops be changed?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 10-13, <i>Push or Pull?</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 2

	<p><b>Lesson 13 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• There are different ways to initiate rotational motion.</li> <li>• The motion of an object can be changed by pushing or pulling.</li> <li>• Tops and zoomers both spin but in different ways.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b; PS 5.2a</p>	
<b>WEEK 5</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: Spinners, pp. 1-7</li> <li>– Teacher Guide Inv. 2: Spinners, Part 2: Zoomers, Materials and Getting Ready, pp. 14-16</li> <li>– Teacher Guide Science Stories folio, pp. 6-7</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 2: Spinners Part 2: Zoomers, pp. 17-19, Steps 1-7</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can spinning objects be kept in motion?” may be used for student journal entries.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 2

<b>WEEK 5 (continued)</b>	<p><b>Lesson 14 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• There are different ways to initiate rotational motion.</li> <li>• The motion of an object can be changed by pushing or pulling.</li> <li>• Tops and zoomers both spin but in different ways.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b; PS 5.2a</p>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: Spinners pp. 1-7</li> <li>– Teacher Guide Inv. 2: Spinners, Part 2: Zoomers, Materials and Getting Ready, pp. 14-16</li> <li>– Teacher Guide Science Stories folio, pp. 6-7</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 2: Spinners Part 2: Zoomers, pp. 17-19, Steps 8-10</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can spinning objects be kept in motion?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 14-17, <i>Tools and Machines</i> pp. 18-21, <i>Move it But Don’t Touch It</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>	<p><b>Homework/Extra Practice</b></p> <p>Home/School Connection – Student Sheet No. 20</p>

## Grade 2

<b>WEEK 5 (continued)</b>	<b>Lesson 15 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Variations in design can influence the rotational motion of spinning objects.</li> <li>Air resistance can act as the force that initiates rotational motion.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a; PS 5.2a
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 2: Spinners, pp. 1-7</li> <li>Teacher Guide Inv. 2: Spinners, Part 3: Twirlers, Materials and Getting Ready, pp. 20-22</li> <li>Teacher Guide Science Stories folio, p. 8</li> <li><a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Investigation 2: Spinners Part 3: Twirlers, pp. 23-25, Steps 1-9</li> <li>Investigation Duplication Master: Student Sheets Nos. 7, 8</li> <li>Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can air start an object spinning?” may be used for student journal entries.</p>	<b>Homework/Extra Practice</b>

## Grade 2

<b>WEEK 6</b>	<p><b>Lesson 16</b> (45 min)</p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Variations in design can influence the rotational motion of spinning objects.</li> <li>Air resistance can act as the force that initiates rotational motion.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a; PS 5.2a</p>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 2: Spinners, pp. 1-7</li> <li>Teacher Guide Inv. 2: Spinners, Part 3: Twirlers, Materials and Getting Ready, pp. 20-22</li> <li>Teacher Guide Science Stories folio, p. 8</li> <li><a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion.</b></li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Investigation 2: Spinners Part 3: Twirlers, pp. 23-25, Steps 10 - 15</li> <li>Investigation Duplication Master: Student Sheets Nos. 7, 8</li> <li>Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can air start an object spinning?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 22-25, <i>Things That Spin</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>	<p><b>Homework/Extra Practice</b></p> <p>Math Extension A – Student Sheet No. 14 at home <i>or</i> Math Extension B – Student Sheet No. 15 and Teacher Sheet No.16 <u>in class</u></p>

## Grade 2

<b>WEEK 6 (continued)</b>	<p><b>Lesson 17 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Wheels roll down a slope.</li> <li>• A slope is a surface that is higher on one end.</li> <li>• Axles support wheels.</li> <li>• Wheel-and-axle systems with wheels of different sizes roll toward the smaller wheel.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b, c; PS 5.2a</p>	
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers, pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Part 1: Rolling Wheels, Materials and Getting Ready, pp. 6-8</li> <li>– Consider Science Notebooks: Download the FOSS Science Notebooks folio at <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a></li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion.</b></li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Part 1: Rolling Wheels, pp. 9-12, Steps 1-15</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can a wheel and axle system be changed?” may be used for student journal entries.</p> <p><b>Note:</b> You may wish to do this investigation in 2 parts to allow plenty of time for recording in notebooks.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 2

<b>WEEK 6 (continued)</b>	<b>Lesson 18 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Cups roll in the direction of the smaller end.</li> <li>To roll straight, two cups can be taped together so the ends are the same size.</li> <li>The amount and location of an added weight can change the way a system rolls.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b; PS 5.2a
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 3: Rollers, pp. 1-5</li> <li>Teacher Guide Inv. 3: Rollers, Part 2: Rolling Cups, Materials and Getting Ready, pp. 13-14</li> <li>Teacher Guide Science Stories folio, p. 9</li> <li><a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Investigation 3: Rollers Part 2: Rolling Cups, pp. 15-18, Steps 1-13</li> <li>Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Questions, “Can we predict the behavior of a rolling cup?” “What happens if weight is added to a rolling cup?” may be used for student journal entries.</p> <p><b>Note:</b> You may wish to do this part of the investigation in 2 sessions to allow plenty of time for recording in notebooks.</p>	<b>Homework/Extra Practice</b>

## Grade 2

<b>WEEK 7</b>	<p><b>Lesson 19 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Cups roll in the direction of the smaller end.</li> <li>• To roll straight, two cups can be taped together so the ends are the same size.</li> <li>• The amount and location of an added weight can change the way a system rolls.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b; PS 5.2a</p>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers, pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Part 2: Rolling Cups, Materials and Getting Ready, pp. 13-14</li> <li>– Teacher Guide Science Stories folio, p. 9</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Part 2: Rolling Cups, pp. 15-18, Steps 14-16</li> <li>– Investigation Duplication Master: Student Sheets Nos. 7, 8</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Questions, “Can we predict the behavior of a rolling cup?” “What happens if weight is added to a rolling cup?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 26-31, <i>Rolling, Rolling, Rolling!</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>

## Grade 2

	<p><b>Lesson 20</b> (45 min)</p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Spheres are round in all directions and roll in all directions.</li> <li>• A runway must be high at the start and low at the finish for a sphere to roll the complete length.</li> <li>• Spheres roll down a slope.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b, c</p>	
WEEK 7 (continued)	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers, pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Part 3: Rolling Spheres, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 10-11</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Part 3: Rolling Spheres, pp. 21-25, Steps 1-8</li> <li>– Investigation Duplication Master: Student Sheet No. 10</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can we make a runway system that will keep a marble rolling?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 32-35, <i>Strings in Motion</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>	
		<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Math Extension A – Student Sheet No. 17</p> <p><b>Note:</b> Students will need standard or non-standard measurement tools to compare the lengths of the runways.</p>	

## Grade 2

<p><b>Lesson 21</b> (45 min)</p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Spheres are round in all directions and roll in all directions.</li> <li>• A runway must be high at the start and low at the finish for a sphere to roll the complete length.</li> <li>• Spheres roll down a slope.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b, c</p>	
<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers, pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Part 3: Rolling Spheres, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 10-11</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion.</b></li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Part 3: Rolling Spheres, pp. 21-25, Steps 9-13</li> <li>– Investigation Duplication Master: Student Sheet No. 10</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can we make a runway system that will keep a marble rolling?” may be used for student journal entries.</p>	<p><b>Homework/Extra Practice</b></p> <p>Math Extension B – Student Sheet No. 18</p> <p><b>Note:</b> Provide students with ½” x 6” paper strips to compare the lengths of the runways and make the long runway.</p>

## Grade 2

	<p><b>Lesson 22</b> (45 min)</p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Spheres are round in all directions and roll in all directions.</li> <li>• A runway must be high at the start and low at the finish for a sphere to roll the complete length.</li> <li>• Spheres roll down a slope.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b, c</p>	
<b>WEEK 8</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Part 3: Rolling Spheres, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 10-11</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching <b>Balance and Motion</b>.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Part 3: Rolling Spheres, pp. 21-25, Steps 14-16</li> <li>– Investigation Duplication Master: Student Sheet No. 10</li> <li>– Assessment Duplication Masters Nos. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How can we make a runway system that will keep a marble rolling?” may be used for student journal entries.</p> <p>Read Science Stories: pp. 32-35, <i>Strings in Motion</i></p> <p>For link to the Balance and Motion Science Stories Audio Stories log on to <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a>: Go to Grade 2, click on Balance and Motion. Click on “Media”; click on Audio Stories.</p>	<p style="text-align: center;"><b>Homework/ Extra Practice</b></p> <p>Home/School Connection – Student Sheet No. 21</p>

## Grade 2

<b>WEEK 8 (continued)</b>	<p><b>Lesson 23 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• A force is a push or a pull.</li> <li>• Magnets exert a push or a pull force on one another depending on the orientation of the magnets.</li> <li>• Magnets can push (repel) or pull (attract) other magnets through gases (air) and solids (cardboard).</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <p>PS 5.1a, b; PS 5.2a</p>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: Rollers pp. 1-5</li> <li>– Teacher Guide Inv. 3: Rollers, Interdisciplinary Extensions, Science Extensions, p. 28</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, Audio Stories, to write questions to a scientist, for teaching tips, and other websites to support teaching</li> </ul> <p><b>Balance and Motion.</b></p>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: Rollers Interdisciplinary Extensions, Science Extensions, p. 28</li> <li>– Investigation Duplication Master: Teacher Sheet No. 11</li> <li>– Assessment Duplication Master No. 1, 2, 3: Anecdotal Notes and Assessment Checklist</li> </ul> <p><b>Note:</b> The Focus Question, “How do rolling magnets interact?” may be used for student journal entries.</p> <p><b>Note: DONUT SHAPED MAGNETS may be borrowed from Grade 4 Teachers using the FOSS kit Magnetism &amp; Electricity or ordered from Delta Education. (see Materials notes)</b></p>	<p style="text-align: center;"><b>Homework/ Extra Practice</b></p>

## Grade 2

<b>WEEK 8 (continued)</b>	<b>Lesson 24</b> (45 min) <b>Objective(s):</b> Performance Assessment		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b, c	
	<b>Advanced Planning/ Notes to Teachers</b> Teacher Guide, Assessment Folio, pp. 6-11	<b>Investigation/Activity</b> – Administer the End-of-Module Assessment – Performance Assessment. – Assessment Duplication Master No. 4 – Assessment Duplication Master No. 7, Portfolio Assessment Checklist – Anecdotal Notes and Assessment Checklist		<b>Homework/ Extra Practice</b>
<b>WEEK 9</b>	<b>Lesson 25</b> (45 min) <b>Objective(s):</b> End of Module Assessment		<b>Alignment with NYS Core Curriculum:</b> PS 5.1a, b, c; PS 5.2a	
	<b>Advanced Planning/ Notes to Teachers</b> Teacher Guide, Assessment Folio, pp. 6-11	<b>Investigation/Activity</b> – Administer the End-of-Module Assessment – Written Assessment. – Assessment Duplication Masters Nos. 5-6 – Assessment Duplication Master No. 7, Portfolio Assessment Checklist – Anecdotal Notes and Assessment Checklist		<b>Homework/ Extra Practice</b>