

# GRADE 7 | *Garden*

## SCOPE & SEQUENCE



### GRADE 7 STANDARDS

At the end of Grade 7, students will be able to:

- Demonstrate knowledge of microclimates and seasonal planting.
- Demonstrate increased understanding of basic business skills to create a budget with income and expenses.
- Demonstrate knowledge of various soils types and soil composition.
- Demonstrate increased knowledge of photosynthesis.
- Demonstrate understanding of the relationship between producers and consumers in the garden food system.
- Evaluate the interdependence of organisms in the garden environment.

## GRADE 7 | FALL


Each activity described below should be designed to last approximately 45 minutes.


Lesson # & Title	Topic	Content Learning Objective(s)	Suggested Lesson Activity	Life Skills Learning Objective(s)	Connections to Kitchen Lessons	Possible Extensions	Academic Standard Connections	Health Standard Connections
<b>START THE YEAR</b> <i>Schoolwide Garden Work Party with Families/Local Community</i>								
1. Welcome to the Garden!	Personal and Community Life Skills (PLS and CLS)		Have students share their names. Explore Garden Agreements established in <b>Grade 6 Lesson #1: Welcome to the Garden</b> together and ask if anyone would like to suggest any updates. Review Personal and Community Life Skills. Then have students elaborate, practicing these agreements as they look around the garden using a leaf scavenger hunt (for example, find the largest leaf; the darkest green leaf; a fuzzy leaf; a leaf that is not green; etc).	<b>PLS.1-6</b>  <b>CLS.5</b> Students participate in the development of agreed upon protocols and behaviors for the garden and kitchen environments.	Compare agreements from <b>Kitchen Lesson #1: Welcome to the Kitchen</b> with the garden agreements.	<b>Classroom:</b> Write a poem comparing the uniqueness of leaves on the school campus to the uniqueness of students in the school community.	<b>NGSS.7.LS1.A</b> Structure and Function.  <b>CCSS.ELA-LITERACY.SL.7.1</b> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.	

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<b>2.</b> Discovering Microclimates and Testing Soils	Soil (S)	<p><b>S.7.1</b> Identify soil compositions in the school environment.</p> <p><b>S.7.2</b> Recognize and classify various soil types.</p> <p><b>WSCG.7.1</b> Understand and identify microclimates around your school, what foods grow best in each one, and why.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	Review how to use shake jars, soil test kits, and air thermometers. Explain how to use a soil thermometer. Then have student teams explore soil, collecting soil samples and soil and air temperatures from various areas around the school. Help them use shake jars and soil test kits to identify soil composition, type, and health. Read soil and air thermometers to record temperatures. Hand out garden journals, and have students record comparisons between different locations on the grounds. Explain the concept of microclimates.	<b>PLS.2</b> Students are able to express empathy and caring for themselves, others, and the environment.	In <b>Kitchen Lesson #2: Making Preserves</b> , discuss “microclimates” in the kitchen, including the refrigerator, freezer, oven, etc. Explain how canning is a process of making a microclimate that is inhospitable for bacteria and microbes.	<b>Community:</b> Visit a local farmer to discuss microclimates that exist on their farm land and how they make decisions based around them.	<p><b>NGSS.7.LS2.B</b> Cycle of Matter and Energy Transfer in Ecosystems.</p> <p><b>CCSS.MATH.CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	

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3. Micro-climates	Weather and Seasons, Climate and Geography <b>(WSCG)</b>	<b>WSCG.7.1</b> Understand and identify microclimates around your school, what foods grow best in each one, and why.  <b>GTE.7.1-5</b> Garden Tools and Equipment	Have student teams elaborate on their understanding of microclimates from <b>Lesson #2: Discovering Microclimates and Testing Soils</b> by reading seed packets and planting guides, and then selecting a crop to plant in a particular microclimate in the school garden (for example, bush beans against a sunny, hot wall or lettuce in a more shaded area). Then have them prepare the area for planting, including amending the soil.	<b>CLS.3</b> Students understand and apply principles of fairness, equity, and democracy in the garden and kitchen environments.	Work with the kitchen educator to identify crops you will be using this year that can be planted in various microclimates around the school.	<b>Classroom:</b> Create a sun map showing where the shadow hits the school grounds at multiple times during the day in that season to inform decision making.	<b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems  <b>CCSS.ELA-LITERACY.RI.7.1</b> Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	


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4. Planting in Micro-climates	Garden and Food Systems (GFS)	<p><b>GFS.7.3</b> Describe the relationship between producers and consumers in the human world.</p> <p><b>WSCG.7.1</b> Understand and identify microclimates around your school, what foods grow best in each one, and why.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	Have students explain why plants are essential to our survival (they can make food, we can't!). Then have student teams plant the crops they selected in <b>Lesson #3: Microclimates</b> , and make plans to care for them.	<b>CLS.2</b> Students cooperate and communicate well with each other.	In the kitchen, harvest, cook, and enjoy the crops you planted throughout the year.	<b>Classroom:</b> Create an interactive, rhythmic play or rhyme for elementary students that tracks all levels of the food chain back to plants using a song like "Green Grass Grows All Around" as a model.	<p><b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems.</p> <p><b>CCSS.ELA-LITERACY.W.7.2</b> Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p>	

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5. Photo-synthesis, Part 1	Plants (P)	<b>P.7.2</b> Explain photosynthesis.	Have students explore plant material, such as a heavy log, and discuss their ideas about where plant matter comes from. Then, have them observe the chemical reaction described in <u>Life Lab's "Photosynthesis Revealed" lesson</u> to allow them to see evidence of carbon being released by our breath (the chemical will change colors). Hand out journals and have students draw the test tubes, and use arrows and labels to show what happened and why they think it happened. Then explain that you are going to put an aquatic plant in one of the tubes. Have students record predictions of what impact they think the plant will have on the chemical and why. 	<b>PLS.6</b> Students actively seek creative and resourceful solutions.	In <b>Kitchen Lesson #5: Seared Pork Chops with Hoisin BBQ Sauce and Pineapple Asian Slaw</b> , highlight that when we eat cabbage we are eating leaves, or the parts of the plants that gather sunlight for photosynthesis to occur.	<b>Classroom:</b> Create a stop motion video with paper cutouts to show where plant matter comes from.	<b>NGSS Science and Engineering Practice:</b> Engaging in Argument from Evidence.  <b>CCSS.ELA-LITERACY.SL.7.1.C</b> Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.	


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6. Photo-synthesis, Part 2	Plants (P)	<b>P.7.2</b> Explain photosynthesis.	Have students revisit the chemical reaction from <b>Lesson #5: Photosynthesis, Part 1</b> to observe changes since the plant has been added to the bottle. Give teams 6 cards that say "Carbon," 12 that say "Hydrogen," and 6 that say "Oxygen." Explain and demonstrate how to arrange them into carbon dioxide molecules (2 Carbons, 1 Oxygen) and water molecules (2 Hydrogen, 1 Oxygen). Explain that these represent the carbon dioxide in the air and water in the soil. Now have them rearrange them into C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> and explain that this represents a carbohydrate, or sugar. This is what plants do! They make food out of thin air! Have students revisit their original conceptions from <b>Lesson #5: Photosynthesis, Part 1</b> to come up with a revised theory of where plant material comes from. 	<b>CLS.2</b> Students cooperate and communicate well with each other.	In the garden, make a salad and highlight that the leaves of the plants gather sunlight for photosynthesis to occur.	<b>Classroom:</b> Create a video of the carbon, hydrogen, and oxygen rearranging in a choreography with a popular song, modeled after "The Electric Slide." Add lyrics or a repeated phrase.	<b>NGSS Science and Engineering Practice:</b> Developing and Using Models.  <b>CCSS.ELA-LITERACY.SL.7.1.C</b> Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.	


## GRADE 7 | WINTER


Each activity described below should be designed to last approximately 45 minutes.


Lesson # & Title	Topic	Content Learning Objective(s)	Suggested Lesson Activity	Life Skills Learning Objective(s)	Connections to Kitchen Lessons	Possible Extensions	Academic Standard Connections	Health Standard Connections
7. Brain-storming Products	Weather and Seasons, Climate and Geography <b>(WSCG)</b>	<b>WSCG.7.2</b> Demonstrate knowledge of seasonal gardening.	Engage students by walking through the garden together. Brainstorm possible products they might harvest from their garden, prepare in the kitchen, and sell to raise funds for a gift to the garden when they are in Grade 8. Explore possible products they could make for each season, and discuss benefits of each. A few possibilities include fruit preserves, pickles, baked goods, breakfast or lunch items, and the like. 	<b>PLS.6</b> Students actively seek creative and resourceful solutions.	In this garden lesson, discuss the environmental, economic and nutritional benefits of seasonal foods, and discuss how their business contributes to the local food system.	<b>Community:</b> Visit a local farmers market to explore the different products that are available in your area.	<b>Social Studies:</b> Economics.  <b>CCSS.MATH. CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	<b>National Health Education Standard 5:</b> Students will demonstrate the ability to use decision-making skills to enhance health.




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8. Considering Customers	Business Planning (BP)	<b>BP.7.1</b> Demonstrate the ability to create a food business project.	As a class, explore possible customers for the student business, such as other students, school staff, families, or farmers market customers (if they can go sell at a local farmers market). Explain how to design a survey. Help students design a survey to conduct with potential customers to help them decide what to sell, where and when to sell it, and the like. For more guidance on running a garden business with students, read <i>Growing Ventures</i> by the National Gardening Association. 	<b>CLS.1</b> Students demonstrate problem solving and resolve conflict as a team.	In this garden lesson, discuss nutrient loss when foods are stored, processed, and shipped. Discuss the health benefits of local foods.	<b>Community:</b> At a local farmers market, conduct a “dot survey” displaying multiple choice questions, each on a piece of poster board. Request that customers put a sticker dot on the choice that matches their opinion most. Ask strategic questions to inform business decisions.	<b>Social Studies:</b> Economics.  <b>CCSS.MATH. CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	

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9. Planning Our Business, Part 1	Business Planning (BP)	<b>BP.7.1</b> Demonstrate the ability to create a food business project.	Explore together the customer survey results from <b>Lesson #8: Considering Customers</b> . Review what you have in abundance in the garden, discuss what you could plant now for a fall harvest, and decide together via discussion and vote what product(s) to sell. Start with something you can plant this spring and harvest, prepare, and start selling in the fall of Grade 8. Then have students self-select a team to work on. Each team will explore one of the 4 P's for this product: Pricing (What do similar products cost?), Production (Make a prototype), Packaging (How can we make our product visually appealing to our customers?), and Placement (Where are we most likely to reach our customers?). 	<b>CLS.2</b> Students cooperate and communicate well with each other.	In this garden lesson, review the health benefits of eating local foods, discussed in <b>Lesson #8: Considering Customers</b> . Have students discuss how they might convey these benefits to customers in the packaging and/or marketing of their product.	<b>Community:</b> Interview a food business in your community about how they make decisions based on the 4 P's.	<b>Social Studies:</b> Economics.  <b>CCSS.MATH.CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	


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<b>10.</b> Planning Our Business, Part 2	Business Planning ( <b>BP</b> )	<b>BP.7.1</b> Demonstrate the ability to create a food business project.	Together with students, explain the benefits of running a business, including contributing to the local food system; making something healthy available to customers; raising funds to give back to the garden program; and learning business skills. Then have teams elaborate on their research, presenting their findings on the 4P's from <b>Lesson #9: Planning Our Business, Part 1</b> , give and receive feedback from the rest of the class, and finalize plans for pricing, production, packaging and placement. 	<b>PLS.6</b> Students actively seek creative and resourceful solutions.	Students will make the product for the business planned here in <b>Grade 8 Kitchen Lesson #2: Preparing the Product for Our Business</b> .	<b>Community:</b> Visit a local art critique at a university or museum noticing how constructive criticism can be given to improve a current work.	<b>Social Studies:</b> Economics.  <b>CCSS.ELA-LITERACY.SL.7.4</b> Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.	

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<b>11.</b> Planting Fruit Trees	Gardening Tools and Equipment <b>(GTE)</b>	<b>GTE.7.1-5</b> Garden Tools and Equipment	Have students explore local fruit, consulting with a local gardening guide, horticulturalist, or orchardist about when to plant fruit trees in your region, and which varieties will do the best. Explain and demonstrate how to plant a fruit tree and then work together with your students to plant a stone fruit (plum, peach, etc) or a pome fruit (apple, pear, etc) tree. 	<b>PLS.2</b> Students are able to express empathy and caring for themselves, others, and the environment.	Harvest fruit and incorporate it into dishes in the kitchen throughout the year.	<b>Classroom:</b> Research the work of Johnny Appleseed, using many different sources to compare facts and accounts.	<b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems.  <b>CCSS.ELA-LITERACY.SL.7.1</b> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.	

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12. Grafting	Plants (P)	<p><b>P.7.1</b> Describe and perform grafting, slips, and cutting propagation methods.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	<p>Demonstrate, or invite an orchardist to demonstrate, how to graft fruit stock onto root stock on a fruit tree. Demonstrate knife safety and discuss how this is both similar and different from using knives in the kitchen. Then have students do practice cuts on sticks (but not on the tree itself).</p> 	<b>PLS.3</b> Students cultivate honest and responsible behaviors that contribute to the learning of the community.	Have students incorporate these fruits into dishes they plan in the dinner menus they make in <b>Grade 8 Kitchen Lesson #1: Welcome to the Kitchen!</b>	<p><b>Community:</b> Teach elementary school students how to graft fruit stock onto root stock on a fruit tree. Practice clear communication and appropriate vocabulary to clear up any misconceptions students may have.</p>	<p><b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems.</p> <p><b>CCSS.ELA-LITERACY.SL.7.1.A</b> Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.</p>	

## GRADE 7 | SPRING



Each activity described below should be designed to last approximately 45 minutes.

Lesson # & Title	Topic	Content Learning Objective(s)	Suggested Lesson Activity	Life Skills Learning Objective(s)	Connections to Kitchen Lessons	Possible Extensions	Academic Standard Connections	Health Standard Connections
<b>13.</b> Crop Planning for the Business	Business Planning <b>(BP)</b>	<b>BP.7.2</b> Create a garden planting list.  <b>GPM.7.1</b> Understand and apply basic garden math skills to the design and planning of school/ community gardens.	As a class, have students explore what type of crop, and the quantity they will need, to plant in the spring in order to have enough produce for their food business that begins in the fall of Grade 8 (for example, berries for berry jam). Then have students measure and map an area in the school garden where they can grow all of the produce needed for their business.  	<b>CLS.1</b> Students demonstrate problem solving and resolve conflict as a team.	Students will make the product for the business planned here in <b>Grade 8 Kitchen Lesson #2: Preparing the Product for Our Business.</b>	<b>Community:</b> Interview local food businesses about how they make decisions on where they source produce or the experience of growing it themselves.	<b>Social Studies:</b> Economics.  <b>CCSS.MATH. CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	

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14. Planting for Our Business	Garden Planning and Maintenance (GPM)	<p><b>GPM.7.1</b> Understand and apply basic garden math skills to the design and planning of school/ community gardens.</p> <p><b>BP.7.1</b> Demonstrate the ability to create a food business project.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	Review safe tool use and the importance of following best practices for harvesting and handling food from the garden. Have students elaborate on their garden skills to date by working together to prepare the bed(s) where they will plant produce for their business. Then have them use spacing information from a seed packet, transplant label, or planting guide to map out where in the bed they will plant each plant. Have them measure with rulers, and mark each planting area with a hand trowel, chopstick, or the like. Once spacing looks good, have students transplant plants into each spot and water them in.	<b>CLS.3</b> Students understand and apply principles of fairness, equity, and democracy in the garden and kitchen environments.	Students will make the product for the business planned here in <b>Grade 8 Kitchen Lesson #2: Preparing the Product for Our Business.</b>	<b>Community:</b> Visit a local community garden or school garden to lead a planting. Use information from seed packets to guide decisions.	<p><b>CCSS.MATH.CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems.</p>	

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15. Managing Insects	Garden and Food Systems (GFS)	<p><b>GFS.7.1</b> Identify beneficial and non-beneficial insects in the soil and garden environments and create management strategies.</p> <p><b>P.7.1</b> Describe and perform grafting, slips, and cutting propagation methods.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	Have students recall the role of beneficial insects in a garden ecosystem and methods of attracting them. If no one mentions it, explain to students that planting perennials is an effective way to attract more beneficial insects who, in turn, will reduce the population of non-beneficial insects. <u>Demonstrate how to take a cutting from a perennial plant such as a Salvia and place it in water to propagate.</u> Have each student elaborate, taking two cuttings to propagate.	<b>PLS.2</b> Students are able to express empathy and caring for themselves, others, and the environment.	As you build a habitat for beneficial insects, have students make signs explaining how these insects help us grow produce for our kitchen.	<b>Community:</b> Create an infographic or chart showing photos or scientific drawings of insects categorizing them as beneficial or harmful. Distribute at a local library or community organization.	<p><b>NGSS.7.LS4.D</b> Biodiversity and Humans.</p> <p><b>CCSS.ELA-LITERACY.RI.7.2</b> Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.</p>	



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<b>16.</b> Business Income and Expenses 	Business Planning ( <b>BP</b> )	<b>BP.7.3</b> Create basic income/expense model.	Engage students by revisiting the business plans they created in <b>Lesson #9: Planning Our Business, Part 1</b> . Then, have students explore their planting list and other projected purchases (such as mason jars or art supplies) to tally expenses for their business. Explain to students how to use their suggested product price to determine how much they would have to sell to break even; to make a profit; etc. Elaborate by discussing feasibility of selling that number and adjust plans accordingly. 	<b>PLS.5</b> Students develop the ability to make informed and responsible decisions.	Students will make the product for the business planned here in <b>Grade 8 Kitchen Lesson #2: Preparing the Product for Our Business</b> .	<b>Community:</b> Interview value-added product vendors about the decisions they have made to lower their expenses so their business can be more profitable.	<b>Social Studies:</b> Economics.  <b>CCSS.MATH. CONTENT.7.NS.A.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.	

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17. Interdependence	Garden and Food Systems (GFS)	<b>GFS.7.2</b> Evaluate the interdependence of organisms in the garden environment.	Explore interdependence by having students plant 3 crops that intercrop well together, such as the 3 Sisters: corn, beans and squash. Explain how each crop supports the others (i.e. beans fix nitrogen for corn and squash, corn provides climbing structure for beans, etc). Share the history of the <u>3 Sisters Garden</u> . Have students elaborate by representing intercrop visually, such as by creating a labeled diagram illustrating the interdependence between each crop. Note: For a crop that you can harvest in the fall after summer vacation, plant popcorn, winter squash, and dry beans.	<b>PLS.6</b> Students actively seek creative and resourceful solutions.	In this lesson, have students add the kitchen to their diagrams and draw and label arrows connecting it with the garden ecosystem (i.e. produce into kitchen, compost from kitchen to garden, etc). If you planted the 3 Sisters, describe the unique nutritional benefits of the 3 Sisters: Carbohydrates in corn; Proteins in beans; and vitamins and minerals in squash. Then cook the beans in <b>Grade 8 Lesson #6: Cooking Beans</b> .	<b>Community:</b> With the help of a local artist, turn this concept into a mural that can be painted in the community.	<b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems  <b>VA:Cr2.3.7a</b> Apply visual organizational strategies to design and produce a work of art, design, or media that clearly communicates information or ideas.  <b>Social Studies:</b> Native American Culture and History.	

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18. Cuttings and Slips	Plants (P)	<p><b>P.7.1</b> Describe and perform grafting, slips, and cutting propagation methods.</p> <p><b>GTE.7.1-5</b> Garden Tools and Equipment</p>	<p>Review safe tool use. Divide class into 2 groups. Have each group elaborate on their garden learning to date by spending about 20 minutes at each of the following stations:</p> <ul style="list-style-type: none"> <li>Planting perennials propagated in <b>Lesson #15: Managing Insects</b> (once roots are about <math>\frac{3}{4}</math>" long, cuttings are ready to be planted. If perennials are not ready, make this station about bringing the cuttings home and writing directions for how to plant them at home.)</li> <li>Start sweet potato slips to take home and observe over time.</li> </ul>	<p><b>PLS.1</b> Students are self-aware and show respect for their own needs, the needs of others, and the environment. They practice safe and conscientious behaviors in the garden and kitchen environments.</p>	In the kitchen, have students discuss the propagation methods used for any of the ingredients they use in their dishes for the Feast Around the World.	<p><b>BAM Box!:</b> Have students prepare <u>sweet potato slips</u> to take home, grow out, and document over time in their journals. If you live where sweet potatoes grow, they can return these to the garden when they're ready to plant out.</p>	<p><b>NGSS.7.LS2.A</b> Interdependent Relationships in Ecosystems.</p> <p><b>CCSS.ELA-LITERACY.SL.7.1.C</b> Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.</p>	