## GRADE 3 Garden



## SCOPE & SEQUENCE



## GRADE 3 STANDARDS

At the end of Grade 3, students will be able to:

- Demonstrate increased understanding of the structure and function of plant parts, specifically of flowers.
- Demonstrate knowledge of germination, propagation, and plant growth.
- Demonstrate ability to design and conduct science experiments in the garden.
- Demonstrate knowledge of geographic and climate influences on food.
- Demonstrate knowledge of food systems.
- Demonstrate knowledge of beneficial insects in the garden.
- Demonstrate knowledge of pollinators and predators in the garden.
- Demonstrate knowledge of basic garden design using basic math.

	GRADE 3   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			
S	START THE YEAR Schoolwide Garden Work Party with Families/Local Community										
1. Welcome to the Garden!	Personal and Community Life Skills (PLS and CLS)		Engage students by having each student share their name and something interesting they notice in the garden. Explore teamwork by doing an age-appropriate team-building exercise. Explain how to work together as a team by establishing garden agreements together. Review Personal and Community Life Skills. Then have students elaborate, practicing these agreements as you explore the garden using a scavenger hunt.	PLS.1-6  CLS.5  Students participate in the development of agreed upon protocols and behaviors for the garden and kitchen environments.	Compare group agreements for the kitchen with agreements students have in the garden. How are behavior expectations similar in both places? How are they different?	Read Chrysanthemum by Kevin Henkes, a story about acceptance and appreciation for new friends on the first days of school.	CCSS.ELA- LITERACY.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.				

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2. Bread is for Eating	Garden and Food Systems (GFS)	GFS.3.4 Define local food system.	Engage students by reading aloud Bread is for Eating by David and Phillis Gershator. When the book is finished, have each student explore wheat by picking a wheat seed from a wheat plant and chew it like gum. Explain how these seeds are ground to make flour and bread. Then have students prepare a snack with bread, such as avocado toast, together. As they enjoy, have them elaborate by discussing the elements of the food system that went into the bread.	PLS.3 Students cultivate honest and responsible behaviors that contribute to the learning of the community.	Students will process whole wheat into pretzels in Kitchen Lesson #9: Threshing, Winnowing and Grinding Wheat and Kitchen Lesson #10: Old-Fashioned Pretzels.	Classroom: Have each student write a story—each from a different perspective of someone or something along the same food system.  Community: Visit the people in your community that interact along this food system towards baking bread.  Cafeteria: Trace an item in the lunch line back to its source.	NGSS Science and Engineering Practice: Developing and Using Models.  CCSS.ELA- LITERACY.W.3.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.		

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3. Seed Starting Mix	Soil (S)	S.3.1  Describe and/or create a planting medium for different types of gardens  GTE.3.1-5  Garden Tools and Equipment	Explain that seed starting mixes are important for giving seeds the best chance of sprouting by providing them with everything they need. Demonstrate how to follow a "recipe" to make a seed starting mix. Have students make and use the mix to fill containers and then plant seeds. Have them plant peas, sunflowers, or other plants with edible sprouts. Challenge teams to elaborate by modifying the "recipe" and make their own seed starting mixes that they think would be good for plants. Hand out journals that students will use to reflect at the end of each lesson, and have students record their own "recipes."	CLS.1 Students demonstrate problem solving and resolve conflict as a team.	In the garden, discuss how a "recipe" for seed starting mix compares to with a kitchen recipe.	Classroom: Describe the parts that make up the soil recipe as fractions of the whole.	NGSS Science and Engineering Practice: Constructing Explanations and Designing Solutions.  CCSS.MATH. CONTENT.3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.		

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4. Seed Starting Mix Exper- iments	Plants (P)	P.3.2 Create an experiment (inquiry, observe, collect data, and make conclusions) to test various growing environments for plants. GTE.3.1-5 Garden Tools and Equipment	Using the soil mixes created by the teams of students in Lesson #3: Seed Starting Mix, have teams plant the same type of seed in all of their containers. Have them post their soil recipe in front of their container of seeds. Then have them explore, observe, and record the differences in each team's germination rates, plant growth, and the like in their journals over time.	PLS.4 Students are active and engaged learners who show up on time prepared to learn and manage their time wisely.	Once their seeds germinate, have them harvest the sprouts and conduct a comparative taste test in the garden with sprouts of the same type grown in different soil mixes. Discuss any flavor or texture differences using Culinary Flavor and Texture concepts and terms learned in the kitchen.	Classroom: Create a line graph to chart and compare the growth of different plants.	CCSS.MATH. CONTENT. 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.  NGSS Science and Engineering Practice: Planning and Carrying Out Investigations	

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5. Discovering Our Pests	Garden and Food Systems (GFS)	GFS.3.1 Understand how to increase the beneficial insects in a garden environment.	Have student teams explore the garden looking for pests and evidence of pests. Use a garden field guide such as the one found at <u>Dave's Garden</u> online, to try to identify what types of pests are causing the damage. Then explain the role of predatory insects in keeping down pest populations in gardens. Have teams research which types of predatory insects reduce the populations of your most common pests using a resource such as <u>Permaculture Research</u> Institute's Guide to Plants that Attract Beneficial Insects.	PLS.1 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.	In the garden, discuss the "seconds" that farmers often sell at a reduced rate, which can include irregular or pest-damaged produce. Discuss culinary options for using cost-saving seconds, such as cutting off the damaged parts or using the produce in recipes where the damage will be less noticeable, such as in pies, smoothies, or casseroles.	Classroom: Tally the amount of each insect found in the garden. Compare and contrast the numbers of pests to predators.  Community: Create informational flyers to distribute throughout the neighborhoods to home gardeners to present images and descriptions of beneficial insects to protect and harmful insects to beware of.	NGSS Science and Engineering Practice: Asking Questions and Defining Problems  CCSS.ELA- LITERACY.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	

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6. Discovering Beneficial Insects	Garden and Food Systems (GFS)	GFS.3.2 Design a plan to support and increase beneficial insects in the garden.	Have teams elaborate on their research by preparing and presenting a plan for increasing beneficial insects in their garden, for example by planting a particular perennial to attract them. Conduct a class vote on which plan to pursue.	CLS.2 Students cooperate and communicate well with each other.	Enjoy a farm fresh dish, such as that prepared in Kitchen Lesson #6: Cooking with What's In Abundance. As you enjoy it, give thanks to the predatory insects that ate the pests and allowed your crop to grow.	Classroom: Chart votes on a bar graph to compare.	NGSS Science and Engineering Practice: Constructing Explanations and Designing Solutions.  CCSS.MATH. CONTENT. 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	

			<b>GR</b> Each activity described below sl	ADE 3   WINTE		5 minutes.		
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7. Planting for Beneficial Insects	Garden and Food Systems (GFS)  Garden Tools and Equipment (GTE)	GTE.3.1-5 Garden Tools and Equipment	Explain how to use measuring tape and garden string to measure, stake out, and mark a new bed. Then demonstrate safe and proper use of a hoe for weeding. Have students elaborate by preparing the bed for planting together. As a class, implement the plan that won votes in Lesson #6: Discovering Beneficial Insects (for example by strategically planting certain plants to attract predatory insects that will reduce the population of a specific pest). Have students create signs for the beneficial insect garden bed and include information about which insects the plants are meant to attract, pests they eat, and crops they're helping guard. For example, a sign might say: "This calendula attracts lady bugs which eat our aphids and protect our salad greens!"	PLS.1 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.	As you enjoy any garden fresh produce in the kitchen, look for any evidence of crop damage by pests. Then review and celebrate the role of beneficial insects in protecting that crop from any more damage.	Community: Start seeds for perennials that attract beneficial insects in containers. Send seedlings home with students to plant at home or to give to others.	CCSS.MATH. CONTENT.3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.  CCSS.ELA- LITERACY.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.	

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8. Web of Life	Garden and Food Systems (GFS)	GFS.3.3 Describe a food web.	Give each student a card with a plant or animal from your garden on it. Also include a card with a farmer or gardener on it, and one with a person who buys and eats food on it. Have students stand in a circle and give a ball of yarn to one student in the circle. Challenge them to explore interdependence by tossing the yarn to another student and suggesting how they are connected. For example, "I'm a sunflower and I'm connected to the worm because the worm made soil for me to grow in." Continue until you have a web. Discuss how everything in the garden is interconnected. Use this to explain the term food web.	CLS.2 Students cooperate and communicate well with each other.	In the garden, ask students to add cards representing different roles they know people play in kitchens (chefs, dishwashers, etc). Add these people to the web and discuss how they interact with the food web.	Classroom: Write a narrative in sequence in which each of the "characters" from the webbing activity in this garden lesson connects to the next. Instead of a plot of beginning, middle, and end it can be modeled as a "circular tale" like If You Give a Mouse a Cookie by Laura Numeroff.	CCSS.ELA- LITERACY.W.3.3.A Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally.  NGSS Science and Engineering Practice: Developing and Using Models.	

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9. Mapping Magic Spaces	Garden and Food Systems (GFS)	GFS.3.3 Describe a food web.	Give each student a string tied in a circle with about a 2-foot diameter. Have students find a "Magic Space" where they can sit alone in the garden and place their string circles. Once in their spots, have them explore, drawing maps showing everything they can see in their circles. Then have them draw arrows connecting as many things they can, labeling the arrows. For example, you might have an arrow from a bird to a bug to a plant that says "Bird eats bugs off plants." Challenge them to find as many arrows as they can. Come together, share out the connections, add your own ideas, and explain that all of these connections represent the food web in the garden. Have students look for arrows that would connect between their circles.	PLS.4 Students are active and engaged learners who show up on time prepared to learn and manage their time wisely.	When students work with wheat in Kitchen Lesson #9: Threshing, Winnowing, and Grinding Wheat, they will explore systems in a similar way to reinforce the idea that things work together. In the kitchen lesson, they will discuss or diagram connections between different elements of the wheat process, such as "Wheat goes into bread which goes into us; wheat stalks go into compost which goes out to the garden," etc.	Classroom: Write a narrative story with the "Magic Space" as the setting and the animal inhabitants as the characters.  Community: Imagine "Magic Spaces" throughout your community and what connections may exist in them between the humans, the land, and the animals.	NGSS Science and Engineering Practice: Developing and Using Models.  Social Studies: Geography.	

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10. Researching Biogerions	Weather and Seasons, Climate and Geography (WSCG)	WSCG.3.1 Define and map the bioregions of your state	Assign each team of students a bioregion from your state to explore via research. Provide them with key questions to answer, including ecology, elevation, climate, population centers, and the like. Have each team research and then elaborate by presenting their bioregion. As they share out, add their bioregion to a large, collective map of your state for the entire class to see. Save your map for future lessons.	CLS.2 Students cooperate and communicate well with each other.	In the garden, bring in a common item of produce from each bioregion and do a tasting of a regional food after each research team presents their findings on their region. Discuss the benefits of local, seasonal foods.	Classroom: Have each group write an informational paragraph about their bioregion including a main idea, detail sentences, and a conclusion sentence.  Community: Interview people that live in each of the bioregions to learn about how the ecology of the region affects their lifestyle and livelihood.	NGSS Science and Engineering Practice: Analyzing and Interpreting Data.  Social Studies: Geography  CCSS.ELA- LITERACY.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	

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11. Tracing the Journey of Food	Weather and Seasons, Climate and Geography (WSCG)	WSCG.3.1 Define and map the bioregions of your state.  GFS.3.4 Define local food system.	Select one bioregion from your state and one crop that is grown there. Have student teams work together to trace the journey that crop would take to turn from a plant or animal in that region into a processed food in a store in another region. Discuss as a class how all of the bioregions interact in the food system as we grow crops in one place, process them in another, transport them for sale in another, and so on.	CLS.1 Students demonstrate problem solving and resolve conflict as a team.	In the garden, have students contrast the journey of food they just researched with the journey of wheat from farm to table in Kitchen Lesson #9: Threshing, Winnowing, and Grinding Wheat and Kitchen Lesson #10: Old-Fashioned Pretzels.	Classroom: Write letters from a crop as it travels along its journey, similar to the model of The Adventures of a Plastic Bottle by Alison Inches.  Community: Work with the local farmers market to highlight the journey of certain local products from the farm to the market.	Social Studies: Geography.  CCSS.ELA- LITERACY.W.3.3  Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.	National Health Education Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

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12. Bioregions and Local Food Systems	Garden and Food Systems (GFS)	GFS.3.4 Define local food system.  WSCG.3.1 Define and map the bioregions of your state	Engage students by leading a kinesthetic activity reviewing the plant life cycle from seed to plant for a plant that grows in your bioregion. Explore how that food (oranges, for example) is harvested, then travels across the state to be juiced and frozen into popsicles before traveling to the farmers market to be sold to the community. Explain this process further by reading a text about local food systems and elaborate on student understanding by writing a letter to a local farmer showing gratitude for the work and care they contributed to every step from farm to market. Students can be evaluated based on the understanding of the local food system they express in their letter.	CLS.4 Students appreciate and are respectful of differences and diversity in their communities.	Prepare a dish in the kitchen featuring key crops from your state. For each crop, highlight the region it was grown and discuss all of the people that got it to where it is now.	Community: Create a market stand and sell (or give away!) your food products, for example in front of the school at the end of the school day.	Social Studies: Economics.  CCSS.ELA- LITERACY.W.3.3  Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.	Standard 7: Students will demonstrate the ability to practice health- enhancing behaviors and avoid or reduce health risks.

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13. Garden Caretakers	Garden Planning and Maintenance (GPM)	GPM.3.2 Describe and/or demonstrate proper weeding techniques. GTE.4.1-4 Garden Tools and Equipment	Review safe use of hoes, digging forks, hand forks, or any other relevant tools. Guide students in using division strategies to divide tasks and tools. Then rotate through a Garden Care Station Rotation:  • Weed a bed together and prepare it for planting  • Flip the compost pile  • Plant a Healthy Snack Bed (designed in Kitchen Lesson #12: Healthy Snack Plan) or identify other necessary tasks at the time, such as harvesting something in abundance, picking snails off of plants, or removing dead flowers from a bush.  If you made popsicles in Lesson #12: Bioregions and Local Food Systems, celebrate your hard work by enjoying them together.	PLS.1 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.	During this garden lesson, as you frame the student roles as garden caretakers, make the connection between the work they're doing in the garden, the food growing, and the dishes they're preparing in the kitchen.	Community: Plan workdays at other community gardens to weed, flip compost, and whatever else needs to be accomplished.	CCSS.MATH. CONTENT.3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	

Lesson # Topic	Content Learning	Suggested Lesson Activity	Life Skills Learning	Connections to	Possible	Academic Standard	Health Standard
& Title	Objective(s)		Objective(s)	Kitchen Lessons	Extensions	Connections	Connections
14. Preparing a Bed for Planting (GPM)	g and Calculate	Review safe use of hand weeding tools, hand trowels, and any other relevant tools. Have students explore gardening by preparing a bed together where they will plant plants that require supports, such as sugar snap peas, pole beans, cane fruits, or tomatoes. Then have them use spacing information from a seed packet, transplant label, or planting guide to map out where in the bed you 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 them plant seeds or transplant plants that require support into each spot and water in.	PLS.1 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.	Incorporate peas and/ or beans into recipes such as in Kitchen Lesson #18: Sesame Peanut Noodle Salad or Grade 4 Kitchen Lesson #6: Nutty Buttery Green Beans.	Classroom: Write a poem about what is your support to help you climb higher to your fullest potential.  Community: Teach others at a community garden how to use spacing information from seed packets and map out where to plant each seed.	NGSS Science and Engineering Practice: Using Mathematics and Computational Thinking.  CCSS.MATH. CONTENT.3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	

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15. Designing Supports	Garden Planning and Maintenance (GPM)	GPM.3.3 Identify needs and create support systems for various plants (beans, peas, tomatoes, cane fruit). GTE.3.1-5 Garden Tools and Equipment	Have students explore various trellising equipment in the garden. Demonstrate how to safely and properly install trellising equipment. Assign a plant to each team of 4–6 students. Challenge teams to elaborate on their learning by designing and building their own support structure for their plant. Have them revisit to compare designs and modify as plants grow over time.	PLS.6 Students actively seek creative and resourceful solutions.  CLS.1 Students demonstrate problem solving and resolve conflict as a team.	Compare support structures in the garden with those in cooking (tiered cakes, braided pie tops, etc). Discuss how you might use climbing plants grown in the garden for cooking. In the kitchen, prepare a dish using the climbing plants students grew in the garden. For example, you can incporporate peas or beans into Kitchen Lesson #18: Sesame Peanut Noodle Salad or Grade 4 Kitchen Lesson #6: Nutty Buttery Green Beans.	Classroom: Write a "How to" Guide for the developed trellis design.  Community: Build a bean teepee, tunnel, or other design for a local preschool or community garden.	NGSS Science and Engineering Practice: Constructing Explanations and Designing Solutions.  NGSS.3.ETS1.A Defining and Delimiting Engineering Problems.  NGSS.3.ETS1.B Developing Possible Solutions.  NGSS.3.ETS1.C Optimizing the Design Solution.  CCSS.ELA- LITERACY.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	

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16. Flower Dissection	Plants (P)	P.3.1 Describe structures and functions of flowers.	Have students dissect flowers with easily visible structures, such as passion flowers, lilies, gladioli, tulips, or daffodils. Have them explore, looking at each part and guessing what its function is based on its structure. Have them share out and explain the scientific name for a few key parts: pistil, stamen, petals, and ovary. Then have them elaborate, finding another flower in the garden and look for those same structures, which they can draw and label in their journals.	PLS.2 Students are able to express empathy and caring for themselves, others, and the environment.	Garnish a salad or a dish such as in Kitchen Lesson #14: Biscuits with Berries with edible flowers from the garden.	Classroom: Read The Reason for a Flower by Ruth Heller.  Community: Find flowers growing in your community and look closely to identify parts.	NGSS Science and Engineering Practice: Engaging in Argument from Evidence.  CCSS.ELA- LITERACY.SL.3.1.D Explain their own ideas and understanding in light of the discussion.		

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17. Build a Flower	Plants (P)	P.3.1 Describe structures and functions of flowers.	Have students elaborate on what they learned from dissecting flowers to build their own model flowers, using recycled crafting materials such as cardboard, construction paper, etc. Each flower must include a structure for attracting pollinators, one for giving off pollen, and one for collecting pollen.	PLS.6 Students actively seek creative and resourceful solutions.	In the kitchen, use the concept of structure and function as you introduce or review kitchen tools in order to help students recognize how this concept cuts across disciplines. For example, the shape of a spatula is flat (structure) in order to slide under things (function).	Classroom: Write an informational paragraph to accompany the flower model describing each of the structures and their purpose.  Community: Display models in a local library to inform patrons of the flower parts and the purpose of flowers.	NGSS Science and Engineering Practice: Developing and Using Models.  CCSS.MATH. CONTENT.3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	

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18. Planting Wheat for Next Year's Grade 3 Class	Garden Planning and Maintenance (GPM)	GPM.3.1 Calculate number of seeds and seed spacing for garden beds.  GPM.3.2 Describe and/ or demonstrate proper weeding techniques.	Have students explore and measure a garden bed that is prepared for planting. Guide them in calculating the number of wheat seeds needed to fill the bed. Explain that they are planting the wheat now for next year's Grade 3 class to harvest. Then plant that crop together.	CLS.2 Students cooperate and communicate well with each other.	Remind students of their experience threshing, winnowing, and grinding wheat in Kitchen Lesson #9: Threshing, Winnowing, and Grinding Wheat. Review the anatomic and nutritional differences between whole wheat and white flour.	Classroom: Read From Wheat to Bread by Stacy Taus-Bolstad.	NGSS Science and Engineering Practice: Using Mathematics and Computational Thinking.  CCSS.MATH. CONTENT.3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	