In this chapter, students learn about the variety of vegetables, how they contribute to good health, and how they add flavor, color, and texture to meals. Students examine how to select, store, and prepare vegetables.

**Build Background**

Ask students to name their favorite vegetable. Ask volunteers to share their responses with the class and explain how they like their favorite vegetable prepared.

**Increasing Interest**

Many children mistakenly believe that all vegetables taste bad. Imagine you have a young sibling who refuses to eat vegetables. What steps will you take to increase her interest in vegetables and motivate her to eat them? Write a step-by-step guide that explains your ideas.

**Writing Tips**

Follow these steps to write a step-by-step guide:

- Consider what steps are necessary to achieve a desired outcome.
- Present steps in chronological order with an introduction and conclusion.
- Explain the purpose of each step.

**Step-by-step guides will vary.**

For example, one step-by-step guide may include the following: 1. Prepare colorful vegetables that your younger sibling has not tried and present them in an appealing way. This will teach your sibling about variety and appeal. 2. Eat the vegetables you prepare in front of your younger sibling. This will set a positive example. 3. Talk about how good the vegetables taste. This will increase your sibling’s curiosity.
Before You Read

Examine the photos in this chapter. How many of the vegetables pictured have you tried? Make a list.

Read to Learn

Key Concepts
- List the nutrients found in vegetables.
- Identify the eight types of vegetables.
- Explain how to store fresh vegetables.
- Describe how to prepare fresh vegetables.
- Identify the types and uses of convenience forms of vegetables.

Main Idea

Vegetables contribute to good health, can be prepared in many ways, and add flavor, color, and texture to meals.

Content Vocabulary

You will find definitions for these words in the glossary at the back of this book.
- tuber
- solanine
- salad greens
- nudges
- cooking greens
- aromatic vegetable
- sea vegetables

Academic Vocabulary

You will find these words in your reading and on your tests. Use the glossary to look up their definitions if necessary.
- dainty
- compound

Graphic Organizer

Use a graphic organizer like the one below to note signs of quality to look for when choosing vegetables.

D Main Idea

Discuss the main idea with students. Ask students: Do you think the flavor, color, and texture of different vegetables influence a person's tendencies to like or dislike certain vegetables? Explain. (Answers will vary depending upon students' experiences.)
Nutrients In Vegetables

There are countless ways to prepare and serve vegetables as main dishes, side dishes, appetizers, and snacks. Vegetables add flavor, color, and texture to meals. They also contribute to your health.

Vegetables are rich in many vitamins and minerals, making them among the most nutritious foods. For example, bell peppers, tomatoes, and raw cabbage are good sources of vitamin C. Leafy green vegetables provide folic acid, vitamin K, calcium, and magnesium.

Vegetables are also an important source of fiber, carbohydrates, and phytochemicals. They contain no cholesterol, and most are low in calories, fat, and sodium. Many vegetables contain antioxidants, including vitamins A and C and lycopene, that may lower your risk of some cancers and heart disease.

Answer Bell peppers, tomatoes, and raw cabbage are good sources of vitamin C.
Roots A plant’s food supply is stored in its roots. The purpose of a plant’s roots are to absorb water and nutrients and anchor the plant to the ground. Many roots can be eaten raw, but others must be cooked. Carrots, beets, turnips, and radishes are roots.

Tubers A tuber is a large underground stem that stores nutrients. This part of the plant must be cooked. The potato is the most popular tuber. Other tubers include yams and jicama.

Bulbs Found in the underground part of the stem, bulbs are fleshy structures surrounded by layers of fleshy leaves. They can be eaten raw or cooked and used in many recipes. Onions and garlic are bulbs.

Identifying Vegetables

Vegetables come in an incredible array of shapes and sizes, from the dainty, or delicate, green pea to the hefty orange pumpkin. Figure 29.2 describes nearly three dozen vegetables and their uses.

Vegetables that come from leaves are called leafy greens. Leafy greens that are eaten raw are called salad greens. Many lettuce varieties are salad greens. Leafy greens that are eaten cooked are called cooking greens. Cooking greens are usually tougher and thicker than salad greens. Cooking greens can be added to soups, sauces, and other recipes. Cooking greens include collards, dandelion greens, kale, mustard greens, chard, and spinach.

Figure 29.2 Vegetable and Their Uses

Plant Parts Vegetables come from many different plant parts, including leaves, stems, fruit, and seeds. Which vegetables shown here are types of cabbage? Which vegetable is a type of fungus?

Artichokes
- Large, unopened flower bud of a plant in thistle family with thick, green, compact scales. Nutty flavor.
- Pull off outer leaves.
- Use raw with dip.
- Use cooked in appetizers, salads, and entrees.

Asparagus
- Green stem vegetable. Tall stalks with closed, compact, rich green tips. Related to onions, garlic, and leaks. Come in green, purple, and white varieties.
- Use raw with dip.
- Use cooked in salads, pasta dishes, and as a side dish.

Beans
- Seed vegetable.
- Young and tender, with firm, crisp pods.
- Varieties include yellow wax beans and snap beans (also known as green beans or string beans).
- Beans are fresh if they make a snapping sound when bent.
- Choose unblemished beans with a bright appearance and good color. Avoid wilted, flabby, or tough pods.
- Use raw plain or with dip. Use cooked in salads, stir-fries, and as a side dish.

Beets
- Root vegetable.
- Firm, round, and smooth, with deep red color and a slender tap root.
- Crisp with sweet flavor. Color bleeds into other foods.
- Avoid elongated or wilted beets. Beet greens are the crisp, dark green leaves of beets, used as cooking greens.
- Use cooked in salads and as a side dish.

Caption Answer Broccoli, cabbage, cauliflower are types of cabbages. Mushrooms are a type of fungus.

Discussion Ask students: Which type of potatoes make good French fries and why? (New, white, and Round Red potatoes because they keep their shape.)
Bok Choi
- Head of dark green leaves on thick, crisp, edible white stalks.
- Mild flavor like cabbage.
- Use raw in salads. Use cooked in stir-fries and as a side dish.

Broccoli
- Type of cabbage.
- Related to cauliflower.
- Firm, compact cluster of tiny buds on stout, edible stems. Deep emerald green, with possible purple tinge. Avoid yellowing or open buds, watery spots on cluster, and very thick stems.
- Use raw with dip or in salads. Use cooked as a side dish.

Brussels Sprouts
- Enlarged buds cut from tall stem.
- Look like small cabbages.
- Bright green color, compact leaves, and a firm body.
- Avoid wilted leaves or yellow or black spots.
- Use raw with dip. Use cooked in soups and stews and as a side dish.

Cabbage
- Leaf vegetable with a short, broad stem and a compact, heavy head of leaves or flowers.
- Strong flavor.
- Varieties include green, red, savoy (milder flavor), kale.
- Napa cabbage has elongated head and thick-veined, cream-colored crinkly leaves with a mild flavor.
- Use raw, shredded, in salads or slaws. Use cooked in stir-fries and as a side dish. Use leaves to wrap meat fillings.

Carrots
- Root vegetable.
- Lacy greens and long, slender, orange root.
- Crunchy.
- Avoid wilted, flabby carrots. Baby variety is available.
- Use raw as crudités or shredded or sliced in salads. Use cooked in breads, soups, stews, roasts, and as a side dish.

Cauliflower
- Type of cabbage.
- Compact, tiny white or creamy white florets in clusters on stalks surrounded by green leaves.
- Avoid brown spots.
- Use raw with dip or in pasta salad. Use cooked in stir-fries and soups.

Celery
- Stem vegetable.
- Green stalk containing individual ribs with green leaflets.
- Crisp; bitter to slightly sweet flavor. “Hearts” are innermost tender ribs.
- High water content.
- Use raw with dip.
- Use cooked in soups, stews, stir-fries, and stuffing.

Collards
- Large, dark green leaves on thick stems.
- Flavor is a cross between cabbage and kale.
- Use raw, shredded, in salads or slaws.
- Use cooked in stir-fries and as a side dish.
- Use leaves to wrap meat fillings.
### Vegetables and Their Uses (continued)

**Corn**
- Seed vegetable.
- Ears of plump kernels enclosed in green husks with moist, golden silk.
- Kernels may be yellow, white, or both.
- Sweet and juicy.
- Silk ends should not be decayed or have worm injury.
- Use cooked, on the cob or as loose kernels.

**Cucumbers**
- Fruit vegetable related to pumpkins, watermelon, and squash.
- Deep green skin covering cool, moist, whitish flesh with edible seeds.
- Often waxed to keep in moisture.
- Avoid cucumbers with an overly large diameter or shriveled ends.
- Use raw, plain or with dip, or sliced or shredded in salads.

**Eggplant**
- Fruit vegetable related to tomatoes and potatoes.
- Many varieties.
- Most common is dark purple, elongated, and rounded horn-shaped.
- Firm, smooth, and glossy, with meaty flesh.
- Use cooked in stir-fries, stews, and baked dishes.
- Often stuffed.

**Garlic**
- Bulb vegetable related to onions and leeks.
- Plump white bulbs made of several small cloves encased in thin skin.
- Strong flavor mellow with cooking but becomes bitter when overcooked.
- Use raw in oils, dressings, and spreads.
- Use cooked in soups, stews, and roasts, or baked whole.

**Jicama**
- Tuber shaped like a turnip. Tough brown skin.
- White flesh.
- Slightly sweet flavor, crunchy texture, juicy.
- Peel before using.
- Use raw as a snack and in salads.
- Use cooked in stir-fries.

**Kohlrabi**
- Short, white stem shaped like a globe with green leaves.
- Tastes like a mild, sweet turnip.
- Use cooked in soups, stews, stir-fries, and as a side dish.

**Leeks**
- Related to onion and garlic, with a milder, sweet flavor.
- Thick, short white stalks with crisp, blue-green leaves.
- Use raw in thin slices in salads.
- Use cooked in casseroles, soups, stews, and a side dish.

**Mushrooms**
- Type of fungus.
- Many edible varieties, including white, portobello, and shiitake.
- Short stem with pink or light-tan gills and a white, creamy, or light brown cap.
- Moist with mild to bold flavor.
- Use raw as a snack, in salads, or stuffed.
- Use cooked in soups, stews, omelets, and stir-fries, or marinated.

**Crisp Thinking**
Evaluate Substitutes
Reiterate that different vegetables have different structures because they come from different plant parts. Based on this information, ask students what they would do if they planned to make stuffed eggplant but realized right before dinner that they do not have an eggplant on hand. Ask students: What vegetable(s) could you use in the recipe as a substitute for the eggplant? What factors would you consider when choosing a substitute? Ask students to share their responses with the class. (Answers will vary, but students may suggest mushrooms. The factors to consider may include: The substitute's sturdiness, size, flavor, and cooking time. The yield of the recipe or some of its ingredients may change to accommodate the substitute vegetable.)
**Figure 29.2  Vegetables and Their Uses (continued)**

- **Okra**
  - Fruit vegetable. Tapered, oblong fuzzy pods with a taste similar to eggplant.
  - When cut, gives off a sticky substance that thickens soups.
  - Dark green and red varieties.
  - Bends with slight pressure.
  - Use raw, marinated, in salads.
  - Use cooked in soups and stews, or breaded and fried.

- **Onions**
  - Bulb vegetable.
  - Green (scallions) are mild young onions with long, straight green leaves a small white bulb.
  - Yellow, white, and red onions are firm, round, and dry with small necks, juicy flesh surrounded by papery skin, and mild to strong flavor.
  - Vidalia onions are crisp, juicy, and sweet.
  - Use raw, chopped, in salads and as fillings.
  - Use cooked in soups, stews, stir-fries and roasts.

- **Parsnips**
  - Root vegetable.
  - Whitish color, similar in shape to carrots.
  - Firm with a sweet, nutty flavor.
  - Use cooked, mashed, or added to stews.

- **Peppers**
  - Fruit vegetable.
  - Sweet (bell, banana, pimiento) or hot (chile).
  - Bell peppers are bright and glossy and may be green, red, yellow, orange, or purple.
  - Bell-shaped, firm, and hollow, with a short, thick stem and three to four lobes.

- **Peas**
  - Crisp, bright green pods filled with small, sweet peas.
  - Snow pea pods are flat.
  - Sugar snap pea pods are plump.
  - Use raw as a snack or in salads.
  - Use cooked in pasta dishes, baked dishes, soups, and as a side dish.

- **Potatoes**
  - Tubers.
  - Varieties include: Idaho or russet (dark brown), new (freshly harvested), white, round red, and blue or purple.
  - Firm, heavy, round to oval, with thin skin.
  - White, starchy flesh.
  - Purple has purple flesh.
  - Texture varies with type.
  - New, whites, and Round Reds keep their shape, making them good for boiling, frying, and salads.
  - Russets loosen up easily and bake well.
  - Use cooked in soups, stews, cold salads, and as a side dish.
Compare Squash Varieties  
Ask students:  
How is winter squash different from summer squash? What similarities exist between a summer squash and spaghetti squash? How does acorn squash compare to zucchini?  
Have students use a chart to compare how squash varieties are similar and different. Ask students to include specific examples of how each variety is prepared or served, such as spaghetti squash prepared as a main dish with sauce, or a side dish of steamed zucchini, seasoned as desired. (Charts will vary, but should compare several varieties of squash and include specific examples of how each variety is prepared or served. Have students share their ideas and charts with the class.)
### Sea Vegetables

Sea vegetables are seaweeds used as vegetables. They have been used as food for centuries in coastal regions around the globe. Sea vegetables are more common than you might realize. Manufacturers use them as thickeners and stabilizers in such products as ice cream, pudding, salad dressing, and even toothpaste! Sea vegetables grow in water with filtered sunlight. Many are grown in Japan. Sea vegetables are actually algae, not plants. They are low in fat and a rich source of vitamins and minerals. However, they contain more sodium than other vegetables. Figure 29.3 describes several varieties of sea vegetables.

### Figure 29.3 Common Sea Vegetables

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arame</td>
<td>Dark brown with a mild, slightly sweet flavor.</td>
<td>Used without cooking in salads; sautéed.</td>
</tr>
<tr>
<td>Kombu, or kelp</td>
<td>Dark brown or black with a delicate flavor. Sold in sheets or strips. White powder covering the surface adds flavor.</td>
<td>Used in soups, stews, stir-fries, and salads or cooked as a vegetable.</td>
</tr>
<tr>
<td>Carrageen</td>
<td>Mossy with color ranging from yellow-green, through red to purplish-brown.</td>
<td>It is used as a thickener in ice cream and other milk products.</td>
</tr>
<tr>
<td>Laver</td>
<td>Dark purple with a strong, tangy, slightly sweet flavor. Sold in sheets.</td>
<td>Used in soups or deep-fried as an appetizer.</td>
</tr>
<tr>
<td>Nori</td>
<td>Dark green, dark purple, or black with a sweet flavor. Comes in sheets.</td>
<td>Used to wrap seafood and rice rolls, sushi.</td>
</tr>
<tr>
<td>Dulse</td>
<td>Dark pink to brick red with a pungent, salty flavor.</td>
<td>Used in soups or as a condiment. Also eaten like beef jerky.</td>
</tr>
<tr>
<td>Hijiki</td>
<td>Black with a mild, salty, sea-like flavor. Highest mineral content of all sea vegetables.</td>
<td>Used as a vegetable in soups, stews, and stir-fries.</td>
</tr>
<tr>
<td>Agar</td>
<td>Tasteless. Sold in blocks, flakes, or powder.</td>
<td>Can be used as a substitute for gelatin. Will set at room temperature.</td>
</tr>
</tbody>
</table>

**Contrast**

A tuber is a stem, and a bulb is a part of a stem. Unlike tubers, bulbs are fleshy and surrounded by layers of fleshy leaves.

### Nutrition Check

**What are the differences between a tuber and a bulb?**

**Caption Answer**

Most of the sea vegetables listed here, including arame, kombu, wakame, nori, and hijiki, have a generally mild or delicate flavor. Two of the sea vegetables, laver and dulse, have a strong or tangy flavor. Agar is tasteless.

**Discussion**

Ask students: Which sea vegetables are common in soups? (Kombu, laver, wakame, dulse, hijiki, agar)

**Answer**

Answers will vary. Students may suggest incorporating chopped vegetables into their scrambled eggs, topping sandwiches with assorted vegetables, eating raw vegetables and dip as a snack, and including a colorful mix of vegetables with dinner.
Selecting and Storing Fresh Vegetables

Fresh vegetables taste good, look appealing, are full of nutrients, and can be used in countless ways. The quality of fresh vegetables generally peaks during the summer months, and prices are typically lower then, too. Exploring seasonal vegetables is a good way to try new flavors and get the benefits of fresh vegetables throughout the year.

Many people grow their own vegetables. Growing vegetables saves money and helps you enjoy the freshest produce. For information on starting a vegetable garden, visit a garden center, consult gardening books or Web sites, or visit the Web site of your local Cooperative Extension office.

Choosing Quality Vegetables

Depending on where you shop, fresh vegetables may be available loose, in a plastic-covered tray, or pre-packaged in a plastic bag. Some vegetables, such as broccoli and parsley, usually come in bunches held together with a rubber band or plastic tie. When you buy vegetables, look for these signs of quality:

- **Ripeness** Vegetables are harvested when ripe, so buy only what you can use during the storage life of the vegetable. Most fresh vegetables should be used within two to five days, although root vegetables last from one to several weeks. Underripe vegetables have poor texture and flavor.

- **Color and Texture** Vegetables should have a bright color and crisp texture. Avoid green potatoes. The green color, which is usually caused by exposure to light, may indicate the presence of a bitter, toxic compound called **solanine**. A compound is a combination of two or more substances. If green parts develop on potatoes during storage, cut them away before cooking.

- **Shape** Each type of vegetable has its own characteristic shape. Misshapen vegetables usually have poor flavor and texture.

- **Size** A vegetable should be heavy for its size. Avoid very large or very small vegetables. Extra-large vegetables may be overripe, tough, and have poor flavor. Extremely small vegetables may be immature and lack flavor.

- **Condition** Choose crisp, fresh vegetables and avoid wilted, decayed, or damaged ones. Unless you plan to use the tops of root vegetables, such as carrots and beets, buy them without the tops. The tops draw moisture from root vegetables, making them wilt. Root vegetables, bulbs, and tubers should not have any sprouts (new growth in the form of offshoots). Sprouts indicate that the vegetables have been stored too long.

Critical Thinking

**Evaluate Information** Ask students: Why might it be a good idea to understand the difference between various signs of quality in vegetables? How would you benefit from this information? (Answers will vary, but students may say that it can help you decide when or whether to purchase vegetables, based on their quality and how long they will last after purchase. It would also help to ensure that you avoid underripe and overripe vegetables that may have poor texture and lack flavor.)

Writing Support

**Step-by-Step Guide**

Sizing Up Quality Ask students: What do you look for when buying vegetables? How do you know when a tomato is ripe for picking? How would you select an eggplant or a mushroom? What steps will you take to choose quality vegetables? Write a step-by-step guide that explains your ideas. (Step-by-step guides will vary. For example, one step-by-step guide may include the following: 1. Look for ripeness. Vegetables are harvested when ripe, so buy only what you can use during the storage life of the vegetable. 2. Check color and texture. Vegetables should have a bright color and crisp texture. 3. Examine the shape and size. Each type of vegetable has its own characteristic shape and should be heavy for its size. 4. Evaluate condition. Choose crisp, fresh vegetables and avoid wilted, decayed, or damaged ones.)
Storing Fresh Vegetables

Except for roots, tubers, and bulbs, most vegetables are highly perishable and should be refrigerated as soon as you bring them home. Only wash vegetables before refrigerating them if dirt is visible. Moisture can encourage bacteria to grow, and the vegetables may spoil faster or get moldy. If you do wash vegetables before storing them, dry them thoroughly.

To maintain the freshness of vegetables, store them according to their type:

- **Potatoes**: Store potatoes, including sweet potatoes, in a cool, dark, dry place. Storing potatoes in a dark place prevents them from turning green. If you do not have a dark storage area, put potatoes in a paper bag. If you must store potatoes at room temperature, buy only what you can use within a few days.

- **Onions**: Store onions, potatoes, and onions, should be stored separate from potatoes, because they will get moldy. Do not store onions in the same bag or bin with potatoes. The onions will absorb moisture from the potatoes and become moldy, and the potatoes will sprout faster.

- **Other Vegetables**: Most vegetables should be stored in the refrigerator in plastic bags, airtight containers, or the refrigerator crispers. This will keep them fresh longer. Use perforated plastic bags to allow moisture to escape. Some vegetables, like tomatoes, should be ripened before refrigerating.
Paring and Peeling Fresh Vegetables

After washing, remove any inedible parts of the vegetable, including stems and soft spots. A few vegetables, such as peppers, have inedible seeds that should be removed. Some recipes call for peeling vegetables with a vegetable peeler. To retain more nutrients, eat edible skins instead of peeling them away. You do not have to peel cucumbers, potatoes, or carrots, for example.

Preparing Raw Vegetables

Many vegetables taste great and look appetizing without cooking because of their bright colors and crunchy texture. You can serve many vegetables raw, including celery, cucumbers, radishes, tomatoes, peppers, turnips, carrots, cabbage, cauliflower, and broccoli.

Raw vegetables can be served in salads, as a snack, or as crudité on a relish tray. 

Crudités are sliced or small whole vegetables served raw, often with dip, as an appetizer. Ranch dressing is a popular choice for a crudité dip. Flavored yogurt also makes a simple tasty dip for vegetables.

To prepare crudités, cut vegetables into small pieces that can be picked up easily. Experiment with a variety of shapes for extra appeal. On a serving plate, you might arrange rings, wedges, and sticks in a design that shows off colors and shapes. When you are deciding what to serve on a vegetable plate, consider including a variety of tastes. Sweet cherry tomatoes, for example, nicely complement the mild flavor of green beans and a more distinctive tasting asparagus.

To keep a supply of nutritious vegetable snacks on hand, simply cut up raw vegetables and refrigerate them in a covered container or sealed plastic bag. Add a few ice cubes or a tablespoon or two of cold water to the container to keep the vegetables crisp. You can restore crispness to a vegetable like celery by placing it in ice water for a few minutes.

Cooking Fresh Vegetables

Many vegetables, including most roots and tubers, must be cooked to make them edible and easy to digest. Fresh vegetables can be cooked several different ways. The method you choose and the length of cooking time depends on the vegetable, its tenderness, the size of the pieces, and your own taste preferences.

How Cooking Affects Vegetables

Cooking affects vegetables’ nutrient content, texture, color, and flavor.

Nutrients Some nutrients dissolve in cooking water, are destroyed by heat, or both. Vitamin B is lost in water, for example, while vitamin C is lost in water and through heat.

Skill Practice

Guided Practice

List Ask students to identify five vegetables that can be served and eaten raw. (Answers will vary, but may include: celery, cucumbers, radishes, tomatoes, peppers, turnips, carrots, cabbage, cauliflower, and broccoli.)

Define Ask students to define crudités and explain how they should be prepared. (Answers will vary, but may include: crudités are sliced or small whole vegetables served raw, often with dip, as an appetizer on a relish tray. To prepare crudités, cut vegetables into small pieces that will be easy to pick up. Experiment with a variety of shapes and arrangements, such as rings, wedges, and sticks in a design that shows off colors and shapes and adds extra appeal.)

Describe Have students write one or two paragraphs in which they describe how they would store cut up raw vegetables for a quick healthy snack. (Paragraphs will vary, but may include: Store cut up raw vegetables in a covered container or sealed plastic bag in the refrigerator. Add a few ice cubes or a tablespoon of cold water to the container to keep the vegetables crisp.)

Critical Thinking

Evaluate Safety Imagine that Lauren plans to bake acorn squash halves. Since the skin will not be eaten, Lauren decides not to wash the squash before preparing and baking it. Did she make the right decision? Why or why not? (Answers will vary, but may include: Lauren’s decision is unwise. Even though the skin will not be eaten, when she cuts the squash in half, dirt and bacteria can be transferred to the edible part of the squash.)
Simmering Vegetables

Simmer vegetables by putting a small amount of water in a medium-size saucepan, covering it, and bringing it to a boil. Add the vegetables, recover the pan, and bring the water to a boil again. Then lower the heat until the water simmers. Cook covered until the vegetables are tender, yet somewhat firm. Keep the heat low enough to prevent scorching. Drain the vegetables before serving. Using a small amount of water helps keep nutrients from being lost.

To allow the true flavor of vegetables to come through, do not add salt during or after cooking. Instead, experiment with flavor by adding herbs or spices or use the cooking water to make a seasoned sauce. The cooking liquid contains nutrients. Serve it with the vegetables or save it to use in sauces, soups, or stews. Do not add water to cook greens such as spinach or chard. The water left from washing these leaves is enough to cook them.
In hard-water areas, minerals in cooking water can change the color of red vegetables, such as red cabbage, to purple or purplish-green. To prevent this undesirable color change, add a small amount of acid—vinegar or lemon juice—to the cooking water. Tomatoes retain their color when cooked because they have natural acid.

**Simmering Root Vegetables**

Potatoes and beets take longer to cook than many other vegetables. Cover them with water, put on the lid, and simmer until the vegetables are tender. To help retain nutrients, cook both potatoes and beets with skins on. If you prefer to eat them without the skins, peel them after the vegetables have been cooked.

Mashed is one favorite way to prepare potatoes. After the potatoes are cooked, drain the water, add seasonings, and mash with an electric mixer or by hand. A little butter adds rich flavor. Gradually adding a little milk as you beat produces a fluffy texture.

**Steaming Vegetables**

Steaming helps vegetables retain their water-soluble nutrients. Place a steamer basket in a saucepan with a tight-fitting lid. Fill the pan with water to just below the bottom of the basket. Cover the pan and bring the water to a boil. Then add the vegetables to the steamer basket and re-cover the pan. Steam the vegetables until they are tender. Green beans and other tender vegetables steam more quickly than such firm vegetables as potatoes and carrots. Thicker pieces of vegetables also take longer to steam.

**Pressure-Cooking Vegetables**

Pressure-cooking is a handy way to prepare vegetables that need a long cooking time, such as beets, turnips, whole carrots, and potatoes. These vegetables cook quickly under the high temperature in a pressure cooker. Like steaming, pressure-cooking preserves most of the nutrients in vegetables. Follow the manufacturer’s directions carefully when using a pressure cooker.

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**TECHNOLOGY FOR TOMORROW**

**Talented ‘Taters**

You may have eaten potatoes today without even knowing it. Potatoes are a surprising ingredient in many processed foods. Technology aids in the processing of these potatoes. They are steam-peeled, machine-scrubbed, partially cooked, cooled, and then cooked again. The resulting mash is thinly spread onto a hot drum and dried. This sheet of pulverized potato is crumbled into fine flakes, which are used in breads, noodles, dry soup mixes, muffin mixes, meat and fish products, and many other foods. To make a variety of crunchy snacks, bits of processed potato are forced from a high-pressure machine called an extruder. As each piece shoots out, it rapidly expands. This process is called “explosion puffing.”

**Get Involved** Examine the labels of ten different packaged foods. Which ones contain potatoes? In a paragraph, describe your findings and explain why you think the potatoes were included.

NCSS VIII A Science, Technology, and Society

Identify and describe both current and historical examples of the interaction and interdependence of science, technology, and society in a variety of cultural settings.

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**Braising Vegetables**

Braising is similar to stewing but uses less liquid. Braising vegetables develops greater nuances of flavor. It also preserves more color in vegetables. Onions, carrots, parsnips, and potatoes are often added to braised dishes, such as pot roast. You can also braise vegetables by themselves for a side dish. Carrots, potatoes, and eggplant work well braised. Celery hearts lose much of their bitter flavor when braised. Cut the vegetables into large pieces and place them in a heavy pan with a small amount of water or other liquid. Season them as you like. Cover tightly and bake in the oven at 375°F until the vegetables are tender and browned and the liquid is reduced to a sauce. Braising times depend on the variety of vegetables used, their shape and size, and their maturity and tenderness.

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**Quiz**

Ask students to answer the following questions:

1. Define both salad greens and cooking greens. (Vegetables that are from leaves are called leafy greens. Leafy greens that are eaten raw are called salad greens. Leafy greens that are eaten cooked are called cooking greens.)

2. What is carrageen, and what is one common use for it? (Carrageen is a mossy sea vegetable that is often used as a thickener in ice cream and other milk products.)

3. Explain why you should avoid buying potatoes that are green or sprouting. (The green color may indicate the presence of solanine, a bitter toxic compound. Sprouts indicate that the potatoes have been stored too long.)

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**TECHNOLOGY FOR TOMORROW cont.**

**Universal Access Kinesthetic Learners**

Braise Vegetables Have students work in groups of three and four to create and give a presentation illustrating changes that happen to vegetables when they are braised. Then, ask students: What is the difference between braising and stewing vegetables? What vegetables work well braised? (Presentations should illustrate the changes that happen to vegetables when they are braised, including: develops greater nuances in flavor and preserves more color. Braising is similar to stewing but uses less liquid. Carrots, potatoes, and eggplant work well braised. Have groups share their presentations with the class.)
Frying Vegetables

Vegetables can be sautéed, fried, stir-fried, or deep-fried. Aromatic vegetables are often sautéed to bring out their flavor. Aromatic vegetables are vegetables such as onion, garlic, celery, and carrots, that add flavor and aroma to dishes.

Frying cooked vegetables in a small amount of butter or margarine gives them a tasty crust. Hash browns are made this way from shredded cooked potatoes. You can also fry raw vegetables, although they take longer to cook. To speed cooking time for raw vegetables, add a small amount of water to the pan and then cover it so the vegetables also cook in moist heat. Add the water carefully to prevent spatters.

Potatoes are often deep-fried. Eggplant, onion rings, zucchini, and mushrooms can be dipped in batter and then deep-fried as well.

Baking Vegetables

Baking is a simple way to cook many vegetables, including onions, tomatoes, winter squash, potatoes, and eggplant. You can cut winter squash in half, remove the seeds, and place the halves on a baking sheet. Bake the squash at 350°F until tender.

Baking potatoes makes them fluffy inside and crispy outside. Poke holes in potatoes before you bake them, to allow steam to escape and keep them from exploding. Place the potatoes directly on the oven rack. If you like crispy skin, rub them with oil before placing in the oven. Potatoes can bake at any temperature between 300°F and 450°F, so you can bake them with other foods that require exact temperatures. For example, you can bake muffins at 375°F and bake potatoes at the same time. Baked potatoes are done when a fork easily pierces the potato.

Roasting Vegetables

Any vegetable can be roasted. Brussels sprouts, carrots, onions, turnips, and asparagus taste particularly good roasted. Cut the vegetables into pieces of similar size. Drizzle with oil, sprinkle with seasonings, and toss lightly to coat. Then place them on a baking sheet in a single layer. Roast at 425°F until browned, tender, and caramelized. To assure even roasting, turn the vegetables over about halfway through the cooking time.

Potatoes, onions, and carrots can be roasted in the same pan with meat. Pare the vegetables and place them in the pan around the roast. Cut large vegetable pieces into halves or quarters. Turn them occasionally to moisten them with the meat drippings. This method adds fat to vegetables, but it browns them and produces a tasty crust.

Grilling Vegetables

Follow these guidelines for the best results grilling vegetables:
• Brush the grate of the grill with oil to keep vegetables from sticking.
• To shorten grilling time, blanch less tender vegetables, such as carrots, before grilling.
• Marinate vegetables for added flavor.
• Keep vegetables from drying out by brushing them with an oil and herb mixture.
• When making skewers, group vegetables that have similar cooking times. For example, make one skewer for onions and another for mushrooms.
• Use the center of the grill, the hottest part, for vegetables that take time to cook.
• Wrap large pieces of potatoes, and other vegetables that take time to cook, in heavy-duty foil before placing them on the grate.
• Grill small pieces in a vegetable basket or on skewers.

Microwaving Vegetables

Microwave ovens cook vegetables quickly, using only a small amount of water. As a result, vegetables lose few nutrients and retain color, texture, and flavor.

Large vegetable pieces take longer to cook than small ones. Arrange the tender parts of the vegetable toward the center of the plate and the less tender parts toward the edge. For example, arrange broccoli spears so that the stems are pointing toward the edge.
Cover the container to retain moisture, and stir or turn the vegetables during cooking to allow heat to reach all the parts so that the vegetables cook evenly. When cooking potatoes, squash, and other whole vegetables that have a skin, first pierce the skin with a fork to keep the vegetables from bursting.

Follow the directions in the oven’s owner’s manual for cooking times, power settings, and any special instructions.

Using Leftover Vegetables
Leftover vegetables, both raw and cooked, have many uses in recipes. Marinate cold, cooked vegetables in a tangy salad dressing and serve them on a bed of lettuce. Add cooked vegetables to a stir-fry dish or mix them into a casserole. Add cooked vegetables to a soup, fold them into an omelet, or sauté them with garlic and onions for a side dish.

Using Convenience Forms of Vegetables
Vegetables come in many convenience forms, including canned, frozen, and dried. Convenience vegetables are handy and easy to use. They can be stored longer than fresh vegetables and can be prepared quickly. Convenience vegetables are available all year long, often at a lower cost than fresh vegetables.

Canned Vegetables
Vegetables are canned whole, sliced, or in pieces. Most canned vegetables are packed in water. Some, such as Harvard beets and creamed corn, are packed in sauces. Salt is generally added to canned vegetables as a preservative, but you can also find no-salt and low-salt vegetables.

Canned, frozen, and dried vegetables make it easy to create nutritious soups, stir-fries, casseroles, and other tasty lunches and dinners. Why do canned and frozen vegetables take less time to cook than fresh vegetables?

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Use canned vegetables the same way you use cooked fresh vegetables. Season them for a side dish, for example, or toss them in a salad. Canned vegetables are already cooked, so you only need to heat the vegetables in their liquid until they are heated through. Do not overcook cooked vegetables, because they will soften and lose nutrients and color.

**Frozen Vegetables**

Frozen vegetables are closest in nutrients, color, and flavor to fresh vegetables, although their texture may be different. Frozen vegetables are packaged whole or in pieces. You can also buy combinations of vegetables, such as peas and carrots, or vegetables packed in cheese or butter sauces. Frozen vegetables usually come in cartons or plastic bags. Remove what you need from the package and store the rest in the freezer. Some frozen vegetables can be heated in the microwave oven right in their container.

Frozen vegetables take less time to cook than fresh vegetables because they are preheated prior to freezing. To cook frozen vegetables, follow the directions on the package. In general, it is best to use as little water as possible when preparing frozen vegetables. It is not necessary to thaw frozen vegetables before cooking them. Frozen vegetables keep their flavor, color, and nutrients best if they are heated for the least amount of time necessary.

**Dried Vegetables**

Dried vegetables come in different forms. Mushrooms, tomatoes, and potatoes are available dried. You can add water to reconstitute them for use in recipes. Many vegetables, including onions, parsley, chives, and garlic, are dried for use as flavorings in entrées, side dishes, and soups. Follow package directions for use.

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**Light and Healthy Recipe**

**Vegetable Stir-Fry**

**Ingredients**
- 1 cup Julenened white onion
- 1 cup Julenened carrots
- 1 cup Julenened zucchini
- 1 cup Julenened green bell pepper
- 1½ tsp. Vegetable oil
- 1 cup Bean sprouts
- 2 tsp. Low-sodium soy sauce
- ¼ tsp. Ground ginger

**Directions**
1. Heat a wok or large skillet over high heat. Add the oil, then the onion and carrots. Stir-fry for 3 minutes.
2. Add the zucchini and bell pepper. Continue stir-frying for 1 minute.
3. Add the bean sprouts. Stir-fry for 45 to 60 seconds or until sprouts are heated through.
4. Turn off the heat. Add the soy sauce and ginger and mix gently. Serve immediately.

**Nutrition Analysis per Serving**
- Calories: 74
- Total fat: 2 g
- Saturated fat: 0 g
- Cholesterol: 0 mg
- Sodium: 129 mg
- Carbohydrate: 12 g
- Dietary fiber: 3 g
- Sugars: 6 g
- Protein: 4 g

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**Recipe Prep Tip**

Wok cooking is discussed in later chapters. Provide students with basic instructions on wok cooking: Turn the heat on high and add the oil, allowing it to heat as the wok heats. Cook the food fast while moving it around continuously. Do not allow food to sit in the wok once it is done as it will continue cooking and may burn. Be careful and attentive at all times.
Chapter Summary

Vegetables can be prepared and served in a variety of ways. They supply many nutrients. There are eight types of vegetables that come in an array of shapes and sizes. Select vegetables by looking for specific signs of quality. To maintain their freshness, store vegetables properly according to their type. Wash vegetables to ensure safety. Preparing vegetables may involve removing inedible parts, paring, or peeling. Vegetables may be eaten raw or cooked, which affects vegetables’ nutrients, texture, color, and flavor. Vegetables may be cooked using several methods. Convenience forms of vegetables are handy and easy to use.

Content and Academic Vocabulary Review

1. Use these content and academic vocabulary words to create a crossword puzzle on graph paper. Use the definitions as clues.

   **Content Vocabulary**
   - tuber (p. 451)
   - salad greens (p. 451)
   - cooking greens (p. 451)
   - sea vegetables (p. 456)
   - solanine (p. 457)
   - crudités (p. 459)
   - aromatic vegetable (p. 462)

   **Academic Vocabulary**
   - dainty (p. 451)
   - compound (p. 457)

Review Key Concepts

2. Describe the nutrients found in vegetables.
3. Identify the eight types of vegetables.
4. Explain how to store fresh vegetables.
5. Describe how to wash and prepare fresh vegetables.
7. Identify the types and uses of convenience forms of vegetables.

Critical Thinking

8. Explain whether Denise’s statement is accurate: “I have a very well-rounded diet. I get my daily recommended serving of vegetables by eating 3 cups of spinach every day.”
9. Compare and contrast salad greens and cooking greens.
10. Explain whether Jude should buy potatoes that the seller says “are green because they are very fresh and still ripening.”

Critical Thinking

6. Vegetables may be simmered, steamed in a steamer basket above water, pressure-cooked under high temperatures, braised by baking in the oven in a heavy pan with a small amount of liquid, fried in a small amount of fat in a frying pan, baked in an oven, roasted in an oven at higher temperatures until browned, tender, and caramelized, cooked on a grill, or microwaved using a small amount of water.

7. Convenience forms of vegetables are canned, frozen, and dried. Canned vegetables can be used in the same way as cooked fresh vegetables. Frozen vegetables may be used in much the same way as fresh vegetables once they have been thawed. Dried vegetables can be reconstituted with water and used in recipes.

8. Denise’s diet is not as well rounded as it could be. She should eat a variety of colorful vegetables each day to ensure she gets an assortment of nutrients.
9. Leafy greens that may be eaten raw are called salad greens. Leafy greens that are eaten cooked are called cooking greens. Cooking greens are usually tougher and thicker than salad greens.

10. Jude should not buy the green potatoes. The green color may indicate the presence of a bitter, toxic compound called solanine.

11. Each team should be assigned a different type of vegetable (tuber, flower, stem). Analyses will vary. For example, if one team used the fruit part of a plant in a fresh tomato sauce recipe, they may note that the plant part became very soft and tender with cooking, that the other ingredients (herbs and spices) complemented the tomatoes well, and that in the future they might try adding chopped mushrooms and olives to the recipe.

12. Jackie should keep a supply of nutritious vegetable snacks on hand. Once a week, she can cut up an assortment of raw vegetables and refrigerate them in a covered plastic container with a few ice cubes or a bit of cold water. This way, she will always have a healthy snack ready to eat.

13. Charts will vary depending on the vegetables students compare, but should clearly present the differences in nutritional values. For example, a chart may be formatted like a table with rows, listing six types of vegetables across the top, and several types of nutrients in the leftmost column. Students can plug nutrient information in the appropriate square.

14. Dario is a vegetarian who avoids gelatin because it is an animal product. However, he wants to prepare an appealing recipe that calls for gelatin. What vegetable substitute can he use?

15. Puppet Play Follow your teacher’s instructions to form groups. Work together to develop a puppet play for young children about the benefits of eating vegetables. Write the play and create the puppets. Perform the play for young children.

16. Cost Comparison Visit a supermarket and conduct a cost comparison of fresh, canned, frozen, and dried forms of one type of vegetable. Which form is the least expensive? Why? Which form is the most expensive? Why? Report your findings and explain your insights in a paragraph.

**Real-World Skills**

**Problem-Solving Skills**

14. Dario can use agar, a tasteless sea vegetable that acts as a vegetarian gelatin. It is sold in blocks, flakes, or powder.

15. Plays will vary, but content should effectively present the benefits of eating vegetables. In addition to offering many health benefits, vegetables add flavor, color, and texture to meals.

**Financial Literacy Skills**

16. Paragraphs will vary but should compare the differences in cost among four forms of one type of vegetable, noting the most and least expensive forms. Reasons for differences in cost will vary but may include: dried, canned, and frozen forms are more costly because of the process involved in processing and packaging them, or fresh forms are less costly because they are abundant and in season.
Academic Skills

**Food Science**

17. **Onions and Tears** Cutting an onion can be a tearful experience because onions contain lacrimator, a chemical that causes the eyes to water.

**Procedure** Chill an onion for an hour in ice water. Then peel and dice it using a sharp knife. For comparison, peel and dice another onion without chilling. Was there a difference in the amount of irritation experienced?

**Analysis** How does chilling affect the onion’s chemistry? Do you think the sharpness of the knife matters?

**English Language Arts**

19. **Vegetable Exploration** Use three different resources, including two books, to research one of the following topics: baby vegetables, starting a vegetable garden, or production and distribution of less familiar vegetables (for example, fiddlehead ferns, celeriac, broccoli flower, fennel). Write an informative report based on your research. Remember to cite all the sources you use in your report. Include pictures or drawings in your report to illustrate your topic.

**Test-Taking Tip** Before deciding whether a statement is true or false, read it carefully, and recall what you have learned from reading the text. Does the statement reflect what you know? Pay close attention to individual words. One word can make the difference between a true statement and a false one.

**TRUE OR FALSE**

Read the statement and determine if it is true or false.

20. Of the three convenience forms of vegetables, canned vegetables are closest in nutrients, color, and flavor to fresh vegetables.

a. True
b. False

**Mathematics**

18. **Using a Pressure Cooker** Leslie does not eat artichokes as often as she would like because they take a long time to cook. As a solution, she purchased a pressure cooker that claims to cook vegetables 3 ½ times faster than regular cooking methods. If it typically takes Leslie about 40 minutes to cook an artichoke in boiling water, how long would it take in the pressure cooker?

**Math Concept** Working with Time To convert decimal minutes (such as 14.87) into minutes and seconds, keep the whole number portion (as minutes), and multiply the decimal portion by 60 (which represents the seconds).

**Starting Hint** Find the new cooking time by dividing 40 minutes by 3 ½. Convert the decimal portion into seconds by multiplying by 60. Round to the nearest second.

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