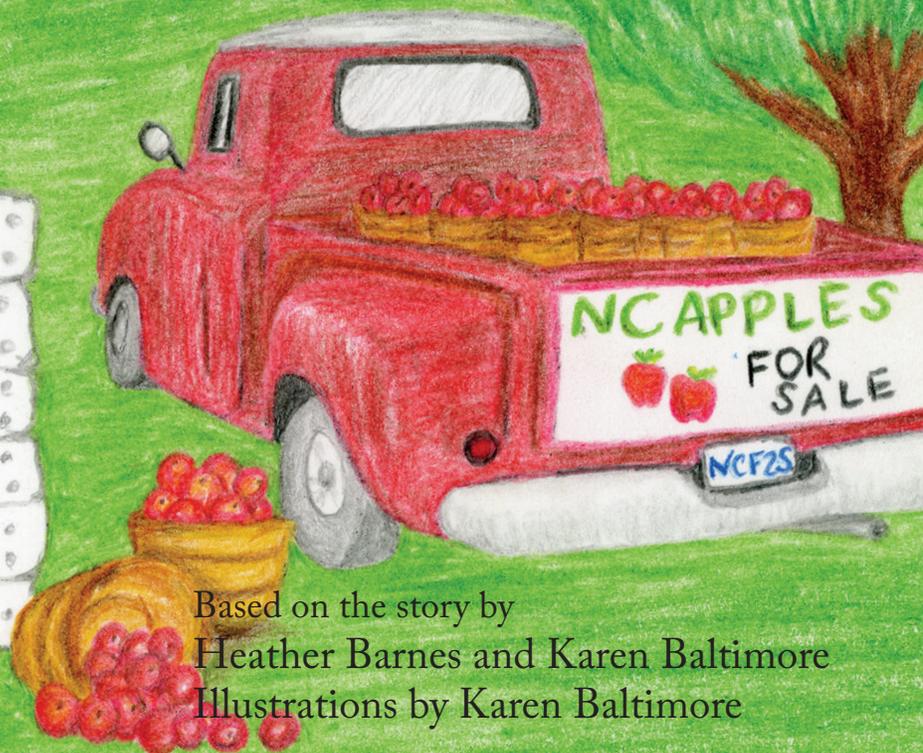
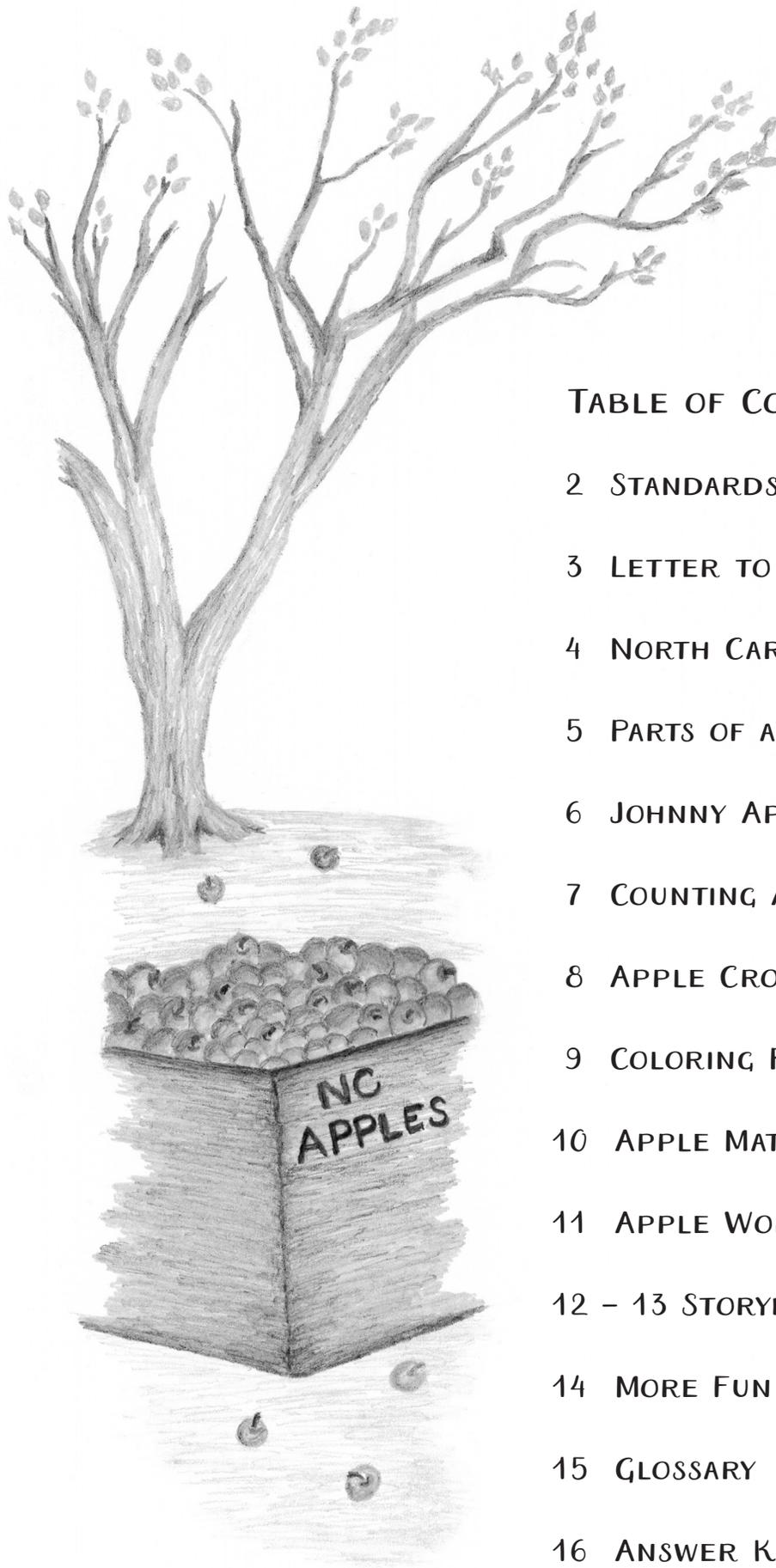


# FROM FARM to SCHOOL - CROPS of NORTH CAROLINA

*A*  
VISIT  
*to the*  
APPLE  
ORCHARD  
ACTIVITY BOOK



Based on the story by  
Heather Barnes and Karen Baltimore  
Illustrations by Karen Baltimore



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# STANDARDS

## *From Farm to School – Crops of North Carolina: A Visit to the Apple Orchard* Storybook and Activity Book North Carolina Common Core and Essential Standards Quick Reference

The *From Farm to School – Crops of North Carolina: A Visit to the Apple Orchard* Storybook and Activity Book allow you to teach objectives of the Healthful Living Essential Standards while integrating the concepts of healthy eating into the Common Core Standards. The Quick Reference summarizes the standards addressed in the storybook and activity book. Additional standards and objectives may be applicable in utilizing and expanding upon these resources. Effective nutrition education can motivate and enable students to eat healthy and be active. Fit, healthy students are ready to learn. Teachers can make a difference by encouraging students to eat healthy every day, incorporating nutrition education into lesson plans to reinforce healthy choices for students, and teaching and role modeling healthy eating.

Grade	English Language Arts	Math	Information Technology	Science	Social Studies	Healthful Living
Kindergarten	L.K.1, L.K.2, L.K.4, L.K.6 RF.K.1, RF.K.3, RF.K.4 RI.K.1, RI.K.2, RI.K.3, RI.K.4, RI.K.7 RL.K.1, RL.K.4, RL.K.5, RL.K.7 W.K.8	K.CC.1, K.CC.3, K.CC.4, K.CC.5, K.CC.6  K.G.1  K.MD.3	K.IN.1, K.IN.1.2, K.SI.1, K.SI.1.1, K.SI.1.2, K.RP.1, K.RP.1.1, K.TT.1, K.TT.1.1	K.E.1, K.E.1.1, K.E.1.2, K.E.1.3, K.P.1, K.P.1.1, K.P.2, K.P.2.1	K.E.1, K.G.1.2, K.G.1.3, K.G.2, K.G.2.1, K.G.2.2  K.H.1.2	K.NPA.1.1, K.NPA.1.2, K.NPA.2
1	L.1.1, L.1.4 RF.1.1, RF.1.3, RF.1.4 RI.1.1, RI.1.2, RI.1.3, RI.1.4, RI.1.5, RI.1.6, RI.1.7, RI.1.10 RL.1.1, RL.1.7 W.1.8	1.MD.4  1.NBT.1, 1.NBT.2	1.IN.1, 1.IN.1.2, 1.RP.1, 1.RP.1.1, 1.SI.1, 1.SI.1.1, 1.SI.1.2, 1.TT.1, 1.TT.1.1	1.L.1, 1.L.1.1, 1.L.1.2, 1.L.1.3, 1.L.2, 1.L.2.1	1.E.1, 1.E.1.1, 1.E.1.2, 1.E.1.3,  1.G.1.1, 1.G.1.2, 1.G.1.3, 1.G.2.2	1.NPA.1, 1.NPA.1.1, 1.NPA.2, 1.NPA.2.1
2	L.2.3, L.2.4, L.2.6 RF.2.3, RF.2.4 RI.2.1, RI.2.2, RI.2.3, RI.2.4, RI.2.5, RI.2.6, RI.2.7, RI.2.10 W.2.8	2.NBT.1, 2.NBT.2, 2.NBT.3	2.IN.1, 2.RP.1, 2.RP.1.1, 2.SI.1, 2.SI.1.1, 2.TT.1, 2.TT.1.1	2.E.1, 2.E.1.3, 2.L.2, 2.L.2.1	2.C&G.1.1, 2.E.1, 2.E.1.1, 2.E.1.2, 2.E.1.3, 2.E.1.4,  2.G.1, 2.G.1.1, 2.G.1.2, 2.G.2.1, 2.H.1.1	2.NPA.1.1, 2.NPA.1.2, 2.NPA.2, 2.NPA.2.2
3	L.3.3, L.3.4  RI.3.1, RI.3.2, RI.3.3, RI.3.4, RI.3.5, RI.3.7, RI.3.8, RI.3.10 RF.3.1, RF.3.2 RL.3.1, RL.3.4, RL.3.7, RL.3.10 W.3.7, W.3.8	3.OA.1, 3.OA.2, 3.OA.3, 3.OA.7	3.IN.1, 3.IN.1.1, 3.RP.1, 3.RP.1.1, 3.SI.1, 3.TT.1,  3.TT.1.1	3.L.2, 3.L.2.1, 3.L.2.2, 3.L.2.3, 3.L.2.4	3.E.1, 3.E.1.1, 3.E.1.2, 3.E.2, 3.E.2.2  3.G.1, 3.G.1.1, 3.G.1.3, 3.G.1.4, 3.G.1.5, 3.G.1.6	3.NPA.1, 3.NPA.2, 3.NPA.2.1
4	L.4.3, L.4.4 RI.4.1, RI.4.2, RI.4.3, RI.4.4, RI.4.5, RI.4.7, RI.4.10 RF.4.3, RF.4.4 RL.4.1, RL.4.2, RL.4.4, RL.4.7, RL.4.10W.4.8	4.NBT.1, 4.NBT.2  4.OA.1, 4.OA.2	4.IN.1, 4.IN.1.1, 4.IN.1.2, 4.RP.1, 4.RP.1.1, 4.SI.1, 4.SI.1.1, 4.SI.1.2, 4.SI.1.3, 4.TT.1, 4.TT.1.1	4.L.1, 4.L.2, 4.L.2.1, 4.L.2.2	4.E.1, 4.E.1.1, 4.E.1.2, 4.E.1.3, 4.E.2, 4.E.2.1,  4.G.1.2, 4.G.1.3	4.NPA.1.1, 4.NPA.2
5	RI.5.1, RI.5.2, RI.5.3, RI.5.4, RI.5.7, RI.5.10 RF.5.3, RF.5.4 RL.5.1, RL.5.4, RL.5.7, RL.5.10 L.5.3, L.5.4 W.5.8	5.NBT.1	5.IN.1, 5.IN.1.1, 5.IN.1.2, 5.RP.1, 5.RP.1.1, 5.SI.1, 5.SI.1.1, 5.SI.1.2, 5.TT.1,  5.TT.1.1	5.E.1, 5.E.1.1,  5.L.2, 5.L.3, 5.L.3.1, 5.L.3.2,  5.P.3, 5.P.3.1, 5.P.3.2	5.E.1, 5.E.1.2, 5.E.2, 5.E.2.2,  5.G.1, 5.G.1.2	5.NPA.1.1, 5.NPA.2

English Language Arts	L = Language, RF = Reading: Foundational Skills, RI = Reading: Informational Text, RL = Reading Standards for Literature, W = Writing
Math	CC = Counting and Cardinality, G = Geometry, MD = Measurement and Data, NBT = Number and Operations in Base Ten, NF = Number and Operations: Fractions, OA = Operations and Algebraic Thinking
Science	E = Earth, L = Life Science, P = Physical Science
Information Technology	IN = Informational Text, RP = Research Process, SI = Sources of Information, TT = Technology as a Tool
Social Studies	C&G = Civics and Government, E = Economic and Financial Literacy, G = Geography and Environmental Literacy, H = History
Healthful Living	NPA = Nutrition and Physical Activity

## LETTER TO EDUCATORS

Dear Teachers,

Agriculture is North Carolina's number one industry. The NC Department of Agriculture and Consumer Services (NCAD&CS) has been providing fresh, NC produce to schools across the state since 1997 through the NC Farm to School Program.

Agriculture can be the basis for lessons in math, language arts, science, social studies, art and other school subjects.

This activity guide is designed to be used with *From Farm to School – Crops of North Carolina: A Visit to the Apple Orchard*, also available from NCDA&CS. Printed copies are available on a first-come, first-serve basis and can also be downloaded from our website, [www.ncfarmtoschool.com](http://www.ncfarmtoschool.com).

For more information on apples visit the following:

NC Department of Agriculture and Consumer Services  
[www.ncagr.gov/markets/kidstuff/](http://www.ncagr.gov/markets/kidstuff/)

NC Farm to School Program  
[www.ncfarmtoschool.com](http://www.ncfarmtoschool.com)

North Carolina Apple Growers Association  
[www.ncapplegrowers.com/](http://www.ncapplegrowers.com/)

NC Department of Public Instruction, School Nutrition Services  
[childnutrition.ncpublicschools.gov/information-resources/nutrition-education](http://childnutrition.ncpublicschools.gov/information-resources/nutrition-education)

NC Cooperative Extension/4-H, Grow For It  
[www.growforit.org](http://www.growforit.org) – See the “Curriculum” Section

NC Farm Bureau, Ag in the Classroom – Curricula, Workshops, Resources and Grants  
[www.ncagintheclassroom.com](http://www.ncagintheclassroom.com)

Four kindergarten classes in Struthers, Ohio, chose to study apples as a group project.  
Find out more at <http://ecrp.uiuc.edu/v4n2/danyi.html>.



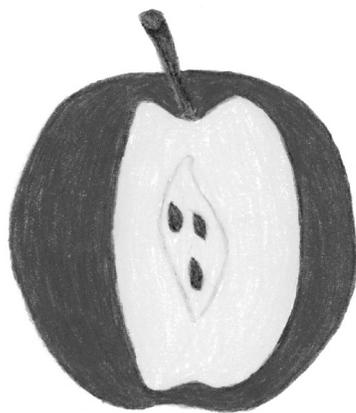
Design and illustration by Karen Baltimore  
For more of her work, please visit  
[www.karenbaltimore.com](http://www.karenbaltimore.com)

## NORTH CAROLINA APPLES AT A GLANCE – EXTENSION ACTIVITIES

Apple trees were first brought to North Carolina by settlers in the 1700s. The first trees were planted in Henderson County, which remains the top apple-producing county in the state.

Peak apple harvest lasts from mid-August through November. North Carolina has over 300 apple farmers and more than 10,000 acres of orchards. This ranks us seventh in US apple production. Visit [www.ncagr.gov/stats](http://www.ncagr.gov/stats) to find out what states rank above North Carolina.

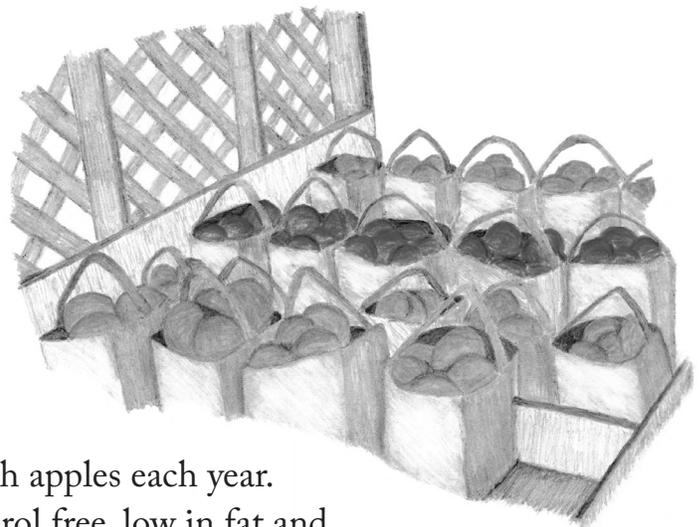
September is North Carolina Apple Month. This is marked by many festivals. Take a few moments to research and mark on a map the location of apple festivals in our state.



If you cut open an apple and plant the seed inside, it will not grow “true.”

For example, if you plant the seed of a Red Delicious apple, it will produce an apple tree, but not a Red Delicious tree. Apple trees, like many other plants, are grafted. Grafting is the process of joining the upper part (which produces the fruit) of one plant with the roots of another. This technique was first used in China over 4,000 years ago. Learn more about grafting crops from NC Cooperative Extension’s article found at <https://content.ces.ncsu.edu/grafting-and-budding-nursery-crop-plants>.

Workers can pick twenty bushels a year from a fully producing tree. Approximately 60% of the state’s apples are sold for processing into cider, juice, applesauce, baby food and other products. The rest of North Carolina’s apples are sold fresh at roadside markets, grocery stores or pick-your-own orchards. Find an orchard near you at [www.ncfarmfresh.com](http://www.ncfarmfresh.com).

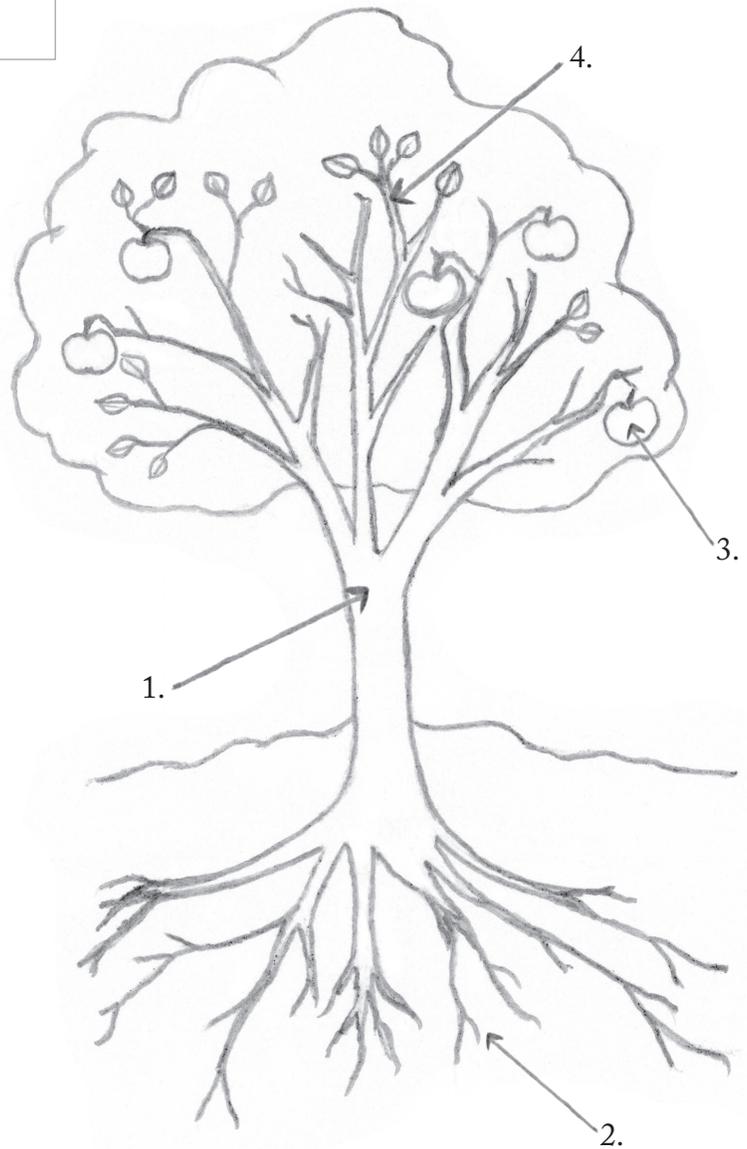
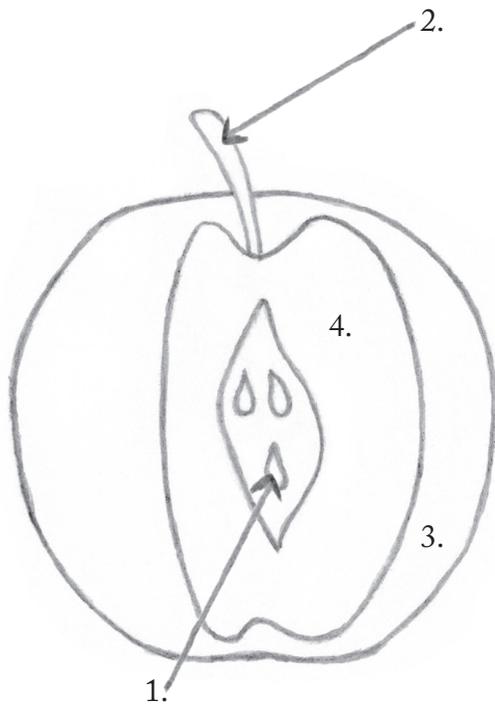


Americans eat approximately 18.5 pounds of fresh apples each year. Called “Nature’s Toothbrush,” apples are cholesterol free, low in fat and sodium and a good source of vitamin C and fiber. They should be stored in a plastic bag in the refrigerator. Keep them away from strong smelling foods, because apples can absorb their odor.

## PARTS OF AN APPLE AND AN APPLE TREE

Use the words in the box to label the parts of the apple and the apple tree. Then, color the picture.

Word Bank	
<u>Apple</u>	<u>Apple Tree</u>
Stem	Branch
Skin	Fruit
Flesh	Roots
Seed	Trunk



Apple

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Apple Tree

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Bonus: How many apples are on the tree? \_\_\_\_\_ How many seeds are in the apple? \_\_\_\_\_

## JOHNNY APPLESEED

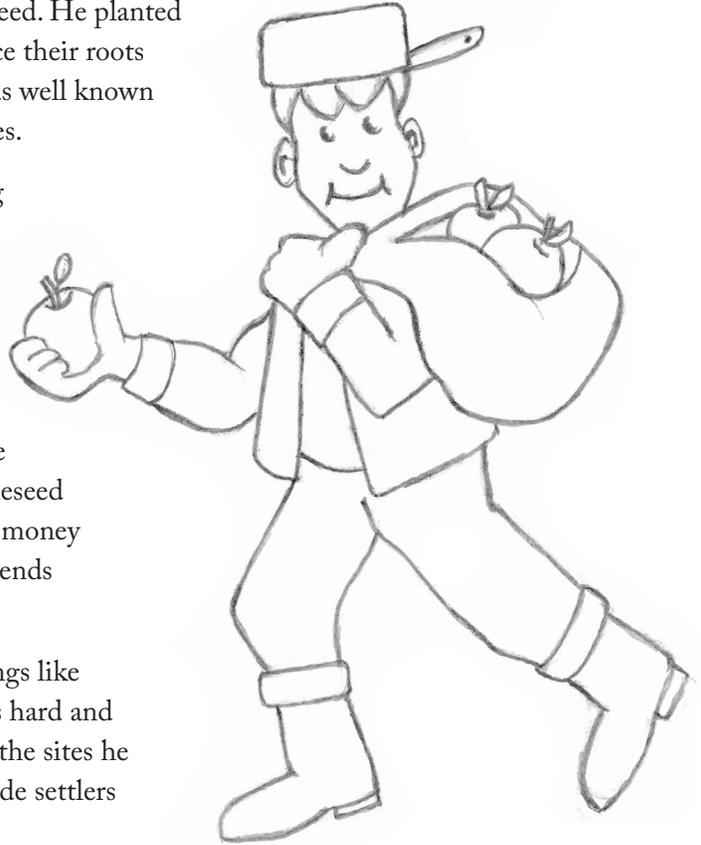
Read the passage and answer the questions below. Then, color the picture.

American folklore tells the story of a man called Johnny Appleseed. He planted millions of apple seeds. Apple trees across the United States trace their roots to Johnny Appleseed. His real name was John Chapman. He was well known because of his love for planting apple trees and also for his stories.

Johnny Appleseed walked through the wilderness carrying a bag of apple seeds on his back. He planted apple seeds in neat rows in the clearings he found. He built fences around the orchards to keep wild animals away. Johnny planted entire orchards of apples in Pennsylvania and New York.

Johnny Appleseed also sold the trees he grew to settlers in the area. The trees provided fruit for years and years. The roots of the trees would prevent erosion on farms during rainy seasons. Appleseed traded young trees for supplies or clothes if people did not have money to pay. Appleseed traveled and worked alone, but made many friends along the way.

Johnny Appleseed was a simple man. He did not care about things like fancy clothes or money. He rarely wore shoes. His feet looked as hard and tough as leather. He not only planted trees, but would return to the sites he planted to prune and care for the trees. His cheerful attitude made settlers happy. Appleseed left apples and spread joy wherever he went.



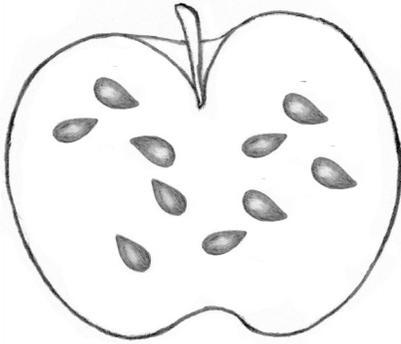
1. What was Johnny Appleseed's real name?
  - a. John Chatham
  - b. John Chapman
  - c. Daniel Boone
  - d. Roy Rogers
2. Johnny Appleseed is best known for his ...
  - a. his stories.
  - b. fancy clothes.
  - c. love of planting apple trees.
  - d. both a and c.
3. Johnny Appleseed ...
  - a. traded apple saplings for supplies.
  - b. was a cheerful man.
  - c. liked to tell stories.
  - d. all of the above

# COUNTING APPLE SEEDS

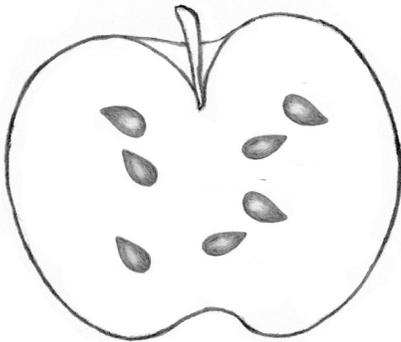
Count the seeds in each apple. Draw a line from the seeds to the number that they match.



10



7



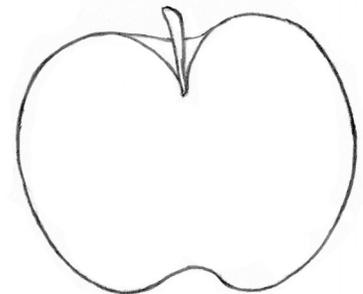
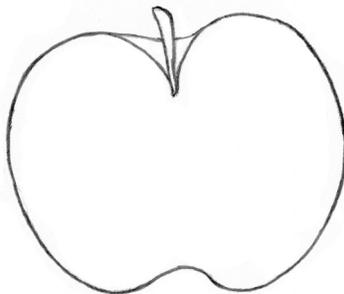
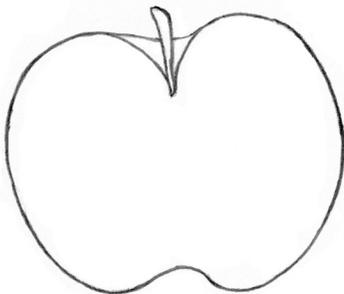
5

Draw the number of seeds above each apple in the apple below it.

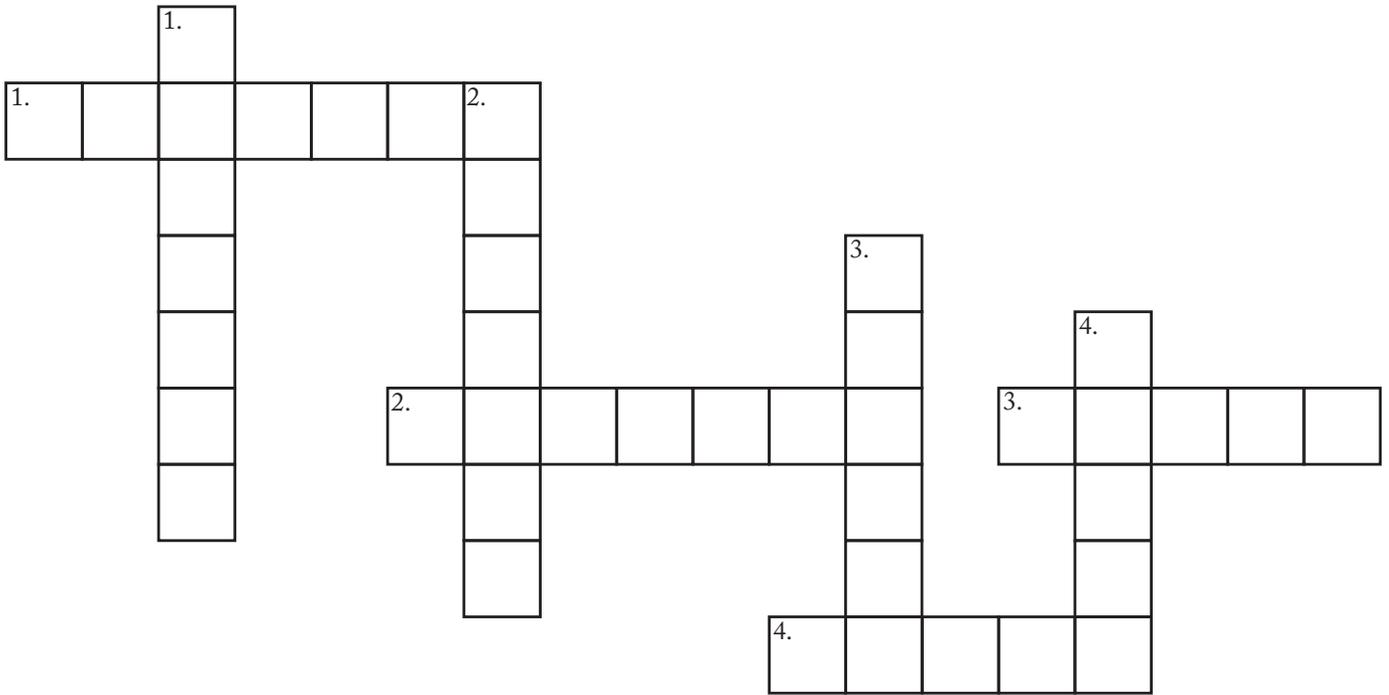
3

8

6



## APPLE CROSSWORD



### ACROSS

1. When a plant is not actively growing, usually during winter
2. If a tree has too many \_\_\_\_\_, farmers will remove some of them so the fruit will be larger and healthier.
3. To remove old or damaged tree limbs
4. Apples will \_\_\_\_ in water because they are 25 percent air.

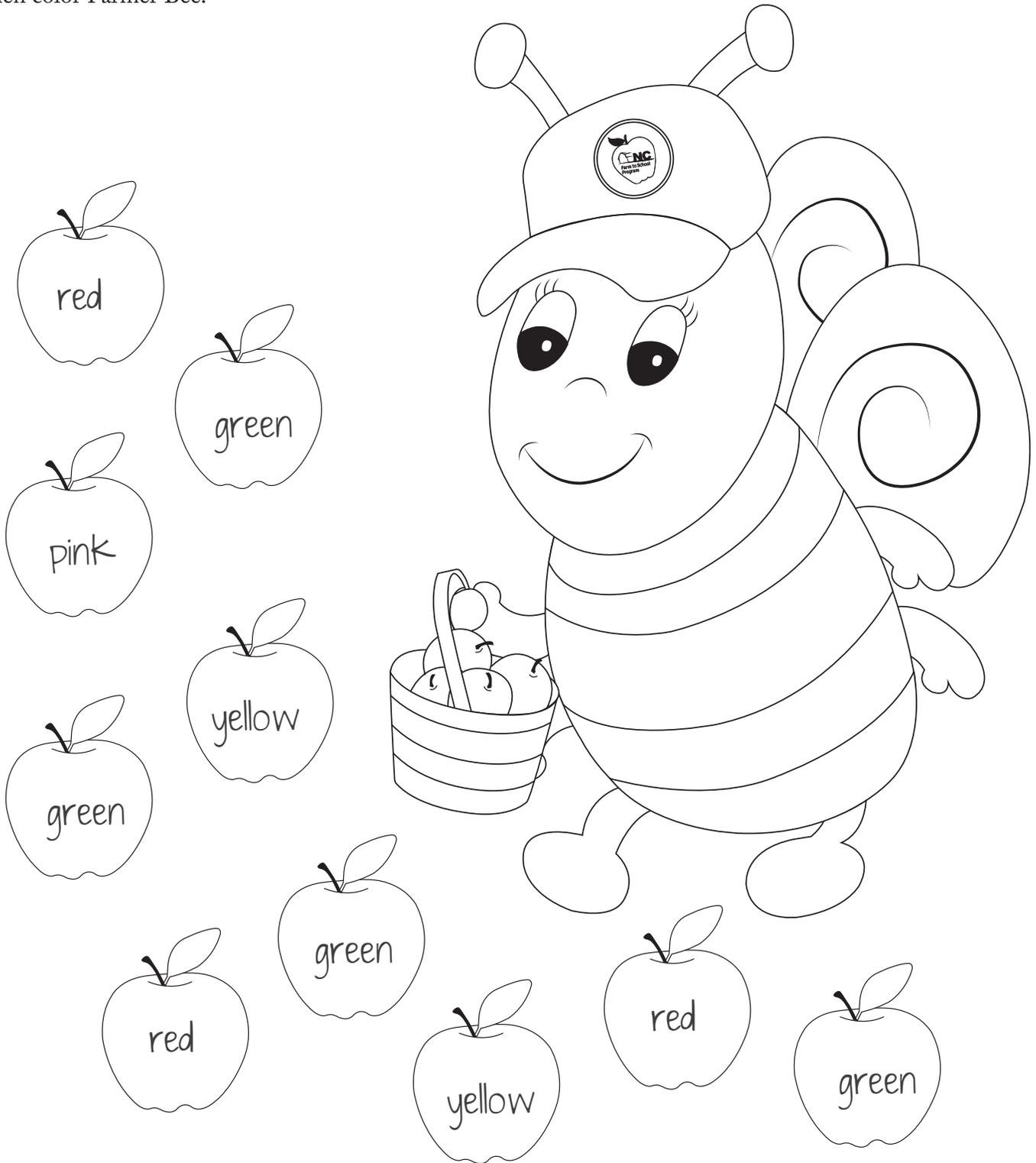
### DOWN

1. A piece of land planted with fruit trees
2. Planting system used by many new orchards, limbs are trained to grow along a wire
3. A unit of weight equal to 42 pounds
4. Farmers use a variety of ways to protect trees from \_\_\_\_\_, including fans, sprinklers and helicopters.



# COLORING PAGE

Farmer Bee is gathering apples. Help her by coloring the apples the color they are labeled with. Then color Farmer Bee.



Bonus: Count the apples you colored.

How many red apples are there? \_\_\_\_\_

How many yellow apples are there? \_\_\_\_\_

How many green apples are there? \_\_\_\_\_

How many pink apples are there? \_\_\_\_\_

How many apples are in the basket? \_\_\_\_\_

How many apples are there in all? \_\_\_\_\_

## APPLE MATH

Read and answer each problem. Show your work.

1. There are 7 apples. Each apple has 5 seeds. How many seeds are there?

\_\_\_\_\_ seeds

2. Every basket holds 8 apples. How many apples are there in 5 baskets?

\_\_\_\_\_ apples

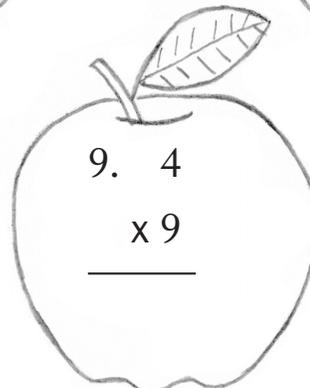
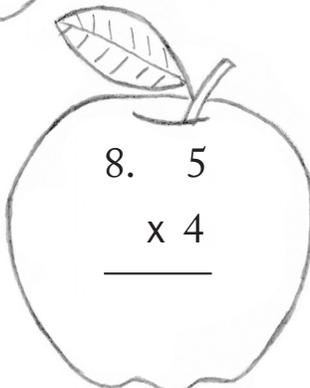
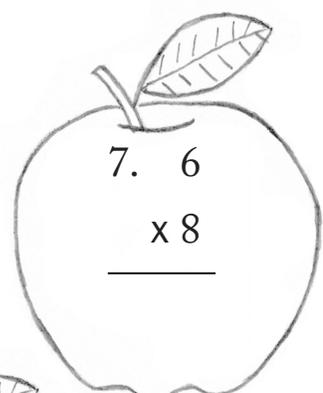
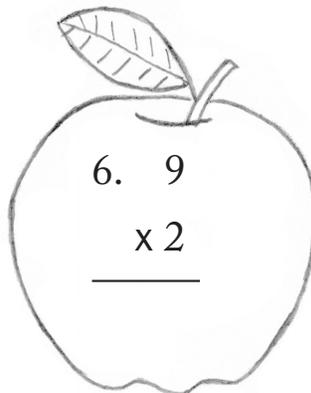
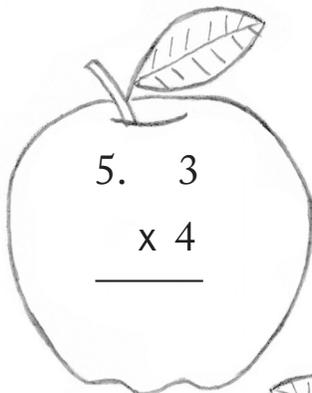
3. There are 8 rows in the orchard. Each row has 7 trees. How many trees are in the orchard?

\_\_\_\_\_ trees

4. Johnny is baking apple pies. He wants to make 6 pies. Johnny needs 4 apples for each pie. How many apples does he need in all?

\_\_\_\_\_ apples

Solve each problem.



## APPLE WORD SEARCH

Find the words hidden below. Words are placed horizontally, vertically, diagonally and backwards.

V S O U R T E G M W D S T  
P A R Z T A R P L N W B L  
R S E F G R O E F S A T H  
U E B A D T L U L C R E A  
N E O R C H A R D L F E R  
I D W M O K M T U A I W V  
N S B I R C I D E R F S E  
G N U R E V J T S E G D S  
Q P S I R C K R A E E R T  
C L H X S H N U O P I H M  
W A E R L N S N A C K C L  
R N L S T E M K N B L Z W  
P T O O V F L O W E R A H

FARM  
SNACK  
CRISP  
ORCHARD  
TRELLIS

PLANT  
TREE  
HARVEST  
FLOWER  
TRUNK

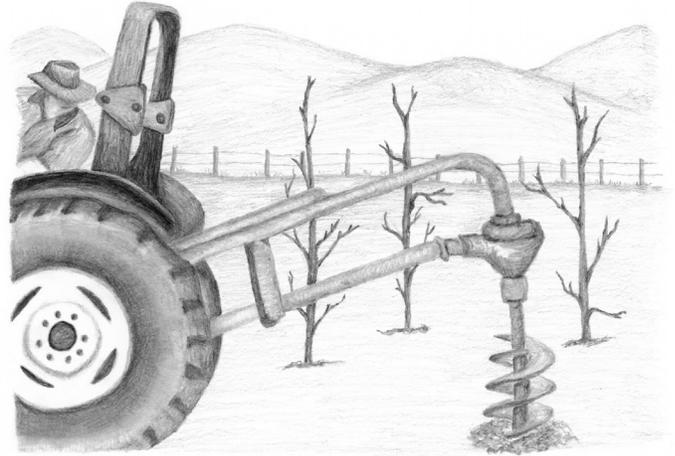
DWARF  
CORE  
SOUR  
STEM  
PRUNING

TART  
SEEDS  
BUSHEL  
SWEET  
CIDER

## STORYBOOK WORKSHEET

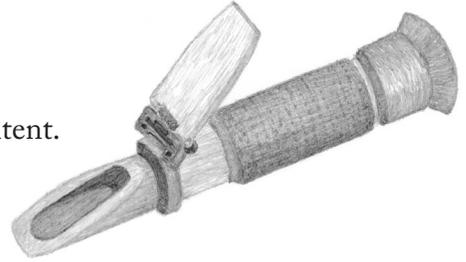
Circle the best answer to the following questions based on the story.

- Apples are mainly grown in what part of North Carolina?
  - Eastern
  - Coastal plain
  - Western
  - Piedmont
- Apples can be \_\_\_\_\_.
  - pink
  - green
  - red
  - all of the above
- Apples grow on trees planted in \_\_\_\_\_.
  - orchards
  - greenhouses
  - valleys
  - barns
- Traditional orchards have trees that can grow as high as \_\_\_\_\_ feet tall.
  - 15
  - 20
  - 34
  - 8
- Farmers plant new trees in the winter because the plants are \_\_\_\_\_, meaning they are not actively growing.
  - dormant
  - blooming
  - pruning
  - vining
- To help control the size of the tree and the size and quality of the fruit, farmers will \_\_\_\_\_ the tree, removing damaged or old limbs.
  - water
  - bind
  - fertilize
  - prune
- An apple will grow from each flower that has been pollinated by a \_\_\_\_\_.
  - mockingbird
  - honey bee
  - weevil
  - worm



8. Some farmers use sprinkler systems to protect trees from frost. The water will freeze around the \_\_\_\_\_, protecting them from damage.
- A. fruit
  - B. leaves
  - C. flowers
  - D. roots

9. A \_\_\_\_\_ is a tool used by farmers to measure a fruit's sugar content.
- A. refractometer
  - B. thermometer
  - C. heater
  - D. tape measure



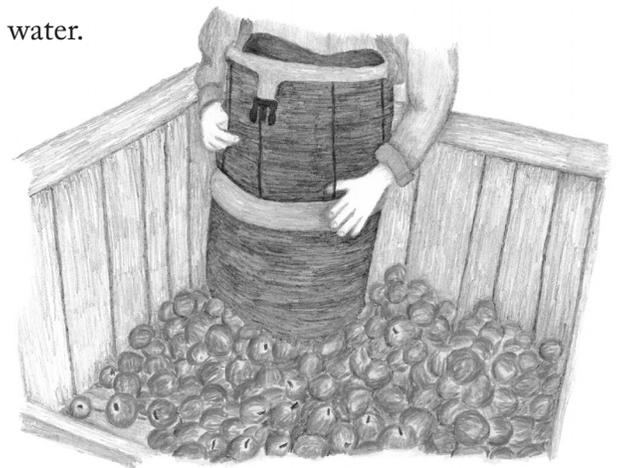
10. Cool evening temperatures in late summer cause some apples to change \_\_\_\_\_.
- A. flavor
  - B. smell
  - C. size
  - D. color

11. Workers can harvest \_\_\_\_\_ of apples from one mature tree in a year.
- A. 16 bushels
  - B. 20 bushels
  - C. 42 bushels
  - D. 30 bushels

12. Apples can be stored up to a \_\_\_\_\_ in the right conditions.
- A. month
  - B. week
  - C. year
  - D. century

13. Because apples are \_\_\_\_\_ percent air, they will float in water.
- A. 25
  - B. 7
  - C. 50
  - D. 33

14. North Carolina's apples are used to make \_\_\_\_\_.
- A. vinegar
  - B. applesauce
  - C. cider
  - D. all of the above



15. It takes about 36 apples to make a \_\_\_\_\_ of apple cider.
- A. pint
  - B. cup
  - C. gallon
  - D. quart

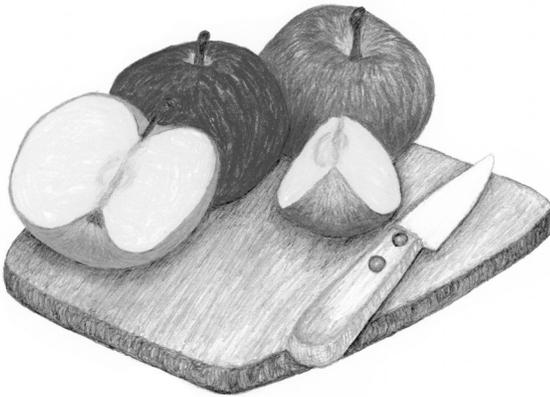
## MORE FUN WITH APPLES

### Pick Your Own Apples

There are many pick-your-own apple orchards. Plan a trip to an apple farm and pick some apples fresh off the trees! North Carolina apples are harvested from August through November. Go to [www.ncfarmfresh.com](http://www.ncfarmfresh.com) to find a farm in your area. Visit the farms' website or call and ask if they offer tours or apple cider pressing demonstrations.

### A Little Apple History

- The first U.S. apple trees were planted by the pilgrims in the Massachusetts Bay Colony.
- A tablet found in Mesopotamia dating from 1500 B.C. records the sale of an apple orchard by an Assyrian named Tupkitilla for the price of three prized breeding sheep.
- Egyptian pharaoh Ramses the Great ordered domestic apples grown in the Nile Delta in the 13th century B.C.



### Science with Apples

Gather six small bowls. In five of the bowls, place in equal amounts each of these liquids: water, olive oil, lemon juice, salt water and seltzer water. Leave one bowl empty. Slice an apple into six pieces. Place a slice into each bowl.

See the apple slices over several hours and document the changes you observe, taking pictures if desired. Answer the following questions:

- Did the apple slices change color?
- What color did they change to?
- Which apple slice changed color the fastest? The slowest?
- Why do you think the apple slice changed color?

### Apple Tasting

Visit your local orchard, grocery store or farmers market and buy several apple varieties. Gently wash each apple and follow the steps below:

Examine each apple.

- Is the apple soft or firm to touch?
- Describe the smell.

Ask an adult to help cut each apple in half.

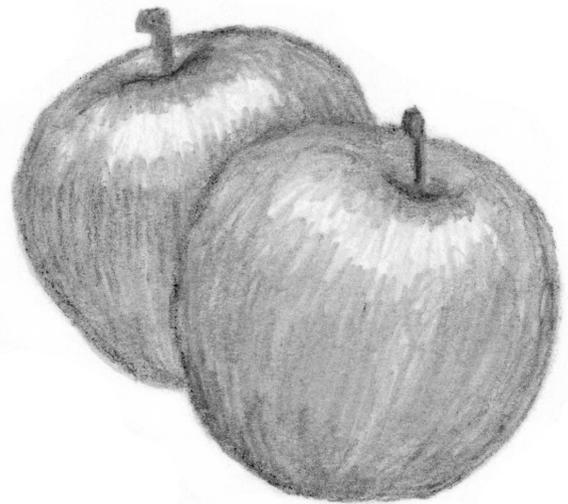
- Do they all look alike? How do they differ?
- Are the seeds grouped alike in each one?
- Count the seeds in each one. How many are there?

Peel one half of the apple.

- What kind of texture does it have?
- How does it taste? Is it tart or sweet? Bitter or mild?
- Which apples do you like best? Which do you like the least? Why?

### Apple Art

Gather paint colors and apples. Ask an adult to cut apples in half. Pour paint in a shallow container. Dip apple into the paint and press firmly on paper or other surface. Use other fruits and vegetables to create artwork.



## GLOSSARY

**Agriculture** – the science, art or practice of cultivating the soil, producing crops and raising livestock, also includes the preparation and marketing of the resulting products

**Bushel** – weight of measure used for apples and other fruit

**Core** – central part of the apple where seeds are found

**Dormant** – not actively growing

**Dwarf tree** – tree that does not grow over 10–12 feet tall

**Farm** – land used for growing crops or raising animals

**Farmer** – a person who cultivates land or crops or raises animals, such as livestock or fish

**Flesh** – part of the apple we eat

**Frost** – thin layer of ice that forms when temperatures reach certain temperatures

**Frost fan** – large fan used to protect blooms from frost damage

**Harvest** – to gather a crop when it has reached maturity

**Orchard** – land where fruit trees are planted

**Pollination** – process of bees or other pollinators moving pollen from one flower to another; required for growing apples and other fruits and vegetables

**Prune** – trim trees or other plants by cutting branches that are dead, diseased or overgrown

**Refractometer** – an instrument used to measure the sugar content of fruit

**Root** – plant part that grows underground, absorbing water and nutrients

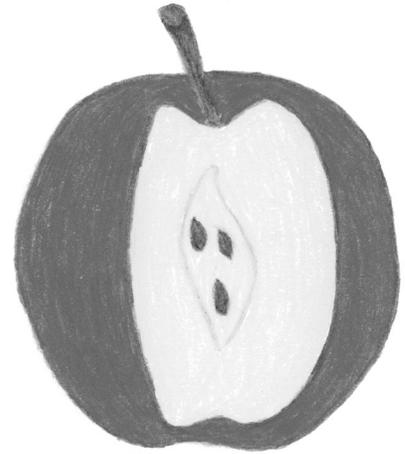
**Soil** – the upper layer of earth that may be dug or plowed and in which plants grow

**Stem** – a plant part, such as a branch, that supports another part, such as a leaf or fruit

**Thin** – to physically remove blooms or immature apples or other fruit from a tree

**Tractor** – a piece of equipment that has many jobs on the farm, including pulling other equipment like an auger or tree planter

**Trellis system** – system where apple tree branches are trained to grow along a wire



# ANSWER KEY

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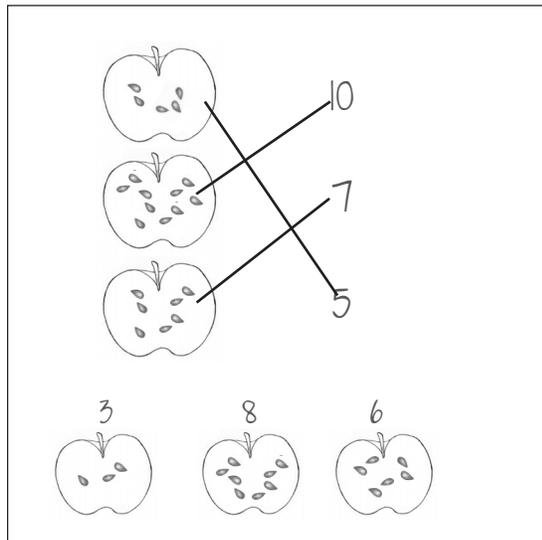
Apple    Apple Tree  
 1. Seed    1. Trunk  
 2. Stem    2. Roots  
 3. Skin    3. Fruit  
 4. Flesh    4. Branch

Bonus: 5 apples,  
 3 seeds

Page 6

1. b  
 2. d  
 3. d

Page 7



Page 8

**ACROSS**  
 1. Dormant  
 2. Flowers  
 3. Prune  
 4. Float

**DOWN**  
 1. Orchard  
 2. Trellis  
 3. Bushel  
 4. Frost

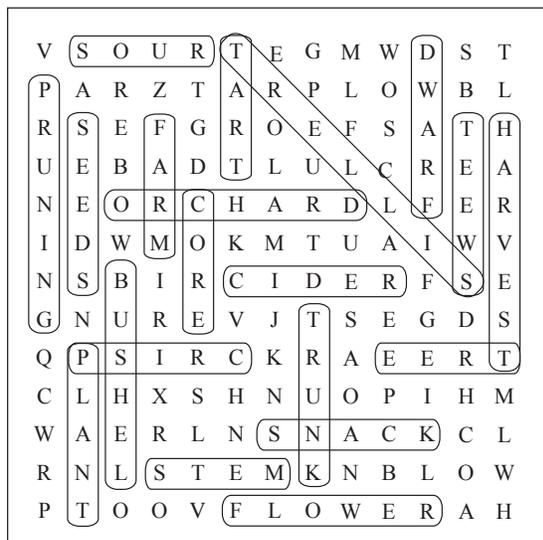
Page 9

Bonus:  
 Red - 3            Yellow - 2  
 Green - 4        Pink - 1  
 Basket - 4        Total - 14

Page 10

1. 35            6. 18  
 2. 40            7. 48  
 3. 56            8. 20  
 4. 24            9. 36  
 5. 12

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Page 12 - 13

1. c            9. a  
 2. d            10. d  
 3. a            11. b  
 4. b            12. c  
 5. a            13. a  
 6. d            14. d  
 7. b            15. c  
 8. c



The North Carolina Farm to School program has been supplying school cafeterias with fresh, NC grown produce since 1997. The program is coordinated by the North Carolina Department of Agriculture and Consumer Services. For more information, please visit [ncfarmtoschool.com](http://ncfarmtoschool.com).



This publication was supported by the U.S. Department of Agriculture's (USDA) Agricultural Marketing Service through grant 12-25-B-1688. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.

Printed by:  
North Carolina Department of Agriculture and Consumer Services  
Steve Troxler, Commissioner

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