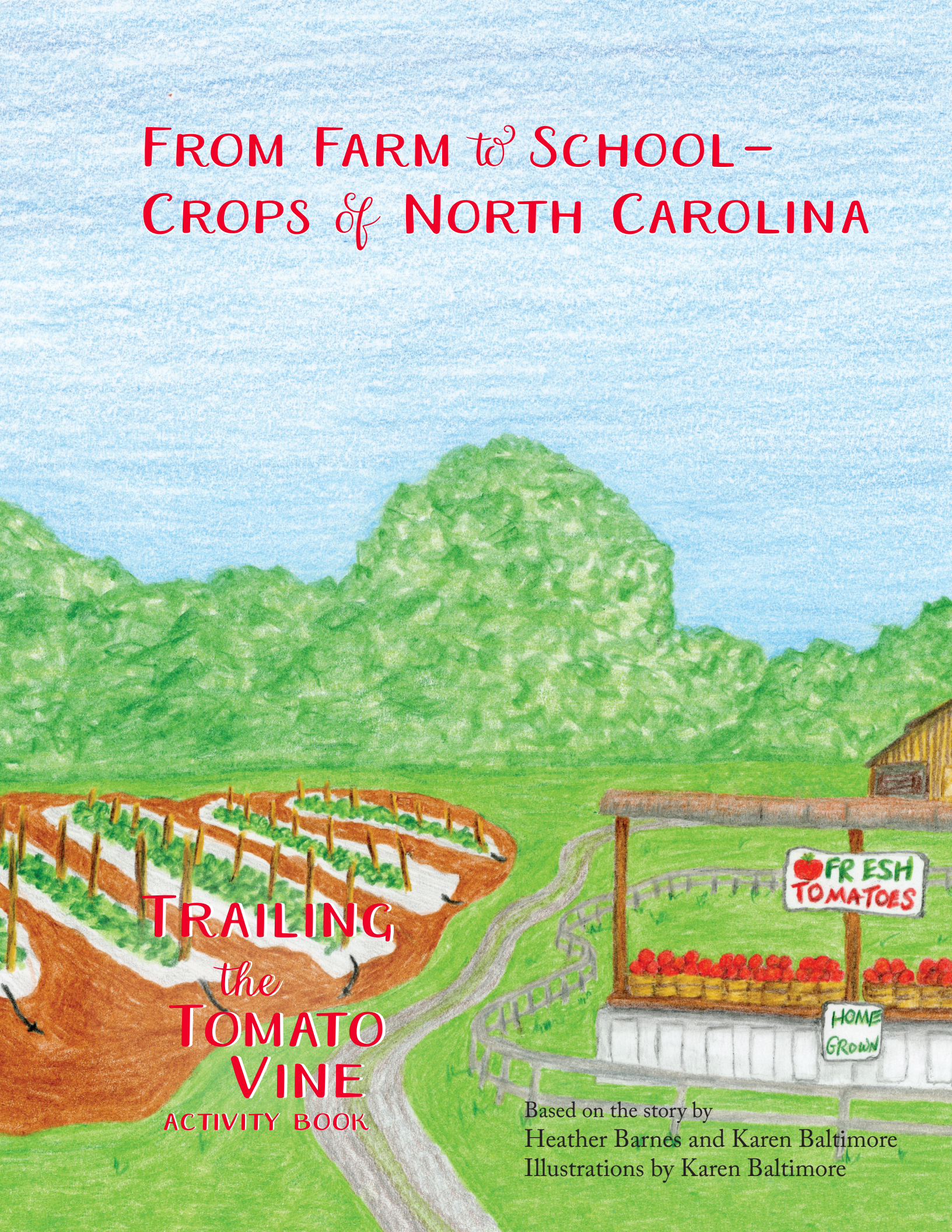


FROM FARM to SCHOOL – CROPS of NORTH CAROLINA



TRAILING *the* TOMATO VINE ACTIVITY BOOK

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

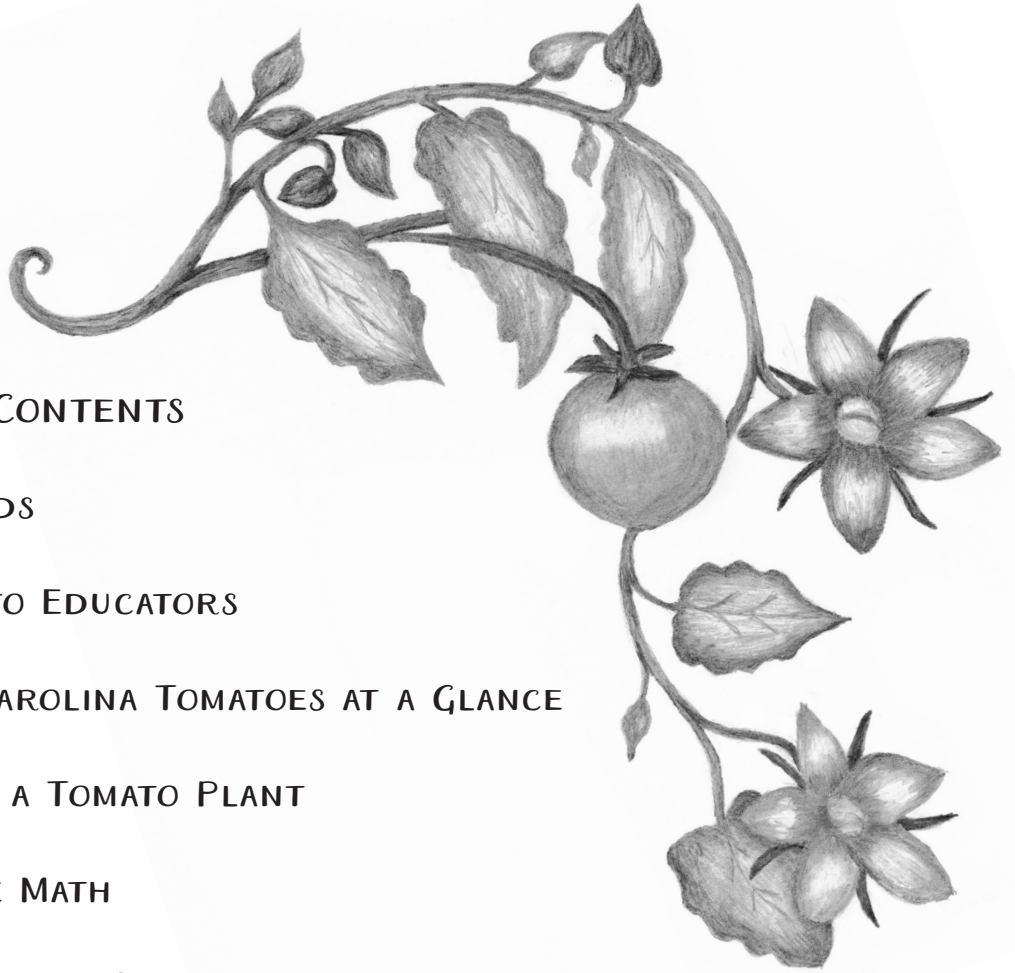


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STANDARDS

From Farm to School – Crops of North Carolina: Trailing the Tomato Vine Storybook and Activity Book North Carolina Common Core and Essential Standards Quick Reference

The *From Farm to School – Crops of North Carolina: Trailing the Tomato Vine 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.G.2 K.MD.1 K.OA.1, K.OA.2, K.OA.3, K.OA.4	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.2, K.NPA.2.2
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.G.1 1.MD.4 1.NBT.1, 1.NBT.2, 1.NBT.4 1.OA.1, 1.OA.6	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.G.1 2.NBT.2, 2.NBT.3, 2.NBT.5, 2.NBT.7 2.OA.1, 2.OA.2	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.1.1, 2.E.1.3	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.G.1 3.NBT.2 3.OA.1, 3.OA.2, 3.OA.3, 3.OA.5, 3.OA.6, 3.OA.7, 3.OA.8	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.4.10 W.4.8	4.G.2 4.MD.2 4.NT.1, 4.NBT.2, 4.NBT.4, 4.NBT.5, 4.NBT.6 4.OA.2, 4.OA.3, 4.OA.4	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.G.4 5.NBT.5, 5.NBT.6, 5.NBT.7 5.OA.2	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.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 and can be the basis for lessons in math, language arts, science, social studies, art and other school subjects.

North Carolina farmers grow tomatoes in fields and greenhouses across the state. The North Carolina Department of Agriculture and Consumer Services (NCDA&CS) has been providing fresh fruits and vegetables grown in our state, including tomatoes, to schools across the state since 1997 through the NC Farm to School program.

This activity guide is designed to be used with *From Farm to School – Crops of North Carolina: Trailing the Tomato Vine*. Printed copies are available on a first-come, first-serve basis and can also be downloaded from our website, www.ncfarmtoschool.com.

For more information on tomatoes visit the following:

North Carolina Farm to School program, NCDA&CS
www.ncfarmtoschool.com

NCDA&CS - Marketing Tomatoes
www.ncagr.gov/markets/commodit/horticul/tomatoes/

Ag in the Classroom, North Carolina Farm Bureau – Curricula, Workshops, Resources and Grants
www.ncagintheclassroom.com

NC Department of Public Instruction, School Nutrition Services
<http://childnutrition.ncpublicschools.gov/information-resources/nutrition-education>

North Carolina 4-H Grow For It Program – Curricula, Programs, Resources
www.growforit.org

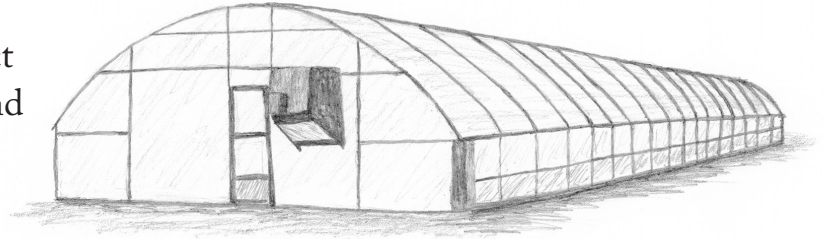


Design and illustration by Karen Baltimore
For more of her work, please visit
www.karenbaltimore.com

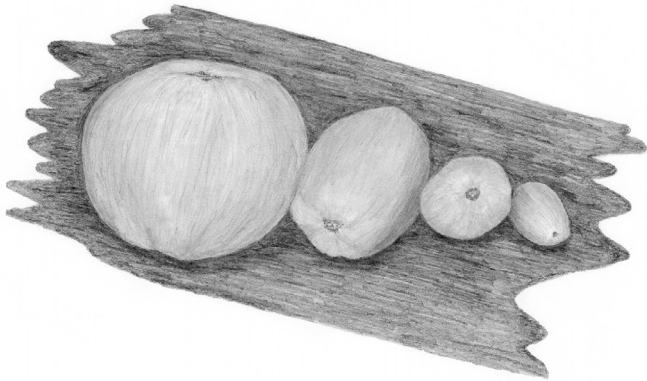
NORTH CAROLINA TOMATOES AT A GLANCE – EXTENSION ACTIVITIES

Tomatoes are grown in greenhouses and fields from Manteo to Murphy. Over 300 family farms across North Carolina grow more than 85 million pounds of tomatoes every year. Visit www.ncagr.gov/stats to find out how many acres of tomatoes are grown in your county.

Tomatoes have even traveled to space. Participants in the “Tomatosphere” project can plant seeds that have been in space and compare their growth to “control” seeds. Visit <http://tomatosphere.org/> for more information on the program.



Thomas Jefferson, the third President of the United States, grew tomatoes on his farm, Monticello. Have students research and make a list of other Presidents who were farmers.



Botanically tomatoes are a fruit, but for nutrition purposes are considered a vegetable. In 1893, the Supreme Court of the United States, in *Nix versus Hedden*, ruled tomatoes should be taxed as a vegetable.

Farmers grow slicing, Roma, cherry and heirloom tomato varieties. Tomatoes come in all colors of the rainbow. Some varieties even have stripes.

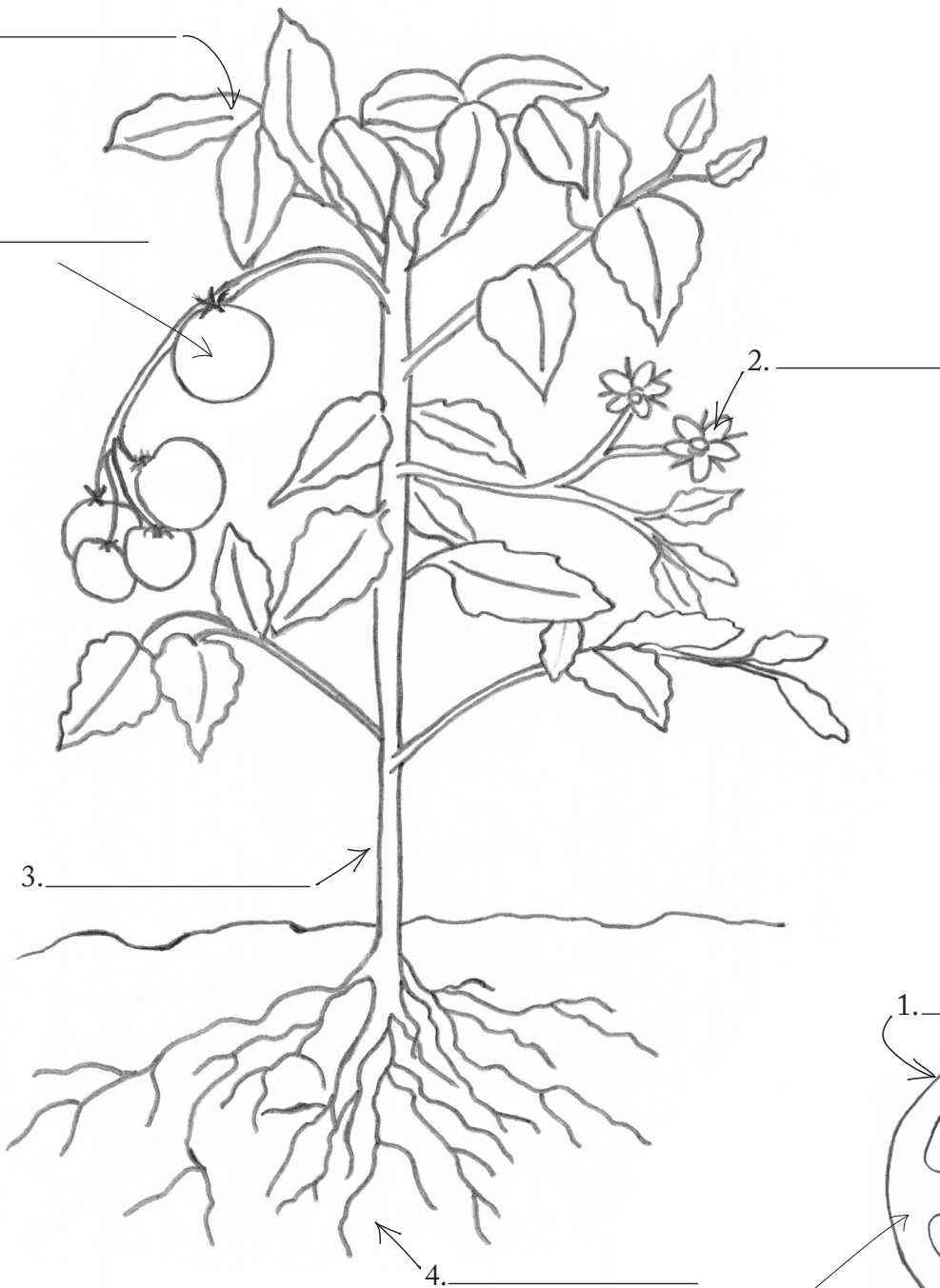
Where do you store tomatoes? Ripe tomatoes should be stored unwashed with the stem up in a cool, dark place. If tomatoes are not ripe, store in a brown paper bag for 1–2 days. An unripe tomato will not ripen as quickly if stored in the refrigerator. Students can conduct an experiment and document how long it takes for tomatoes to ripen when stored in different conditions.

Tomatoes are cholesterol free and low in fat. One cup of raw tomatoes has 30 calories. They are an excellent source of vitamins A and C and rich in lycopene. They are eaten raw and used as an ingredient in many foods. What foods do you eat that contain tomatoes?



PARTS OF A TOMATO PLANT

Use the words in the box to label the parts of a tomato plant and fruit. Color.



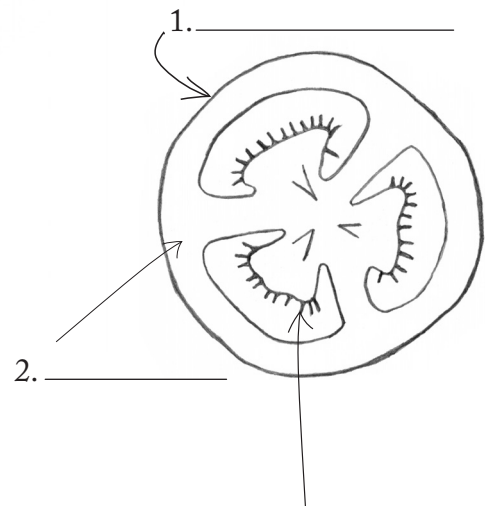
Word Bank

Plant

Flower
Fruit
Leaf
Stem
Roots

Fruit

Seed
Skin
Wall



Bonus

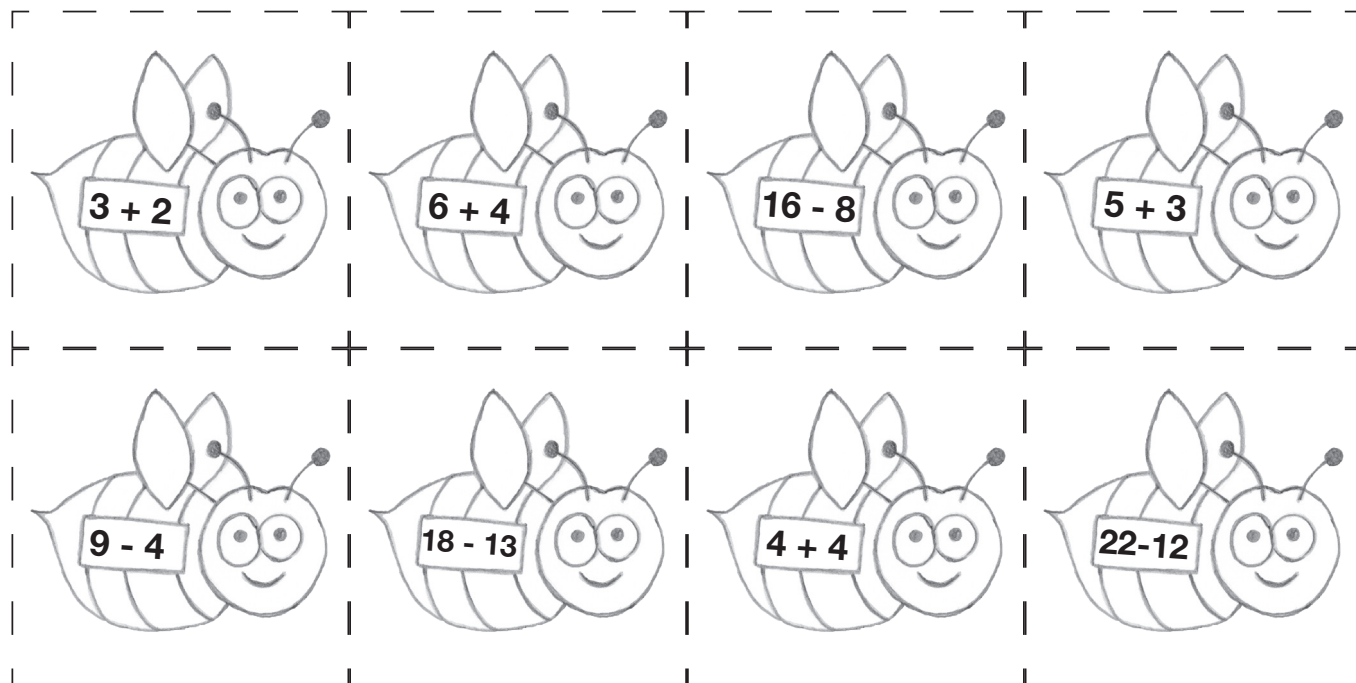
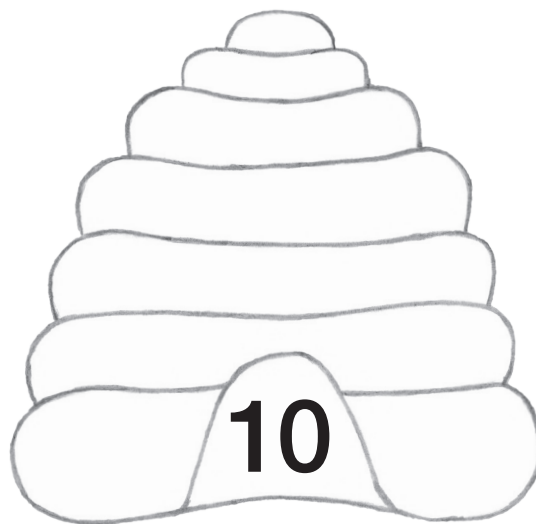
How many flowers are on the plant? _____

How many tomatoes are on the plant? _____

3. _____

BEE HIVE MATH

Solve the problems at the bottom of the page. Color the bees and then cut and paste them in the bee hive with the matching answer.



TOMATO WORD SCRAMBLE

Unscramble the words and use the number code to find the answer to the riddle.

LEWORF

4			12		

UFTIR

		11		2

LTAPN

	15			

NVEI

	7		3

HRQEUSENOE

13				8					

DESE

1			17

YRTA

	6		18

KTEAS

		10		

CRSEKU

		9	16		

BNYEHEOE

	14					5	

WHY IS A TOMATO ROUND AND RED?

5 3 9 10 11 1 3 7 4 7 2 12 10 1 15 14 8 13 , 1 16 7 8 8 18

10 8 17 13 6 3 3 8 , 7 2 12 14 11 15 17 5 3 10 5 3 10 8 •

HONEY BEE READING COMPREHENSION

Read the passage below about honey bees and answer the questions.

Let's Learn About Honey Bees

Honey bees are important pollinators of fruits, vegetables and flowers. They live in groups called colonies. There are three types of honey bees: workers, drones and the queen. There is only one queen in each hive and she lays all the eggs.

All worker bees are female. Each one has a job. Some drink nectar from flowers, spreading pollen from flower to flower. Other worker bees build, clean and protect the hive. They also take care of the queen bee. Worker bees are the only bees most people ever see flying outside the hive. Drones are male and do not have stingers like worker bees.

Bees live together in a house called a hive. Worker bees use beeswax to build cells inside the hive. Each cell has six sides and is called a hexagon, so they fit together with no space between them. Bees will stay in the hive during the winter, feeding on the honey they produced from nectar gathered during the spring and summer.

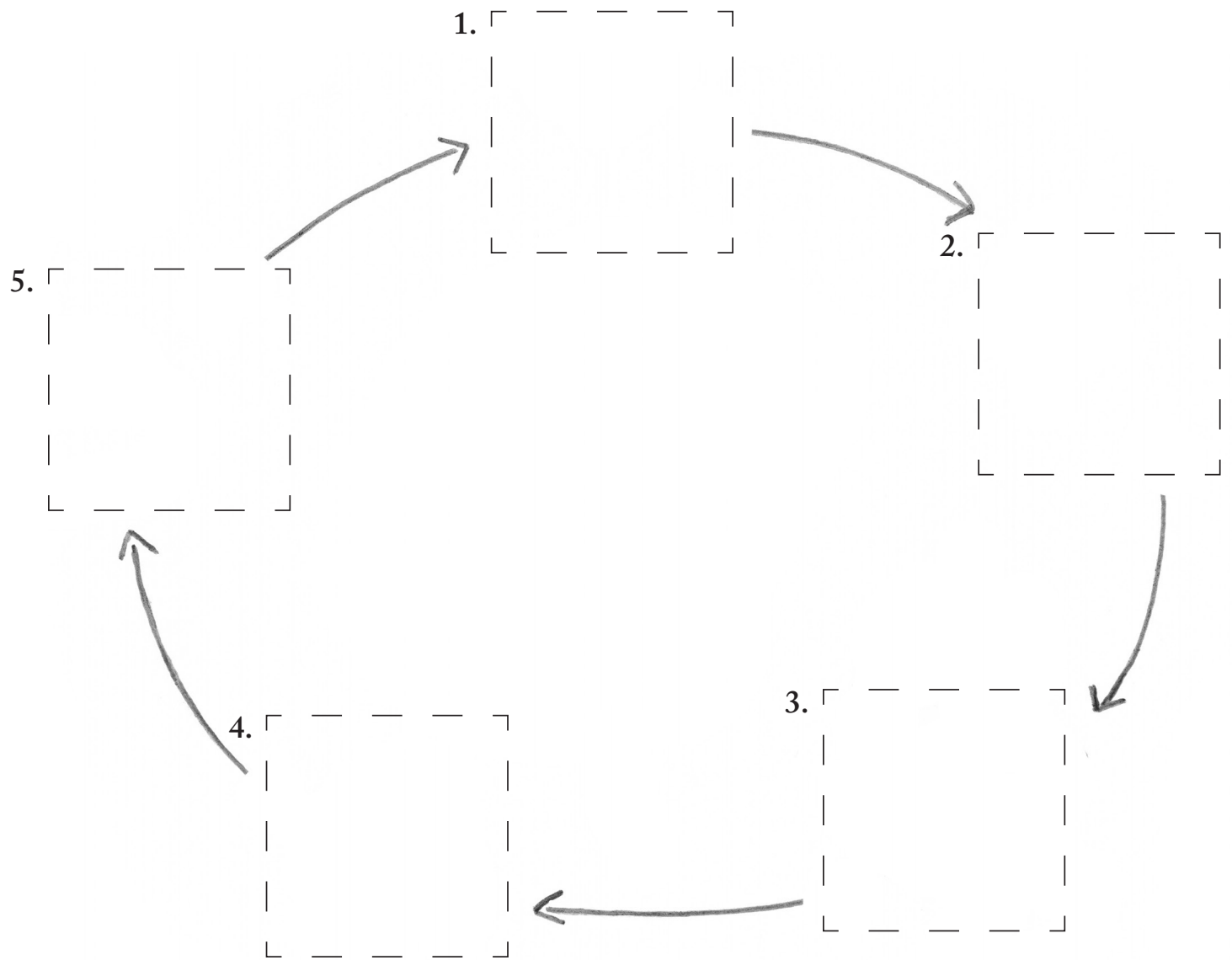
Honey is a natural sweetener. It is the only food made by an animal that people eat. Do you like honey?

1. What jobs does a worker bee do?
 - a. Build the hive
 - b. Drink nectar
 - c. Protect the hive
 - d. All of the above
2. What is the house called that honey bees live in?
 - a. A cell
 - b. A room
 - c. A hive
 - d. A hexagon
3. What shape does a cell in the hive look like?
 - a. Triangle
 - b. Octagon
 - c. Hexagon
 - d. Square
4. Which bees do you see outside of the hive?
 - a. Drones
 - b. Worker bees
 - c. Baby bees
 - d. The queen bee



LIFE CYCLE OF A TOMATO

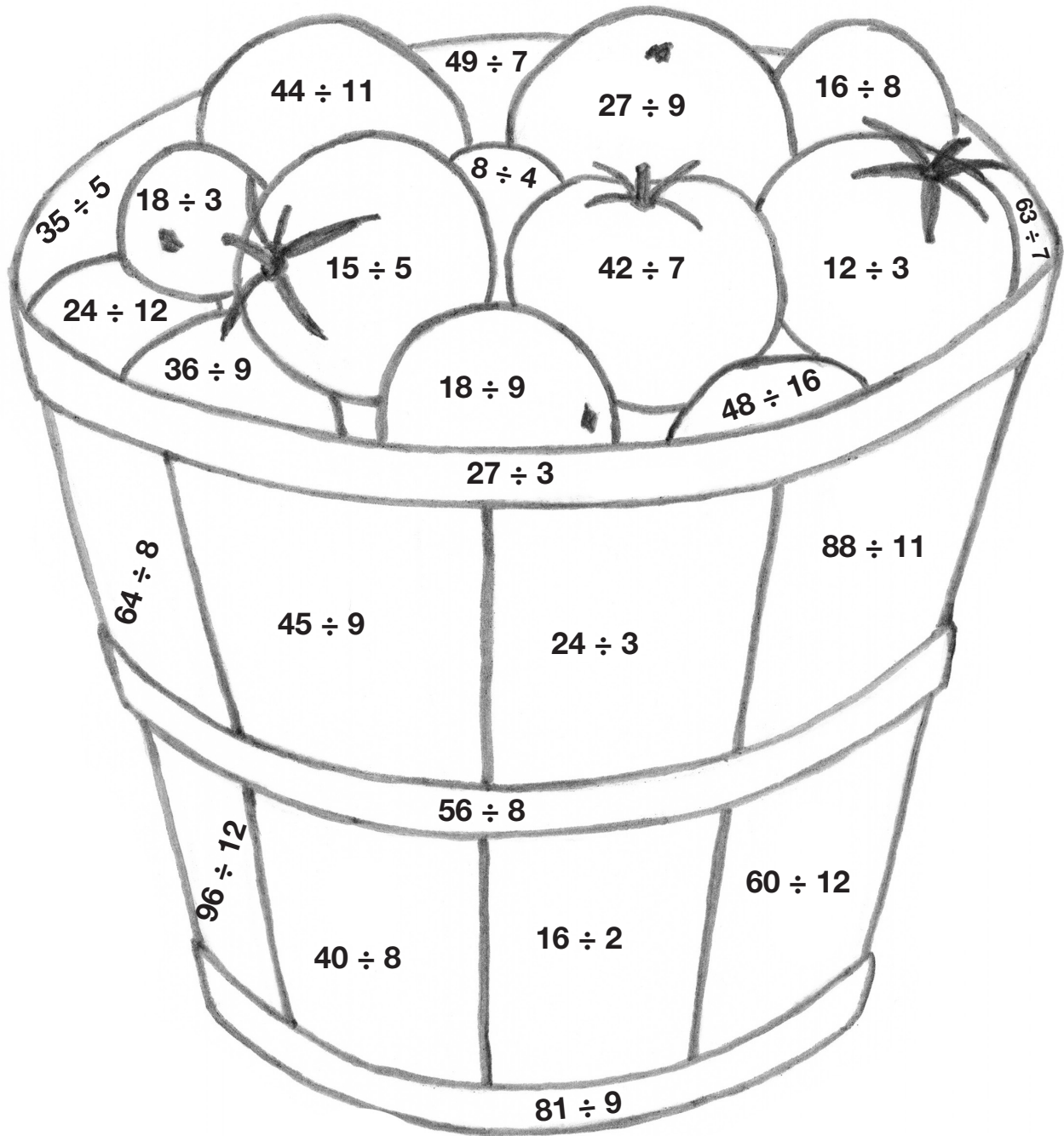
Color each picture. Cut them out and glue in the correct order on the life cycle chart.



TOMATO MATH COLOR BY NUMBER

Solve the division problems below. Color by the code based on the answer.

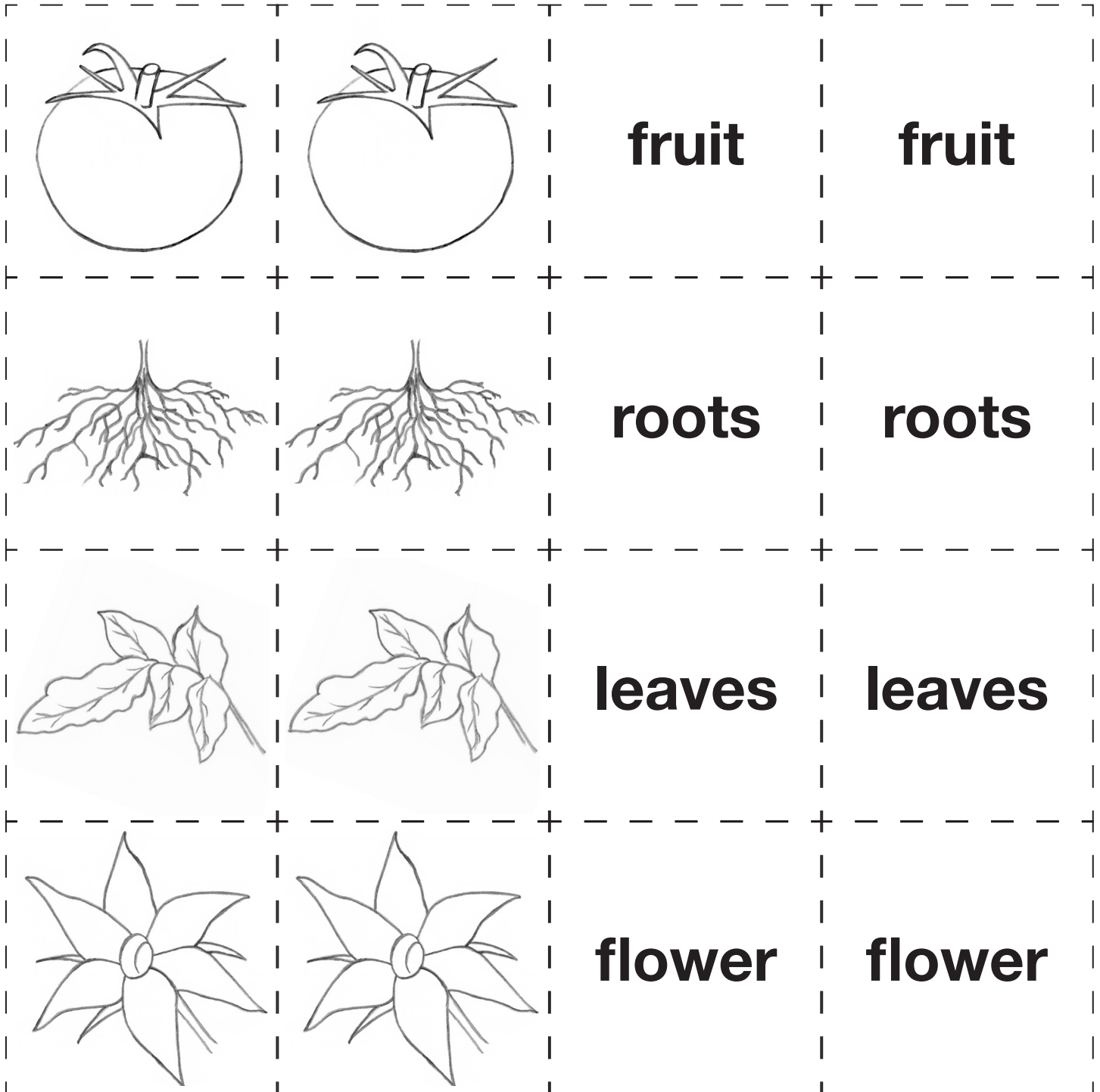
Green	Red	Purple	Yellow	Light brown	Dark brown
4	3	6	2	5, 8	7, 9



Bonus question: You have 64 tomatoes and four baskets. How many tomatoes should you put in each basket so that each one has the same amount? _____

TOMATO MEMORY GAME

Color and cut out the game pieces below. Place them face down on a flat surface. Begin the game by turning two pieces over. If they match, put them in a pile. If they don't match, turn the pieces back over and try again. Continue the game until you have made all eight matches.



STORYBOOK WORKSHEET

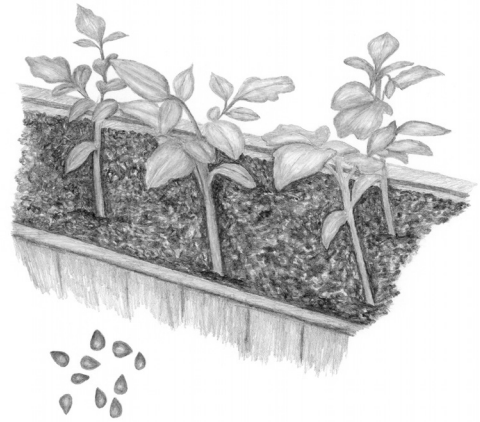
Circle the best answer to the following questions based on the story.

1. North Carolina is the _____ largest tomato producing state in the United States.

- A. sixth
- B. fourth
- C. seventh
- D. first

2. A tomato vine has _____.

- A. flowers
- B. leaves
- C. roots
- D. all the above



3. Tomato seeds are placed in trays and kept in a _____ where they will grow into tomato plants.

- A. barn
- B. field
- C. bucket
- D. greenhouse

4. Seeds will germinate in _____ days.

- A. 5 to 7
- B. 10 to 14
- C. 12 to 24
- D. 2 to 3

5. _____ are relative of the tomato.

- A. Peppers
- B. Eggplants
- C. Potatoes
- D. all of the above



6. Farmers start getting fields ready for planting in _____.

- A. March
- B. September
- C. mid-February
- D. July

7. In the field, beds may be covered with _____ to control weeds.

- A. plastic
- B. water
- C. straw
- D. mud

8. _____ plastic is used for summer crops because it reflects light and keeps the soil from getting too warm.
- A. Black
 - B. Orange
 - C. White
 - D. Brown

9. Tomato plants need eight hours of _____ every day.
- A. fertilizer
 - B. sunlight
 - C. water
 - D. weeding

10. _____ are used to support the vines as it grows..
- A. Trays
 - B. Plastic
 - C. Tape
 - D. Stakes

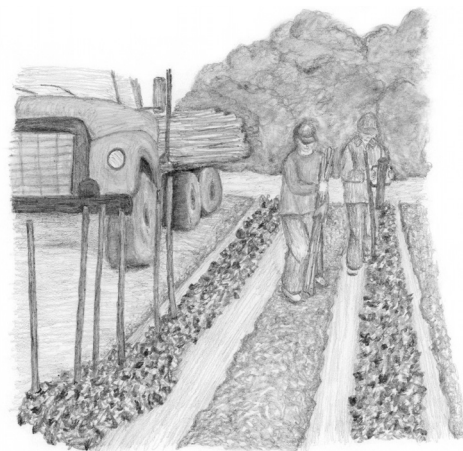
11. _____, or leafy shoots, will appear on the plant two to four weeks after transplanting.
- A. Suckers
 - B. Flowers
 - C. Vines
 - D. Blossoms

12. The flowers of a tomato plant are _____ and will appear _____ weeks after transplanting.
- A. orange, two to three
 - B. yellow, five to eight
 - C. yellow, four to six
 - D. white, four to six

13. After flowers are pollinated by the bees, small _____ tomatoes will form.
- A. red
 - B. yellow
 - C. orange
 - D. green

14. _____ is an odorless, tasteless gas naturally produced by tomatoes.
- A. Chlorine
 - B. Hydrochloric acid
 - C. Ethylene
 - D. Fluoride

15. To ripen a tomato, store _____.
- A. in the refrigerator
 - B. at room temperature
 - C. in the freezer
 - D. in direct sunlight



MORE FUN WITH TOMATOES

Color Experiment

Black and white plastic is used to prevent weeds and control ground temperature when growing tomatoes. Which color absorbs the most heat? Use this experiment to figure out the answer.

Supplies needed

2 identical jars or drinking glasses
Thermometer
Measuring cup
Water
2 elastic bands or tape
1 sheet each, white paper and black paper



Instructions

Wrap white paper around one of the glasses using an elastic band or tape to fasten it. Repeat with the other glass using the black paper. Fill the glasses with the exact same amount of water. Place glasses in the sun for a few hours. Measure the temperature of the water in each glass using the thermometer. Record your results. Which one is warmer?

Why?

Dark surfaces such as the black paper absorb more light and heat than the lighter colored ones. Lighter surfaces reflect, or throw back, more light and will stay cooler.

Take a Closer Look

With the help of an adult, slice open a tomato and see what it looks like on the inside.

- Is it smooth or rough?
- Does it have a smell?
- Count how many seeds are inside.

Now taste the tomato.

- What does it feel like in your mouth?
- Do you like the taste? Why or why not?

Can you think of any foods you eat that have tomatoes in them?

Make a list. What's your favorite?



Growing Tomatoes

Tomatoes are easy to grow! Follow the instructions below and see if you can grow your own.

Supplies needed

A small pot or plastic cup
Potting soil
Tomato seeds
Water

Instructions

Fill the pot or cup with soil. Using a pencil, poke a hole halfway down into the soil. Drop the seeds in the hole and fill the hole with soil. Water the seeds, but be careful not to water too much. Check the soil every day to make sure it is damp. In about a week, you will see a small seedling push through the soil. Move the pot to a warm, sunny spot. When the seedling gets a few inches tall, plant it outside in the ground or in a larger pot. As the plant grows, you will need to place a stake in the soil and gently tie the stem of the plant to the stake with yarn or twine. Before long, you will see flowers on your plant. The tomatoes will grow from the flowers!

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

Bedder – piece of equipment used to form soil into raised beds

Drip tape – thin tube with holes that water drips through; used under agricultural plastic to irrigate crops

Ethylene – a naturally occurring, odorless, tasteless gas produced by tomatoes and other fruits and vegetables

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

Greenhouse – a structure with glass or plastic walls and roof that is used for growing plants

Germination – process by which a plant grows from a seed

Harvest – to gather a crop when it has reached maturity

Irrigate – supply water to crops to help growth or protect from frost or freezing temperatures

Raised bed – soil that is mounded above soil level for the purpose of planting

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

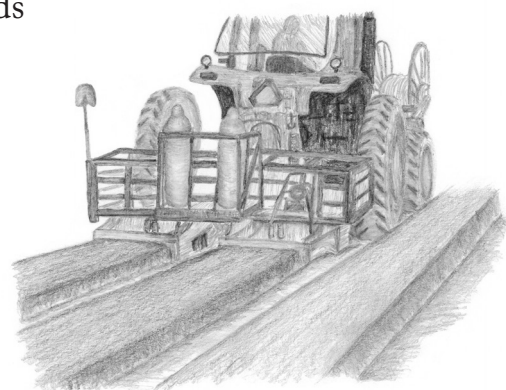
Sprout – new growth

Suckers – a small shoot that grows where a branch meets the stem

Stringing – practice of tying twine to an end stake, stretching it along one side of the plant, looping it around another stake and continuing the process down the row of tomatoes

Tractor – a piece of equipment that has many jobs on the farm, including pulling other equipment like a bedder, setter or plow

Transplant – to remove a plant from the ground and move it to another place



*Most definitions adapted from Merriam-Webster

ANSWER KEY

Page 5

Plant	Fruit
1. Leaf	1. Skin
2. Flower	2. Wall
3. Stem	3. Seed
4. Roots	Bonus
5. Fruit	2 flowers, 5 tomatoes

Page 7

LEWOLF F L O W E R

UFTIR F R U I T

LTAPN P L A N T

NVEI V I N E

HRGEUSENOE G R E E N H O U S E

DESE S E E D

YRTA T R A Y

KTEAS S T A K E

CRSEKU S U C K E R

BNYEHOE H O N E Y B E E

WHY IS A TOMATO ROUND AND RED?

BECAUSE IF IT WAS LONG, SKINNY

AND GREEN, IT WOULD BE A BEAN.

Page 10

Bonus: 16

Page 6

4 + 4 = 8
5 + 3 = 16 - 8 = 8
8

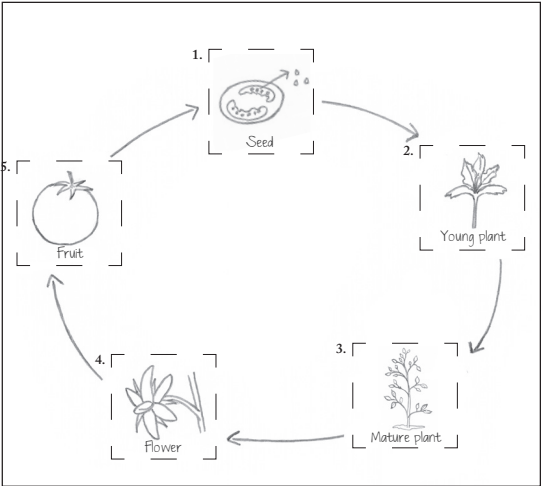
6 + 4 = 22 - 12 = 10
10

18 - 13 = 5
3 + 2 = 9 - 4 = 5
5

Page 8

1. D 2. C 3. C 4. B

Page 9



Page 12 – 13

1. C	10. D
2. D	11. A
3. D	12. C
4. B	13. D
5. D	14. C
6. A	15. B
7. A	
8. C	
9. B	



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.



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