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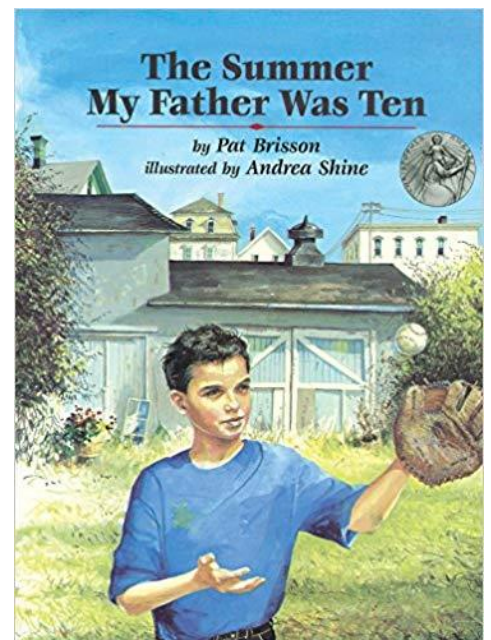
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### *The Summer My Father Was Ten*

By: Pat Brisson

**"Every year my father and I plant a garden. Tomatoes, peppers, onions, marigold, and zinnias grow in neat, straight rows...and every spring my father tells me about Mr. Bellavista and the summer my father was ten." - From the book. That was the summer the boy lost a baseball under a tomato plant in Mr. Bellavista's garden. And someone tossed a tomato back instead of the baseball. A lively battle took place, which seemed like great fun at the time, but in the end Mr. Bellavista's garden had been destroyed. In a touching story of one boy's efforts to make amends, we see the rebuilding of a garden and the forming of a relationship across generations. With luminous, beautifully detailed watercolors, the artist has captured both the sadness and the quiet joy woven throughout the tale. <sup>1</sup>**



#### **Did You Know? (Ag Facts) <sup>2 - 3</sup>**

- About 1/3 of the human diet is derived directly or indirectly from insect-pollinated plants.
- Gardening can be a great workout. Pulling weeds and planting flowers will burn 200-400 calories per hour!
- One teaspoon of good soil contains more than one million living things!
- An oligochaetologist is another name for worm expert.

#### **Discussion Questions**

- Why do you think most people wouldn't expect Mr. Bellavista and the boy to become friends?
- Why is it important to know the father made spaghetti sauce every year?

Grade Level(s): K-5

Purpose: Students will observe physical characteristics of flowers and explore principles of pollination.

Vocabulary:

- **sentimental**: feelings or tenderness, sadness, or nostalgia
- **opera**: a genre of classical music
- **flannel**: a kind of soft, woven fabric
- **marigold**: a plant of the daisy family, typically with yellow, orange, or copper-brown flowers
- **pistil**: female parts of a flower, including the stigma (where pollen lands), style (stalk-like part between stigma and ovary), and ovary (at the base, develops into the fruit and contains the seeds)
- **pollenizer**: plant that provides pollen
- **pollinator**: agent that moves pollen resulting in the pollination of flowers
- **stamen**: male parts of a flower, including the anther (produces and contains pollen) and filament (stalk supporting the anther)

Background Agricultural Connections <sup>2</sup>

To understand inherited traits in plants, you need to understand how seeds are produced. Seeds contain embryos that develop into plants. Before a plant can form a seed embryo, pollination and fertilization must occur in the flower. The reproductive organs of plants are found in the flower. The male parts of the flower include the filament, which looks like a stalk, and the anther at the top of the filament, which produces pollen grains. Pollination occurs when pollen from an anther is transferred to a stigma. The stigma is the female part of the flower that is specially developed to catch pollen grains. Below the stigma is the style. A pollen grain that has been caught by the stigma reaches down the style to fertilize the egg (or eggs) in the ovary. This fertilization process creates a seed (or seeds) inside the ovary. In most cases, the ovary then swells and becomes the fruit of the plant (e.g., cherries, avocados, apples, cucumbers).

Many flowers contain both male and female parts. Some plants can pollinate themselves; they are self-fertile. Other plants have chemical or physical barriers to self-pollination and need to be cross-pollinated. In cross-pollination, pollen is delivered to a flower of a different plant. Plants adapted to cross-pollinate usually have taller **stamens** (collective male parts) than **pistils** (collective female parts) to better spread pollen to other flowers. In self-pollination, pollen moves from the anther to the stigma of the same flower or to another flower on the same individual plant. The seeds from self-pollinated flowers produce plants that look like the parent plant. This isn't true with cross-pollination, which yields offspring of two different parents. The offspring of cross-pollinated plants may show some traits from both parents or may not resemble either parent.

Plants that cannot self-pollinate require a **pollenizer**—a separate plant to provide pollen. Even plants that can self-pollinate will often produce larger fruit and healthier offspring with a pollenizer. A good pollenizer is a plant of the same species that blooms at the same time as the plant to be pollinated and provides compatible, viable, and plentiful pollen. Peaches are

considered self-fertile because fruit can be produced without cross-pollination, although cross-pollination usually produces a better crop. Apples are considered self-infertile; most apple trees will not form fruit without cross-pollination by an apple tree of a different variety. Pollination is critical for the production of many important agricultural crops, including corn, wheat, rice, apples, oranges, tomatoes, and squash.

In addition to planting the proper pollenizers for their crop, farmers must also consider whether their crops require a special **pollinator**. The terms pollenizer and pollinator are often confused—a pollenizer is a plant that provides pollen; a pollinator is an agent that moves pollen, whether it be wind, water, bees, bats, moths, or birds. Insects are among the most common pollinators.

Many flowers grow flashy petals and produce unique smells to attract insect pollinators to their rich supplies of pollen and/or nectar (sticky, sweet liquid on the end of the stigma). These flowers trade sweet nectar and protein-rich pollen in return for the pollination service that insects perform as they move from flower to flower. Insects don't just pollinate flowers for fun; most are collecting food.

Different insects are attracted to different types of flowers depending on color, scent, and size. Butterflies are attracted to orange, yellow, pink, and blue flowers that have large landing pads. Moths are active at night, requiring flowers that are open and provide nectar at night. Large, white flowers are particularly easy for moths to find in the dark. Honey bees see colors on the higher end of the human visual spectrum, including ultraviolet, which humans cannot see. Honey bees tend to prefer blue, purple, and yellow flowers that have sweet scents.

It's common to see bee boxes in orchards because honey bees are good pollinators for many fruit crops. Once a honey bee finds an abundant source of nectar and pollen, it will return to the hive and tell other bees how to locate that source by performing a dance. After a hive is placed in an orchard, it doesn't take long for a steady stream of busy bees to start buzzing from flower to flower. Honey bees have lots of little hairs on their bodies, and a furry bee moving around inside a flower picks up a lot of pollen. Some of this pollen will be brought back to the hive for food, but some will be deposited on the stigmas of other flowers that the bee visits, pollinating those flowers. In an orchard, lots of pollinated flowers will lead to lots of tasty fruit!

### Flower Dissection

Materials:

- Cut flowers, 1 per student
  - Contact a local florist and ask if they have some old flowers they will be discarding; look for flowers that exhibit easily identifiable parts: lilies, roses, tulips, columbines, irises, petunias, snapdragons, and sunflowers)
- 5-gallon bucket with water to store the cut flowers
- *The Basic Parts of a Flower* handout
- Clear tape
- *Flower Power* activity sheet, 1 per student
- [Parts of a Flower Poster](#)

Procedures:

1. Collect flowers in advance, and store them in the 5-gallon bucket with water in the bottom. Dissect a few flowers, and place them on card stock or a sheet of paper; label the parts.
2. Discuss the background information with your class. Explain to your students that they are going to examine, dissect, and label the parts of the flower that are associated with pollination and seed formation.
3. Read and discuss the *Basic Parts of a Flower* handout as a class, or have students read the handout individually or in small groups.
4. Give each student a copy of the *Flower Power* activity sheet, clear tape, and a piece of card stock or paper. Have 6–7 pairs of scissors located centrally in the classroom.
5. Using the Parts of a Flower Poster (see *Materials*) as a guide, instruct the students to first label the flower parts on the *Flower Power* activity sheet.
6. Show students the previously dissected flowers. Explain that flower dissection requires precision and a “light touch.” Rough handling of the flower will destroy the parts that need to be labeled. Give each student a flower. Have the students carefully dissect the flower and tape the parts onto their card stock or paper.
7. Ask the students to label each flower part. They should use the *Flower Power* activity sheet as a reference.
8. Discuss the following questions:
  - a. Are some flowers easier to dissect than others?
  - b. Were some parts easier to identify than others?
  - c. Did every flower contain pollen? Why or why not?
  - d. How do you think your flower is pollinated?
  - e. Can you predict the size and shape of the seeds that may be produced by the flower based on how the flower looks?
  - f. If your flower were self-pollinated, and its seeds were planted, what would the flowers of its offspring look like? What if it were cross-pollinated?

### Story Mapping<sup>2</sup>

Materials:

- *The Summer My Father Was Ten* by Pat Brisson
- Story Map handout (Optional)

Procedures:

1. Discuss with students how symbols on a map indicate notable features. In addition, discuss the symbols that students see every day at home, school, and when traveling. These include symbols on the restrooms at school; stop, warning, and directional signs while traveling; and symbols used to represent different games or apps on smart phones and tablets. Explain to students that stories can be mapped using symbols to help remember the characters and the story.
2. Read *The Summer My Father Was Ten* to the students. Encourage students to visualize the characters, settings, and events as they listen. After reading the story, they will be mapping it.

3. Discuss the setting, main characters, and problem presented in the story and chart the sequence of events. You may wish to use the *Story Map* handout to facilitate this process. Ask students to list all of the events that took place in the story and write them on the board. Review the story, focusing students' attention on the sequence of main events. Emphasize what happened first, next, and then...
4. As students agree upon the order of listed events, number these in sequence.
5. Ask each student (or group of students) to illustrate one of the story's events. Story illustrations can then be displayed in a vertical or a horizontal sequence, in a circular pattern, or as a winding trail that traces the movements of the characters. The story map the class creates will not only help students retell the story, but will also increase their comprehension and retention.
6. Another strategy to assist with reading comprehension is "concept mapping" or "concept webbing." Concept maps use a web of words or pictures and connecting lines to associate concepts and vocabulary. Go back to the text of *The Summer My Father Was Ten*, and have the students find words that are plant- or garden-related (e.g. seed, soil, etc.). Place the word in the center of a whiteboard or piece of paper and then connect other associative words to it with lines. For younger students, pictures can be used in place of words.

### Enriching Activities

- Have students look up information about tomatoes. How many tomatoes does the average tomato bush produce? If Mr. Bellavista planted fifteen tomato plants that were destroyed, how many tomatoes were destroyed?
- As the families shared spaghetti dinners in later year, have students bring in a recipe for spaghetti sauce. You may decide to cook a spaghetti lunch in your classroom to reinforce measurement concepts.
- Further explore the world of bees and pollination with these two, half-hour videos from *America's Heartland*:
  - [Episode 304: Migrant Bees](#)
    - Something has been happening that concerns farmers, especially citrus and nut growers, everywhere: there's less "buzz" in the air. Bees are disappearing. While apiarists - bee farmers - try to determine the cause of "disappearing hive syndrome," some are seeing a new business opportunity in taking their bees on the road.
  - [Episode 208: Not So Sweet](#)
    - California almond farmers grow 80% of the world's almond supply and almost 100% of the US almond crop, generating more than 1.5 billion dollars a year in revenue. But to pollinate trees and grow those almonds, you need bees, lots of bees!

### Suggested Companion Resources

- [Achoo! Why Pollen Counts](#) (book)
- [The Reason for a Flower](#) (book)
- [The Life and Times of the Honeybee](#) (book)
- [Tops and Bottoms](#) (Book)

- [Introduction to Pollination](#) (video)
- [Pollen Gallery](#) (website)

#### Sources/Credits

1. Brisson, P. (1998). *The Summer My Father Was Ten*. Honesdale, PA: Boyds Mills Press.
2. Utah Ag in the Classroom
3. WebMD

#### Suggested SC Standards Met:

##### English/Language Arts:

- K.RL.5.1 With guidance and support, ask and answer who, what, when, where, why, and how questions about a text; refer to key details to make inferences and draw conclusions in texts heard or read.
- K.RL.5.2 With guidance and support, ask and answer questions to make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.
- K.RL.6.1 Describe the relationship between illustrations and the text.
- K.RL.7.1 With guidance and support, retell a familiar text; identify beginning, middle, and end in a text heard or read.
- K.RL.7.2 Read or listen closely to compare familiar texts.
- K.RL.8.1 With guidance and support, read or listen closely to: a. describe characters and their actions; b. compare characters' experiences to those of the reader; c. describe setting; d. identify the problem and solution; and e. identify the cause of an event.
- 1.RL.5.1 Ask and answer who, what, when, where, why, and how questions to demonstrate understanding of a text; use key details to make inferences and draw conclusions in texts heard or read.
- 1.RL.5.2 Make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.
- 1.RL.6.1 Describe the relationship between the illustrations and the characters, setting, or events.
- 2.RL.5.1 Ask and answer literal and inferential questions to demonstrate understanding of a text; use specific details to make inferences and draw conclusions in texts heard or read.
- 2.RL.5.2 Make predictions before and during reading; confirm or modify thinking.
- 2.RL.8 Analyze characters, settings, events, and ideas as they develop and interact within a particular context.
- 3.RL.5.1 Ask and answer literal and inferential questions to determine meaning; refer explicitly to the text to support inferences and conclusions.
- 3.RL.8 Analyze characters, settings, events, and ideas as they develop and interact within a particular context.
- 4.RL.5.1 Ask and answer inferential questions to analyze meaning beyond the text; refer to details and examples within a text to support inferences and conclusions.

- 4.RL.6.1 Determine the development of a theme within a text; summarize using key details.
- 4.RL.8 Analyze characters, settings, events, and ideas as they develop and interact within a particular context.
- 5.RL.5.1 Quote accurately to analyze the meaning of and beyond the text to support inferences and conclusions.
- 5.RL.6.1 Determine and analyze the development of a theme within a text; summarize using key details.
- 5.RL.8 Analyze characters, settings, events, and ideas as they develop and interact within a particular context.

Math:

- 3.ATO.8 Solve two-step real-world problems using addition, subtraction, multiplication and division of whole numbers and having whole number answers. Represent these problems using equations with a letter for the unknown quantity.
- 3.MDA.2 Estimate and measure liquid volumes (capacity) in customary units (i.e., c., pt., qt., gal.) and metric units (i.e., mL, L) to the nearest whole unit.
- 4.NSBT.4 Fluently add and subtract multi-digit whole numbers using strategies to include a standard algorithm.
- 4.NSBT.5 Multiply up to a four-digit number by a one-digit number and multiply a two-digit number by a two-digit number using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using rectangular arrays, area models and/or equations.
- 5.NSBT.5 Fluently multiply multi-digit whole numbers using strategies to include a standard algorithm.

Science:

- K.L.2 The student will demonstrate an understanding of organisms found in the environment and how these organisms depend on the environment to meet those needs.
- 1.L.5 The student will demonstrate an understanding of how the structures of plants help them survive and grow in their environments.
- 2.L.5 The student will demonstrate an understanding of how the structures of animals help them survive and grow in their environments.
- 3.L.5 The student will demonstrate an understanding of how the characteristics and changes in environments and habitats affect the diversity of organisms.
- 4.L.5: The student will demonstrate an understanding of how the structural characteristics and traits of plants and animals allow them to survive, grow, and reproduce.
- 5.L.4 The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems.

## The Basic Parts of a Flower

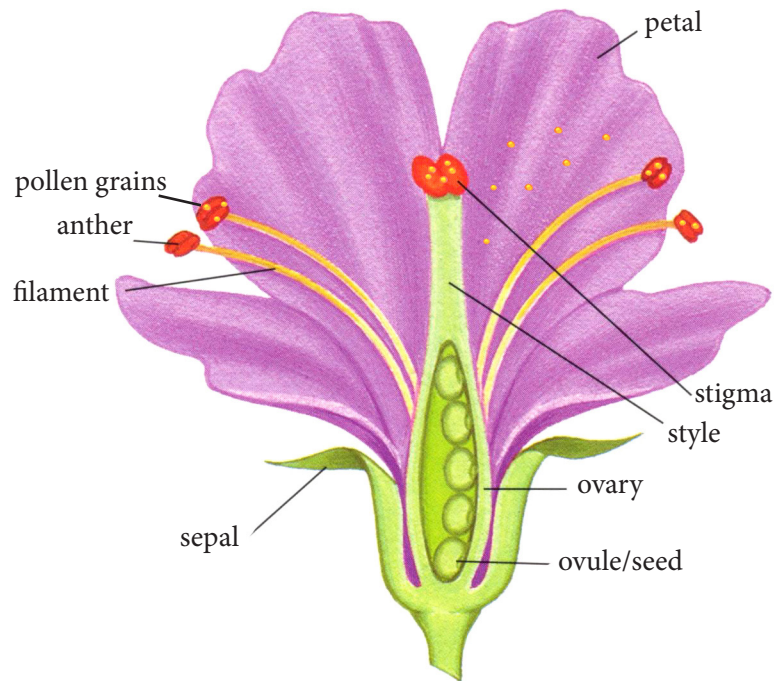
A flower is made up of many different parts. The sepal and petals are usually easy to see. The petals are the colorful, often bright part of the flower. Colorful petals attract pollinators and are usually the reason why we buy and enjoy flowers. The sepals look like little green leaves growing at the base of the petals. The sepals enclose and protect the developing flower bud before it opens up into a fully developed flower. Flowers contain the reproductive system of the plant, and some of the most important parts of a flower are the male and female parts that carry the traits the parent plant will pass on to its offspring.

The male part of the flower is called the stamen. The **stamen** is the pollen producing part of the plant, and it is made up of two parts: the anther and filament. The filament is the stalk that holds the anther and attaches it to the flower. The anther produces and holds the pollen, which will hopefully be transported to the female part of the flower by wind, animals, or insects.

The female part of the flower is called the **pistil**, and it is made up of the stigma, style, and ovary. The stigma is the head of the pistil; it often looks like a sticky bulb on a long stalk in the center of a flower. The stigma receives the pollen grains. The style is the stalk that the stigma sits on top of, and the ovary is usually at the base of the style.

When a plant is pollinated, the pollen that has landed on the stigma grows a tube that reaches down through the style to the ovary. If pollen from an incompatible plant of a different species lands on the stigma, it won't grow a pollen tube. When the pollen tube reaches the ovary, the ovules inside the ovary can be fertilized by the pollen. Then the ovules become seeds, and the ovary swells. Seeds can be sown to grow new plants, and they can also be important food sources. We eat the seeds of wheat, corn, beans, and many other plants. We also eat many fruits, which are enlarged ovaries that contain the seeds of the plant.

Some flowers are perfect, meaning they have both male parts and female parts in the same flower. Roses, lilies, and dandelions have perfect flowers. Other flowers are imperfect, meaning each flower has either all male parts or all female parts. Cucumbers, pumpkins, and melons have imperfect flowers.



After reading the information on the left, can you find these parts on the flower you are dissecting?

- petals
- anther
- filament
- sepal
- stigma
- style
- ovary

Not all flowers will look like the diagram, so read the description of basic flower parts carefully.



# Flower Power

Using the "Glossary of Flower Parts," label the parts of the flower below.



## Glossary of Flower Parts:

**Petals** -- the colorful, thin structures that surround the pollination parts of the flower

**Sepal** -- commonly green, leaflike structures that protect the bud prior to opening

**Anther** -- the bright sac that produces and contains the pollen grains

**Filament** -- the stalk that supports the anther

**Pollen grains** -- the powdery particles that contain the male portions of the flower; also a nutritious, protein-rich food for bees

**Stigma** -- sticky surface where the pollen lands and eventually travels down toward the ovary

**Style** -- the narrow region of the pistil between the stigma and the ovary

**Ovary** -- the base of the female portion of the flower containing the seeds

The **Stamen** or male part of the flower includes the anther and filament.

The **Pistil** or female part of the flower includes the stigma, style, and ovary.

# Story Map

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Title and Author:	Images or pictures may be drawn on separate pieces of paper.
Setting:	
Characters:	
Problem:	
Event 1:	
Event 2:	
Event 3*:	
Solution:	

\* There may be fewer or more "Events" depending on the story.