Unit 3/Week 5

Title: Snowflake Bentley

Suggested Time: 5 days (45 minutes per day)

Common Core ELA Standards: RI.4.1, RI.4.2, RI.4.3, RI.4.7; W.4.2, W.4.4, W.4.9; SL.4.1, SL.4.2; L.4.1, L.4.2, L.4.5

Teacher Instructions

*Refer to the Introduction for further details.*

**Before Teaching**

1. Read the Big Ideas and Key Understandings and the Synopsis. Please do **not** read this to the students. This is a description for teachers, about the big ideas and key understanding that students should take away **after** completing this task.

Big Ideas and Key Understandings

Having the perseverance to pursue your dreams, no matter the hardships or what others may think, can lead to the discovery of unique ideas that can be appreciated by others.

Synopsis

Snowflake Bentley is a biography about the life of Wilson Bentley, a self-taught scientist who photographed thousands of individual snowflakes in order to study their unique formations. From the time he was a small boy, Wilson Bentley saw snowflakes as small miracles. And he determined that one day his camera would capture for others the wonder of the tiny crystal. Bentley's enthusiasm for photographing snowflakes was often misunderstood in his time, but his patience and determination revealed two important truths: no two snowflakes are alike; and each one is startlingly beautiful. He demonstrated his scientist's vision and perseverance through lectures and a book about snow crystals. Because of his wonderful work with snow crystals, he became affectionately known as "Snowflake" Bentley.

1. Read entire main selection text, keeping in mind the Big Ideas and Key Understandings.
2. Re-read the main selection text while noting the stopping points for the Text Dependent Questions and teaching Vocabulary.

**During Teaching**

1. Students read the entire main selection text independently.
2. Teacher reads the main selection text aloud with students following along. (Depending on how complex the text is and the amount of support needed by students, the teacher may choose to reverse the order of steps 1 and 2.)
3. Students and teacher re-read the text while stopping to respond to and discuss the questions and returning to the text. A variety of methods can be used to structure the reading and discussion (i.e.: whole class discussion, think-pair-share, independent written response, group work, etc.)

Text Dependent Questions

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| **Text Dependent Questions** | **Evidence-based Answers** |
| Snowflake Bentley is a biography, the story of a person’s life, with additional sidebar information scattered throughout the selection. The sidebar information on page 381 says that Wilson Bentley was born on February 9, 1865 in Jericho, Vermont in the heart of the “snowbelt.” Why is Jericho described as the “heart of the snowbelt?”  | Jericho, Vermont is described as the “heart of the snowbelt” because there is so much snow. The annual snowfall in about 120 inches.  |
| A **simile** compares two unlike things using the words "like" or "as". (The child’s hands were as cold as ice.) The author uses a simile to describe how Willie felt about snow. Identify the simile and explain what two things are compared. | The simile is: Snow was as beautiful as butterflies or apple blossoms. The snow is being compared to butterflies and apple blossoms. |
| When Willie was a boy, how were his daily activities different from the other children?    | While the other children built forts and pelted snowballs at roosting crows, Willie used an old microscope his mother gave him to look at things like flowers, raindrops, blades of grass, and snow. He also caught snowflakes and studied the icy crystals and all forms of moisture. He kept a record of the weather and did many experiments with the raindrops. |
| Intricate means complicated or complex. By using the old microscope his mother gave him, Willie discovered certain intricate characteristics of snowflakes. List three intricate characteristics that Willie discovered. | Willie discovered that most ice crystals have six branches, all six branches are alike, and no two snowflake designs are the same. |
| Willie spent three winters trying to draw the complicated patterns he saw when he looked at snowflakes through the microscope, but the snow crystals always melted before he could finish. Explain what Willie meant when he said, “When a snowflake melted…just that much beauty was gone, without leaving any record behind.”  | Willie said snowflake designs were masterpieces of design and no one snowflake design was ever repeated. When a snowflake melted, there would never be a repeat of that snowflake and its beauty would be gone forever. |
| Describe how the camera with the microscope allowed Willie to share the snowflakes others.  | The camera with its own microscope made images on large glass negatives. Its microscope could magnify a tiny crystal from 64 to 3,600 times its actual size. This made it possible for Willie to photograph the snowflakes and capture the image forever. Willie can finally share the beauty of snowflakes with others.  |
| After Willie’s parents spent their savings to buy him the camera with its own microscope, Willie faced even more setbacks. Describe the problem that Willie faces on page 386. How did he respond to the problem? | Willie’s first pictures were failures. The pictures looked like shadows. Mistake by mistake, snowflake by snowflake, Willie worked through every snow storm. Even though Willie did not give up, winter ended and he had no good pictures of snowflakes.  |
| The second winter, Willie tried a new experiment and it worked. How did the neighbors react to the idea of Willie photographing snowflakes?  | Willie’s neighbors thought it was silly to photograph snowflakes. They laughed at his idea of photographing snowflakes. Because snow was so common in Vermont, the neighbors felt like they didn’t need his pictures. The neighbors said, “Snow is as common as dirt. We don’t need pictures.” |
| While other farmers kept warm by a fire or rode to town with horses and sleigh, Willie stood outside in the cold waiting hours for just the right crystal to photograph. Describe the obstacles Willie faced in trying to capture that just right snowflake.  | Willie stood at the shed door and caught snowflakes on a black tray. Sometimes the snowflakes were jumbled and broken and he had to wait for hours before finding a snowflake that was just right. If the shed was warm, the snow would melt. If he twitched a muscle, the snowflake would break. He used a wooden pick to slide the snowflake in place on the microscope. He had to be careful and work fast or the snowflake would evaporate. |
| To inspire means to urge or encourage someone to do something. Willie’s work was greatly respected near the end of his life and inspired others. Provide four details from the text to support this statement. | Willie’s work was greatly respected near the end of his life. The details that support this statement include: (1) Scholars came from far and near to hear him speak about snow crystals. (2) A professor said he was doing great work. (3) He came to be known as the world’s expert on snow. (4) Other scientists raised money to help him publish his book. |
| What information does the author provide to support the idea that Willie remained unusually dedicated to his work even to the end of his life?  | At the age of 66, Willie walked six miles in a blizzard to make more pictures. As a result, he became ill with pneumonia and died two weeks later. |
| Wilson Bentley spent fifty years developing his technique or method of photography in Jericho, Vermont. After his death, describe how the people of Jericho honored him.  | The people of Jericho built a monument for Willie Bentley in the middle of town. Forty years after his death the children of his village worked to set up a museum in honor of the farmer-scientist. |

Vocabulary

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|  | **KEY WORDS ESSENTIAL TO UNDERSTANDING** | **WORDS WORTH KNOWING** General teaching suggestions are provided in the Introduction  |
| **TEACHER PROVIDES DEFINITION** not enough contextual clues provided in the text | intricateinspiretechnique | masterpiecesfoolishness, negativesmolecules |
| **STUDENTS FIGURE OUT THE MEANING**sufficient context clues are provided in the text | annualgrandeurevaporate | moisture |

Culminating Task

* Re-Read, Think, Discuss, Write
* *Wilson Bentley’s passion to photograph snowflakes caused him to become known as “the Snowflake Man.” Write a paragraph that gives examples of his love for snowflakes from childhood to adulthood and how this passion caused him to become known as “the Snowflake Man.” Use evidence from the text to support your answer.*

Answer:As a child, Wilson Bentley was curious about nature and loved to learn. While other children built forts and pelted snowballs, Willie used an old microscope to look at things like flowers, raindrops, blades of grass, and snow. Willie said that snow was as beautiful as butterflies or apple blossoms. He became very interested in snowflakes and wanted to find a way to share them with others. When he saw how beautiful snowflakes were under a microscope, he dedicated his life to sharing that beauty with the world, no matter what others thought. With a special camera, Willie spent many years improving the quality of his photographs. He gave speeches about snow crystals. He became known as an expert on snow and had a book published with his best snowflake pictures. He was called “the Snowflake Man” because he spent his life sharing the beauty of snow crystals with other people.

Additional Tasks

* Choose one of the articles on www.snowflakebentley.com to have students read in conjunction with this story.

Note to Teacher

* This story lends itself to connections to Science, with a focus on precipitation, for instance.