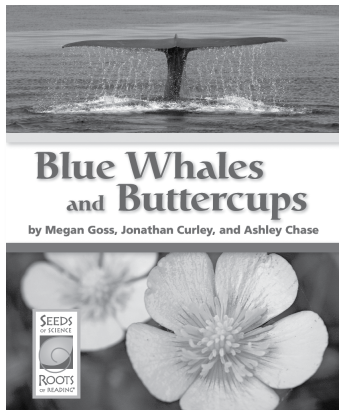


Teaching Scientific Comparison Writing

with *Blue Whales and Buttercups*
from *Seeds of Science/Roots of Reading*®



Introduction

This strategy guide introduces an approach for teaching students to write a scientific comparison. This type of writing encourages careful observations and helps students explain how two things are similar and how they are different. This guide includes an introductory section about scientific comparison writing, an overview of one approach for teaching students to write a scientific comparison using information found in many science texts, and a plan for teaching scientific comparison writing with the *Seeds of Science/Roots of Reading*® book, *Blue Whales and Buttercups*.

Book Summary

Blue Whales and Buttercups invites students to consider the diversity of life on Earth. The photographs and captions show the many ways organisms are different. For example, living things differ in size and shape, move in different ways, and have different means of protecting themselves. The book also draws attention to the characteristics that some organisms share. These similarities help scientists classify organisms into groups. However, the shared characteristic of being made up of cells is evidence that all living things are related to one another. *Blue Whales and Buttercups* provides a virtual tour of a wide range of amazing living things on Earth. It also shows that living things are different in many ways and the same in other ways.

About This Book

Reading Level

Guided Reading Level*: N

Key Vocabulary

characteristic, evidence, observe, variation

Text Features

bold print, captions, glossary, headings/subheadings, labels, photographs, table of contents

*Guided Reading Levels based on the text characteristics from Fountas and Pinnell, *Matching Books to Readers*.

Science Background

Variation Among Species

There is enormous variation among living things. It is estimated that between 2 million and 100 million different species currently live on Earth. Each species shares a set of characteristics that includes its structures, behaviors, and internal processes. The characteristics of each species make it different from other species. Differences include shape, size, coloration, ways of moving, ways of getting food, reproducing, and many more.

Evidence of Relatedness

Despite the great variety among living things, different species also share some characteristics. The characteristics that different species share can be evidence for how closely related they are. Generally, closely related species share many characteristics, while more distantly related species share fewer. For example, giraffes and bison share more characteristics than giraffes and gorillas, which is evidence that giraffes are more closely related to bison than to gorillas. All living things are composed of one or more cells. The cells of all living things contain many of the same chemicals and carry out similar biochemical processes. This is evidence that all living things are related.

About Scientific Comparison Writing

Scientists make comparisons after carefully observing what they are studying. These comparisons help scientists understand the relationships among things in the natural world and are the basis of classification. A scientific comparison explains how two or more things are both similar and different. Typically, a scientific comparison draws specific parallels between two or more things by beginning with a description of similarities, followed by a discussion of differences. The language of comparison (e.g., *alike*, *similar*, *different*, *in contrast*) is used to signal when similarities and differences are being discussed. Writing a scientific comparison encourages attention to detail and can help students better understand science ideas.

Teaching Scientific Comparison Writing

The following guidelines can be used to teach scientific comparison writing using information found in many science texts.

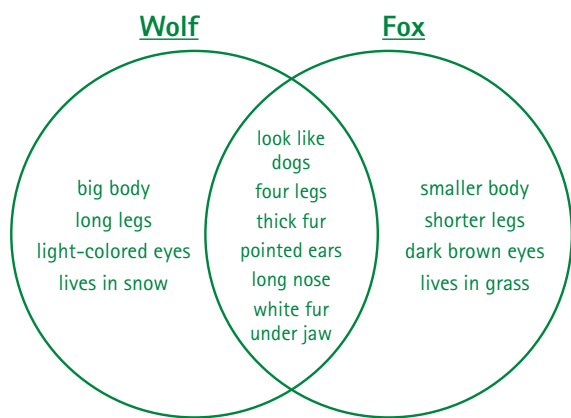
- Select a text that provides information about two things that can be compared. Good choices include books about things in the natural world, such as animals, rocks and minerals, or objects in the Solar System.
- Introduce the word *characteristic* by explaining that characteristics are things you can observe, such as how something looks or what it does. If you have chosen a book about the Solar System, you could point out that a characteristic of planets is that they are spherical.
- As students read, ask them to look for descriptions of characteristics. To support making comparisons, have students observe characteristics shown in photographs as well. It is often helpful to have students discuss these observations with a partner.
- Choose two things from the book that can be compared. Draw a Venn diagram on the board and label the two circles (for instance, “planets” and “moons”).
- Have students help you complete the Venn diagram. List similarities where the circles

Comparison Words

Similarity	Difference
alike	even though
similar	different
both	but
too	while
in the same way	although
similarly	in contrast
the same as	on the other hand

overlap and differences where they do not overlap. As you record students’ ideas, use brief phrases.

- Use the process of shared writing to construct a scientific comparison. First, explain that scientific comparisons begin with a topic sentence that tells what is being compared. With the class’ help, write a topic sentence on the board, such as “Planets and moons are the same in some ways and different in others.”
- Have students talk you through turning the notes from the Venn diagram into two or three sentences that describe similarities. Use the words from the “Similarity” column in the box at the top of this page as needed.
- As you write the piece with the students’ help, point out that a transition sentence is needed to signal a shift from similarities to differences. Provide an example, such as “While planets and moons are alike, there are also ways they are different.”
- Using the Venn diagram, create two or three sentences that describe differences. Use the words from the “Difference” column in the box at the top of this page as needed.
- Explain that scientific comparisons end with a conclusion that explains what was learned by making the comparison. Provide an example, such as “Planets and moons are similar in many ways but also have differences that allow us to classify them.”
- Find opportunities to make comparisons throughout a unit of study. You may want to use the Scientific Comparison Writing copymaster included with this guide to support students’ writing as you give them more independence.



Teaching Scientific Comparison Writing with *Blue Whales and Buttercups*

Getting Ready

1. Make a copy of the Scientific Comparison Writing copymaster for each student.
2. Make a class chart that lists comparison words, using the box on page 2 as a guide.
3. Draw a Venn diagram on the board and label one circle “Wolf” and the other “Fox.”

During Class

1. Read *Blue Whales and Buttercups* in a way that is consistent with your classroom routines, giving students as much independence as possible. Discuss the text to ensure that students understand the ideas presented.
2. Review the definition of the word *characteristic* on page 4 of the book. Ask students to reread the second paragraph. Explain that characteristics are things you can observe, such as how something looks or what it does. Some examples from the text include size, body shape, body covering (fur, feathers), and number of limbs. Have students point out several characteristics of one living thing in the book.
3. Have students turn to page 12 and carefully observe the photographs of the wolf and the fox. Provide time for students to share observations of similarities and differences.
4. Use the Venn diagram to record students’ observations in a group discussion. List similarities where the circles overlap. List differences where the circles do not overlap. (See the Venn diagram above for possible responses.)

5. Distribute a Scientific Comparison Writing student sheet to each student. Provide needed support for them to craft a well-developed scientific comparison paragraph. Point out the organizational supports for paragraph structure included on their student sheets.
6. First, have students write a topic sentence that introduces what is being compared. [A wolf and a fox are similar in some ways and different in others.]
7. Next, ask students to write about ways a wolf and a fox are similar. Have them use the middle section of the Venn diagram and the Comparison Words chart for reference. [Both are four-legged animals that look similar to dogs. They each have thick fur and pointed ears. The shape of their noses is similar, too. Both have white fur under their jaws.]
8. Have students write a transition sentence that signals a shift from similarities to differences. [While a fox and a wolf are alike, there are many ways they are different.]
9. Encourage students to write two or three sentences about how a wolf and a fox are different. Have them refer to the outer sections of the Venn diagram and the Comparison Words chart for reference. [A fox is smaller than a wolf and has shorter legs. A fox’s eyes are a dark brown color, and a wolf’s eyes are a light color. In contrast to the fox’s grassy habitat, the wolf lives somewhere snowy.]
10. Have students write a concluding sentence that explains what was learned by making the comparison. Remind them that when two animals share characteristics, this may be evidence that the animals are related. [Even though wolves and foxes are different, their shared characteristics are evidence that they are closely related.]

Independent Extension

Have students work with a partner to select two living things from *Blue Whales and Buttercups*. Have them read about these living things and observe the photographs closely. Then, have partners discuss how the living things are alike and different. Encourage students to use comparison words as they talk about similarities and differences.

Name _____ Date _____

Scientific Comparison Writing

Title of book: _____

(Topic sentence)

(Similarities)

(Transition sentence)

(Differences)

(Conclusion)

About Strategy Guides

A six-page strategy guide is available for each *Seeds of Science/Roots of Reading*® student book. These strategies support students in becoming better readers and writers. They help students read science texts with greater understanding, learn and use new vocabulary, and discuss important ideas about the natural world and the nature of science. Many of these strategies can be used with multiple titles in the *Seeds/Roots* series. For more information, as well as for additional instructional resources, visit the *Seeds/Roots* Web site (www.seedsofscience.org/strategyguides.html).

Available Student Books for Grades 3–4

Nine engaging student books are now available from *Digestion and Body Systems* and *Variation and Adaptation*, each with a corresponding strategy guide. The books are part of the *Seeds of Science/Roots of Reading*® curriculum program described on page 6. Eighteen student books from the remaining grade 3–4 units (*Weather and Water* and *Light Energy*) are currently in development and will be available in late 2009.

<i>Digestion and Body Systems</i>	
Strategy	Student Book
Analyzing Part-to-Whole Relationships	<i>Systems</i>
Teaching About the Nature and Practices of Science	<i>Secrets of the Stomach</i>
Teaching Process Description Writing	<i>Voyage of a Cracker</i>
Searching for Information in Science Texts	<i>Handbook of Body Systems</i>
Making Sense of Data in Science Texts	<i>What's the Diagnosis?</i>
<i>Variation and Adaptation</i>	
Strategy	Student Book
Teaching Scientific Comparison Writing	<i>Blue Whales and Buttercups</i>
Using Discourse Circles	<i>The Code</i>
Using Visual Evidence to Make Inferences	<i>Mystery Mouths</i>
Teaching About the Nature and Practices of Science	<i>Evidence from the Past</i>

Extend Learning with *Seeds of Science/Roots of Reading*®

The strategy featured in this guide is drawn from the *Seeds of Science/Roots of Reading*® curriculum program. *Seeds/Roots* is an innovative, fully integrated science and literacy program.

The program employs a multimodal instructional model called “Do-it, Talk-it, Read-it, Write-it.” This approach provides rich and varied opportunities for students to learn science as they **investigate** through firsthand inquiry, **talk** with others about their investigations, **read** content-rich books, and **write** to record and reflect on their learning.

Take advantage of the natural synergies between science and literacy instruction.

- Improve students’ abilities to read and write in the context of science.
- Excite students with active hands-on investigation.
- Optimize instructional time by addressing goals in two subject areas at the same time.

To learn more about *Seeds of Science/Roots of Reading*® products, pricing, and purchasing information, visit www.seedsofscience.org



Variation and Adaptation Science and Literacy Kit



Developed at Lawrence Hall of Science and the Graduate School of Education at the University of California at Berkeley.

Seeds of Science/Roots of Reading® is a collaboration of a science team led by Jacqueline Barber and a literacy team led by P. David Pearson and Gina Cervetti.

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