

# Teacher's Guide

## Spider®

THE MAGAZINE FOR CHILDREN

### MAGAZINE ARTICLES

Doodlebug & Dandelion . . . . .	4
Adventure Story 700L	
Won't You Be My Frankenstein? . . . . .	10
Humorous Poem	
Simone the Private Fly: The Monstrous Slumber Party. . . . .	11
Drama 520L	
Midnight Mummy Bowling. . . . .	20
Procedure 1170L	
Shadow Play . . . . .	22
Procedure 660L	
The Witch Who Couldn't Order In. . . . .	24
Fantasy 450L	
Goblin Magic. . . . .	30
Humorous Poem	



## Teacher's Guide for *Spider*: October 2016

Using This Guide . . . . .	2
Skills and Standards Overview . . . . .	3
Article Guides . . . . .	4
Cross-Text Connections . . . . .	11
Mini-Unit . . . . .	12
Graphic Organizers . . . . .	15
Appendix: Meeting State and National Standards . . . . .	17



## OVERVIEW

*In this magazine, readers will encounter a witch, a goblin, several small mummies, and some spooky nighttime noises. **Spider: October 2016***

*includes stories, poems, and activities that incorporate Halloween details.*

## ESSENTIAL QUESTION:

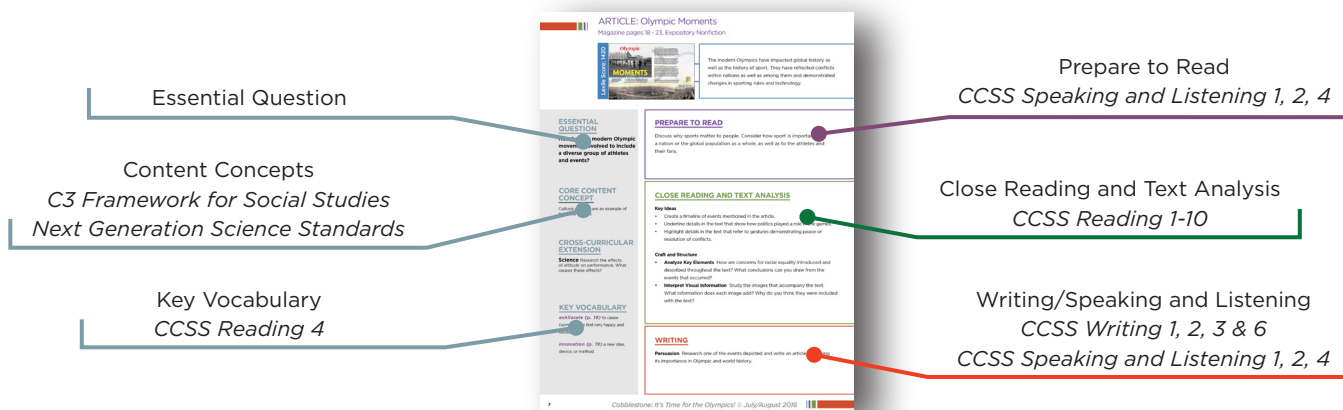
***How do authors use Halloween details in fiction, poetry, and nonfiction?***



We invite you to use this magazine as a flexible teaching tool, ideal for providing interdisciplinary instruction of social studies and science content as well as core literacy concepts. Find practical advice for teaching individual articles or use a mini-unit that helps your students make cross-text connections as they integrate ideas and information.

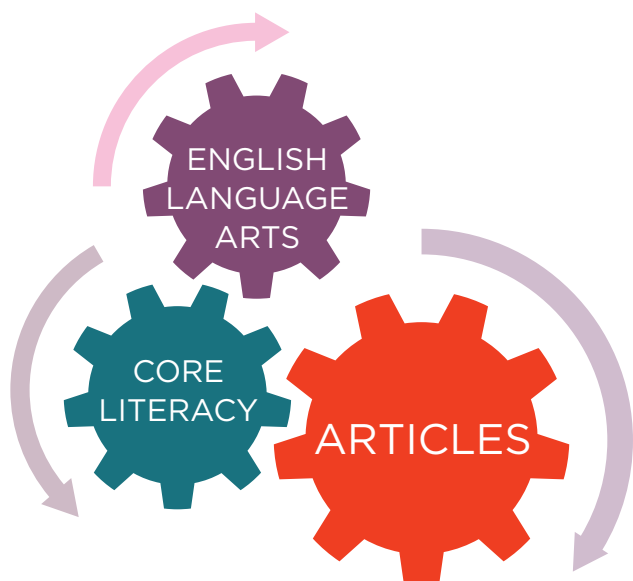
## READ INDIVIDUAL ARTICLES PAGES 4 - 10

Each article in this magazine is well-suited for teaching literacy concepts and content area knowledge. For each individual article in this guide, you'll find the following:



## TEACH A MINI-UNIT PAGES 12 - 14

Magazine articles can easily be grouped to make cross-text connections and comparisons. Our Mini-Unit allows students to read and discuss multiple articles and integrate ideas and information (CCSS.Reading.9). Discussing multiple articles (CCSS.Reading.9) prepares students to write texts to share and publish in a variety of ways (CCSS.Writing.2).



**Essential Question:** How do authors use Halloween details in fiction, poetry, and nonfiction?

MAGAZINE ARTICLES	ENGLISH LANGUAGE ARTS CONCEPT	LITERACY SKILLS	CORRESPONDING CCSS ANCHOR STANDARDS
<b>Doodlebug &amp; Dandelion</b> Adventure Story	Stories have a beginning, a middle, and an end.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Analyze Plot</li> <li>Interpret Visual Information</li> <li>Write a Story</li> </ul>	<i>Reading 1, 3 &amp; 7</i> <i>Writing 3</i>
<b>Won't You Be My Frankenstein?</b> Humorous Poem	Poets use rhyme and repetition to make their poems sound interesting and fun.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Identify Sound Devices</li> <li>Interpret Visual Information</li> <li>Write an Acrostic Poem</li> </ul>	<i>Reading 1, 3, 4 &amp; 7</i> <i>Writing 3</i>
<b>Simone the Private Fly: The Monstrous Slumber Party</b> Drama	Sound effects are noises made for use in a play. They help the audience imagine the action that is taking place.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Analyze Drama</li> <li>Analyze Characters</li> <li>Perform a Play</li> </ul>	<i>Reading 1, 3 &amp; 5</i> <i>Speaking and Listening 1</i>
<b>Midnight Mummy Bowling</b> Procedure	A procedure text gives directions for how to do something.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Analyze Text Structure</li> <li>Interpret Visual Information</li> <li>Write Directions</li> </ul>	<i>Reading 1, 2, 5 &amp; 7</i> <i>Writing 2</i>
<b>Shadow Play</b> Procedure	Procedure texts may include illustrations to help readers understand what to do.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Interpret Visual Information</li> <li>Analyze Word Choice</li> <li>Demonstrate an Activity</li> </ul>	<i>Reading 1, 4, 5 &amp; 7</i> <i>Speaking and Listening 4</i>
<b>The Witch Who Couldn't Order In</b> Fantasy	Fantasy stories often include characters with special powers and animals that can talk.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Analyze Characters</li> <li>Analyze Plot</li> <li>Write a Story</li> </ul>	<i>Reading 1 &amp; 3</i> <i>Writing 3</i>
<b>Goblin Magic</b> Humorous Poem	Poets create humor in their poems by describing silly situations and making funny rhymes.	<ul style="list-style-type: none"> <li>Close Reading</li> <li>Analyze Sound Devices</li> <li>Analyze Poetry</li> <li>Present a Poem</li> </ul>	<i>Reading 1, 4 &amp; 5</i> <i>Speaking and Listening 1</i>

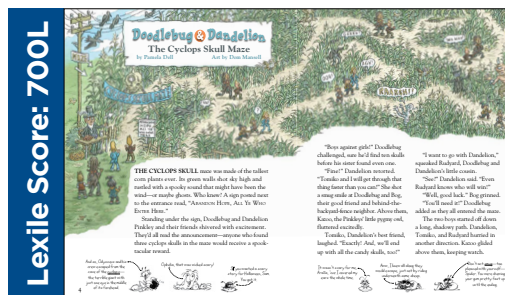
**Comparing Texts:** CCSS Reading 1, 3, 5 & 9; CCSS Writing 2

**Mini-Unit:** CCSS Reading 1 & 9; CCSS Writing 4 & 8; Speaking & Listening 4



# ARTICLE: Doodlebug & Dandelion

Magazine pages 4 - 9, Adventure Story



Doodlebug, Dandelion, and their friends go to the Cyclops Skull maze and need to find three candy skulls to win a prize. Doodlebug challenges the girls to see who can find the most skulls first.

## ESSENTIAL QUESTION

**How do authors use Halloween details in fiction, poetry, and nonfiction?**

## CORE CONTENT CONCEPT

**English Language Arts** Stories have a beginning, a middle, and an end.

## CROSS-CURRICULAR EXTENSION

**Art** Look at photos of corn mazes. Then use paper and markers to design your own corn maze.

## KEY VOCABULARY

**cyclops (p. 4)** an imaginary beast with one eye in the middle of its forehead

**retorted (p. 5)** answered in a quick way

## PREPARE TO READ

Tell students that the story they are about to read takes place in a corn maze. Show photos of corn mazes and invite students to share any experiences they've had walking through them. Were they scared? Did they get lost? Was it fun?

## CLOSE READING AND TEXT ANALYSIS

### Key Ideas

- How can you tell that Dandelion and Tomiko believe they will win the race? Find details in the story to support your answer. *CCSS Reading 1*
- Why does Tomiko say, "This maze isn't easy"? Name three challenges she and Dandelion face in the maze. *CCSS Reading 1*
- What makes the maze scary for Dandelion, Tomiko, and Rudyard? Use story details to support your answer. *CCSS Reading 1*

### Craft and Structure

- Analyze Plot** What happens at the beginning of the story? What happens in the middle? What happens at the end of the story? Work with a partner to make lists of the events. *CCSS Reading 3*
- Interpret Visual Information** How do the illustrations help you understand the story? How do they help you understand the characters' feelings? *CCSS Reading 7*

## WRITING

**Write a Story** What do you think happened to Doodlebug and Bog in the maze? Write part of this story from Doodlebug's point of view. Be sure to include details about what he says and feels. Also add dialogue and illustrations.

# ARTICLE: Won't You Be My Frankenstein?

Magazine page 10, Humorous Poem



Most people think Frankenstein is a horrible monster, but this poet doesn't agree.

## ESSENTIAL QUESTION

**How do authors use Halloween details in fiction, poetry, and nonfiction?**

## CORE CONTENT CONCEPT

**English Language Arts** Poets use rhyme and repetition to make their poems sound interesting and fun.

## CROSS-CURRICULAR EXTENSION

**Language Arts** Ask your school librarian to help you find a story book that includes a Frankenstein monster. Compare the character in the book with the character in this poem.

## KEY VOCABULARY

**bloodshot (p. 10)** having many red lines

**tinted (p. 10)** having a small amount of color

## PREPARE TO READ

Ask students if they know who Frankenstein is. If students are not familiar with Frankenstein, briefly explain the story. Then cover up the poem and display the illustration. Have students brainstorm words to describe Frankenstein. Draw a word web on the board to record their ideas.

## CLOSE READING AND TEXT ANALYSIS

### Key Ideas

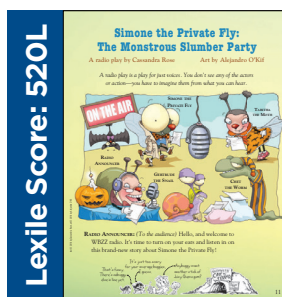
- What words are used to describe Frankenstein's teeth and eyes? *CCSS Reading 1*
- How does this monster move? How does he smell? Use details from the poem to support your answer. *CCSS Reading 1*
- How does the poet feel about Frankenstein? Why are these feelings surprising? Find details in the story to support your answer. *CCSS Reading 3*

### Craft and Structure

- **Identify Sound Devices** Which pairs of words rhyme? Which word is repeated in the poem? Do you like the rhyme and repetition? Tell why or why not. *CCSS Reading 4*
- **Analyze Visual Information** Does Frankenstein look adorable or disgusting in the picture? Discuss your ideas in a group. *CCSS Reading 7*

## WRITING

**Write an Acrostic Poem** Write an acrostic poem about Frankenstein. Include lots of icky details. Add a picture and then share your poem with the class.



Tabitha thinks there are monsters in her house making scary sounds. Her friend Simone the Private Fly is soon on the job—solving the mystery of the monster noises.

## ESSENTIAL QUESTION

**How do authors use Halloween details in fiction, poetry, and nonfiction?**

## CORE CONTENT CONCEPT

**English Language Arts** Sound effects are noises made for use in a play. They help the audience imagine the action that is taking place.

## CROSS-CURRICULAR EXTENSION

**Language Arts** Look for spooky radio play recordings in the library or on the computer. Then gather some friends, turn off the lights, and enjoy.

## KEY VOCABULARY

**slumber** (p. 11) sleep

**bloodthirsty** (p. 14) eager to hunt

## PREPARE TO READ

Ask students if they've ever heard scary noises at night. Discuss the noises and why they scared students. Then discuss what was actually making the noises. Next, tell students they are going to read about scary noises at a slumber party. Invite students to share what they know about slumber parties.

## CLOSE READING AND TEXT ANALYSIS

### Key Ideas

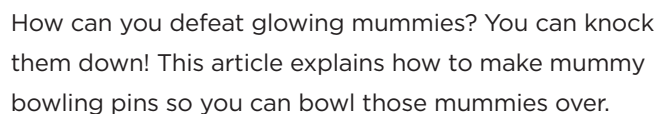
- Why is Tabitha so tired? Use text details to support your answer. *CCSS Reading 1*
- Make a list of the scary things Tabitha imagines she hears. Next to this list, write what is actually making the noise. Use details from the text to support your answers. *CCSS Reading 1*
- How do Simone and Tabitha react to the ghost? Who is most afraid? Use text details to support your response. *CCSS Reading 3*

### Craft and Structure

- **Analyze Drama** With a partner, list the sound effects in the play. Then list the actions that create the sounds. Did the author do a good job of using words to describe noises? How would you change any of the sound effects? *CCSS Reading 5*
- **Analyze Characters** How would you describe Simone to a friend? Write a paragraph that describes Simone. Explain how her words and actions helped you describe her. *CCSS Reading 3*

## SPEAKING AND LISTENING

**Perform a Play** Work with a group to perform the play for the class. First assign the roles. Then decide how you will create the sound effects. Sit in a circle and practice the play. Then read it for the class.







This article tells readers how to use light and shadow to turn their hands into giraffes, elephants, and other animals.

## ESSENTIAL QUESTION

**How do authors use Halloween details in fiction, poetry, and nonfiction?**

## CORE CONTENT CONCEPT

**English Language Arts** Procedure texts may include illustrations to help readers understand what to do.

## CROSS-CURRICULAR EXTENSION

**Science** What is a shadow? Find a nonfiction book or use the Internet to learn what shadows are and how they are made.

## KEY VOCABULARY

**position (p. 22)** the way something is arranged or placed

## PREPARE TO READ

Ask students if they have ever seen or made shadow puppets. If possible, turn off the main lights, project a bright light on a wall, and demonstrate a simple shadow puppet, such as bunny ears. Invite volunteers to take a turn. Then tell students they will learn how to make animal shadow puppets in the next article.

## CLOSE READING AND TEXT ANALYSIS

### Key Ideas

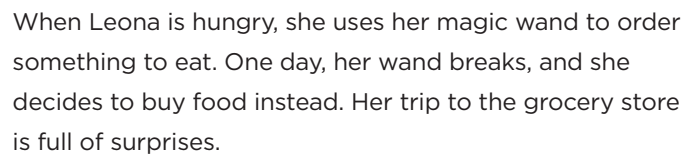
- Why do you need a light-colored wall? What would happen if you tried to make a shadow on a dark wall? *CCSS Reading 1*
- What are the subheadings in the article? What do they help you understand? Support your answer with text details. *CCSS Reading 5*
- Which animal is probably the easiest to create? Which one is the most difficult? Use details in the illustrations to explain your answers. *CCSS Reading 1*

### Craft and Structure

- **Interpret Visual Information** What do the illustrations in this article help you understand? Would the directions be clear without the illustrations? Explain your thinking. *CCSS Reading 7*
- **Analyze Word Choice** Which words and phrases in the article make it seem fun and friendly? Work with a partner to list them. Then swap and compare lists with other pairs. *CCSS Reading 4*

## SPEAKING AND LISTENING

**Demonstrate an Activity** Practice making different animal shadow puppets. Then demonstrate this for the class. As you make each animal, describe how you are positioning your hands.





The speaker in this poem blames his bad behavior on a bunch of little goblins.

## ESSENTIAL QUESTION

**How do authors use Halloween details in fiction, poetry, and nonfiction?**

## CORE CONTENT CONCEPT

**English Language Arts** Poets create humor in their poems by describing silly situations and making funny rhymes.

## CROSS-CURRICULAR EXTENSION

**Writing** Write a humorous poem about a little boy or girl and the way they behave. Use rhyme and repetition in your poem.

## KEY VOCABULARY

**cockroach (p. 30)** a black or brown insect that is sometimes found in homes

## PREPARE TO READ

Ask students to describe what a “time-out” is. Discuss what kinds of behavior might result in a time-out. Then tell students that the next poem is about a boy who behaves badly and gets a time-out. Ask students to think about whether or not he deserves it.

## CLOSE READING AND TEXT ANALYSIS

### Key Ideas

- What is this poem about? Use details from the text to support your answer. *CCSS Reading 1*
- Find three examples of naughty things the boy does. *CCSS Reading 1*
- Who does the boy blame for his bad behavior? Find details in the poem to support your answer. *CCSS Reading 1*

### Craft and Structure

- **Analyze Sound Devices** Which words rhyme in this story? Write the pairs of words that rhyme. Then circle the words and rhymes that are funny. What do you think makes them funny? *CCSS Reading 4*
- **Analyze Poetry** What actions and situations make this poem humorous? Work with a group of classmates to discuss the poem and the parts that are especially funny. *CCSS Reading 5*

## SPEAKING AND LISTENING

**Present a Poem** Work with a group of classmates to present this poem to the class. Assign lines for each group member to read aloud. Use funny voices and expressions. Make hand motions to show what the boy is doing.



### CROSS-TEXT CONNECTIONS

**SYNTHESIZE:** Guide students to compare articles they read. Help students find the connections between pieces of information in multiple articles. Use prompts, such as the following examples, to have students work together to **Integrate Ideas and Information** (CCSS.Reading.9).

- Compare Dandelion in “Doodlebug and Dandelion” with Simone in “Simone the Private Fly: The Monstrous Slumber Party.” How are these characters similar? How are they different? Think about their words and actions. Then write two paragraphs to explain their similarities and differences.
- The poems “Won’t You Be My Frankenstein” and “Goblin Magic” are similar in a few different ways. Make a list of their similarities. Think about:
  - The way the lines begin.
  - The sound of the poem.
  - The words and descriptions.
- Are the creatures in these poems both adorable? Write 1-2 sentences to explain your ideas.
- The articles “Midnight Mummy Bowling” and “Shadow Play” are both procedure texts that describe how to do something. Compare the text features and sections in these articles. In what ways are the features and sections similar? In what ways are they different? Use a Venn diagram (p. 16) to record your ideas.
- The stories “The Witch Who Couldn’t Order In” and “Simone the Private Fly: The Monstrous Slumber Party” both include animal characters. Compare Harrison and Simone. Are they both important characters? Do they act like animals or people? Write a paragraph to explain your ideas.
- “Doodlebug & Dandelion,” “Simone the Private Fly: The Monstrous Slumber Party,” and “The Witch Who Couldn’t Order In” all include situations in which characters are frightened by someone or something. Make a three-column chart. Label the columns with the story titles. In each column, list the characters who are frightened and what frightens them.



**EXPLORATORY LEARNING - FLEXIBLE MINI-UNIT DESIGN****ENGAGE****READ FOR A  
PURPOSE****APPLY**

**ENGAGE:** Engage students in the topic of Halloween by first reviewing the Essential Question: How do authors use Halloween details in fiction, poetry, and nonfiction? Next, brainstorm with students a list of the different Halloween details in the magazine texts. Record the story titles and details in a chart like the one below.

Story Title	Halloween Details
"Doodlebug & Dandelion"	Cyclops Skull Maze, monsters in the maze, masks
"Won't You Be My Frankenstein?"	
"Simone the Fly: The Monstrous Slumber Party"	strange noises, scary thoughts
"Midnight Mummy Bowling"	bowling pins look like mummies
"Shadow Play"	
"The Witch Who Couldn't Order In"	
"Goblin Magic"	





**READ FOR A PURPOSE**

**INTRODUCE THE ACTIVITY: HALLOWEEN DETAILS POSTER** Tell students that they will be creating posters that show Halloween details from some of the magazine articles. Explain that students will choose three articles from the magazine to focus on. Their posters will include:

- The titles of the three articles and the authors' names.
- A short quote from each of the articles that includes a Halloween detail.
- An original picture for each article.

Help students understand how to choose quotes by giving them some examples from the magazine. The following example is from “Doodlebug & Dandelion”: “The next second, they rushed around a corner, screaming at full blast from behind their masks.”

**RETURN TO THE TEXT:** Explain to students that before they can create their Halloween posters, they need to gather the quotes they will include. Tell students that they need to do the following:

- Reread the articles they chose to focus on.
- Use a graphic organizer like the one below to record a quote from each story. (See Poster Quotes organizer on page 15.)
- Tell students to be sure to write down the number of the page on which each quote appears. Later on, they will need to double-check that their quotes are accurate.

Title and Author	Page Number	Quote





**APPLY: HALLOWEEN DETAILS POSTER:** Students are ready to begin creating their posters using the quotes they gathered when they reread the magazine texts. Students may work independently or in pairs, depending on the stories and quotes they chose.

**Materials:** Poster board or construction paper, markers, colored pencils

### STEP 1: PLAN

Remind students that they will be creating drawings to go with the quotes they chose. Have students jot down notes on their Poster Quotes chart about what they plan to draw.

Next, have students go back to the magazine to check that they have copied the story quotes and author names correctly.

Distribute paper or poster board to students and have them decide where they will place their quotes and pictures. They can use pencils to mark these places.

### STEP 2: DRAW

Distribute markers and colored pencils to students and have them get started on their posters. Remind students that their posters should be fun and colorful.

### STEP 3: WRITE

After students have finished drawing their pictures, they are ready to add the quotes to their posters. Remind students to:

- write the quotes accurately.
- include quotation marks.
- add the story title and author after each quote.

### STEP 4: SHARE

Have students share their posters by holding a walk-through. Students should place their posters on their desks or tables and then walk around the classroom to view their classmates' posters. If possible, play some fun Halloween music during the walk-around. Tell students that when the music stops, they should return to their seats. Then invite students to read their quotes aloud.



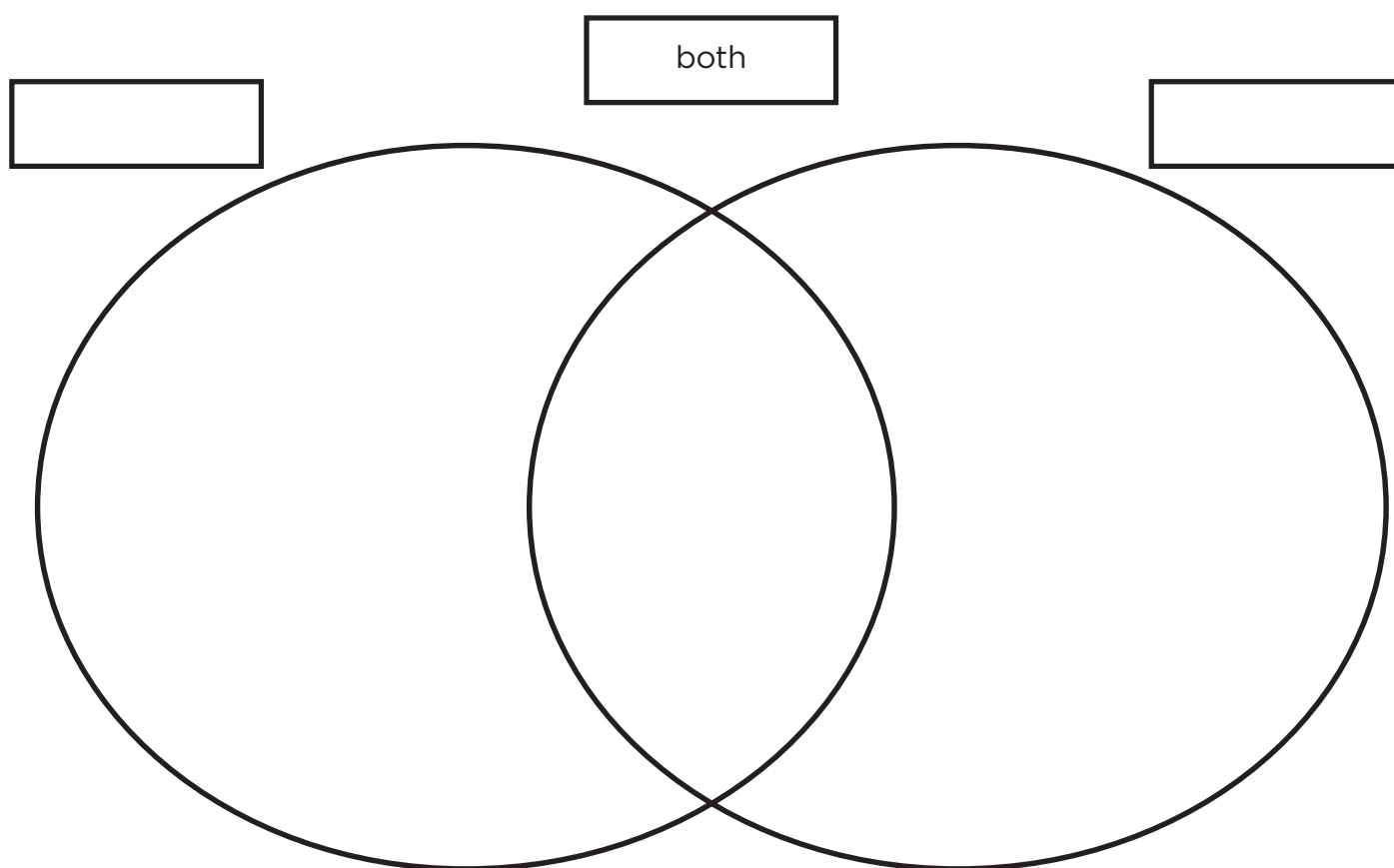
NAME: \_\_\_\_\_

## POSTER QUOTES

Title and Author	Page Number	Quote

NAME: \_\_\_\_\_

## VENN DIAGRAM





## Meeting State and National Standards: Core Instructional Concepts

The articles in this magazine provide a wealth of opportunities for meeting state and national instructional standards. The following pages contain charts listing Core Instructional Concepts for each of three curricular areas: English Language Arts, Science, and Social Studies.

### USING THE STANDARDS CHARTS

#### ELA

Corresponding CCSS anchor standards have been listed next to each item on the Core Instructional Concepts chart. To customize the chart, add your own grade, state, or district standards in the last column. Match the concepts and standards from the chart to the activities on each page of the Teacher's Guide to complete your lesson plans.

#### SOCIAL STUDIES

Content Concepts in each Article Guide are based on Dimension 2 of the CS Framework for Social Studies: Applying Disciplinary Concepts and Tools. Use the last column in the accompanying chart to correlate these concepts to your state or district standards.

#### SCIENCE

Content Concepts in each Article Guide are drawn from the Three Dimensions of the Next Generation Science Standards. You will also find connections to these concepts within individual close-reading questions.

#### MATH

Content Opportunities for math activities are provided in the Cross-Curricular extensions on each Article Guide page.



# CORE INSTRUCTIONAL CONCEPTS: READING, LITERATURE, AND LANGUAGE ARTS

SKILLS AND CONCEPTS	CCSS ANCHOR STANDARD	CORRESPONDING STANDARD
---------------------	----------------------	------------------------

## KEY IDEAS AND DETAILS

<b>Read closely to determine what a text says explicitly.</b>	Reading 1	
<b>Make logical inferences</b> to determine what the text communicates implicitly.	Reading 1	
<b>Cite specific textual evidence to support conclusions</b> drawn from the text.	Reading 1	
<b>Determine central ideas or themes</b> of a text and analyze their development.	Reading 2	
<b>Summarize key supporting details and ideas.</b>	Reading 2	
Analyze how <b>individuals, events, and ideas develop and interact</b> over the course of a text.	Reading 3	

## CRAFT AND STRUCTURE

<b>Interpret words and phrases</b> as they are used in a text.	Reading 4	
<b>Determine technical, connotative, and figurative meanings.</b>	Reading 4	
Analyze how specific <b>word choices</b> shape meaning or tone.	Reading 4	
Analyze the <b>structure of texts</b> (sequence, cause/effect, compare/contrast, problem/solution)	Reading 5	
Recognize the <b>genre, key elements, and characteristics</b> of literary texts.	Reading 5	
Assess how <b>point of view or purpose</b> shapes the content and style of a text.	Reading 6	
Analyze how an <b>author's style and tone</b> affects meaning.	Reading 6	

## INTEGRATION OF KNOWLEDGE AND IDEAS

<b>Integrate and evaluate content</b> presented in diverse media and formats.	Reading 7	
<b>Identify and evaluate the argument and claims</b> in a text.	Reading 8	
<b>Analyze how two or more texts address similar themes or topics.</b>	Reading 9	

## WRITING

Write <b>arguments</b> to support claims, using valid reasoning and relevant and sufficient evidence.	Writing 1	
Write <b>informative/explanatory texts</b> to examine and convey complex ideas and information clearly and accurately.	Writing 2	
Write <b>narratives</b> to develop real or imagined experiences or events.	Writing 3	
<b>Draw evidence</b> from literary or informational texts to support analysis, reflection, and research.	Writing 9	
Conduct short as well as more sustained <b>research projects</b> .	Writing 10	



# CORE INSTRUCTIONAL CONCEPTS: SOCIAL STUDIES

## C3 INQUIRY ARC DIMENSION 2: APPLYING DISCIPLINARY CONCEPTS AND TOOLS

## STATE OR DISTRICT STANDARD

### CIVICS

Analyze the <b>origins, functions, and structure of different governments</b> and the <b>origins and purposes of laws</b> and key constitutional provisions.	
Summarize core <b>civic virtues and democratic principles</b> .	
Evaluate <b>policies</b> intended to address social issues.	

### ECONOMICS

Evaluate the <b>benefits and costs of individual economic choices</b> .	
Analyze <b>economic incentives</b> , including those that cause people and businesses to specialize and trade.	
Explain the <b>importance of resources</b> (i.e. labor, human capital, physical capital, natural resources) in <b>methods of economic production</b> .	
<b>Explain</b> the <b>functions of money</b> in a market economy.	
<b>Explain</b> the importance of <b>competition</b> in a market economy.	
Apply economic concepts (i.e. interest rate, inflation, supply and demand) and theories of <b>how individual and government actions affect the production of goods and services</b> .	
<b>Analyze economic patterns</b> , including activity and interactions between and within nations.	

### GEOGRAPHY

<b>Construct and use maps</b> and other graphic representations (i.e. images, photographs, etc.) of different places.	
<b>Explain cultural influences</b> on the way people live and modify and adapt to their environments.	
<b>Analyze places, including their physical, cultural and environmental characteristics</b> and how they change over time.	
Analyze <b>movement of people, goods, and ideas</b> .	
<b>Analyze regions, including how they relate to one another</b> and the world as a whole from a political, economic, historical, and geographic perspective.	

### HISTORY

Interpret historical context to <b>understand relationships among historical events or developments</b> .	
Evaluate historical events and developments to identify them as <b>examples of historical change and/or continuity</b> .	
<b>Analyze perspectives</b> , including factors that influence why and how individuals and groups develop different ones.	
<b>Evaluate historical sources</b> , including their reliability, relevancy, utility, and limitations.	
<b>Analyze causes and effects</b> , both intended and unintended, of historical developments.	



# CORE INSTRUCTIONAL CONCEPTS: SCIENCE

## DIMENSION 1: SCIENTIFIC AND ENGINEERING PRACTICES

Dimension 1 focuses on the practice of science, and how knowledge is continually adapted based on new findings. The eight practices of the K-12 Science and Engineering Curriculum are as follows:

- Asking questions (for science) and defining problems (for engineering)
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations (for science) and designing solutions (for engineering)
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

## DIMENSION 2: CROSSCUTTING CONCEPTS

Dimension 2 provides an organizational schema for integrating and interrelating knowledge from different science domains. The eight NGSS Crosscutting Concepts are as follows:

- Patterns
- Similarity and Diversity
- Cause and Effect
- Scale, Proportion, and Quantity
- Systems and System Models
- Energy and Matter
- Structure and Function
- Stability and Change

## DIMENSION 3: DIMENSIONS AND DISCIPLINARY CORE IDEAS

Dimension 3 presents a contained set of Disciplinary Core Ideas to support deeper understanding and application of content. The following chart details Core Ideas for curriculum, instructional content, and assessments within four domains.

LIFE SCIENCE	PHYSICAL SCIENCE	EARTH SCIENCE	SPACE SYSTEMS
<ul style="list-style-type: none"><li>• Structure and Function of Living Things</li><li>• Life Cycles and Stages</li><li>• Reproduction &amp; Inherited Traits</li><li>• Animals</li><li>• Plants</li></ul>	<ul style="list-style-type: none"><li>• Forces and Interactions</li><li>• Energy</li><li>• Light</li><li>• Sound</li><li>• Electricity/ Magnetism</li><li>• Matter</li><li>• Waves</li><li>• Heat</li><li>• Chemistry</li><li>• Information Processing</li></ul>	<ul style="list-style-type: none"><li>• Weather</li><li>• Climate</li><li>• Rocks &amp; Soil</li><li>• Erosion and Weathering</li><li>• Landforms</li><li>• Water</li><li>• Oceans</li><li>• History of Earth</li><li>• Plate Tectonics</li><li>• Volcanoes, Earthquakes, and Tsunamis</li></ul>	<ul style="list-style-type: none"><li>• Solar System</li><li>• Planets</li><li>• Moon</li><li>• Sun</li></ul>

