

Teacher's Guide

arts & sciences for kids

ask[®]



MAGAZINE ARTICLES

A Taste of Sweet	6
Expository Nonfiction	860L
I Love Sugar	12
Expository Nonfiction	900L
What's Diabetes?	18
Expository Nonfiction	470L
Sugar Birds	22
Expository Nonfiction	970L
Can I Eat That Window?	24
Expository Nonfiction	920L
Candy Cane Twist	25
Expository Nonfiction	1010L

**Teacher’s Guide for Ask:
Why Do We Love Sweets?**

Using This Guide **2**

Skills and Standards Overview **3**

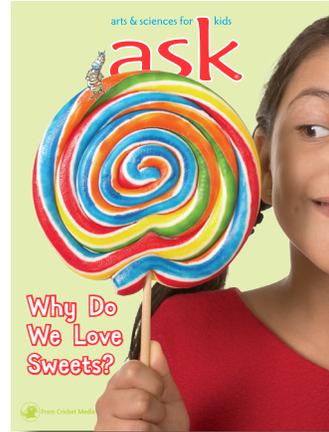
Article Guides **4**

Cross-Text Connections **10**

Mini-Unit **11**

Graphic Organizers **14**

Appendix: Meeting State and
National Standards **16**



OVERVIEW

*In this magazine, readers will learn all about sugar. **Ask: Why Do We Love Sweets?** includes information about hummingbirds, sugar glass, and*

candy canes, the history and science of sugar, and life with diabetes.

ESSENTIAL QUESTION:

What are the characteristics and effects of sugar?

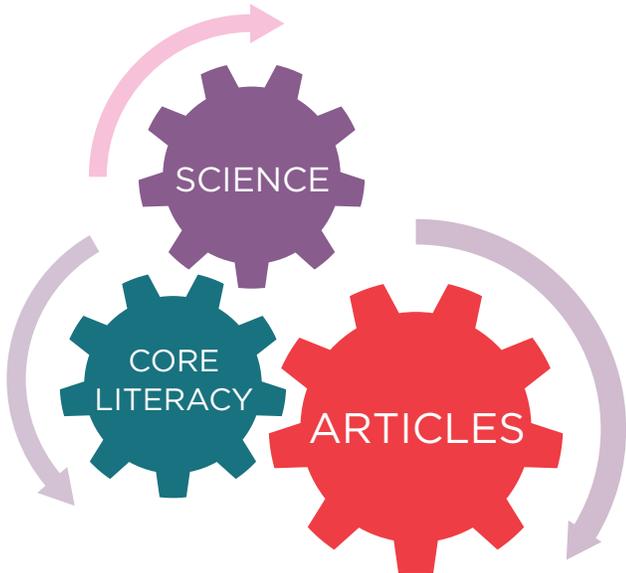
We invite you to use this magazine as a flexible teaching tool, ideal for providing interdisciplinary instruction of social studies and science content as well as core literacy concepts. Find practical advice for teaching individual articles or use a mini-unit that helps your students make cross-text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

READ INDIVIDUAL ARTICLES PAGES 4 - 9

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:

The diagram shows a sample article page titled "ARTICLE: Olympic Moments" with several sections highlighted by callouts:

- Essential Question:** "Thinking: Modern Olympic moments combined to include a diverse group of athletes and events?"
- Content Concepts:** "C3 Framework for Social Studies" and "Next Generation Science Standards"
- Key Vocabulary:** "CCSS Reading 4"
- Prepare to Read:** "Prepare to Read" section with a callout to "CCSS Speaking and Listening 1, 2, 4"
- Close Reading and Text Analysis:** "CLOSE READING AND TEXT ANALYSIS" section with a callout to "CCSS Reading 1-10"
- Writing/Speaking and Listening:** "WRITING" section with a callout to "CCSS Writing 1, 2, 3 & 6" and "CCSS Speaking and Listening 1, 2, 4"



TEACH A MINI-UNIT PAGES 11 - 13

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: What are the characteristics and effects of sugar?

MAGAZINE ARTICLES	SCIENCE & SOCIAL STUDIES	LITERACY SKILLS	CORRESPONDING CCSS ANCHOR STANDARDS
A Taste of Sweet Expository Nonfiction	People have used and are using natural and human resources to produce goods.	<ul style="list-style-type: none"> • Close Reading • Analyze Text Structure • Interpret Visual Information • Collaborate 	<i>Reading 1, 2, 3, 5 & 7</i> <i>Speaking & Listening 1</i>
I Love Sugar Expository Nonfiction	Food is digested to release the energy animals need to maintain body warmth and to move.	<ul style="list-style-type: none"> • Close Reading • Interpret Visual Information • Analyze Author's Purpose • Keep a Nutrition Journal 	<i>Reading 1, 3, 6 & 7</i> <i>Writing 7</i>
What's Diabetes? Expository Nonfiction	Food is digested to release the energy animals need to maintain body warmth and to move.	<ul style="list-style-type: none"> • Close Reading • Analyze Point of View • Analyze Author's Purpose • Present a Scene 	<i>Reading 1 & 6</i> <i>Speaking & Listening 1</i>
Sugar Birds Expository Nonfiction	Animals use their external parts to help them survive, grow, and meet their needs.	<ul style="list-style-type: none"> • Close Reading • Interpret Visual Information • Interpret Figurative Language • Write a Poem 	<i>Reading 1, 4 & 7</i> <i>Writing 3</i>
Can I Eat That Window? Expository Nonfiction	Matter can be changed by heating and cooling.	<ul style="list-style-type: none"> • Close Reading • Interpret Visual Information • Interpret Word Choice • Explain a Procedure 	<i>Reading 1, 2, 4 & 7</i> <i>Speaking & Listening 4</i>
Candy Cane Twist Expository Nonfiction	Matter can be changed by heating and cooling.	<ul style="list-style-type: none"> • Close Reading • Interpret Visual Information • Analyze Text Structure • Write an Advertisement 	<i>Reading 1, 2, 5 & 7</i> <i>Writing 1</i>

Comparing Texts: *Reading 1, 2, 3 & 9; Writing 2, 7 & 8*

Mini-Unit: *Reading 1, 3 & 9; Writing 1, 5, 7, 8 & 9; Speaking and Listening 4*



ARTICLE: A Taste of Sweet

Magazine pages 6 - 11, Expository Nonfiction



Find out about the origins of different sources of sugar—honey, maple syrup, cane sugar, and sugar beets.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Social Studies People have used and are using natural and human resources to produce goods.

CROSS-CURRICULAR EXTENSION

Geography Locate on a world map the places to which sugar cane spread from New Guinea.

KEY VOCABULARY

evaporates (p. 6) changes from a liquid into a gas

native (p. 6) produced, living, or existing naturally in a particular region

plantation (p. 9) a large area of land, especially in a hot part of the world, where crops (such as cotton) are grown

PREPARE TO READ

Show students a container or an image of honey. Ask if they know where honey comes from. Then, show some table sugar or an image of table sugar. Ask students if they know where table sugar comes from. Tell students that they will learn about honey and table sugar, as well as other types of sugar.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- How do honeybees make honey? Use information from the article to summarize the steps. *CCSS Reading 2*
- Use a Venn diagram (p. 15) to compare and contrast the information about sugar cane and sugar beets. Cite text details in the diagram. *CCSS Reading 3*
- What information in the article supports the idea that people love sugar? Use details from the text to support your response. *CCSS Reading 1*

Craft and Structure

- **Analyze Text Structure** How do the titles of each section prepare you to read those sections? What information do they give you? *CCSS Reading 5*
- **Interpret Visual Information** Work in a group to study the photos and discuss how they help you understand the information presented in the text. What do all of these photos have in common that is especially helpful for viewing tiny things? *CCSS Reading 7*

SPEAKING AND LISTENING

Collaborate With a group of classmates, take turns asking and answering questions about the article. Use the words *who*, *what*, *why*, *where*, *when*, and *how*. Use details and information in the article to answer questions.



It's difficult to find a person who doesn't like sugar. This article discusses the good, the bad, and the ugly truths about sugar.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Science Food is digested to release the energy animals need to maintain body warmth and to move.

CROSS-CURRICULAR EXTENSION

Health Spot the sugar! Read the labels of several prepackaged and canned foods in your kitchen for sugar content. Create a chart to record your findings.

KEY VOCABULARY

molecules (p. 12) the smallest possible amount of a particular substance that has all the characteristics of that substance

carbon (p. 12) a chemical element that is found in all living plants and animals

hydrogen (p. 12) a chemical element that has no color or smell and that is the simplest, lightest, and most common element

PREPARE TO READ

Ask students which they think has more sugar, an apple or a can of soda. Tell students that an apple has only six teaspoons of sugar while a can of soda has nine. Explain that students will learn about the sugar content in different foods and why people love sweet foods.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

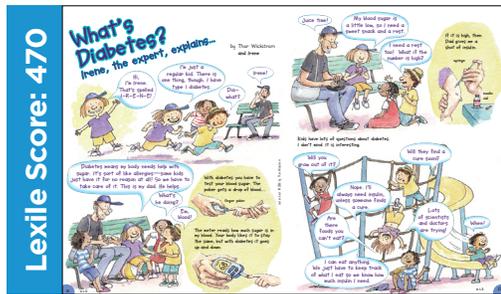
- Locate two facts from the article that you found amazing. Explain why these facts surprised you. *CCSS Reading 1*
- How does eating too much sugar affect the body? Cite evidence from the text to support your answer. *CCSS Reading 1*
- How are simple sugars similar to Legos? Use details from the text and illustration on page 12 to support your answer. *CCSS Reading 3*

Craft and Structure

- **Interpret Visual Information** Study the “How Much Sugar?” photos. What ideas in the text do these photos help you understand? *CCSS Reading 7*
- **Analyze Author’s Purpose** Authors write to persuade, to entertain, to inform, or to express an opinion. Why do you think this author decided to write about sugar? *CCSS Reading 6*

WRITING

Keep a Nutrition Journal Keep a nutrition journal for five days. Record the foods you consume and the amount of sugar and protein they contain. You may need to use a nutrition book or website to find this information. After five days, review the information you recorded and write your conclusions about your eating habits. Are you happy with them or do you want to change them?



A brave young girl named Irene talks about a disease she has—type 1 diabetes—and how she and her dad work together to keep her healthy.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Science Food is digested to release the energy animals need to maintain body warmth and to move.

CROSS-CURRICULAR EXTENSION

Health Visit the American Diabetes Association online to learn more about diabetes. Present your findings in a colorful brochure or poster.

KEY VOCABULARY

meter (p. 18) a device that measures and records the amount of something that has been used

vial (p. 19) a very small plastic or glass container

insulin (p. 20) a substance that your body makes and uses to turn sugar into energy

PREPARE TO READ

Ask students if they know anyone who has type 1 diabetes or if they have ever heard of diabetes. Explain that type 1 diabetes is a childhood and young adult disease and that people who have this disease must be careful about the amount of sugar they take in at each meal.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- What happens if Irene's blood sugar is too low or too high? What actions must she take? Find details in the article to support your answer. *CCSS Reading 1*
- What is wrong with the way Irene's pancreas functions? Use details from the article to support your answer. *CCSS Reading 1*
- How are type 1 diabetes and type 2 diabetes different? Cite details from the text to support your response. *CCSS Reading 1*

Craft and Structure

- **Analyze Point of View** Irene gives you a firsthand account of what it's like to live with diabetes. With a partner, discuss how this information would sound different if it was in a book or on a website about diabetes. *CCSS Reading 6*
- **Analyze Author's Purpose** This author wrote about the serious subject of diabetes using pictures and word balloons. What was the author's purpose for doing this? *CCSS Reading 6*

SPEAKING AND LISTENING

Present a Scene With a group of classmates, act out the scene in this article. First, assign roles to group members. Then work together to turn the speech bubbles into a script. You may want to number the speech bubbles and then write the lines in that order. You may also want to assign names to the characters and then use names to identify each character's lines in the script. Rehearse several times and then perform for the class.



Just about everyone likes to watch a hummingbird as it zips from flower to flower, sucking up nectar. This article explains how a hummingbird is able to drink nectar from flowers and why it needs so much of this sugar water.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Science Animals use their external parts to help them survive, grow, and meet their needs.

CROSS-CURRICULAR EXTENSION

Science View a slow-motion video of a hummingbird sucking nectar from a flower. In a paragraph, describe what you observe.

KEY VOCABULARY

spout (p. 22) a tube, pipe, or hole out of which a liquid flows

hover (p. 23) to float in the air without moving in any direction

PREPARE TO READ

Read the title “Sugar Birds” and preview the photos. Ask students what they know about hummingbirds. Then display a K-W-L chart and work with students to fill in the first two columns. Return to the chart after reading to discuss what students learned and to note questions that weren’t answered.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

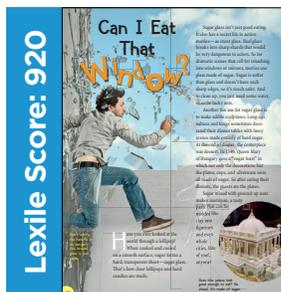
- What happens when a hummingbird sips nectar? Find details in the article to support your answer. *CCSS Reading 1*
- Explain why hummingbirds need to sip sugar all day long. Provide details from the article to support your explanation. *CCSS Reading 1*
- What does a hummingbird eat in addition to sugar water? What nutritional benefits does the hummingbird receive from this food? *CCSS Reading 1*

Craft and Structure

- **Interpret Visual Information** What do the images in this article help you understand about hummingbirds? Find information in the text that is also shown in the photos. *CCSS Reading 7*
- **Interpret Figurative Language** The article states that the hummingbird’s wings beat so fast “they look like a blur.” What image does this description create in your mind? Write your ideas. *CCSS Reading 4*

WRITING

Write a Poem Write a poem about a hummingbird or another kind of bird you especially like. Think about the way the bird looks and moves, the sounds it makes, and any special behaviors you notice. Use vivid language to describe your bird. Then share your poem with the class.



Have you ever wondered how actors in movies can jump through windows without getting hurt? You'll find the answer in this article.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Science Matter can be changed by heating and cooling.

CROSS-CURRICULAR EXTENSION

Social Studies Conduct research to find out more about the history of edible sculptures. Share what you learn with the class.

KEY VOCABULARY

transparent (p. 24) able to be seen through

shards (p. 24) sharp pieces of something, such as glass or pottery

PREPARE TO READ

Explain that a stunt person is an individual who replaces an actor during a dangerous scene. Explain that there is also something called stunt glass that movie producers use during dangerous scenes. Ask students to guess what stunt glass is made of.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- In one or two sentences, summarize the main idea of this article. Cite details from the text in your summary. *CCSS Reading 2*
- Why is sugar glass used in movies instead of windows and mirrors? Use details from the article to support your answer. *CCSS Reading 1*
- What is an edible sculpture? Provide two examples from the article in your explanation. *CCSS Reading 1*

Craft and Structure

- **Interpret Visual Information** Which ideas in the text are illustrated by the photos? Work with a partner to find the ideas in the article. *CCSS Reading 7*
- **Interpret Word Choice** The article states that sugar glass has “a secret life in action movies.” What does this mean? Why does the author use the word “secret”? *CCSS Reading 4*

SPEAKING AND LISTENING

Explain a Procedure Conduct online and library research to learn how sugar glass is made. Create a report to explain the process and include photos and illustrations. After practicing your delivery, share your report with the class.



Find out how old-fashioned candy canes are made.

ESSENTIAL QUESTION

What are the characteristics and effects of sugar?

CORE CONTENT CONCEPT

Science Matter can be changed by heating and cooling.

CROSS-CURRICULAR EXTENSION

Art Look in the library or online to find a candy recipe. Draw and label a series of pictures to illustrate some of the steps in the recipe.

KEY VOCABULARY

molten (p. 26) melted by heat

concoction (p. 26) something (such as a food or drink) that is made by mixing together different things

slab (p. 26) a thick, flat piece of a hard material

PREPARE TO READ

Show students a candy cane or an image of a candy cane and ask them if they have ever eaten one. Invite students to guess how candy canes are made—by a machine or by hand. Explain that in this article, students will visit a candy shop where candy canes are made the old-fashioned way.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Why do you think John senior won't reveal the amount of corn syrup he uses in the candy? Support your response with details from the text. *CCSS Reading 1*
- How does marble help the candy cool? Use details from the article to support your answer. *CCSS Reading 1*
- Write a brief summary of the stages involved in making a homemade candy cane. Cite details from the text in your summary. *CCSS Reading 2*

Craft and Structure

- **Interpret Visual Information** Choose two photos and find the text details they illustrate. How do the photos help you understand the text? Do the photos make a difference in your understanding? Explain. *CCSS Reading 7*
- **Analyze Text Structure** Articles that describe a process are usually organized in chronological order. What organization does this article use? Turn the article into a recipe by rewriting it as numbered steps. *CCSS Reading 5*

WRITING

Write an Advertisement Create an advertisement for the candy canes made by the Martinsville Candy Kitchen. Your ad should make people want to buy these candy canes, so include details about why they are special and unique. Describe the people, the store, the ingredients, and the process. If you choose to make a written ad for a magazine, include illustrations. If you decide to make a radio ad, include sound effects, such as breaking candy canes.

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*).

- Review “A Taste of Sweet,” “I Love Sugar,” and “What’s Diabetes?” to gather facts about the history, chemistry, and health effects of sugar. Record your ideas in a three-column chart.
- Refer to “I Love Sugar,” “Sugar Birds,” and “What’s Diabetes?” to find information about how animals, people, and plants process sugar. Write a paragraph to summarize what you learn.
- Look through “A Taste of Sweet,” “I Love Sugar,” “Can I Eat That Window?” and “Candy Cane Twist” to find interesting facts about the history and uses of sugar. Use this information to create a brochure about sugar. Include pictures, maps, and quotes in your brochure.
- Use information from two or more articles to answer this magazine’s topic question: Why do we love sweets?
- Design a snack shop that sells healthy snacks on one side of the store and sugary treats on the other side. What kinds of snacks would you find on the healthy side of the shop? What would you find on the sugary treats side? Use multiple articles to create a list of items for each side of the store.

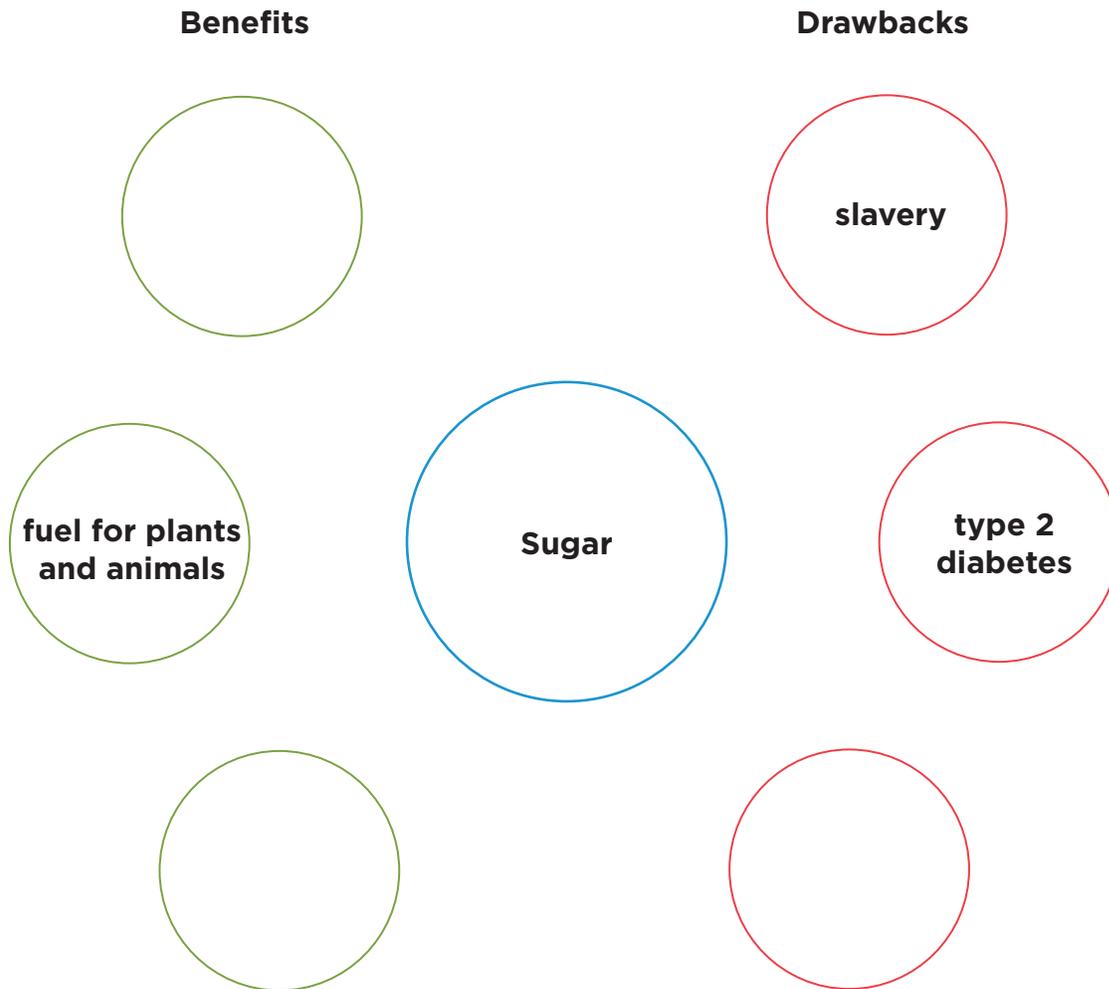
EXPLORATORY LEARNING - FLEXIBLE MINI-UNIT DESIGN

ENGAGE

READ FOR A PURPOSE

APPLY

ENGAGE: Engage students in the topic of sugar by focusing on the Essential Question: What are the characteristics and effects of sugar? Remind students that they have read about the history of sugar, the effects sugar has on plants, animals, and humans, and interesting uses of sugar. Help students brainstorm some of the benefits and drawbacks of sugar. Record their responses in a chart like the one below.



READ FOR A PURPOSE INTRODUCE THE ACTIVITY: Sugar—Good or Bad?: Explain to students that they will be writing an opinion statement to support one of the following opinions:

1. Sugar is mostly good.
2. Sugar is mostly bad.

Continue by explaining that students will support the opinions with facts, examples, and reasons from the magazine texts. Now is a good time to either assign the opinions to students or have them choose the opinion they want to support.

RETURN TO THE TEXT: Explain to students that before they can write their opinion statements, they must gather evidence—facts, examples and reasons from the magazine texts—to use for support. Distribute the Evidence Log shown below (p. 14). Have students work independently to go through the magazine articles to find at least four strong pieces of information that support their opinions. Explain that they will use this information when they begin to draft their opinion statements.

Opinion I'm Supporting:		
	Examples and Facts	Article Title and Page Number
1		
2		
3		
4		

APPLY: SUGAR—GOOD OR BAD? Now that students have gathered facts, examples, and reasons from the articles, they are ready to begin drafting their opinion statements. Students should work independently or in pairs to complete this activity.

Step 1: Build Background Remind students that in writing an opinion statement, their goal is to convince other people—the audience—to agree with them. Tell students to imagine their opinion statements are going to be published in the school newspaper, so their audience is their schoolmates. Tell students to keep their audience in mind as they write.

Step 2: Explain Guidelines Display the writing guidelines below and go over them with students. Tell students to use this information to help them draft and revise their statements.

- Opinion statements will be written in one paragraph.
- Clearly state your opinion at the beginning of the paragraph.
- Support your opinion with the information from your Support Log.
- Use details and language that will appeal to your audience.
- Restate your opinion at the end of your paragraph.

Step 3: Draft Have students begin writing their statements. After the first draft is completed, remind students to review and change their drafts, using the writing guidelines to help them.

Step 4: Revise and Edit Have students exchange statements with a partner for feedback. Tell students to let their partners know if they need to provide more supporting evidence. Then have students incorporate the feedback they received.

Step 5: Share Have students read their statements aloud. Then discuss whether any students' opinions changed as a result of writing or listening to the statements.

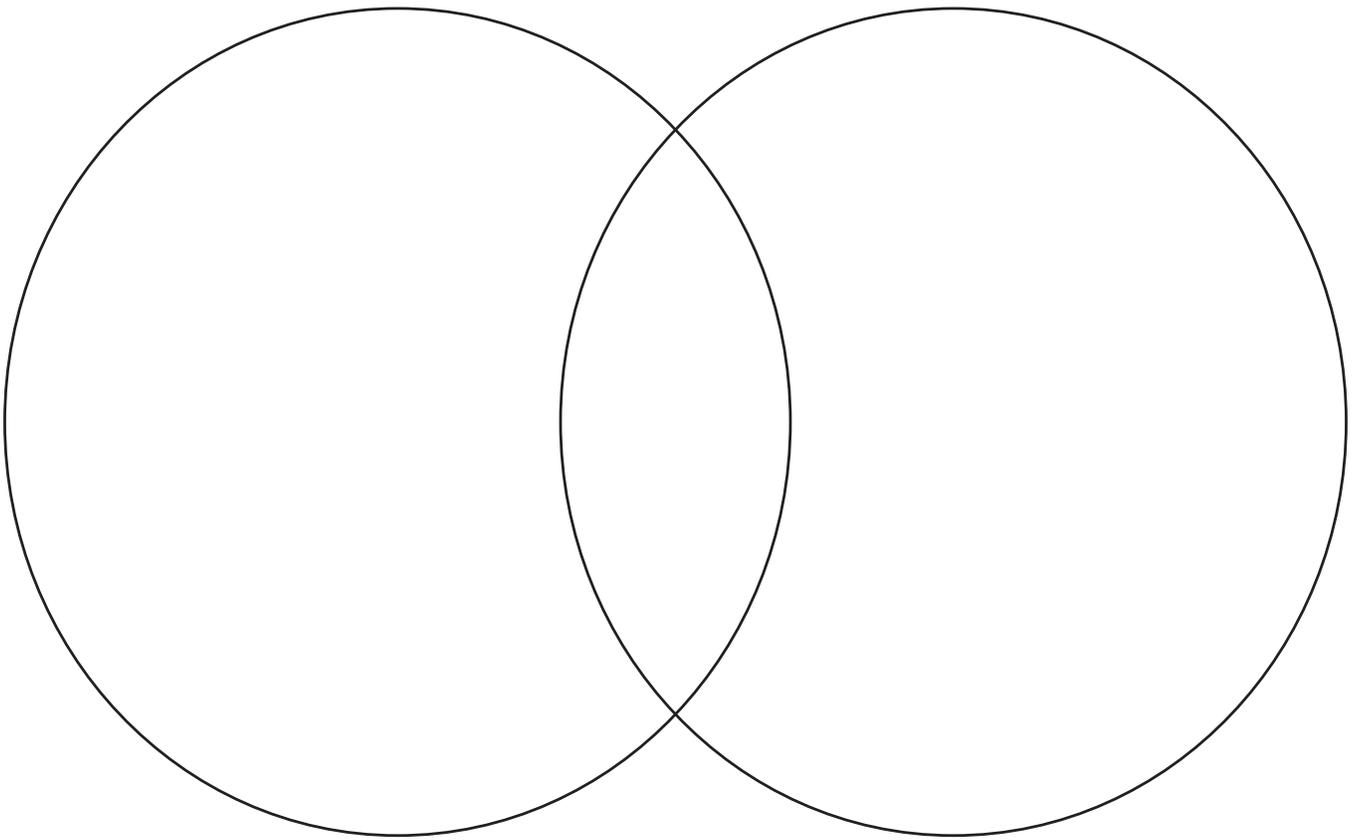
NAME: _____

EVIDENCE LOG

Opinion I'm Supporting:	
Examples and Facts	Article Title and Page Number
1	
2	
3	
4	

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
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KEY IDEAS AND DETAILS

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

CRAFT AND STRUCTURE

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

INTEGRATION OF KNOWLEDGE AND IDEAS

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

WRITING

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



CORE INSTRUCTIONAL CONCEPTS: SOCIAL STUDIES

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

**STATE OR
DISTRICT
STANDARD**

CIVICS

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

ECONOMICS

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

GEOGRAPHY

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

HISTORY

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

- Structure and Function of Living Things
- Life Cycles and Stages
- Reproduction & Inherited Traits
- Animals
- Plants

PHYSICAL SCIENCE

- Forces and Interactions
- Energy
- Light
- Sound
- Electricity/Magnetism
- Matter
- Waves
- Heat
- Chemistry
- Information Processing

EARTH SCIENCE

- Weather
- Climate
- Rocks & Soil
- Erosion and Weathering
- Landforms
- Water
- Oceans
- History of Earth
- Plate Tectonics
- Volcanoes, Earthquakes, and Tsunamis

SPACE SYSTEMS

- Solar System
- Planets
- Moon
- Sun

