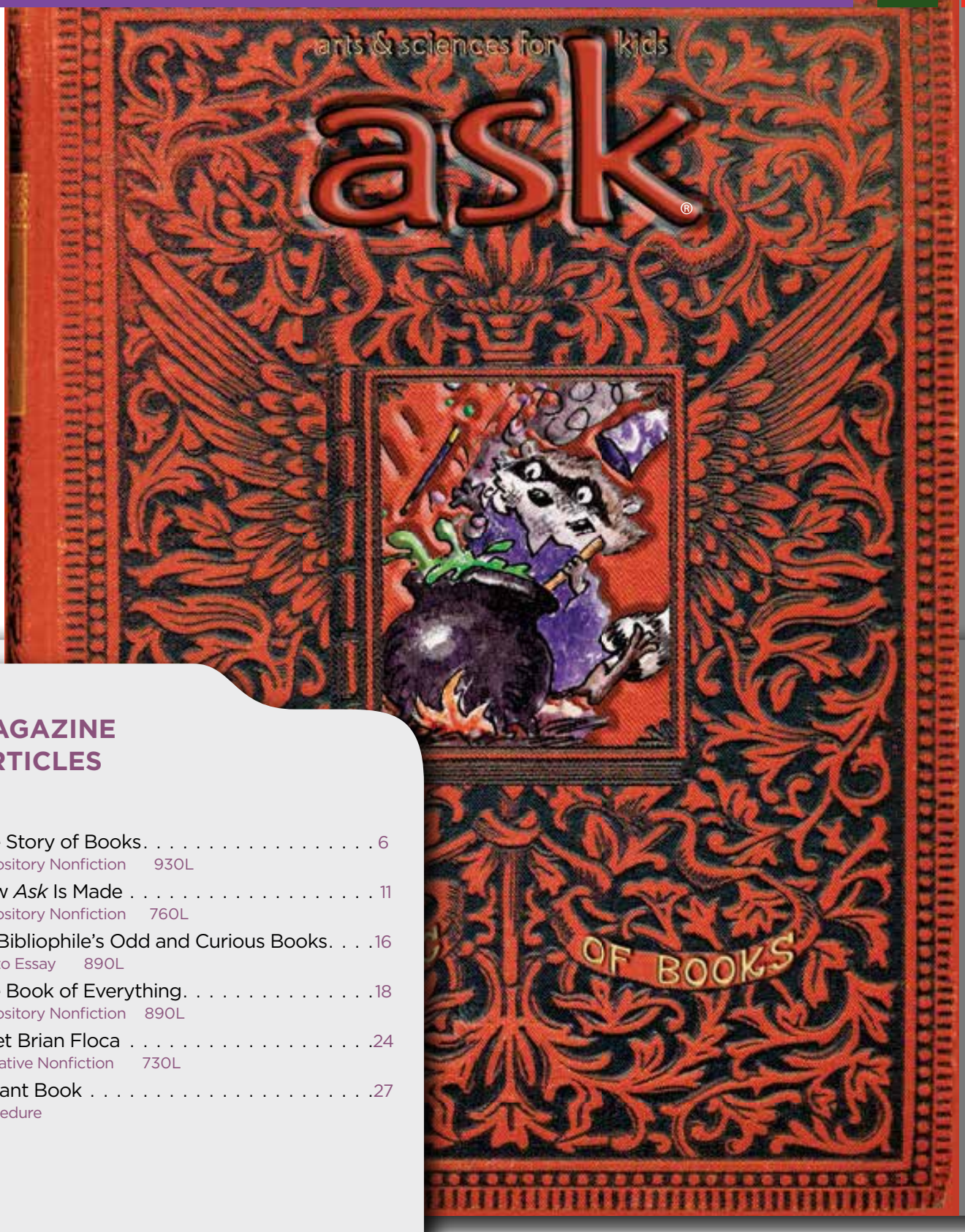
Teacher's Guide



MAGAZINE ARTICLES

The Story of Books 6
Expository Nonfiction 930L

How *Ask* Is Made 11
Expository Nonfiction 760L

Dr. Bibliophile's Odd and Curious Books 16
Photo Essay 890L

The Book of Everything 18
Expository Nonfiction 890L

Meet Brian Floca 24
Narrative Nonfiction 730L

Instant Book 27
Procedure

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Teacher's Guide for *Ask: The Magic of Books*

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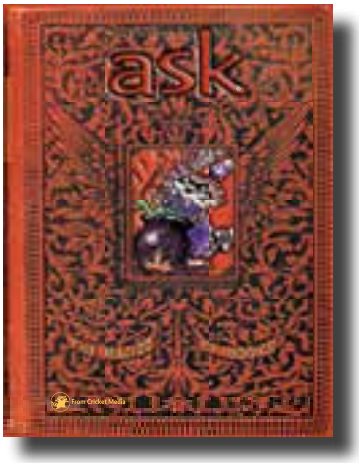


OVERVIEW

In this magazine, readers will learn about the history and development of books. **Ask: The Magic of Books** *includes information about the earliest methods of making books, how an issue of* Ask *magazine is created, the first encyclopedia, a few unusual-looking books, and one author's creative process.*

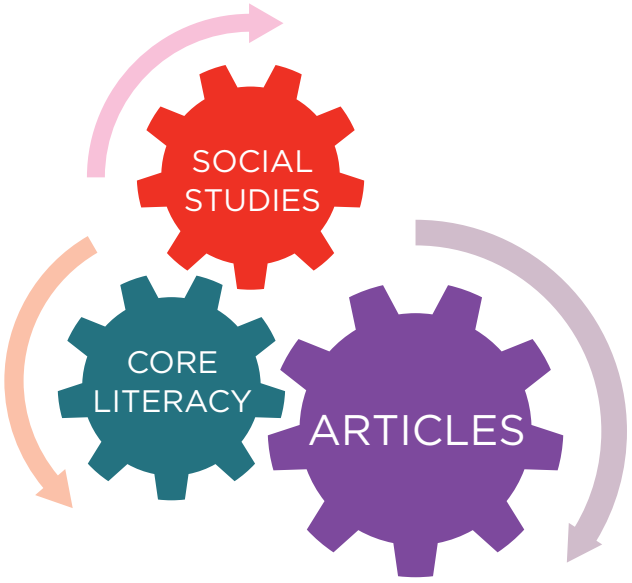
ESSENTIAL QUESTION:

How do ideas turn into books?

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 – 8

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 10 – 12

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).

Skills and Standards Overview

Essential Question: How do ideas turn into books?

MAGAZINE ARTICLES	CORE CONTENT CONCEPT	LITERACY SKILLS	CORRESPONDING CCSS ANCHOR STANDARDS
The Story of Books Expository Nonfiction	Changes in technology represent examples of historical change.	• Close Reading • Analyze Text Structure • Interpret Visual Information • Present a Timeline	*Reading 1, 5 & 7* *Speaking & Listening 4*
How *Ask* Is Made Expository Nonfiction	People's perspectives shape the texts they create.	• Close Reading • Analyze Text Features • Analyze Author's Purpose • Collaborate	*Reading 1, 2, 5 & 6* *Speaking & Listening 1*
Dr. Bibliophile's Odd and Curious Books Photo Essay	The study of artifacts helps us understand life in the past.	• Close Reading • Analyze Tone • Interpret Visual Information • Create a "Photo" Essay	*Reading 1, 2, 6 & 7* *Writing 2*
The Book of Everything Expository Nonfiction	People's perspectives shape the historical sources they create.	• Close Reading • Analyze Text Features • Compare Texts • Write an Advertisement	*Reading 1, 5 & 9* *Writing 1*
Meet Brian Floca Narrative Nonfiction	People's perspectives shape the texts they create.	• Close Reading • Determine Author's Purpose • Interpret Visual Information • Write Interview Questions	*Reading 1, 3, 6 & 7* *Writing 3*
Instant Book Procedure	The needs of a culture influence the technologies it creates.	• Close Reading • Analyze Text Features • Interpret Visual Information • Write Directions	*Reading 1, 2, 5 & 7* *Writing 2*

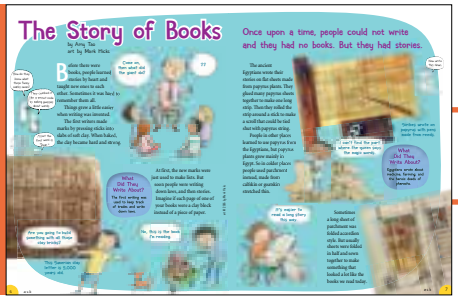
Comparing Texts: *Reading 1 & 9; Writing 2 & 7*

Mini-Unit: *Reading 1 & 3; Writing 2, 5, 7 & 8*

ARTICLE: The Story of Books

Magazine pages 6 - 10, Expository Nonfiction

Lexile Score: 930



Today, books are everywhere—in libraries, classrooms, homes, bookstores, and online—but this hasn't always been the case. This article explains how books have evolved over time—from clay tablets to the books we know today.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies Changes in technology represent examples of historical change.

CROSS-CURRICULAR EXTENSION

Social Studies Use a world map to show where developments in making books occurred. Print out a map from the internet. Find and mark the places mentioned in the article. For each place, make a note about what happened there.

KEY VOCABULARY

parchment (p. 7) paper made from the skin of a sheep or goat

accordion style (p. 7) folded or pleated like the bellows of an accordion

etched (p. 10) produced a pattern on a metal surface using acid

PREPARE TO READ

Discuss what learning would be like without books—how would students learn about ideas, history, or any other subject? Explain that for most of history, books did not exist. People had to memorize information. Tell students that this article explains how the books we know today came to be.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- What did people write on before paper was invented? Cite details from the text to support your response. *CCSS Reading 1*
- How did the things people wrote about change over time? Use details from the article to support your answer. *CCSS Reading 1*
- What reasons did some people have for not liking books? Support your response with details from the text. *CCSS Reading 1*

Craft and Structure

- **Analyze Text Structure** Describe the effects the following inventions have had on making books: paper, book pages carved into blocks of wood or stone, the printing press. *CCSS Reading 5*
- **Interpret Visual Information** Choose two illustrations and find the text details they illustrate. How do the illustrations help you understand the text? Do the illustrations make a difference in your understanding? Explain. *CCSS Reading 7*

SPEAKING AND LISTENING

Present a Timeline Create a timeline to show the important events in the evolution of making books—from pressing sticks into clay slabs to computers. For each event on your timeline, write the date and a short explanation. Present your timeline to your class.

ARTICLE: How *Ask* Is Made

Magazine pages 11 - 15, Expository Nonfiction

Lexile Score: 760

Just about every month a new issue of *Ask* comes out. It takes many people and a lot of hard work to create each issue. This article explains all the steps that are taken to create an issue of *Ask*.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies People's perspectives shape the texts they create.

CROSS-CURRICULAR EXTENSION

Writing Imagine that you work for *Ask*. Form a team and brainstorm a fun issue topic. What stories and pictures would you include? Assign a story to each team member to write and illustrate. Create a table of contents and a title for the issue.

KEY VOCABULARY

editor (p. 11) a person whose job is to make changes and corrections to something written

director (p. 12) a person who manages an organized group of people or a part of an organization, such as a business

PREPARE TO READ

Ask students what they enjoy most about *Ask*—the stories, the pictures, or both? Explain that it takes a large team of people to create each issue, including writers, editors, artists, art directors and people who run the printing press. Ask students if they think they'd like to work on a magazine.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- How do the stories and articles get into the magazine? Use details from the text to summarize this process. *CCSS Reading 2*
- How do the photos and drawings get into the magazine? Use details from the text to summarize this process. *CCSS Reading 2*
- What kinds of mistakes do the people at *Ask* find when they check the pages? Cite information from the article to support your response. *CCSS Reading 1*

Craft and Structure

- **Analyze Text Features** Why do you think the author uses speech bubbles in this article? What kinds of details are included in the speech bubbles? What do they help you understand about how *Ask* is made? *CCSS Reading 5*
- **Analyze Author's Purpose** Did the writer of this article want to entertain you, to give you information about something, or both? How does the purpose affect the style and content of the article? *CCSS Reading 6*

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 the questions.

ARTICLE: Dr. Bibliophile's Odd and Curious Books

Magazine pages 16 - 17, Photo Essay

Lexile Score: 890

The dictionary defines a book as "sheets of paper that are put together between two covers." In this article, you'll learn about some interesting books that don't fit this definition.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies The study of artifacts helps us understand life in the past.

CROSS-CURRICULAR EXTENSION

Art The Kansas City library has a fun design. What features—inside and outside—do you think a library should have? Draw a picture of your dream library. Let your imagination be your guide.

KEY VOCABULARY

bibliophile (p. 16) a person who loves or collects books

diorama (p. 16) a three-dimensional miniature model of something

tome (p. 17) a very large, thick book

PREPARE TO READ

Preview the title of the article and the photos. Ask students if they have ever seen any of these types of books or been to a library other than the school or local library. Explain that this article shows examples of some very unusual books.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Summarize the ways in which these books are odd and curious. Use details from the text to support your response. *CCSS Reading 2*
- How is the "lotta book" unusual? Use details from the article to support your answer. *CCSS Reading 1*
- Which of the books can actually be read? Which are just to look at? Support your response with details from the text and photos. *CCSS Reading 1*

Craft and Structure

- **Analyze Tone** How does the author feel about all these unusual books? Does she seem sarcastic? Snooty? Confused? Enthusiastic? Which words and details help convey the tone? *CCSS Reading 6*
- **Interpret Visual Information** Study the photos that accompany the text. How do they support details presented in the text? *CCSS Reading 7*

WRITING

Create a "Photo" Essay A bibliophile is a person who loves or collects books. What do you love or collect? Create a photo essay about it just like the article "Dr. Bibliophile's Odd and Curious Books." Instead of photos, make drawings or cut out images from magazines. Use 4-5 images. Write descriptions to go with your pictures. Finally, give your essay a title.

ARTICLE: The Book of Everything

Magazine pages 18 - 23, Expository Nonfiction

Lexile Score: 890

This article is about a book that changed the world.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies People's perspectives shape the historical sources they create.

CROSS-CURRICULAR EXTENSION

Research Research a topic using an encyclopedia, a periodical, and a reference book. Ask the librarian for help locating sources. How are these sources similar and different? Which did you like best? Write a paragraph to compare and rate these sources.

KEY VOCABULARY

storehouse (p. 20) a large amount or supply of something

revolutionary (p. 20) causing a great change

censor (p. 22) a person who examines books, movies, letters, etc., and removes things that are considered to be offensive, immoral, harmful to society, etc.

banned (p. 22) forbidden

PREPARE TO READ

Ask students to describe how they usually conduct research—online or in the library using books and periodicals? Invite students to name specific sources of information they use. Then ask students whether they use encyclopedias for research. Explain that the next article is about the history of encyclopedias.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Why does the author describe the encyclopedia as "the book of everything"? Support your response with details from the article. *CCSS Reading 1*
- How did the encyclopedia change the world? Cite details from the article to support your answer. *CCSS Reading 1*
- Why did kings and church leaders dislike the first encyclopedia? Use details from the article to support your response. *CCSS Reading 1*

Craft and Structure

- **Analyze Text Features** This article contains subheadings that hint at what the different sections of the article are about. Work with a partner to summarize the information under each subheading. *CCSS Reading 5*
- **Compare Texts** The sidebar on page 23 provides additional information about encyclopedias. How does the information in the sidebar build on ideas in the main part of the article? *CCSS Reading 9*

WRITING

Write an Advertisement Create an advertisement for Diderot's encyclopedia that will make people want to buy copies of it. Include details about how the encyclopedia will make people feel smarter, seem smarter to others, provide entertainment, and look impressive on a home bookshelf. Briefly describe some of the encyclopedia's topics. Include illustrations.

ARTICLE: Meet Brian Floca

Magazine pages 24 - 26, Narrative Nonfiction

Lexile Score: 730

Meet Brian Floca, an award-winning writer and artist who draws for *Click* magazine.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies People's perspectives shape the texts they create.

CROSS-CURRICULAR EXTENSION

Write Read *Moonshot: The Flight of Apollo 11* by Brian Floca or listen to it online. Write a book review that includes a brief summary as well as your opinions about Brian's book. Share your review with classmates.

KEY VOCABULARY

mission (p. 24) a flight by an aircraft or spacecraft to perform a specific task

watercolor (p. 26) a type of paint that is mixed with water

PREPARE TO READ

Ask students how they feel about revising the things they write. Explain that professional writers revise their work many times until they are satisfied. Tell students to notice how often writer-illustrator Brian Floca revises his work.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- How did Brian make sure his drawings for his book were realistic and correct? Cite details from the text to support your answer. *CCSS Reading 1*
- What does Brian do to make sure the words and drawings work well together? Support your answer with details from the article. *CCSS Reading 1*
- What is Brian's key idea about being an illustrator? Find details in the text to support your response. *CCSS Reading 3*

Craft and Structure

- **Determine Author's Purpose** Authors write to persuade, entertain, inform, or give an opinion. What is the main purpose of this article? Explain your reasoning. *CCSS Reading 6*
- **Interpret Visual Information** Study the illustrations that show Brian. What do they convey about the emotions he feels as he works? Discuss your ideas with a partner. *CCSS Reading 7*

WRITING

Write Interview Questions Imagine you are going to interview Brian Floca. Write four questions for Brian that can be answered with the information in this article. For example, one question might be, "What kind of research did you do to make sure your drawings were accurate?" For each of your questions, write Brian's answer.

ARTICLE: Instant Book

Magazine page 27, Procedure

This article shows an easy way to make a book.

ESSENTIAL QUESTION

How do ideas turn into books?

CORE CONTENT CONCEPT

Social Studies The needs of a culture influence the technology it creates.

CROSS-CURRICULAR EXTENSION

Writing Follow the steps to make an "instant book." Research some jokes and write the jokes on the pages of your book. Share your book with your friends and family.

KEY VOCABULARY

instant (p. 27) becoming something very quickly

volume (p. 27) a book that is part of a series or set of books

PREPARE TO READ

Preview the article and brainstorm with students how they might fill an instant book. For example, they could use it as an autograph book, a journal, or a sketch book.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- What materials do you need to make an instant book? Use details from the pictures to support your answer. *CCSS Reading 1*
- How many times do you need to fold the paper before you cut it? What do you need to do after you make a cut with the scissors? Support your responses with information from the pictures. *CCSS Reading 1*
- Why do you think the author titled this article "Instant Book"? What would be another good title for it? Use details from the pictures to support your response. *CCSS Reading 2*

Craft and Structure

- **Analyze Text Features** Number the steps in this activity. How does the author show the order of the steps without using numbers? *CCSS Reading 5*
- **Interpret Visual Information** What do the arrows and the dotted lines mean? How do they help you complete the activity? *CCSS Reading 7*

WRITING

Write Directions "Instant Book" has no written directions. Write a set of directions for making an instant book. Number the steps and include a materials list.

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)*.

- Why did books become more and more popular? Use information from "The Story of Books" and "The Book of Everything" to write a paragraph that answers this question.
- Why did some people throughout history dislike books or try to destroy them or prevent them from being made? Refer to "The Story of Books" and "The Book of Everything" to find information. Write a paragraph that answers this question.
- Make a timeline to show all the different subjects that have been covered in books. Use information from "The Story of Books," "Dr. Bibliophile's Odd and Curious Books," "The Book of Everything," and "Meet Brian Floca."
- What development in the history of books do you think was most important? The development of paper? The invention of the printing press? The encyclopedia? Why is this development more important than others? Write a short essay to respond to these questions. Use information from various articles to support your opinions.
- Compare the way Brian Floca creates his books with the way the editors and art director at *Ask* create a magazine issue. How are their processes similar and different? Which way seems more difficult? Write 3-4 paragraphs to answer these questions.

EXPLORATORY LEARNING - FLEXIBLE MINI-UNIT DESIGN

ENGAGE | **READ FOR A PURPOSE** | **APPLY**

This mini-unit offers students the opportunity for an in-depth look at the history and process of making books. Students will review the many topics and ideas mentioned in the magazine. Next, they will conduct research on some of these topics and ideas using magazine texts. Finally, they will write articles for a class encyclopedia about books.

ENGAGE: Engage students in the topic of books by first reviewing the Essential Question: How do ideas turn into books? Display a chart like the one below. Remind students that the magazine articles contain lots of information about books. Help students brainstorm these ideas and topics, going back to the articles when necessary. Add ideas and topics to the chart. You may not be able to come up with a topic for every letter.

A • Aztecs • art director • artists	**B** • bark	**C** • clay blocks • censor	**D** • deerskin • Denis Diderot	**E** • editors • the Enlightenment • encyclopedia
F	**G** • goatskin • Gutenberg	**H**	**I**	**J**
K	**L**	**M** • metal letters	**N**	**O**
P • printing press • papyrus • parchment • paper	**Q**	**R**	**S** • story ideas • stitcher	**T**
U	**V**	**W**	**X**	**Y**
Z				

READ FOR A PURPOSE

INTRODUCE THE ACTIVITY: A Book About Books Explain to students that they will be making a class encyclopedia full of articles about topics from the magazine. Continue by telling students that they will use the magazine texts to help them research and write about

- one person who was important in the history of books.
- one place connected to the development of books.
- one idea, invention, or event that influenced the history or development of books.

You may want to display the A-B-C chart you created with students during the Engage activity to help students choose topics.

RETURN TO THE TEXT: Explain to students that before they can create their books, they need to look through the magazine texts to gather facts and details about their topics. Have students finalize their topics now if they have not already done so. Then distribute the Research Form (p. 13), shown below, to students and have them use it to record their topics and the information they find in the magazine articles. Explain to students that they will use their research notes to write articles for the class encyclopedia.

Topics	**Notes** (Who? What? Where? When? Why? How?)
Person:	
Place:	
Idea, invention, event:	

APPLY: A BOOK ABOUT BOOKS Now that students have gathered information about their topics, they are ready to begin writing their articles. After all of the articles are finished, they will be sorted alphabetically and bound together to make a class encyclopedia about books.

MATERIALS

- pencils
- writing paper
- colored pencils
- 11 x 17 construction paper
- scissors
- stapler

STEP 1: Build Background

Remind students that they will be writing articles about the topics they researched. Tell students that their articles should

- begin with a statement that tells why the person, place, or idea/invention/event is important to books.
- include details that give more information about the topic.

STEP 2: Draft

Distribute writing paper and have students begin drafting their articles. Remind them to refer to their Research Forms and use who, what, when, where, why, and how details in their articles. When students have finished writing, have them review their drafts to make sure their information is complete and accurate.

STEP 3: Revise and Rewrite

Have students exchange their work with an editing partner for feedback. Tell students to let their partner know if they need to provide more information or if anything seems unclear. Then have students incorporate the feedback they receive. Remind students to

- write each article on a separate piece of paper.
- write the topic of each article at the top of the page.
- write the title of the magazine text they used for research at the bottom of the article.
- add a drawing to each article.
- write their name on each article.

STEP 4: Assemble

Have volunteers gather the articles and work together to sort them alphabetically. Create a cover using the 11 x 17 construction paper and add a title, for example "Our Encyclopedia of Books." Staple the book together. Then post it on a bulletin board in the classroom for students to enjoy and share.

RESEARCH FORM

Topics	Notes (Who? What? Where? When? Why? How?)
Person:	
Place:	
Idea, invention, event:	

Appendix

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		
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