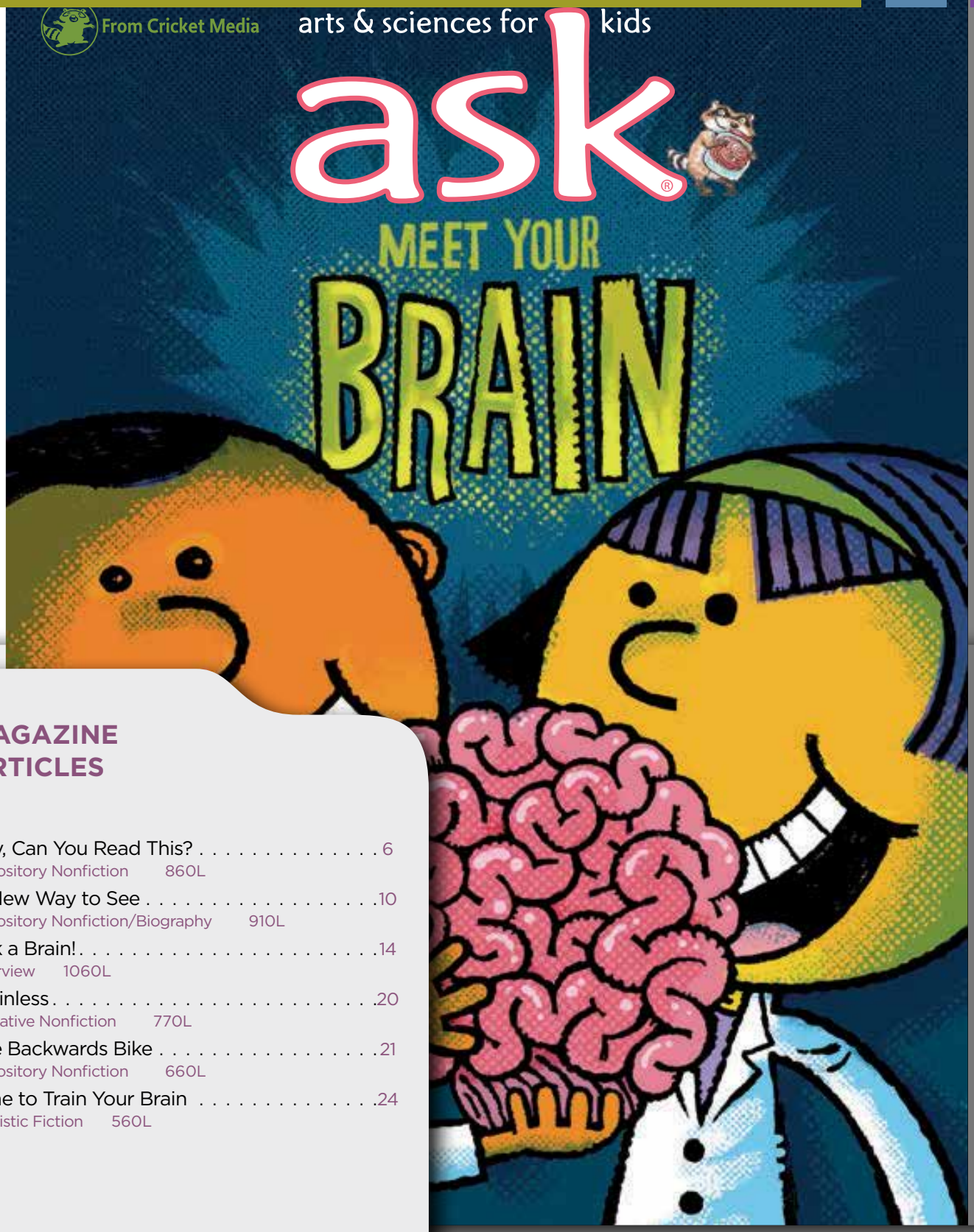
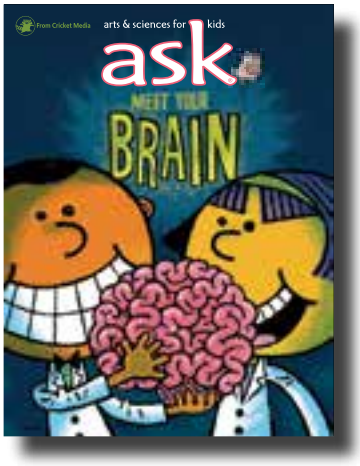
Teacher's Guide



MAGAZINE ARTICLES

Contents

Teacher's Guide for *Ask: Meet Your Brain*



OVERVIEW

In this magazine, readers will learn about how the brain learns new things and is able to overcome challenges to learning. ***Ask: Meet Your Brain*** *includes information about how people learn to read, how humans use echolocation to see, the jobs of different parts of the brain, how the brain can be retrained, and the structure of animal brains.*

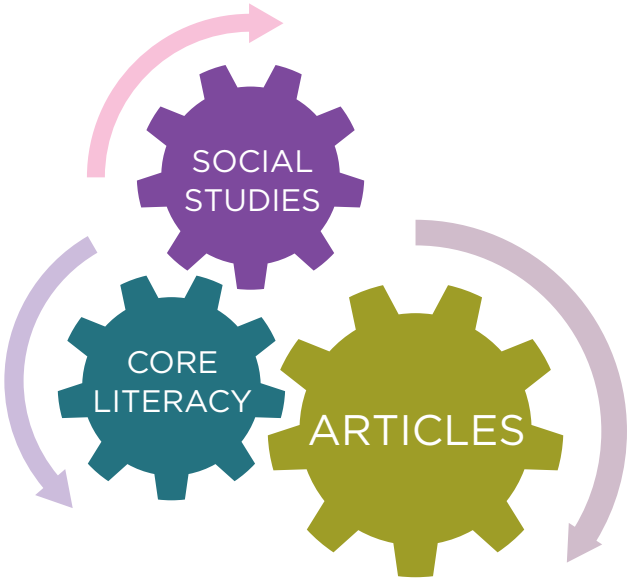
ESSENTIAL QUESTION:

How does the brain learn new things?

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:



TEACH A MINI-UNIT PAGES 12 – 14

Magazine articles can be easily 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 does the brain learn new things?

MAGAZINE ARTICLES	SCIENCE CONCEPTS	LITERACY SKILLS	CORRESPONDING CCSS ANCHOR STANDARDS
Hey, Can You Read This? Expository Nonfiction	Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	• Close Reading • Interpret Visual Information • Interpret Words • Write Opinions	*Reading 1, 4 & 7* *Writing 1*
A New Way to See Expository Nonfiction/ Biography	Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	• Close Reading • Analyze Point of View • Identify Supporting Details • Write Explanatory Texts	*Reading 1, 2 & 6* *Writing 2*
Ask a Brain! Interview	Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	• Close Reading • Analyze Text Structure • Interpret Visual Information • Evaluate Evidence • Collaborate	*Reading 1, 5, 7 & 8* *Speaking & Listening 1*
Brainless Narrative Nonfiction	Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	• Close Reading • Interpret Visual Information • Analyze Purpose • Research and Write	*Reading 2, 3, 6 & 7* *Writing 2*
The Backwards Bike Expository Nonfiction	Sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	• Close Reading • Identify Main Ideas • Analyze Relationships • Interpret Phrases • Write Narrative Texts	*Reading 1, 2, 3 & 4* *Writing 3*
Time to Train Your Brain Realistic Fiction	Sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	• Close Reading • Analyze Text Structure • Analyze Genre • Analyze Style • Write Explanatory Texts	*Reading 1, 2, 5 & 6* *Writing 2*

Comparing Texts: *CCSS Reading 9*

Mini-Unit: *CCSS Reading 1, Reading 7, Writing 9, Writing 10*

ARTICLE: Hey, Can You Read This?

Magazine pages 6 - 9, Expository Nonfiction

Lexile Score: 860

Brain power! Learn how your brain does one of the most amazing things it can do—read!

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

CROSS-CURRICULAR EXTENSION

Art Create an annotated cartoon or illustration that shows what your brain is doing when you come across a word you know, like "party."

KEY VOCABULARY

wordbox (p. 7) an area in the brain that translates shapes into meaningful information

neuron (p. 7) a brain cell

short-term working memory (p. 9) the process involved in using information that is stored only for a short time

PREPARE TO READ

Write a nonsense word on the board. Ask students to read the word. Then, ask them how they knew the word was not a real word. Explain that this article illustrates how the brain interprets shapes into letters and letters into words that we can read.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Highlight details in the article that explain how the brain decodes groups of letters into words and words into sentences. *CCSS Reading 1*
- Based on information in the article, if you were to come across a word you didn't know while reading, what would most likely happen? Support your answer with evidence from the article. *CCSS Reading 1*

Craft and Structure

- **Interpret Visual Information** Study the illustrations on page 8. How do the images work together to help explain how you are able to remember the meanings of words? *CCSS Reading 7*
- **Interpret Words** The author uses the word "fire" several times. Define the word's meaning as it is used in the article. Then, write a sentence using the word in the same way. *CCSS Reading 4*

WRITING

Write Opinions Using information from the article, write an opinion on whether or not people who suffer brain damage can still learn to read.

ARTICLE: A New Way to See

Magazine pages 10 - 12, Expository Nonfiction/Biography

Lexile Score: 910

Bats and dolphins listen to echoes to find their way around. Animals aren't the only ones who do this—humans do too. Find out how 13-year-old Humoody Smith, who is vision impaired, uses echoes to do all sorts of things—even ride a bike!

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

CROSS-CURRICULAR EXTENSION

Social Studies Research to find out more about Louis Braille, the boy who invented Braille at the age of 12.

KEY VOCABULARY

echolocation (p. 10) bouncing sound and listening to the echoes to sense objects

clicking (p. 11) sensing objects by listening for echoes

sensors (p. 12) devices that detect and respond to certain changes in the environment

PREPARE TO READ

Ask students what they know about echolocation. Ask if they have ever tried using echolocation to get around in a dark room. Explain that in this article they will learn about a method called clicking, or sensing objects by listening for echoes.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Daniel Kish says, "Running into a pole is a drag, but never being allowed to run into a pole is a disaster." What do you think he means by this? *CCSS Reading 1*
- Locate two facts from the article that amaze you. Share with a partner why these facts surprised you about the ways blind people see. *CCSS Reading 1*

Craft and Structure

- **Analyze Point of View** What is the author's point of view? How is the author's point of view conveyed in the text? Cite details from the article supporting your answer. *CCSS Reading 6*
- **Identify Supporting Details** Why do you think this article is titled "A New Way to See"? Underline details that connect to the article title. Then create a new title for the title using other details. *CCSS Reading 2*

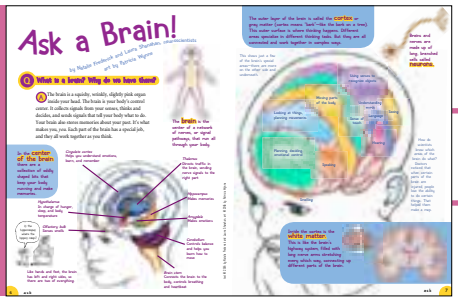
WRITING

Write Expository Texts Write a brief summary of the article, explaining the major steps involved in using echolocation to navigate.

ARTICLE: Ask a Brain!

Magazine pages 14 - 19, Interview

Lexile Score: 1060



What is a brain? Why do we have them? What is a thought? Why do people get headaches? Find out the answers to these questions and more.

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

CROSS-CURRICULAR EXTENSION

Science Draw a picture or create a 3-D model of a brain. Label the different parts.

KEY VOCABULARY

cortex (p. 15) the outer layer of the brain

hippocampus (p. 17) the part of the brain that decides what memories to keep and for how long

earworms (p. 19) songs or jingles that play in your head over and over

PREPARE TO READ

Ask students if they know what a human brain looks like. Display a photograph of a human brain. Explain that students will be reading about how this squishy, wrinkly blob is their body's control system.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- What is the relationship between neurons and thoughts? Support your answer with evidence from the article. *CCSS Reading 3*
- Highlight details in the article that explain why people get headaches, even though the brain cannot feel pain. *CCSS Reading 1*

Craft and Structure

- **Analyze Text Structure** In what order did you read the sections of this article? Does the information from one section depend on the next? Why or why not? *CCSS Reading 5*
- **Interpret Visual Information** The article uses illustrations to help explain how the brain works. With a partner, write 2–3 specific questions about the brain that can be answered using information in the illustrations. Then exchange questions with another pair. *CCSS Reading 7*

SPEAKING AND LISTENING

Collaborate With a partner, discuss the functions of different parts of the brain and how they work together. Then, discuss where memories are stored, and what happens when a memory is forgotten.

ARTICLE: Brainless

Magazine page 20, Expository Nonfiction

Lexile Score: 770

In this humorous article, a variety of "brainless" sea creatures (and a cockroach) discuss the upside of not having a brain.

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

CROSS-CURRICULAR EXTENSION

Literature Write a fictional story about one of the animals in this article that explains how they use different parts of their bodies like a "brain."

KEY VOCABULARY

hydra (p. 20) a small tube-shaped aquatic animal that can regrow parts of its body

larva (p. 20) the young form of animals without backbones that change their shape in different stages of their lives

PREPARE TO READ

Ask students what the function of a brain is. Clarify that its job is to receive information from and send information to the rest of the body. Then ask them if they think it is possible for an animal to live without a brain.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- The animals in this article claim they don't need a brain the way humans do to be able to function. What evidence do they use to support their claim? *CCSS Reading 2*
- How are the animals in the article the same as and different from each other? Support your ideas with details from the text and photos. *CCSS Reading 3*

Craft and Structure

- **Interpret Visual Information** Each description in this article includes a picture. How do the illustrations and photos work to help you understand the text descriptions? *CCSS Reading 7*
- **Analyze Purpose** What is the main purpose of this article? Describe how it shapes the article's content. *CCSS Reading 6*

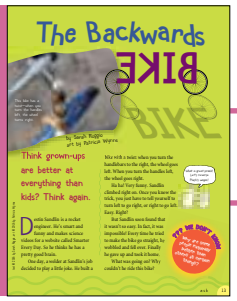
SPEAKING AND LISTENING

Research and Write Research other types of "brainless" animals and write a short essay describing these animals and the parts of their bodies that function like a "brain."

ARTICLE: The Backwards Bike

Magazine pages 21 - 23, Expository Nonfiction

Lexile Score: 660



Destin Sandlin is smart. He's a rocket engineer. So, when a friend of his built a bike that went left when the handlebars turned right, and went right when the handlebars turned left, he thought he would be able to learn to ride it quickly. Boy, did he get a big surprise!

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

CROSS-CURRICULAR EXTENSION

Math Try doing something you already know how to do but do it backwards, repeating the process several times. Make a chart to display your results.

KEY VOCABULARY

cerebellum (p. 22) the part of the brain that keeps your body balanced and sends commands to body parts when you move

plastic brains (p. 23) brains that are flexible and adaptable

PREPARE TO READ

Have you ever wondered how you can never forget how to ride a bike? What if you had to learn how to ride a backwards bike? Do you think you could? Tell students this article is about a man who thought it would be easy, but found it wasn't.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- What evidence is there to support Sandlin's opinion that kids learn new things much more quickly and easily than adults? *CCSS Reading 1*
- Highlight details in the text that explain the job of the cerebellum. *CCSS Reading 1*

Craft and Structure

- **Identify Main Ideas** What is the main idea of this article? What details support the main idea? *CCSS Reading 2*
- **Analyze Relationships** Why did Sandlin have a difficult time learning to ride a bike backwards? *CCSS Reading 3*
- **Interpret Phrases** Use context clues in the article to explain what "plastic brains" are. *CCSS Reading 4*

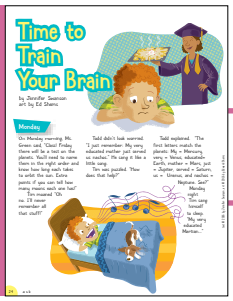
WRITING

Write Narrative Texts Write about a time that you learned how to do something new that was difficult.

ARTICLE: Time to Train Your Brain

Magazine pages 24 - 27, Realistic Fiction

Lexile Score: 560



Learn some fun "super secret test tricks" that will help you ace your next test.

ESSENTIAL QUESTION

How does the brain learn new things?

CORE CONTENT CONCEPT

Science Sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

CROSS-CURRICULAR EXTENSION

Study Skills Choose one of the test tricks from the article and use it to help you study for your next test.

KEY VOCABULARY

memory aid (p. 26) a method to help a person remember something

memory trigger (p. 27) something that causes a person to remember something

PREPARE TO READ

Have you ever had to learn something that seemed too hard to remember? Get ready to read about some fun and unusual ways to help your memory.

CLOSE READING AND TEXT ANALYSIS

Key Ideas

- Underline three details from the article that show how knowing test tricks can help you remember things for a test. *CCSS Reading 1*
- Highlight tips in the section titled "Super Secret Test Tricks" that are not mentioned in other parts of the article. *CCSS Reading 1*
- In one or two sentences, summarize the main idea of this article. Use the term "memory aid" in your summary. *CCSS Reading 2*

Craft and Structure

- **Analyze Text Structure** How would using a nonfiction text structure change the way the information in this article is presented? Rewrite the information in this format. *CCSS Reading 5*
- **Analyze Genre** How do you know this article is fiction? Provide several details from the article that identify it as fiction. *CCSS Reading 5*
- **Analyze Style** What is the author's purpose in writing this article? How does the author's style help to achieve their purpose? *CCSS Reading 6*

WRITING

Write Explanatory Texts Todd used the sentence "My very educated mother just served us nachos." Create another sentence to help you remember the names of the planets.

CROSS-TEXT CONNECTIONS

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

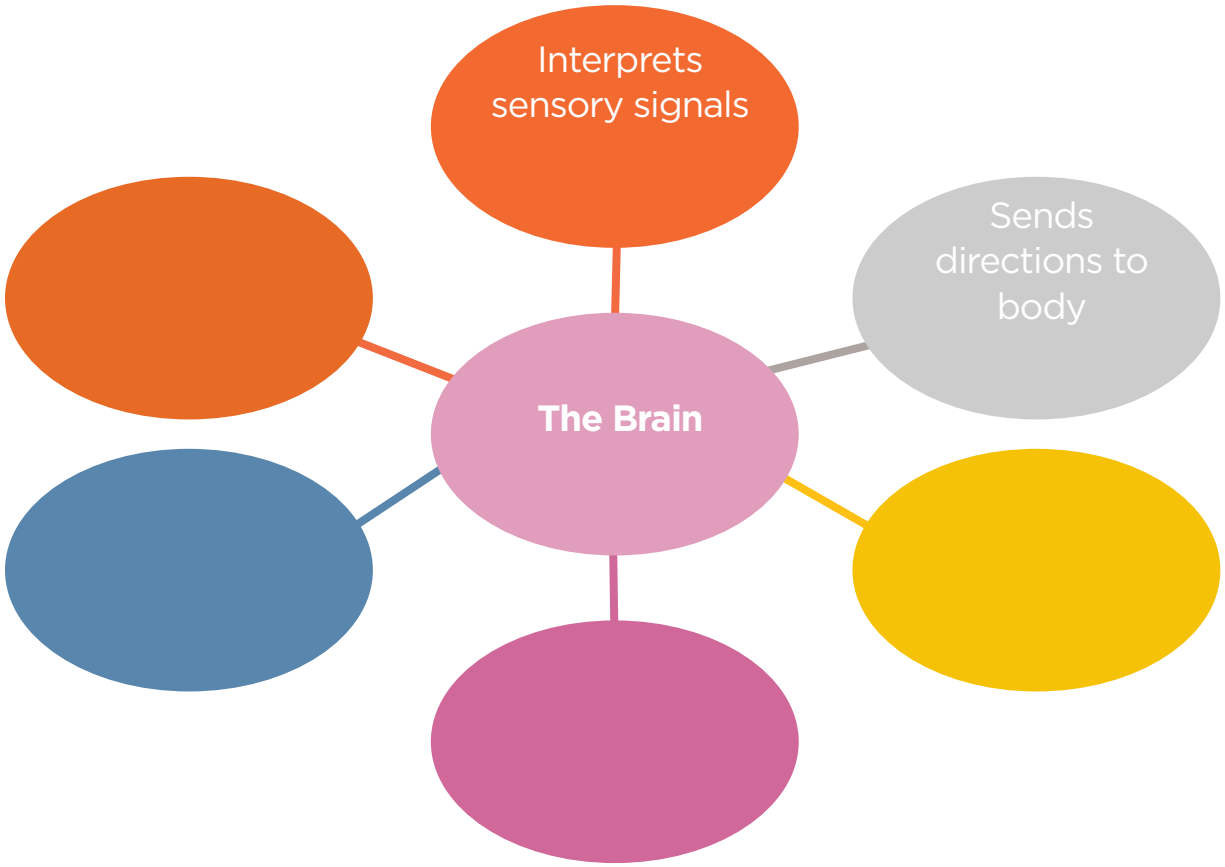
- Combine the information in "Hey, Can You Read This?" (pgs. 6–9) and "Ask a Brain!" (pgs. 14–19) to make a diagram that shows how connections are made in the brain.
- Review the articles "A New Way to See" (pgs. 10–13) and "Backwards Bike" (pgs. 21–23) to answer the essential question: How can the brain learn new things?
- Using information from "Backwards Bike" (pgs. 21-23) and "Time to Train Your Brain" (pgs. 24-27), write a short description of how the brain can be trained to learn new things.
- What is a thought? Find evidence from two or more articles to support your answer.
- Use multiple articles to help you explain why a computer could not replace a human brain.

EXPLORATORY LEARNING - FLEXIBLE MINI-UNIT DESIGN

ENGAGE:
Challenge students to use their brains! In this Mini-Unit, students will work in two teams to present and answer game show questions about what the brain does and how it works. May the best brainiacs win!

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

Engage students in the topic of the brain by displaying a concept web like the one below. The web should include any words and concepts that come to students' minds when they think about how the brain learns new things and is able to overcome challenges to learning—from reading a book, riding a bicycle, and laughing at a funny movie to using echolocation to navigate and memory aids to help remember things. Guide students in completing the organizer.



READ FOR A PURPOSE

INTRODUCE THE ACTIVITY:
Explain to students that they will be participating in a "Who's the Brain?" game show that will test their knowledge about how brains learn new things and overcome challenges to learning. Tell students that they will be divided into two teams. Each team will create questions (and answers) on index cards, based on what they learned by reading the articles in this issue. When both teams have completed their questions and answers, they are ready to begin the game!

RETURN TO THE TEXT:
Explain to students that before they can compete in the "Who's the Brain?" game show, they must gather information from the articles that relates to the Essential Question: How do brains learn new things? Divide the class into two teams. Inform each team that they will create game show questions (and answers) for different articles, shown below, and that they should take notes as they read on the Brain Basics graphic organizer.

TEAM 1

- "Hey, Can You Read This?" (pgs. 6-9)
- "A New Way to See" (pgs. 10–12)
- "Ask a Brain!" (pgs. 14-19)

TEAM 2

- "Brainless" (p. 20)
- "Backwards Bike" (pgs. 21-23)
- "Time to Train Your Brain" (pgs. 24-27)

APPLY: WHO'S THE BRAIN? Game Show

Now that teams have prepared their questions and answers, they are ready to begin the game show. Each team will answer as many questions as they can in the time allowed. May the best team win!

STEP 1: Develop Questions and Answers

Ask each team to use the information recorded on their *Brain Basics* graphic organizers to come up with questions and answers.

STEP 2: Finalize Question and Answer Cards

Instruct each team to use the Q & A graphic organizer to create their final question and answer cards. Assist each team in making sure their questions are clear and verifying the accuracy of their answers.

STEP 3: Prepare

Remind each group that they have prepared questions for different sets of articles. Have students prepare to answer the questions created by the other team by rereading the articles that team based their questions on. Allow sufficient time for students on both teams to reread each article and discuss facts and details about the brain and how it works.

STEP 4: Play!

Start the game by selecting two speakers, one for each team. Speakers will read questions to the other group. When ready, have Team 1's speaker read their first question. Allow 1-2 minutes for the opposing team to discuss their answer. When their time is up, select one representative from Team 2 to announce their answer to the class. Allow Team 1 time to discuss whether or not Team 2 got the answer right. Check the answer in their Q & A graphic organizer if there are any disagreements. Repeat this process, making sure each team has an opportunity to answer the same number of questions. Mark a point for each correct answer. The team with the most points wins.

BRAIN BASICS! Graphic Organizer

ARTICLE TITLE & PAGE NUMBER	FACT OR DETAIL ABOUT THE BRAIN AND HOW IT WORKS

Q & A GRAPHIC ORGANIZER

Q: A:	Q: A:
Q: A:	Q: A:
Q: A:	Q: A:
Q: A:	Q: A:

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