

# muse®

## It Will Have Blood

The sight of blood might make us squirm, but it is an important liquid for life. Find out what scientists know about the amazing properties of blood.

### CONVERSATION QUESTION

What properties of blood are important for health?

### TEACHING OBJECTIVES

- Students will learn about the circulatory system and the properties of blood
- Students will learn about blood diseases
- Students will construct explanations
- Students will develop and use models
- Students will engage in argument from evidence
- Students will summarize key supporting details and ideas
- Students will evaluate policies intended to address social issues
- Students will write informative/explanatory texts to examine and convey complex ideas and information



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

### SELECTIONS

- **Secret Identity**  
Expository Nonfiction, ~1050L
- **The Motion of the Heart**  
Expository Nonfiction, ~1050L
- **Vampire Spiders**  
Expository Nonfiction, ~950L

## Secret Identity

### pp. 10–13, Expository Nonfiction

Use this article about the complex properties of blood to give students strategies for learning unfamiliar science information.



## RESOURCES

- Main Ideas & Supporting Details Worksheet

## OBJECTIVES

- Students will read and analyze a nonfiction science article
- Students will construct explanations
- Students will summarize key supporting details and ideas

## KEY VOCABULARY

- **microscopic** (p. 11) able to be seen only through a microscope
- **viscosity** (p. 11) the thickness of a liquid and its ability to flow
- **elasticity** (p. 11) how well something can return to its original shape or size after being stretched

## ENGAGE

**Conversation Question:** What properties of blood are important for health?

Ask students to make a list of the properties of blood they already know. Encourage them to extend their thinking beyond the color and consistency and include what they think blood does in the body. Explain that reading the article will help them gain more information and fill in some of the gaps in what they might already know.

## INTRODUCE VOCABULARY

Read the vocabulary words aloud. Have students skim page 11 to find the sentences where these words first appear. Then have students work in pairs to read for context clues to determine word meaning and discuss how these words relate to the topic of blood.

## READ & DISCUSS

Have students read the article with a partner. Then lead a class discussion based on the following prompts:

- What are some important properties of healthy blood?
- How are viscosity and elasticity important in blood?
- How does smoking affect blood?

Next, distribute a copy of the *Main Ideas & Supporting Details* worksheet to all students. Discuss the content of the article sections and help students come up with a main idea statement for each section. Tell students to write the main ideas next to the section headings on the worksheet. Then have students reread the article and record supporting details for each main idea they wrote.

## SKILL FOCUS: Constructing Explanations

**INSTRUCT:** Have students choose one of the article sections and become “experts” on the ideas it contains. Divide the class into small groups and have group members take turns explaining the main ideas and supporting details in their section so that others understand. Encourage students to enhance their explanations with visuals. Tell group members who are listening to come up with questions for the speaker.

**ASSESS:** Use a simple checklist assessment when observing the students give their explanations: Did they understand the material? Were they able to articulate the main idea and supporting details? Were they able to engage their audience? Were they able to answer questions?

## EXTEND

**Language Arts/Writing** Have students use details and ideas from the article to write a paragraph that answers the conversation question. Invite students to share their paragraphs with the class.

### Main Ideas & Supporting Details

Write a main idea for each section of the article. Then record supporting details for each of these main ideas.

#### “Looking Liquid, Acting Solid”

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

#### “It’s All About Rate”

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

#### “Keeping the Balance”

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

#### “When Things Go Wrong”

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## The Motion of the Heart

pp. 16–19, Expository Nonfiction

Students discover how early scientists learned about the circulatory system.

Use this article to help students understand the discovery of how the heart pumps blood throughout the body.



### OBJECTIVES

- Students will read and analyze a nonfiction science article
- Students will develop and use models
- Students will evaluate policies intended to address social issues

### KEY VOCABULARY

- **circulatory (p. 16)** the body system that involves the movement of blood through the body caused by the pumping of the heart
- **ventricle (p. 17)** one of two sections of the heart that pump blood out to the body
- **septum (p. 17)** a partition separating two chambers of the heart
- **arteries (p. 18)** tubes that carry blood from the heart to all parts of the body

### ENGAGE

**Conversation Question:** What properties of blood are important for health?

Have students find their pulse on their wrist to feel the pumping of their blood. Ask students to think about the muscle of their heart working day and night to keep their blood circulating. Then tell them that scientists continually add to the study and knowledge of the human body. Continue by explaining that in this article, students read about some of the earliest attempts to better understand how the heart and blood work within the body.

### INTRODUCE VOCABULARY

Explain that the vocabulary words are all part of the circulatory system. Have students write “Circulatory System” at the top of a piece of paper. Using the diagram on page 19, have students draw their own simplified diagram and label it with the vocabulary words.

### READ & DISCUSS

Have students read the article with a partner. Then lead a class discussion based on the following prompts:

- Why is it easier to study the circulatory system now than in the 1600s?
- What questions was William Harvey trying to answer?
- What knowledge changed because of his research?

### SKILL FOCUS: Developing and Using Models

**INSTRUCT:** Have students create and label a model of a human heart by following these steps:

1. List the parts of the heart as described in the article.
2. Create a diagram or 3-D model of the heart using the information from the article.
3. Label the diagram or model using the parts they included on their lists.

**ASSESS:** Have students take turns presenting their diagrams or models of the heart to a small group. Circulate as students present to determine their understanding of the heart and its parts.

### EXTEND

**Social Studies** Explain that medical science often uses animals for research. Ask students if they think this is ethical. Have students debate what constitutes ethics in medical research. Then have them conduct research to help them create a list of three ethical rules for the use of animals in research. Invite students to share their lists with the class.

## Vampire Spiders

pp. 20–23, Expository Nonfiction

A scary hairy spider who eats blood can actually be a person’s best friend! Use this article to examine evidence about how this species is beneficial to human health.



Lexile Score: ~950L

### OBJECTIVES

- Students will read and analyze a nonfiction science article
- Students will engage in argument from evidence
- Students will write informative/explanatory texts to examine and convey complex ideas and information

### KEY VOCABULARY

- **proboscis** (p. 21) a long, thin tube that forms part of the mouth of some insects
- **malaria** (p. 21) a serious disease that causes chills and fever and that is passed from one person to another by the bite of mosquitoes
- **parasite** (p. 22) an animal or plant that lives in or on another animal or plant and gets food or protection from it
- **perception** (p. 23) the way someone thinks about something

### ENGAGE

**Conversation Question:** What properties of blood are important for health?

Have students examine the photograph on the first page of the article. Ask students to describe the spider and their feelings toward it. Explain that they will be reading about a spider that eats human blood.

### INTRODUCE VOCABULARY

Read the vocabulary words aloud. Have students write the words and take their best guess at the definitions. Next, have students look up the words and write the correct definitions. Finally, tell students to look for these words as they read the article.

### READ & DISCUSS

After students have read the article, lead a class discussion based on the following prompts:

- What features of the vampire spider make it seem scary?
- What does the vampire spider need to survive?
- How is blood related to the disease known as malaria?
- How might the vampire spider be used to help people in areas where malaria is a problem?

### SKILL FOCUS: Engage in Argument from Evidence

**INSTRUCT:** Explain that science thinking requires us to look beyond our first impressions and that a creature that looks dangerous and scary—a vampire spider, for example—can in fact be very good for us. Create a T-chart on the board with the headings “How they help us” and “Why they seem scary.” Have students identify details from the article for each column. Record their responses.

**ASSESS:** Have students write a public service announcement (PSA) that explains why people should be kind to vampire spiders and not fear them. Tell students to include details from the article about the good things these spiders do for humans and about the ways in which the spider is harmless. Remind students to make their PSAs persuasive.

### EXTEND

**Language Arts** Have students conduct research to write a thorough answer to this question: *Why is malaria a problem in some regions of the world and not in others?* Invite students to share their responses.