

Muse®

The Science of Fear

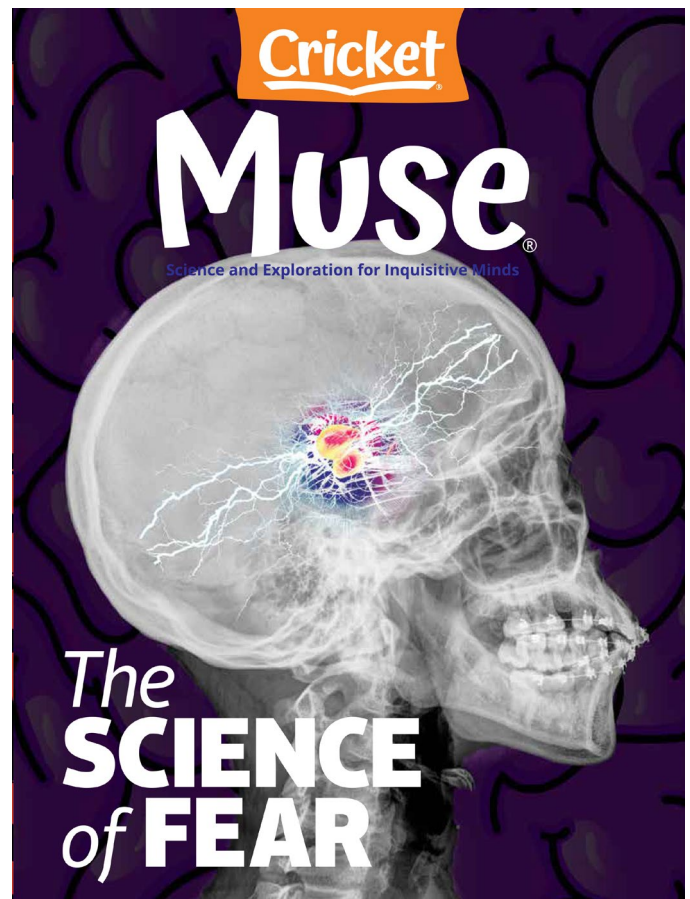
Although most people perceive fear as a negative emotion, it can be an essential response for self-preservation. This issue of MUSE teaches readers that a little fear can be a good thing.

CONVERSATION QUESTION

How are we affected by fear?

TEACHING OBJECTIVES

- Students will learn how the body instinctively prepares itself in the face of danger.
- Students will learn why fear is a good thing for animals and the environment.
- Students will learn how needle phobia differs from other fears and how it can be alleviated.
- Students will collect evidence from a nonfiction text.
- Students will construct explanations that illustrate the duality of human responses.
- Students will examine a problem-solution relationship.
- Students will use alliteration to create a tongue twister relating to a current topic.
- Students will research a specific phobia.
- Students will conduct research.



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

- **Freeze, Fight, Flee**
Expository Nonfiction, ~940L
- **The Fright Stuff**
Expository Nonfiction, ~1020L
- **Giving Fear the Flick**
Expository Nonfiction, ~1030L

Muse® Teacher Guide: October 2021

Freeze, Fight, Flee

pp. 14–16, Expository Nonfiction

Boo! Students will learn about the built-in response system our bodies employ when we face fear.



RESOURCES

Collecting Evidence: Fear Factors

OBJECTIVES

- Students will learn how the body instinctively prepares itself in the face of danger.
- Students will collect evidence from a nonfiction text.
- Students will use alliteration to create a tongue twister about a current topic.

KEY VOCABULARY

- **instinctive** (p. 15) based on feelings or desires that do not come from thinking or learning
- **cortisol** (p. 16) a hormone that helps the body respond to stress
- **dilate** (p. 16) to become wider or larger

ENGAGE

Conversation Question: How are we affected by fear?

Arrange a scenario in which the classroom is quiet, preferably with the lights off or low. Independent reading time is ideal. Create (or plan to have someone else create) a very loud sound. Encourage students to discuss their reactions. Then share what you observed. Make a T-chart listing the emotional and physical responses to the fright.

INTRODUCE VOCABULARY

Read the vocabulary words and definitions. Then display the sentences below and have students use the vocabulary words to complete them. Finally, remind students to look for the vocabulary words as they read.

1. When I saw the wasp, my _____ reaction was to run away.
2. _____ gives your body energy to fight a dangerous situation.
3. When your pupils _____ they change size and become bigger.

READ & DISCUSS

Have students reread the article in small groups to answer the questions below.

1. How does your body prepare you to protect yourself?
2. What is the function of the amygdala, and where is it located?
3. List three reasons why some animals rely on the “freeze” instinct for protection.
4. How do hormones assist your body in a fearful situation?
5. What benefits does extra oxygen provide for different body systems during a “flee” response?

SKILL FOCUS: Collecting Evidence

INSTRUCT: This article presents the reader with detailed information about the body’s three fear responses: freeze, fight, and flee. Present the *Collecting Evidence: Fear Factors* graphic organizer. Tell students they will be reviewing the article and highlighting sentences that describe each fear response. After they have collected this evidence, they will give personal examples related to each fear response.

ASSESS: Reconvene and share answers. Have students discuss how other emotions, such as embarrassment, can also cause physical responses.

EXTEND

Language Arts Review the definition of *alliteration*: the repetition of a consonant sound at the beginnings of words. Then have students notice the example of alliteration in the article title. Explain that tongue twisters often use alliteration. Have students identify alliteration in familiar tongue twisters (“Peter Piper picked a peck of pickled peppers...”). Next, assign students the task of creating a tongue twister relating to any topic they are studying. Invite students to share their tongue twisters with the class.

Fear Factors

Collecting Evidence In the top row of the organizer, use information from the article to describe each fear response. Include details about when each response is activated. In the bottom row, provide a real-life example of each response.

Response: Freeze	Response: Fight	Response: Flee
<p>Description:</p>	<p>Description:</p>	<p>Description:</p>
<p>Example:</p>	<p>Example:</p>	<p>Example:</p>

The Fright Stuff

pp. 18–23, Expository Nonfiction

Fear is a part of life; however, too much or too little fear can have devastating consequences. This article teaches readers how fear can be beneficial for animals and for the environment.



RESOURCES

Construct Explanations: You're Only Human

OBJECTIVES

- Students will learn why fear is a good thing for animals and the environment.
- Students will construct explanations that illustrate the duality of human responses.
- Students will research a specific phobia.

KEY VOCABULARY

- **marauder** (p. 20) one who roams from place to place in search of things to steal or attack
- **innate** (p. 20) existing from the time an animal or person is born
- **ornithologist** (p. 21) a scientist who studies birds

ENGAGE

Conversation Question: How are we affected by fear?

Pose the following question to students: “What are you afraid of?” Have students make a list and then invite them to share their answers. Compile a master list on the board. Use tally marks to indicate when an answer is repeated. Initiate a group discussion focusing on the top three fears. Ask students to consider if these fears are inborn, learned, or a combination of both. Tell students that they will be learning from fear experts when reading “The Fright Stuff.”

INTRODUCE VOCABULARY

Post and discuss the three vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following brainstorming directives, one at a time:

1. Discuss animals that are considered **marauders**. What are some examples of human marauders in history?
2. List three of your **innate** talents. How do you nurture these talents?
3. What locations would be conducive to an **ornithologist's** work?

READ & DISCUSS

Post and discuss the questions prior to reading. Read the article aloud, pausing when answers to the questions are revealed and encouraging students to elaborate.

1. Why is fearless the “new normal” for many raccoons?
2. What happens when an animal loses its appropriate fear of predators?
3. How is fearlessness related to fertility?
4. Why do certain birds lose their ability to fly as they evolve?
5. According to experts, why do humans instinctively fear darkness?

SKILL FOCUS: Construct Explanations

INSTRUCT: Students will construct explanations that illustrate the duality of emotional/biophysical human responses. Instruct pairs of students to study examples from the article that show how fear can be both good and bad for animals and the environment. Students will use critical thinking skills to explain this same paradox in humans.

ASSESS: Review the *Construct Explanations: You're Only Human* worksheet with the class. Ask students to discuss other emotions that can be both good and bad.

EXTEND

Science This article explains that a certain amount of fear helps us stay safe. Explain that when a fear is excessive, it is called a phobia. Have students use the internet to learn about different phobias. Tell them to choose one to study (no repeats) and then have them write a paragraph about it. Invite students to share their paragraphs with the class.

You're Only Human

Construct Explanations Explain how the responses listed in the organizer can be both harmful and helpful to the individual experiencing them. Give examples.

Emotional/Biophysical Human Response	When is this response bad?	When is this response good?
fear		
sorrow		
guilt		
curiosity		
pride		

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Giving Fear the Flick

pp. 30–33, Expository Nonfiction

We've all been told "you're just going to feel a small pinch" before receiving an injection. Students will learn how medical professionals use the power of the mind, careful wording, and purposeful distraction to comfort their needle-fearing patients.



RESOURCES

Problem and Solution: Just a Pinch

OBJECTIVES

- Students will learn how needle phobia differs from other fears and how it can be alleviated.
- Students will examine a problem-solution relationship.
- Students will conduct research.

KEY VOCABULARY

- **intravenous** (p. 31) entering the body through a vein
- **anesthesiologist** (p. 32) a physician who manages the medications and procedures used to reduce or eliminate a patient's ability to feel pain during surgery

ENGAGE

Conversation Question: How are we affected by fear?

Ask students to describe what they dislike most about going to the doctor. Then ask them if they think people avoid going to see a doctor because they fear getting a shot. Have students vote "yes" or "no" and tally the results. Then share this information from the article: "About one in four adults fear needles, and for some, their fear is so intense that they avoid going to the doctor at all." Discuss why this might be dangerous and how such fears could be alleviated.

INTRODUCE VOCABULARY

Point out that the average English word contains five letters. After discussing the definitions of the key words, guide students to notice that these words have 16 and 11 letters (big words). Have students create a T-chart using the words *intravenous* and *anesthesiologist* as the column headings. For each word, give them three minutes to form as many new words as they can using the letters in the word.

READ & DISCUSS

Post and discuss the questions prior to reading. Read the article aloud, pausing when answers to the questions are revealed and encouraging students to elaborate.

1. Describe the tactic that Dr. Cyna uses when he has a patient who is afraid of needles.
2. How is needle phobia different from other phobias?
3. How is real hypnosis less dramatic than what is seen in movies?
4. Why is word choice important with needle-fearing patients?
5. What is "switch-wire" imagery?

SKILL FOCUS: Problem and Solution

INSTRUCT: Tell students they will work in pairs to reread the article and highlight passages that depict how experts are trying to solve the problem of needle phobia. Distribute copies of the *Problem and Solution: Just a Pinch* and have students use it to record the problem-and-solution relationship from the article. Partners should discuss and amend their findings as they are completing their work.

ASSESS: Collect and review the completed worksheets.

EXTEND

Health Inform students that there are many science-based benefits of meditation. In addition to reducing stress, studies show that meditation strengthens the brain regions that lead to an improved capacity to memorize, store, and recall information. Suggest interested students learn more about meditation.

Just a Pinch

Problem and Solution Refer to the article to record and explain the three solutions that are helpful in addressing the problem of needle phobia.

How does each solution help alleviate the problem of needle phobia?		
Solution: Hypnosis	Solution: Distraction	Solution: Self-hypnosis