

Muse®

All the World's a Stage

We've all heard the common refrain "the show must go on!" This month's issue of MUSE brings students behind the stage curtain to learn how the performance arts use science to help make the show a spectacular success.

CONVERSATION QUESTION

What are the challenges of live performances?

TEACHING OBJECTIVES

- Students will learn about the special effects and illusions in the stage production of "Harry Potter and the Cursed Child."
- Students will learn why ballet requires an enormous amount of athleticism and artistry.
- Students will learn about the symptoms of and treatments for performance anxiety.
- Students will construct explanations.
- Students will collect evidence to support a claim.
- Students will examine solutions to a problem.
- Students will perform a simple magic trick.
- Students will learn to count to ten in French.
- Students will use a mathematical process to solve a theme-based word problem.



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

- **Something Magical**
Expository Nonfiction, ~1080L
- **Peak Performance**
Expository Nonfiction, ~1130L
- **Don't Let Stage Fright Steal the Spotlight**
Expository Nonfiction, ~880L

Something Magical

pp. 10–14, Expository Nonfiction

This article will cast a spell over students as they read about the magic that is part of the play “Harry Potter and the Cursed Child.” Readers will learn how it takes a team of professionals and a strong grasp of science to enchant an audience.



RESOURCES

- Construct Explanations: Stage Wizards

OBJECTIVES

- Students will learn about the special effects and illusions in the stage production of “Harry Potter and the Cursed Child.”
- Students will construct explanations.
- Students will perform a simple magic trick.

KEY VOCABULARY

- distorted** (p. 11) changed from the natural, normal, or original shape, appearance, or sound of something in a way that is usually not pleasing
- misdirection** (p. 14) the act of giving someone incorrect information

ENGAGE

Conversation Question: What are the challenges of a live performance?

Select a video clip of any Harry Potter movie to show the class. Then read a passage from the same book. Have students compare and contrast the audience’s experiences. Pose these questions: *Is it difficult to make a book come alive? Why or why not?* Inform students that they will be reading about a Harry Potter stage performance of “The Cursed Child.” Discuss the additional challenges faced when creating a live performance, especially one that includes such wonderful magic.

INTRODUCE VOCABULARY

Post and discuss the two vocabulary words and definitions. Have students Think-Pair-Share with a partner to follow these directives:

- How does your face look **distorted** when you use colored cellophane paper?
- Why might a magician use **misdirection** with the audience when performing a trick?

Tell students to highlight the key terms in the article.

READ & DISCUSS

Pose the following questions to prompt meaningful discussion. Students should use complete sentences and details to answer each question.

- Describe some of the special effects and illusions that can be seen in “Harry Potter and the Cursed Child.”
- What kinds of professionals make the magic in the play happen?
- List the awards won for the play’s brilliant stagecraft.
- What is the main difference between visual effects used in movies and those used on the stage?
- Besides science, what are other secrets to awesome special effects?

SKILL FOCUS: Construct Explanations

INSTRUCT: Advise students to review the article and to study the different special effects that are discussed. Distribute the *Construct Explanations: Stage Wizards* graphic organizer. Tell students they will use information from the article to complete the chart. Students will need to provide clear explanations of how the materials and science created magic.

ASSESS: Review the chart with the class. Have students share details about entertaining live performances they have seen.

EXTEND

Performing Arts: Have pairs of students use books and the internet to learn a basic magic trick. (Ex: sleight of hand, card tricks, spoon bending) Give students a few blocks of time during the week to gather materials, practice the trick, and then perform it for the class. Discuss techniques.

Stage Wizards

Constructing Explanations Gather information from the text to explain how each special effect is performed on stage.

Special Effect	Professionals Involved	Chemicals or Equipment Needed	How the Special Effect Was Created
fire			
flying			
fog			

Peak Performance

pp. 26–27, Expository Nonfiction

Ballet is a highly technical form of dance that requires extreme athleticism, as well as artistry. This article examines the new role that science is playing to keep dancers safe from injury and optimize their potential.



RESOURCES

- Collect Evidence: Power and Beauty

OBJECTIVES

- Students will learn why ballet requires an enormous amount of athleticism and artistry.
- Students will collect evidence to support a claim.
- Students will learn to count to ten in French.

KEY VOCABULARY

- pro prowess (p. 26)** skill or expertise in a particular activity or field
- synchroni synchronize (p. 26)** to cause to occur, move, or operate at the same time or rate
- profilin profile (p. 27)** making or giving a brief description that provides information about someone or something

ENGAGE

Conversation Question: What are the challenges of a live performance?

Ask students if they think that dance is a sport or an art form. Tally results. Then present this definition of *sport*: “an activity involving physical exertion and skill in which an individual or team competes against another or others for competition or entertainment.” After students complete the activities below, return to the question at the beginning of this paragraph. Have any opinions changed?

INTRODUCE VOCABULARY

Display the following statements and underline the key vocabulary terms. Review how to infer the meanings of new words by using context clues and background knowledge. Then have partners work together to determine the meaning of each word. Reveal definitions.

- Rob used his math pro prowess to win the Math Olympics contest.
- The dancers practiced leaping at the same time to synchroni synchronize their steps.
- The band leader is profilin profile each musician’s strength and talents so she knows how much they will need to practice.

Emphasize the key words in the reading.

READ & DISCUSS

Read the article aloud with the class. Have students reread the article in small groups to answer the questions below. Share responses.

- Why have many ballet dancers turned to sports science?
- Explain the process of becoming a ballet dancer.
- What physical and mental traits do you need to become a professional ballet dancer?
- How has the tradition of referring to ballet dancers as artists instead of athletes been detrimental to their well-being?
- How has the ballet world benefited from the use of science?

SKILL FOCUS: Collect Evidence

INSTRUCT: This article presents the reader with detailed information about the artistry and athleticism of professional dancers. Instruct students to review the article and highlight sentences that provide evidence to support each of the claims listed on the *Collect Evidence: Power and Beauty* organizer. They will record and cite the information.

ASSESS: Collect the worksheet to assess students’ ability to collect supporting evidence.

EXTEND

Foreign Language: Explain that the phrase “pas de-deux” means “a dance for two people.” Point out that *deux* is the French word for “two.” Teach students the numbers 1–10 in French. Use online sources to hear correct pronunciation. (1=un, 2=deux, 3=trois, 4=quatre, 5=cinq, 6=six, 7=sept, 8=huit, 9=neuf, 10=dix)

Power and Beauty

Collecting Evidence Gather evidence from the text to support each claim. Include details and examples. Cite your findings by using page numbers.

Claim: Professional ballet dancers have been paying a heavy price for pushing their bodies to the limit.

Supporting evidence (P.____)

Claim: Ballet dancers are not just artists; they are high-performing athletes.

Supporting evidence (P.____)

Claim: The healthcare team helps each dancer physically and psychologically prepare to meet their goals.

Supporting evidence (P.____)

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Don't Let Stage Fright Steal the Spotlight

pp. 36–39, Expository Nonfiction

Performance anxiety affects actors of all ages and experience levels. Readers will learn the physiology responsible for this condition and some remedies that can ease the condition.



RESOURCES

- Problem and Solutions: Fight the Fright

OBJECTIVES

- Students will learn about the symptoms of and treatments for performance anxiety.
- Students will examine solutions to a problem.
- Students will use a mathematical process to solve a theme-based word problem.

KEY VOCABULARY

- **jitters** (p. 38) feelings of extreme nervousness
- **chortling** (p. 38) laughing in a breathy, gleeful way
- **subdued** (p. 39) got control of something, such as a strong emotion

ENGAGE

Conversation Question: What are the challenges of a live performance?

Pose the following question to students: *What are most students afraid of?* Have students work in small groups to brainstorm a list of common fears. Invite groups to share their answers as you 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 about fear responses in “Don’t Let Stage Fright Steal the Spotlight.”

INTRODUCE VOCABULARY

Post and review the three vocabulary words and definitions. For each word, allow students to roll a die for vocabulary activities.

- 1 = Use the word in a sentence.
- 2 = Draw a picture of the word.
- 3 = List two antonyms for the word.
- 4 = List two synonyms for the word.
- 5 = Break the word into syllables and list the part of speech.
- 6 = Make a connection between the word and your life, a book, or a movie.

READ & DISCUSS

Reinforce comprehension of the concepts presented in the article by using the following questions to direct discussion:

1. What are the physical symptoms of stage fright?
2. Why do actors avoid discussing performance anxiety?
3. Explain the brain science behind stage fright. What roles do adrenaline and cortisol play?
4. How can short-term stress be useful?

SKILL FOCUS: Problem and Solutions

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that depict attempts to solve the primary problem in the article (a bout of stage fright). Distribute copies of the *Problem and Solutions: Fight the Fright* graphic organizer. Tell students they will be responsible for explaining each solution.

ASSESS: Have students peer-review the worksheet by sharing completed worksheets with another pair of students. Circulate as they discuss.

EXTEND

Mathematics: Page 37 of the article states, “One study showed that four-fifths of the actors interviewed had experienced at least one bout of ‘stage jitters.’” Use the R-D-W (Read-Draw-Write) process to solve the following word problems based on that fact:

A: If the show has 100 performers, how many of the actors had stage fright? (**Answer:** 80 performers)

B: If the show has 65 performers, how many of the actors did NOT have stage fright? (**Answer:** 13 performers)

Fight the Fright

Examine Solutions Reread the article and highlight passages that tell how the four techniques below can be helpful when facing stage fright. Use text details to explain each technique and how it helps performers.

How can these methods be useful for treating performance anxiety?

Exposure Therapy/Exposure Ladder:

Deep Breathing/Calming Techniques:

Practice:

Lucky Charms/Rituals: