Muse® Teacher Guide: November/December 2019

Three Cheers for Makers

Digital resources have provided new opportunities for curious scientists and eager inventors. This issue of MUSE showcases how inspired minds of all ages are using innovative technologies to make the world a healthier, more creative, and more tolerant place to live.

CONVERSATION QUESTION

How can we use technology to improve people's lives and solve problems?

TEACHING OBJECTIVES

- **Students will learn how the STOMP Troopers are involved in autism advocacy.**
- **Students will learn how three high school researchers are on the cutting edge of science.**
- **Students will learn about the processes used by students to solve scientific puzzles at the Museum of Natural History.**
- **Students will analyze information from a nonfiction text.**
- **Students will examine problem-and-solution relationships.**
- **Students will sequence and explain the process of digital fabrication.**
- **Students will conduct research to expand their knowledge of the holiday period of Mardi Gras.**
- **Students will demonstrate an understanding of the scientific method.**
- **Students will summarize the article using the literary device of alliteration.**

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

- **STOMP Troopers**

Expository Nonfiction, ~950L

- **A Future in the Making**

Expository Nonfiction, ~1150L

- **Digital Detectives**

Expository Nonfiction, ~950L

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STOMP Troopers

pp. 18–21, Expository Nonfiction

In a galaxy NOT so far away, STOMP Troopers are mentoring children and young adults on the autism spectrum. The common goal of these Star Wars enthusiasts is to create Storm Trooper–inspired costumes and to participate in a science fiction–themed Mardi Gras parade. Learn about the work behind the walk!

Lexile Score: ~950L

RESOURCES

- May the Force Be with You

OBJECTIVES

- Students will learn how the STOMP troopers are involved in autism advocacy.
- Students will analyze information from a nonfiction text.
- Students will conduct research to expand their knowledge of the holiday period of Mardi Gras.

KEY VOCABULARY

- ***inspired* (p. 19)** influenced, filled with an encouraging feeling
- ***lavish* (p. 20)** luxurious, elaborate
- ***mentor* (p. 19)** someone who teaches or gives help and advice to a less experienced and often younger person

ENGAGE

Conversation Question: How can we use technology to improve people's lives and solve problems?

Have students share experiences from a time when they dressed in costume to attend an event. (Halloween, class play, etc.) Focus the conversation to address the mental and physical preparations that were necessary. Discuss why this could be more challenging for a person with autism. Introduce the article.

INTRODUCE VOCABULARY

Review the key vocabulary with the class. Guide students to notice that they are all two-syllable words that are different parts of speech (*inspired*: v, *lavish*: adj, *mentor*: n). Have students divide a piece of paper into three columns with the following headings: Two-syllable nouns/Two-syllable verbs/Two-syllable adjectives. Instruct the class to properly partition each key term into syllables and place it in the correct column. As a post-reading activity, have the students search the article for other theme-related words that they can add to each column.

READ & DISCUSS

Read aloud the following questions prior to reading the text. Advise the students to note where in the article these answers are found. Discuss answers to these questions as a post-reading activity.

- Who are the STOMP Troopers?
- What is MakerSpace?
- How are the STOMP Troopers involved in autism advocacy?
- What is the role of Preservation Hall in the parade?

CONCEPT/SKILL FOCUS: Analyzing Information

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that depict the physical preparation needed to participate in the parade and underlining the passages discussing the mental preparations. Distribute the graphic organizer, *May the Force Be with You*, and tell students that they will be responsible for analyzing information from the article and recording it accurately on their charts.

ASSESS: Review as a whole class and direct students to make any necessary corrections or amendments to their work.

EXTEND

Social Studies The textbox on the bottom of page 20 provides basic information regarding the holiday period of Mardi Gras. Have students fold a large piece of paper into thirds and create a K-W-L (Know-Want to know-Learned) chart with the subject title, "Mardi Gras." Allow students to work together to research and share information.

Analyze Information

May the Force Be with You

Use information from the article, "STOMP Troopers," to analyze the physical and mental preparations that the participants must undertake in order to create a successful parade experience.

Physical Preparations	Mental Preparations

What things do **YOU** do to prepare mentally and physically for a big event?

_____

_____

_____

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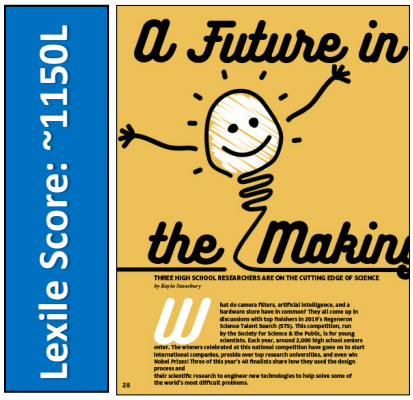
A Future in the Making

pp. 28–31, Expository Nonfiction

Students will be impressed by the scientific accomplishments exhibited by the top finishers of the Regeneron Science Talent Search. This article shares the work of three of this year's impressive finalists.



RESOURCES

- Science Superstars

OBJECTIVES

- Students will learn how three high school researchers are on the cutting edge of science.
- Students will examine problem-and-solution relationships.
- Students will demonstrate an understanding of the scientific method.

KEY VOCABULARY

- ***collaborating* (p. 29)** working with someone to produce or create something
- ***hybrid* (p. 31)** composed of mixed parts
- ***simulation* (p. 30)** imitation of a situation or process
- ***swarming* (p. 30)** moving in or forming a large or dense group
- ***thermodynamics* (p. 31)** branch of science that deals with the relations between heat and other forms of energy

ENGAGE

Conversation Question: How can we use technology to improve people's lives and solve problems?

Model simple problem-and-solution relationships and then have students complete the examples with the omitted problems (P) or solutions (S). Challenge them to create their own. Answers may vary.

P: My pencil point broke.	S:
P: I missed the bus.	S:
P:	S: I cleaned it up.
P:	S: I took a nap.

INTRODUCE VOCABULARY

Invite pairs of students to find definitions for the key vocabulary terms. Then post the definitions provided so that students may check their work for accuracy. Student pairs will choose an additional ten science words from the article. They will then create a word search puzzle using all 15 words. Share the puzzles with another class for use as a prereading exercise for this article.

READ & DISCUSS

Pose the following questions to the students to facilitate meaningful discussion following the reading of the article.

- What is the Regeneron Science Talent Search?
- Why would a scientist need to conduct a simulation?
- How does a scientist create a prototype?
- What do all of these young researchers have in common?

CONCEPT/SKILL FOCUS: Problem and Solution

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that depict how the young scientists in this article investigated solutions to a specific problem. Distribute copies of the graphic organizer, *Science Superstars,* and tell students that they will be responsible for recording the problem/solution relationships from the article. Pairs should discuss their findings as they complete their work and make changes as necessary.

ASSESS: Review the information that the students listed on their charts. Evaluate the thoroughness and accuracy of their statements.

EXTEND

Science Take this opportunity to review the scientific method. (Observe, Form Question, Form Hypothesis, Conduct Experiment, Draw Conclusion) Instruct students to discuss each step in relation to the projects studied in the article. In addition, have them connect this process to your current science curriculum.

Science Superstars

Use information from the article, "A Future in the Making," to explain the problems that these three young scientists set out to solve.

Student Scientist	Problem What is the objective of the research?	Solution What steps has the researcher taken toward the solution?	Goal Why does the scientist want to solve this problem?
Eshika Saxena			
Grace Cai			
Justin Schiavo			

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Digital Detectives

pp. 33–35, Expository Nonfiction

Join these young Digital Detectives in solving scientific puzzles. Students will learn how campers at the American Museum of Natural History assembled evidence, asked questions, and used their research to identify a particular dinosaur species.

RESOURCES

- 3D Dino Detectives

OBJECTIVES

- Students will learn about the processes used by students to solve scientific puzzles at the Museum of Natural History.
- Students will sequence and explain the process of digital fabrication.
- Students will summarize the article using the literary device of alliteration.

KEY VOCABULARY

- ***artifact* (p. 34)** an object remaining from a particular time period
- ***fabrication* (p. 34)** construction, the method by which something is created
- ***minute* (p. 34)** very small
- ***precise* (p. 35)** exact, accurate

ENGAGE

Conversation Question: How can we use technology to improve people's lives and solve problems?

Give each student the name of a specific dinosaur. Review the rules of "20 Questions." (Players may ask up to 20 yes/no questions to help them guess the name of the dinosaur. Ex: Is it a carnivore? Does it have plates?) Have students take turns being the questioner and the responder.

INTRODUCE VOCABULARY

List the key words on the board and have students share their ideas about the meanings. Inform the class that they will encounter these words in their reading, and challenge them to predict the content of the article. Then post the definitions and distribute the article, "Digital Detectives." Read aloud and revisit predictions.

READ & DISCUSS

Reinforce the concepts presented in this article by using the following questions to facilitate meaningful conversation.

- Explain the unique program, "Capturing Dinosaurs."
- How did the student-scientists try to figure out what type of dinosaur they were working with?
- Why did the students take tours of the museum's Dinosaur Hall?
- How are 3D printers different than inkjet printers?
- Which museum resource do you think was the most useful for the students? Why?

CONCEPT/SKILL FOCUS: Sequence and Process

INSTRUCT: Review the article. Elicit from students that the museum campers followed the scientific process with the aid of amazing museum resources to identify and digitally fabricate a specific dinosaur species. Distribute the *3D Dino Detectives* graphic organizer and instruct students to refer back to the text and to properly sequence and explain each step. Their finished work will summarize the systematic research of participants in the "Capturing Dinosaurs" program.

ASSESS: Circulate as students are working on the chart and discuss the information in the article. Direct students having difficulty with the sequencing process to reread the text with a partner.

EXTEND

Language Arts Review the literary device of the alliteration (the occurrence of the same letter or sound at the beginning of adjacent words). Challenge students to summarize the article using as many alliterative phrases as they can. (Ex: Digital Detectives, Student Scientists, etc.) Invite them to share their summaries aloud.

Sequence and Process

3D Dino Detectives

Use information from the article, "Digital Detectives," to explain how the students used museum resources to identify and digitally fabricate the specific dinosaur that they were studying.

Step 1

Step 2

Step 3

Step 4

Step 5

Positive Dinosaur Identification