Spider® Teacher Guide: March 2022

Spider®

THEME

From wormholes to pollinators, science topics are woven into the selections in this issue of *Spider*. Use the stories and articles to teach language arts lessons and engage students in creative science activities.

CONVERSATION QUESTION

How do different authors write about science?

TEACHING OBJECTIVES

- **Students will recognize the genre and key elements of literary texts.**
- **Students will analyze how individuals, events, and ideas develop and interact.**
- **Students will conduct short research projects.**
- **Students will write narratives to develop real events.**
- **Students will plan a pollinator garden.**

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

SELECTIONS

- **Galileo**
  Science Fiction, ~720L
- **A Queen in Space**
  Narrative Nonfiction, ~920L
- **Truman's Last Chance**
  Contemporary Realistic Fiction, ~620L

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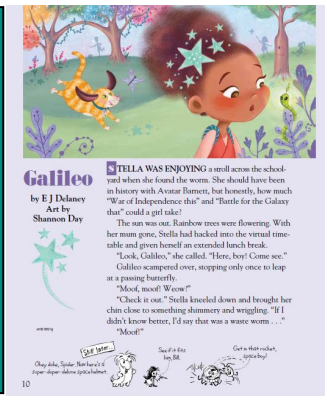
Galileo

pp. 10–15, Science Fiction

Teach students the elements of science fiction using this story about a girl who finds a mysterious worm.

Lexile Score: ~720L



Galileo

by E J Delaney
Art by Shannon Day

STELLA WAS ENJOYING a stroll across the schoolyard when she found the worm. She should have been in history with Avatar Barnett, but honestly, how much "War of Independence this" and "Battle for the Galaxy that" could a girl take?

The sun was out. Rainbow trees were flowering. With her mum gone, Stella had hacked into the virtual timetable and given herself an extended lunch break.

"Look, Galileo," she called. "Here, boy! Come see."

Galileo scampered over, stopping only once to leap at a passing butterfly.

"Moof, moof! Weow!"

"Check it out." Stella kneeled down and brought her chin close to something shimmery and wriggling. "If I didn't know better, I'd say that was a waste worm . . ."

"Moof!"

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RESOURCES

- Elements of Science Fiction

OBJECTIVES

- Students will read and analyze a science fiction story.
- Students will recognize the genre and key elements of literary texts.
- Students will conduct short research projects.

KEY VOCABULARY

- **hacked (p. 10)** secretly gained access to the files on a computer or network
- **virtual (p. 10)** existing or occurring on computers or on the internet
- **detoured (p. 12)** forced to take an alternate route; went a way that is different from the usual way
- **pulsating (p. 13)** making strong and regular beats, sounds, or flashes

ENGAGE

Conversation Question: How do different authors write about science?

Write the term "science fiction" on the board in the center of a web diagram. Ask students to describe what science fiction is, and record accurate responses in the diagram. Help students recognize that authors of science fiction stories use scientific concepts as an important part of their plots. Then ask students to name science fiction movies and books. Introduce them to "Galileo" as an example of this genre.

INTRODUCE VOCABULARY

Display the vocabulary words and read them aloud, along with the 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 the story.

1. A tree had fallen on the road, so the driver _____ around it.
2. The science museum's website gives a _____ tour of its exhibits.
3. At the roller rink, bright lights were _____ to the music's beat.
4. A thief _____ into the bank's computers and stole money.

READ & DISCUSS

After students read the story, use these questions to prompt discussion:

1. In what ways is Stella similar to real-life students?
2. Why does Galileo say "moof" and "weow"?
3. Why is Stella worried when she finds the waste worm?
4. What is inside the bottle tree?
5. How does the star sparrow make the story suspenseful?
6. How is Galileo important in the story?

SKILL FOCUS: Elements of Science Fiction

INSTRUCT: Challenge students to identify some characteristics of science fiction. Then display and review the following list:

- The **setting** is usually in the future—on Earth, another planet, or outer space.
- The **characters** may be a mix of regular people, aliens, robots, and mutant or futuristic beings.
- The **plot** usually incorporates real or imaginary scientific developments and their effects on humans.

Invite students to give examples of these elements from the story or from other science fiction narratives they know.

ASSESS: Distribute the *Science Fiction* worksheet and have students work independently to complete it.

EXTEND

Science Have students conduct research to discover the real science behind one of the story's science fiction details. Choices include virtual reality, holograms, wormholes, spaceships, and hacking.

Elements of Science Fiction

In the first chart, note science fiction details from the story. In the second chart, note realistic details from the story.

Elements of Science Fiction

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Realistic Details from the Story

Setting	Characters	Plot

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A Queen in Space

pp. 21–24, Narrative Nonfiction

Review cause-and-effect relationships using this narrative nonfiction article about honeybees that traveled to space in a shuttle.

RESOURCES

- Cause-Effect Relationships

OBJECTIVES

- Students will read and analyze a science article.
- Students will analyze how individuals, events, and ideas develop and interact.
- Students will write narratives to develop real events.

KEY VOCABULARY

- ***colony*** **(p. 21)** a group of plants or animals living or growing in one place
- ***honeycomb*** **(p. 21)** a group of wax cells with six sides that are built by honeybees in their hive and that contain young bees or honey
- ***shuttle*** **(p. 22)** a spacecraft that can be used more than once and that carries people into outer space and back to Earth

ENGAGE

Conversation Question: How do different authors write about science?

Display these two book titles as column headings: *The Moon Queen Invades Earth*, *NASA's First Mission to the Moon*. Point out that both titles tell about the moon. Ask which book is probably fiction and which is nonfiction. Discuss what students would expect to read about the moon in each book (setting for a made-up story; historical event). Note students' responses in the chart. Then have students preview the photos included with "A Queen in Space." Ask them whether they expect to read a story or a factual article.

INTRODUCE VOCABULARY

Display and read aloud the vocabulary words and definitions. Then have students work in pairs to write sentences that use the words correctly. Have partners share their sentences with other pairs. Then remind students to look for these words as they read the story.

READ & DISCUSS

Have students read the article. Then use these questions for discussion:

1. Which elements of fiction are included in this article?
2. How did having a bee character for a narrator affect the article?
3. What did Dan Poskevich want to learn about the bees?
4. How were the Bee Enclosure Modules important?
5. Why do you think one group of bees was sent into space and one was kept on the ground?
6. What did scientists notice about the space colony's honeycomb?

SKILL FOCUS: Cause-Effect Relationships

INSTRUCT: Explain that events may be related by cause and effect. The first event—the cause—tells why something happened. The second event—the effect—tells what happened. List the following events on the board and have pairs of students discuss possible causes and effects: You overslept on a school day. You forgot to turn in a permission slip. You ate too much pizza. Invite pairs to share their ideas. Then explain that events in a science article are often related by cause and effect.

ASSESS: Distribute the *Cause-Effect Relationships* worksheet to students. Have them work in groups to identify and record cause-effect relationships in the article. Discuss responses as a class.

EXTEND

Science Have students conduct research to learn about the leafcutter bees that went to the space station in 2018. Students can use the 5Ws and How-To charts to take notes on this event. Then have them write a short article about the event from the perspective of a great-great grandchild of one of the bees, using "A Queen in Space" as a model. Remind students to include factual information in their articles. Invite students to share their work with the class.

Cause-Effect Relationships

Complete the cause-effect relationships shown in the chart below. Use information from "A Queen in Space" to help you identify causes and effects.

Cause	Effect
	Engineers built Bee Enclosure Modules for the bees on the shuttle.
Flowers did not grow on the shuttle.	
	Bee food floated around the shuttle in little droplets.
The bees experienced microgravity.	
NASA sent a colony of bees into space.	

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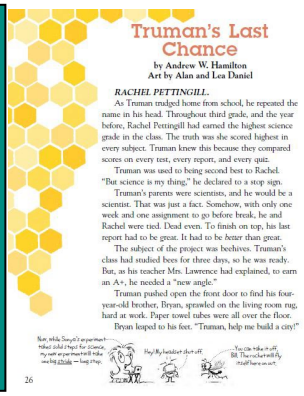
Truman's Last Chance

pp. 26–30, Contemporary Realistic Fiction

Review conflict and resolution using this story about a boy who struggles to come up with a great science project.

Lexile Score: ~620L


Truman's Last Chance

by Andrew W. Hamilton
Art by Alan and Lea Daniel

RACHEL PETTINGILL.

As Truman trudged home from school, he repeated the name in his head. Throughout third grade, and the year before, Rachel Pettingill had earned the highest science grade in the class. The truth was she scored highest in every subject. Truman knew this because they compared scores on every test, every report, and every quiz.

Truman was used to being second best to Rachel. "But science is my thing," he declared to a stop sign.

Truman's parents were scientists, and he would be a scientist. That was just a fact. Somehow, with only one week and one assignment to go before break, he and Rachel were tied. Dead even. To finish on top, his last report had to be great. It had to be better than great.

The subject of the project was beehives. Truman's class had studied bees for three days, so he was ready. But, as his teacher Mrs. Lawrence had explained, to earn an A+, he needed a "new angle."

Truman pushed open the front door to find his four-year-old brother, Bryan, sprawled on the living room rug, hard at work. Paper towel tubes were all over the floor.

Bryan leaped to his feet. "Truman, help me build a city!"

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RESOURCES

- Conflict-Resolution

OBJECTIVES

- Students will read and analyze a short story.
- Students will analyze how individuals, events, and ideas interact.
- Students will plan a pollinator garden.

KEY VOCABULARY

- ***sprawl* (p. 26)** to lie or sit with your arms and legs spread wide apart
- ***scatter* (p. 27)** to place far apart
- ***fragile* (p. 28)** easily broken or damaged
- ***suspected* (p. 29)** thought that something was true

ENGAGE

Conversation Question: How do different authors write about science?

Have students preview the title and illustrations for this story. Then have them work in pairs or small groups to predict something that will happen in the story and how science will be part of the story. Invite students to share their predictions. Remind them to revisit their predictions after reading the story and compare the predicted events with the actual events.

INTRODUCE VOCABULARY

Display and read aloud the vocabulary words and definitions. Have students work in groups of four to write sentences using these words, with each group member responsible for a different word. Have groups review their sentences and confirm that the words are used correctly. Invite students to share, then tell them to circle these words in the text.

READ & DISCUSS

After students read the story, use these questions to prompt discussion:

1. What is Truman's goal?
2. How does Truman feel about Rachel Pettingill?
3. How does Bryan feel about Truman?
4. How does Bryan help Truman?
5. Find phrases showing that Truman is anxious about his project.
6. Why do Bryan and Truman get upset with each other?
7. How do Truman's feelings change over the course of the story?
8. Is Truman a good big brother? Explain.

SKILL FOCUS: Conflict and Resolution

INSTRUCT: Remind students that most stories center around a conflict or problem that the characters face. Discuss conflicts in familiar stories and movies. Then explain that the conflict in a story usually changes and gets more complicated before it is resolved. Choose one of the stories or movies students mentioned and discuss how the conflict in it changes and then is resolved. Next, read aloud magazine page 26 and discuss the conflict that emerges on this page.

ASSESS: Distribute the *Conflict-Resolution* organizer to students. Review the directions and have students work in pairs to complete it. Finally, have pairs discuss and identify the climax in the story.

EXTEND

Science Explain that pollinators are insects and animals that help spread pollen among flowers, which leads to fertilization and the development of seeds and fruits. Have students conduct research to plan a pollinator garden. Students will need to find out about native plants that will attract bees and/or butterflies. Then they can draw a garden and fill it with four or five different plants. Have students label their plants and the pollinators that will be attracted to them.

Conflict-Resolution

- In the **first box**, describe the conflict you learn about on page 26 of the story.
- In the **second box**, tell how this conflict changes and gets worse.
- In the **last box**, explain how the conflict is resolved.

What conflict is introduced on page 26?	How does the conflict become more difficult?	How is the conflict resolved?

Think About It: The climax of a story is the most exciting moment in the story. What is the climax of this story?