

TEACHER'S GUIDE



Trailblazer

April 2016

In This Guide

In this guide, you will find language arts and science lessons for the stories in the April issue of EXPLORER TRAILBLAZER.

Explorer Magazine

EXPLORER magazine is a classroom magazine specifically written for each grade, 2-5. Each grade's magazine contains a grade-appropriate reading experience, develops literacy skills and teaches standards-based science content. Great storytelling and stunning photographs teach your students about our planet and the people, plants, and animals that live on it. Use EXPLORER in your classroom to encourage students to explore our world and make it a better place.

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Fantastic Flier

LANGUAGE ARTS

Objectives

- Students will identify the main topic of the text and of specific paragraphs within the text.
- Students will explain concepts based on information in the text.

Resources

- Vocabulary Assessment Master (page 6)
- Language Arts Assessment Master (page 7)

Summary

- The article “Fantastic Flier” introduces students to the rufous hummingbird, a tiny bird that makes one of the longest migratory journeys of any bird in the world, as measured by body size.

BUILD VOCABULARY AND CONCEPTS

- **adaptation**
- **migration**
- **torpor**

Display the vocabulary words on a word wall or on the whiteboard. Say the words aloud and invite students to share what they know about each.

Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to write each word and its definition on their papers. Then have students draw a picture to remind themselves of what each word means.

When students are finished drawing their interpretations of individual words, discuss with the class how the words could be related to a hummingbird. Then challenge students to sketch a larger picture showing how the three items are related in that context. Instruct students to label each item in their drawings.

READ

Give students a few minutes to scan the article in their magazines. **Ask:** *What do you think this article is about? Why?* Encourage students to share their ideas with the class.

Explain to students that what they just attempted to identify was the main idea of the article. Tell students that the main idea is the main topic. Everything in the article is connected to the main idea. Point out that paragraphs have a main idea, too. Everything in a paragraph is connected to its main idea.

Display pages 2-3 of the projectable magazine. Model how to identify the main idea of the article. **Say:** *When I look at these pages, I notice two things right away: the photo and the headline. The photo tells me that this article is about hummingbirds. The headline tells me that this bird is a fantastic flier. If I read the subhead, I get another clue. Apparently this little bird goes on an amazing journey. Point out the comprehension strategy in the upper right corner of the screen. Read it aloud. **Say:** *Sometimes you have to search for the best clues. After reading this, I know exactly what this article is about. This article will tell me about the amazing journey this hummingbird completes when it migrates.**

Have students read the article in small groups. As students read, encourage them to search for details that support the main idea of the article.

Fantastic Flier

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about the rufous hummingbird's migration.

Ask: *Where did the bird's journey start?* (Alaska) *Where did it end?* (Mexico) *Why is this migration so amazing?* (It's one of the longest migrations of any bird on Earth.) Invite students to identify specific things the bird did along the way.

- **Identify Main Ideas** Remind students that the article has a main idea. But paragraphs have main ideas, too. Explain that they can find the main idea of a paragraph the same way they found the main idea of the article. They must search for important clues. Give each student a copy of the **Language Arts Assessment Master**. Instruct students to write the main idea of the article in the middle circle. Then have them select four more paragraphs in the article. Challenge them to write the main idea of each. Encourage students to turn and talk to analyze and compare results. Challenge them to recognize how the main idea of each paragraph ultimately supports the main idea of the text.

- **Explain Concepts** After reading the article, **say:** *One way to see if you understand information is to try to tell someone else about the topic. If you can't explain the concept, you might need to read the article again.* Have students turn and talk to explain to a partner how why the rufous hummingbird completes this lengthy migration. Prompt discussion with questions such as: *Why do these birds fly to Alaska in the summertime?* (The weather is mild and food is plentiful.) *Why do they fly to Mexico for the winter?* (It's too cold in Alaska in the winter and there is no food.) *How do the birds get food as they make their journey?* (They visit patches of flowers along the way. They drink nectar from the flowers. That gives them energy.)

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *What is a migration?*
- *What does the rufous hummingbird do before it leaves for Mexico?*
- *What surprised you about what you read?*

Fantastic Flier

SCIENCE

Objectives

- Students will recognize that the rufous hummingbird makes one of the longest migratory journeys of any bird in the world.
- Students will understand how the rufous hummingbird's wings allow it to fly in many different ways.

Resources

- Content Assessment Master (page 8)
- Comprehension Check (page 9)

Science Background

Rufous hummingbirds are brightly colored birds. The male has brilliant orange feathers. Females are green and orange. They have been described as the feistiest hummingbirds in North America.

These slender, little birds—which measure between 8-9 cm (3.2 - 3.7 in) long—don't hesitate to fight off other birds twice their size. They will even chase away a curious chipmunk.

It takes bravado like that to accomplish everything this little bird does. The rufous hummingbird can beat its wings up to 62 wing beats a second. And it has an amazing memory.

But its biggest achievement, by far, is the annual solo migration it completes from Alaska to Mexico. The one-way journey is 5,600 kilometers (3,900 miles) long. If you break that down by body lengths, the rufous hummingbird has the longest migration of any bird on Earth.

Once a female arrives at the desired location, she starts building a nest. When finished, the nest will be 5 cm (2 in) wide. She builds it out of soft plants held together with spider webs. As a final touch, she decorates her nest with lichen, moss, and bark. This camouflages the nest and keeps it hidden from predators.

ENGAGE

Tap Prior Knowledge

Ask students if they've ever seen a hummingbird. Have them describe what the hummingbird looked like and what it was doing. Guide students as they compare hummingbirds to other birds they've seen.

EXPLORE

Preview the Lesson

Display pages 2-3 of the projectable magazine. Tell students to examine the photo and describe the hummingbird. Invite a volunteer to read aloud the headline and subhead. **Ask:** *According to the headline, this hummingbird is fantastic flier. What about the picture helps you see that?* (Students may note that the wings are blurred, which indicates that they are beating very quickly.) *Based on the subhead, why does this hummingbird need to be a fantastic flier?* (It completes a long-distance journey.) As a class, brainstorm ideas about where the hummingbird might be traveling and why.

Set a Purpose and Read

Have students read the article in order to recognize that the rufous hummingbird makes one of the longest migratory journeys of any bird in the world and to understand how the hummingbird's wings allow it to fly in many different ways.

EXPLAIN

Following the Rufous Hummingbird

Display page 5 of the projectable magazine. Have students identify the countries labeled on the map. Explain that the line of blue arrows shows the route the rufous hummingbird takes when it migrates. **Say:** *The journey doesn't look very long on this map, but it's actually more than 5,600 kilometers long.* Have students compare that distance to long trips they've taken. Give each student a copy of the **Content Assessment Master**. Have students draw arrows to show the rufous hummingbird's route. Then have them label the three countries, two oceans, and landmarks such as states, mountains, and rivers that the bird passes as it completes its migration.

Fantastic Flier

SCIENCE

EXPLAIN

(continued)

Understanding How Hummingbirds Fly

Display the diagram at the bottom of pages 6-7 in the projectable magazine. Explain to the class that hummingbirds are such amazing fliers because their wings can move in many different ways. Point out that people do this same thing with their arms when they swim. Zoom in on the first illustration. Discuss how the bird is moving its wings. Invite a volunteer to move his or her arms to demonstrate. Examine the other illustrations in this same way. Discuss how being able to rotate the wings 180° helps hummingbirds survive when they migrate.

ELABORATE

Find Out More

Remind students that the article describes the rufous hummingbird's migration from Alaska to Mexico. Point out, however, that this is an annual trip. Each spring, the hummingbird flies from Mexico to Alaska to reach its breeding grounds. Instruct students to conduct research to learn about this trip. What happens along the way, and what happens when the hummingbird reaches its destination?

Extend Your Thinking About Hummingbirds

Display page 9 of the projectable magazine. Remind students that there are many different kinds of hummingbirds. Invite volunteers to read aloud the information to learn about the four species shown here. Discuss how adaptations help each bird survive. Then instruct students to conduct research to find out if these hummingbirds migrate. If so, where do they go and how long is the trip?

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *What do rufous hummingbirds do when they hover?* (They drink nectar from flowers.)
- *Why do they have such great memories?* (They have large brains.)
- *What happens to their heartbeats when they go into torpor?* (It drops by 50 beats a minute.)

If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article.

Name _____

Date _____

VOCABULARY ASSESSMENT : Fantastic Flier

Write each word and its definition. Draw a small picture to show what each word means. Draw a larger picture to show how the words are related to a hummingbird. Label each word in your sketch.

Word	Definition	Picture	Larger Picture

Name _____

Date _____

LANGUAGE ARTS ASSESSMENT: Fantastic Flier

Write the main idea of the article in the middle circle. Pick four paragraphs. Write the main idea of each.

The graphic organizer consists of five ovals. A large central oval is connected to four smaller ovals arranged around it. Each oval contains five horizontal lines for writing.

CONTENT ASSESSMENT: Fantastic Flier

Draw arrows to show the rufous hummingbird's migration route. Label the countries, oceans, and important landmarks the bird passes on its way.



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COMPREHENSION CHECK: Fantastic Flier

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. What is an adaptation?
A a behavior that helps an animal survive
B a regular move from one region or climate to another
C a deep sleep
2. What is torpor?
A the ability to fly backward
B a deep sleep
C a sweet flower
3. In which country does the rufous hummingbird live during summer?
A Canada
B the United States
C Mexico
4. In which country does the rufous hummingbird live during winter?
A Canada
B the United States
C Mexico

5. Tell how a hummingbird's wings move when it hovers.

A Star Is Born

LANGUAGE ARTS

Objectives

- Students will predict definitions and then write sentences to better understand unfamiliar words.
- Students will identify the main topic of a text.
- Students will recount key details and explain how they support the main idea.

Resources

- Vocabulary Assessment Master (page 14)
- Language Arts Assessment Master (page 15)

Summary

- The article “A Star is Born” invites students to explore space to learn how gravity forms new stars.

BUILD VOCABULARY AND CONCEPTS

- atom
- constellation
- dense
- gravity
- molecule

Give each student a copy of the **Vocabulary Assessment Master**. Point out to students that they may have heard some or all of these words before.

Assign each student a partner. Using their prior knowledge as a base, instruct pairs to predict and write a definition for each word. Then have them write a sentence using each word, based on the definitions they wrote.

Display the Wordwise feature on page 15 of the projectable magazine. Review the definitions as a class. Have students add these definitions to their worksheets. Instruct them to write new sentences, using each word as it is defined in the article.

Invite volunteers to read aloud the before and after sentences they wrote for each word. As a class, examine how new knowledge contributed to students' understanding of each word.

READ

Let students know that the purpose of this article is to examine what happens when a star is born. As they read, they will learn about different objects in space and how they are involved in this process.

Tell students that identifying the main idea of an article is important because the main idea tells readers what the article is about. To identify the main idea, they must search for clues. **Say:** *The most obvious place to find a clue is the article's headline. Sometimes it tells you exactly what the article is about. Other times it doesn't. When that happens, you have to search for more clues.*

Inform the class that good readers search for clues in the subhead, section heads, photos, and captions. If the article has a diagram or sidebar, those text elements can help, too. **Say:** *Articles are full of information. But some details are more important than others. These are the key details. Key details always support the main idea. They are the best clues to use when you're trying to figure out the main idea of the article.*

Give each student a copy of the **Language Arts Assessment Master**. Instruct students to read the article on their own. As they do, encourage them to record important details in each section of the article. After reading, instruct students to use the details they collected to identify the main idea of the article. Challenge them to explain how the key ideas in each section supported the main idea if the article.

A Star Is Born

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about how a star is born. **Ask:** *Where in space does a star form?* (in a cloud called a nebula) *Could a star form in a cloud that wasn't dense?* (no) *Why not?* (Only dense clouds have enough matter for a star to form.) Encourage students to share other interesting facts they learned about the formation of stars.

- **Identify the Main Idea** Remind students that the main idea is the topic, or what something is about. The article has a main idea. Each section has a main idea, too. Have students share their **Language Arts Assessment Masters** in small groups. Encourage them to compare the main ideas they recorded for each section and for the article itself. Did they record the same main ideas? If not, have groups re-read the article so they can come up with a common response.

- **Support the Main Idea** Remind students that key details are important details in a text. They support the main idea of the text. Have students share their **Language Arts Assessment Masters** in small groups. Encourage groups to analyze the reasons they recorded for how each key detail supports the main idea of the article.

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *What is a molecule?*
- *Which kind of space cloud will collapse to make a star?*
- *What surprised you about what you read?*

A Star Is Born

SCIENCE

Objectives

- Students will recognize that stars form in space clouds called nebula.
- Students will understand the role of gravity in star formation.
- Students will identify connections between constellations and star formation.

Resources

- Content Assessment Master (page 16)
- "Constellations" poster (Teacher's Edition)

Science Background

When you look up at the night sky, it's hard to miss the stars. They shine and they twinkle. It's easy to imagine that they'll be there forever. But like everything else in the universe, stars have a life cycle. They are born and they die.

A star is born in a cloud of dust called a nebula. There are nebulae scattered throughout most galaxies. When enough gases and dust collect, the gravitational attraction becomes too great. This causes the cloud to collapse upon itself.

As the cloud collapses, it shrinks and starts to spin. The material in the center of the cloud grows hotter and denser. Over time, it forms a core. The core grows as it collects more gasses and dust. When the temperature and pressure get high enough, the core ignites and a star is born.

Newborn stars give off light that carries energy deep into space.

ENGAGE

Tap Prior Knowledge

Ask students to close their eyes and imagine that they're looking up at a nighttime sky full of stars. Invite a few volunteers to describe what they see. Then ask students if they've ever wondered where all of those stars came from. Invite students to share what they know about star formation.

EXPLORE

Preview the Lesson

Display pages 12-13 of the projectable magazine. Instruct student to examine the photos. **Ask:** *What do you see?* (stars) Invite volunteers to read aloud the three captions. Point out that the word *nebula* appears in each captions. If any students have heard this word before, invite them to share what they know. Tell students that they will learn what a nebula is as they read the article.

Set a Purpose and Read

Have students read the article in order to understand how a star is born, recognize the role of gravity in star formation, and identify connections between constellations and star formation.

EXPLAIN

Understanding Space Clouds

Display one Lego next to a small pile of Legos. Ask students which sample they'd rather use to build a pyramid. Invite them to explain why. Then point to the single Lego. **Say:** *The same thing happens in space. Imagine that this Lego is an atom floating all by itself in space. It's too far from other atoms to join together. You can't build a pyramid out of one Lego, and you can't create a star out of one atom.* Point to the pile of Legos. **Say:** *You need lots of Legos to build a pyramid, and you need lots of atoms to make a star. When there are enough atoms, they join together to form molecules. When there are enough molecules, space clouds become dense. Only dense space clouds have enough molecules to make a star.* Encourage students to share their thoughts on space clouds and star formation.

A Star Is Born

SCIENCE

EXPLAIN

(continued)

Recognizing the Role of Gravity

Remind students that space is vast and there can be great distances between atoms and molecules. Something needs to bring them together. Display page 15 of the projectable magazine. Zoom in on the section "Gravity's Pull." Invite volunteers to read the section aloud. Discuss the role of gravity in the formation of stars. Then give each student a copy of the **Content Assessment Master**. Have students work with a partner to create a diagram illustrating how a star is born.

Identifying Constellations Connections

Display page 14 of the projectable magazine. Zoom in on the section "Star Light, Star Bright." Highlight the bold word *constellation*. **Say:** *People often think of constellations as a small group of stars that creates an outline in the sky. But constellations also contain all the space in between. And in that space, you're likely to find a nebula. Something had to create all of those stars.* Zoom in on the photo at the bottom of page 14. Inform students that this photo shows the Orion Nebula, which is located in the constellation Orion. Then display the **"Constellations" poster** for the class. Challenge students to find the constellation Orion on the poster. Invite a volunteer to read aloud the text. Encourage students to share what they know about constellations.

ELABORATE

Find Out More

Display pages 12-13 of the article. Inform students that the photos on these pages show three different nebulae: the Eagle Nebula, the Crab Nebula, and the Ring Nebula. With a partner, have students conduct research to learn more about each nebula. Challenge them to identify where in the sky each nebula is located.

Extend Your Thinking About Stars

Tell students that this article is about how stars are born. But everything that is born eventually dies. As a class, conduct research to about each phase in the life cycle of a star.

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *What is a constellation?* (a part of the sky, including all the stars there)
- *What does gravity do to dense space clouds?* (Gravity makes dense space clouds collapse.)
- *Why can stars only form in dense space clouds?* (Only dense space clouds can collapse.)

If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article.

Name _____

Date _____

VOCABULARY ASSESSMENT: A Star Is Born

Use this organizer to study each vocabulary word in the article.

Word					
Predicted Definition					
Sentence					
Definition from the Article					
Sentence					

LANGUAGE ARTS ASSESSMENT: A Star Is Born

Record key details from each section of the article. Identify the main idea. Tell how the key details in each section support the main idea

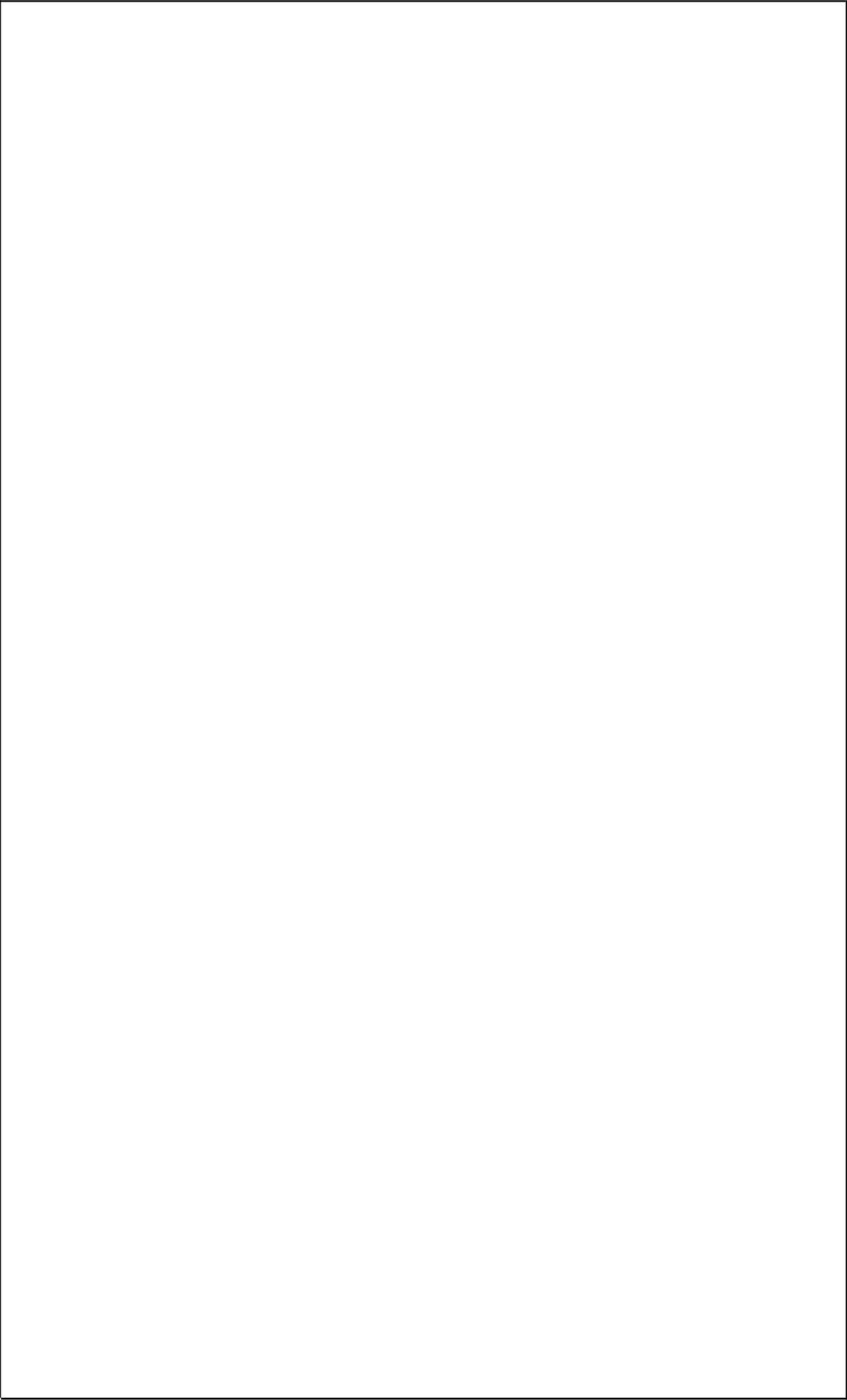
Main Idea	
Key Details	How They Support the Main Idea
Searching Space	
A Star is Born	
Star Light, Star Bright	
Gravity's Pull	

Name _____

Date _____

CONTENT ASSESSMENT: A Star Is Born

Create a diagram to show how a star is born.



COMPREHENSION CHECK: A Star Is Born

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. Where what kind of space clouds do stars form?
A dense
B dark
C constellation

2. What is a molecule?
A a particle of matter
B two or more atoms joined together
C a nebula

3. Which of these space clouds has never created a star?
A Barnard 68
B Crab Nebula
C Orion Nebula

4. What causes space clouds to collapse?
A gases
B energy
C gravity

5. Tell how a star is born.

A Tale of an Atoll

LANGUAGE ARTS

Objectives

- Students will assess their familiarity with and knowledge of vocabulary words to strengthen their understanding of scientific terms.
- Students will explain how the writer uses reasons and evidence to support key points in the text.

Resources

- Vocabulary Assessment Master (page 22)
- Language Arts Assessment Master (page 23)

Summary

- In the article “A Tale of an Atoll,” photographer and biologist Thomas P. Peschak takes readers on a tour of the Aldabra Atoll, the second largest coral atoll in the world.

BUILD VOCABULARY AND CONCEPTS

- **atoll**
- **corals**
- **lagoon**

As a class, discuss the difference between familiarity and knowledge. Guide students to recognize that the more familiar you are with something, the more knowledge you have. Challenge students to explain how this concept applies to words when they read.

Display the vocabulary words on a word wall or on the whiteboard. Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to write each word on their papers. Review the categories under the header “Familiarity with the Word.” Tell students to make a checkmark to indicate how well they know each word.

Instruct students to write what they think each word means on their worksheets. Then display the Wordwise feature on page 23 of the projectable edition. Have students write those definitions on their worksheets and compare them with the definitions they wrote.

READ

Inform students that the purpose of this article is to introduce them to the Aldabra Atoll, an island off the coast of Africa. They will learn how this island formed, what lives there, and how these living organisms are able to survive in such a harsh environment.

Explain to students that writers use several different strategies to make logical connections in a text. Good readers always search for these connections when they read. One common strategy to look for is cause-and-effect.

Display pages 16-17 of the projectable edition. Read aloud the headline and text. Then instruct students to examine the image as you read aloud the caption. Model how to identify an example of cause-and-effect. **Say:** *Sometimes when you read, you find a simple cause-and-effect statement. Here, people fed the tortoise, and the tortoise came to them. You have one cause and one effect. But now the writer is added to the mix. You have a string of causes and one final effect. People fed the tortoise, the tortoise came to them, the tortoise came to expect food when it saw people, and the writer had trouble taking a photo of the tortoise.*

Tell students that they may find a connection when they read, but that doesn't mean they've reached the end. They have to keep searching for links to fully understand how pieces of information are connected.

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article on their own. As they read, instruct students to record four examples of cause-and-effect statement in the text. Challenge them to find examples with more than one link. Encourage them to use the sample as a guide.

A Tale of an Atoll

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about the Aldabra Atoll. **Ask:** *What is an atoll?* (a ring-shaped, coral reef that forms an island) *What is the largest land animal that lives here?* (giant tortoise) *What other giant land-dweller lives on this atoll?* (coconut crab)

- **Strengthen Understanding** Inform students that it's essential for readers to understand technical terms when studying science. Without that knowledge, it's very difficult to understand the text. **Say:** *Once you do understand what scientific terms mean, not only can you follow along with the text but you can use the words correctly in new sentences of your own.* Challenge students to make accurate statements using each of the vocabulary words. Encourage them to use their **Vocabulary Assessment Masters** as resources. But remind them to be original. Students shouldn't restate sentences from the article. They should create new sentences of their own.

- **Describe Connections** After reading the article, remind students that making connections can help them understand what they've just read. One type of connection is the relationship between cause and effect. Invite students to turn and talk to share their **Language Arts Assessment Masters** in small groups. Instruct students to compare their results. Did they each partner identify the same cause-and-effect relationships. If not, do all of their examples make sense. If not, encourage students to review the article to see where the connection went astray. Rejoin as a class. Discuss how identifying cause-and-effect relationships can help readers understand a text.

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *How caused giant tortoises to nearly disappear from the Aldabra Atoll?*
- *What effect do sharks have on this coral reef ecosystem?*
- *What surprised you about what you read?*

A Tale of an Atoll

SCIENCE

Objectives

- Students will understand what an atoll is and how an atoll forms.
- Students will understand how giant tortoises and other organisms are able to survive on the Aldabra Atoll.
- Students will recognize how coral affects every living thing found on or around the Aldabra Atoll.

Resources

- Content Assessment Master (page 24)
- "Amazing Atolls" poster (teacher edition)
- Comprehension Check (page 25)
- "A Tale of an Atoll" Interactive Whiteboard (optional)

Science Background

An atoll is a ring-shaped coral reef that forms an island. The Aldabra Atoll, located east of Africa in the Indian Ocean, is an amazing example.

Aldabra consists of four main islands made out of coral limestone. Those islands are separated by narrow openings that all lead into the large, central lagoon. Measuring 34 km long by 14.5 km wide at its widest point, it covers an area of 155 km². It is one of the largest atolls on Earth.

The climate on Aldabra is harsh. Because the atoll is located in the tropics, it is extremely hot. Yet it gets little rain. The rain that does fall here drains away very quickly.

The land is stark. The coral rock makes for a sharp landscape, and there is very little shade. Despite this, plants and animals do live here. Giant tortoises and large coconut crabs roam the islands. Octopuses, fish, and sharks live around the reef. Mangrove trees thrive in the lagoon.

Many of the species that live here are found nowhere else in the world. This remote atoll provides a safe refuge where they can survive.

ENGAGE

Tap Prior Knowledge

Inform students that the headline for this article is "A Tale of an Atoll." The key words listed in the Wordwise feature are *atoll*, *corals*, *herbivore*, and *lagoon*. Brainstorm ideas about what the tale they are about to read might tell them about a remote island located off the east coast of Africa in the Indian Ocean.

EXPLORE

Preview the Lesson

Display pages 16-17 of the projectable magazine. Highlight the word *atoll* in the headline. If any students know what an atoll is, encourage them to share what they know with the class. Then have students describe the animal in the photo. Brainstorm ideas about what other strange animals might live in this place.

Set a Purpose and Read

Have students read the article in order to understand what an atoll is and how an atoll forms, understand how giant tortoises and other organisms are able to survive here, and recognize how coral affects every living thing on the atoll.

EXPLAIN

Understanding Atolls

Display the "**Amazing Atolls**" poster for the class. Invite volunteers to read aloud each caption. Discuss how an atoll forms. Display pages 18-19 of the projectable magazine. Review the sidebar with students to gain more knowledge about each stage. Then give each student a copy of the **Content Assessment Master**. Instruct students to draw their own diagrams illustrating the three stages in the development of an atoll. Instruct them to write a detailed caption in their own words to describe what happens during each stage.

A Tale of an Atoll

SCIENCE

EXPLAIN

(continued)

Understanding How Organisms Survive

Display pages 16-17 of the projectable magazine. Invite volunteers to describe the giant tortoise. Then point out that this animal is a big, slow reptile. In most parts of the world, mammals are the largest land animals. Brainstorm ideas about why that's not the case here. (Possible response: No large mammals could get what they need to survive here.) Inform students that the tortoise not only gets what it needs, but it also helps create a healthy ecosystem. Its droppings fertilize the soil so grass can grow. Encourage students to identify other organisms that live on or around the Aldabra Atoll. As a class, discuss how each organism gets what it needs to survive here.

Recognizing the Importance of Corals

Remind students that the Aldabra Atoll is a coral reef. It formed when corals colonized the water around a volcano. Point out that corals are animals. When they died their skeletons remained, building the coral reef. Guide students to understand the presence of corals makes it possible for every other living thing to exist here. For example, giant tortoises and coconut crabs live on land that exists because of ancient coral skeletons. As a class, review pages 22-13 to learn how corals also created ecosystems where plants and animals that live in the water can survive. (Some animals hide in the reef. Others go there to find food.)

ELABORATE

Find Out More

The giant tortoise is the largest land-dwelling animal on the Aldabra Atoll. Have students conduct research to learn more about these reptiles and how they are able to survive on the Aldabra Atoll.

Extend Your Thinking About Atolls

Display pages 18-19 of the projectable magazine. Have students examine the aerial view of the Aldabra Atoll. Guide them to recognize that the Atoll's land isn't that far above sea level. Point out that many reports have warned that global warming is causing the water level of Earth's oceans to rise. Discuss what this could mean for the future of the Aldabra Atoll.

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *What is an atoll?* (a ring-shaped, coral reef that forms an island)
- *Why is there a lagoon in the middle of an atoll?* (The atoll forms around a volcano. After the volcano sinks, the area fills with water and forms a lagoon.)
- *Why is coral such an important species on the Aldabra Atoll?* (The atoll is composed of ancient coral skeletons. Without the coral, there would be no atoll.)

If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article. You may also wish to examine the optional **Interactive Whiteboard** lesson that accompanies this article.

Name _____

Date _____

VOCABULARY ASSESSMENT: A Tale of an Atoll

Record information from the article about each vocabulary word.

Word	Familiarity with the Word			Knowledge of the Word	
	I know the word very well.	I've seen or heard the word before.	I don't know the word.	What I think the word means:	How the article defines the word:

LANGUAGE ARTS ASSESSMENT: A Tale of an Atoll

Record four examples of cause-and-effect statements in the article.
Use the sample as a guide.

Sample:

People fed the tortoise. → The tortoise came to them. → The tortoise expected food when it saw people. → The writer had trouble taking a picture.

Name _____

Date _____

CONTENT ASSESSMENT: A Tale of an Atoll

Draw pictures and write captions to tell what happens during each stage when an atoll develops.

Captions			Pictures		

COMPREHENSION CHECK: A Tale of an Atoll

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. What is the largest land animal on the Aldabra Atoll?
A giant tortoise
B coconut crab
C corals
2. What formed the atoll?
A piles of dirt
B coral skeletons
C sand dunes
3. Which tree survives in the atoll's lagoon?
A oak
B maple
C mangrove
4. What animals are at the top of the food chain in the water around the reef?
A jellies
B octopuses
C sharks

5. Tell how sharks help the coral reef survive.

ANSWER KEY

Fantastic Flier

Assess Vocabulary, page 6

Students should record the words and definitions from the Wordwise feature on page 8.

adaptation: a behavior that helps an animal survive

migration: to move regularly from one region or climate to another

torpor: a deep sleep

Sketches should accurately reflect the meaning of each word and how the terms are connected. Students should label all three terms in the larger drawing. Evaluate each response for accuracy.

Assess Language Arts, page 7

Students should record the main idea of the article. (Rufous hummingbirds complete an amazing journey when they migrate.) Additional answers will vary, depending on which paragraphs students choose to investigate.

Assess Content, page 8

Students should draw arrows leading from southeastern Alaska to southern Mexico. They should label Canada, the United States, Mexico, the Pacific Ocean, and the Atlantic Ocean. Additional items labeled will vary.

Comprehension Check, page 9

1. A; 2. B; 3. B; 4. C; 5: The hummingbirds wings move forward and backward in a repeated figure-eight.

A Star Is Born

Assess Vocabulary, page 14

Students predictions for definitions and the sentences they write will vary. They should record the words and definitions from the Wordwise feature on page 15.

atom: a particle of matter

constellation: a part of the sky, including all the stars there

dense: having parts packed closely together

gravity: the force that causes one mass to attract another

molecule: two or more atoms joined together

Assess Language Arts, page 15

Students' questions will vary. Answers should come from the text.

Assess Content page, 16

Students' diagrams will vary but should contain the following steps: 1. Atoms and molecules of matter gather in a dense space cloud, or nebula. 2. The cloud collapses when gravity pulls it toward its center. 3. The molecules move, gain more energy, and crash into one another. 4. The center gets hot and dense enough for a star to form.

Comprehension Check, page 17

1. A; 2. B; 3. A; 4: C; 5: Molecules of gases and dust collect in a dense space cloud. Gravity makes the cloud collapse. The molecules gain energy and crash into one another. The center begins to glow.

A Tale of an Atoll

Assess Vocabulary, page 22

Students should record the vocabulary words from the Wordwise feature on page 23, make checkmarks to show how familiar they are with each word, and write definitions in their own words. Then they should record the definitions from the article.

atoll: a ring-shaped, coral reef that forms an island
corals: marine invertebrates that typically live in colonies

lagoon: a shallow body of water separated from a larger body of water by reefs or barrier islands

Assess Language Arts, page 23

Answers will vary but should relate logical cause-and-effect relationships from the article.

Assess Content, page 24

Illustrations should resemble those on the "Amazing Atolls" poster and pages 18-19 of the article. Captions should be written in students' own words.

Comprehension Check, page 25

1. A; 2. B; 3. C; 4: C; 5: Sharks eat fish that eat seaweed. Without sharks, seaweed would overgrow and smother the coral. There would be no reef.