

# TEACHER'S GUIDE



Adventurer

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 ADVENTURER.

## 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.

EXPLORER is part of NATIONAL GEOGRAPHIC EXPLORER's Education program. Visit the "For Teachers" tab on EXPLORER's website, [ngexplorer.cengage.com](http://ngexplorer.cengage.com), to find additional resources for extending your students' learning.

## Your Subscription Includes:

- Magazines
- Classroom Posters
- Projectable Magazine
- Interactive Whiteboard Lesson
- Teacher's Guide
- App (additional subscription required)

# Fantastic Flier

## LANGUAGE ARTS

### Objectives

- Students will understand how parts of a rufous hummingbird's body help it complete a long migration.
- 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

Display page 5 of the projectable magazine. Inform students that the bird they are looking at is a rufous hummingbird. It is just 9 cm (3.7 in) long. Yet it flies back and forth from Alaska to Mexico each year.

Inform students that the hummingbird has unique adaptations that allow it to accomplish this mission. Once they understand what those adaptations are, they will understand how the rufous hummingbird is able to fly so far.

Have students examine pages 4-5 in their student magazines. Model how to explain a relationship between the bird's anatomy and its survival. **Say:** *On page 4, I see a flower. The caption says that this flower is one of the rufous hummingbird's favorites. The hummingbird drinks nectar from the flower. Nectar is inside flowers, and this flower is long and narrow. But so is the hummingbird's beak. It fits right inside the flower!* Tell students that they'll learn more details about how the hummingbird gets nectar from this flower as they read 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, have them identify and describe four of the hummingbird's body parts. Challenge them to explain how those body parts help the hummingbird complete its long migration.

### 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 extraordinary?* (It's the longest migration, measured in body lengths, of any bird on Earth.) Invite students to identify specific things the bird did along the way.

- **Understanding Relationships** Point out to students that explaining relationships, such as the connection between the rufous hummingbird's body parts and its ability to fly long distances, is a strategy that can help them understand what they read. **Say:** *Understanding what you read is important. It's much easier to figure things out if you can find relationships between examples and concepts in the text.* Have students compare their **Language Arts Assessment Masters** with a partner. Did students select the same body parts? Did they describe them in the same ways? If partners explained the benefits of the same body part in different ways, encourage them to reread the text and review the information once again.

- **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?*
- *Why do you think the rufous hummingbird completes this migration?*
- *What surprised you about what you read?*

# Fantastic Flier

## SCIENCE

### Objectives

- Students will understand how the rufous hummingbird's wings allow it to fly in many different ways.
- Students will recognize that rufous hummingbirds store up energy before their long migrations and eat along the way.

### 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. Challenge students to explain how the hummingbird has the energy to fly such a long way.

### Set a Purpose and Read

Have students read the article in order to understand how the rufous hummingbird's wings help it fly. They will also recognize that these hummingbirds store up energy before they migrate and eat along the way.

## EXPLAIN

### 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.

# Fantastic Flier

## SCIENCE

### EXPLAIN

(continued)

#### Recognizing How Hummingbirds Get Energy

Display pages 4-5 of the projectable edition. Inform students that, like all animals, hummingbirds get energy from food. One of a hummingbird's favorite foods is the nectar inside flowers. **Say:** *Hummingbirds convert the sugar in nectar into energy. They can do this fairly quickly, but they use energy just as fast.* Explain that in order for a hummingbird to survive on a long migration, it must find, use, and conserve energy. Give each student a copy of the **Content Assessment Master**. Instruct students record interesting details about how the rufous hummingbird gets, uses, and conserves energy before, during, and after its annual migration.

### 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 more species of hummingbirds. Challenge them to identify interesting adaptations of each.

### EVALUATE

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

- *Where do rufous hummingbirds get energy?* (from the nectar they drink)
- *What does torpor help rufous hummingbirds do?* (conserve energy)
- *Why do hummingbirds use energy so quickly?* (They have a high metabolism.)

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

**LANGUAGE ARTS ASSESSMENT: Fantastic Flier**

Identify and describe four body parts of the rufous hummingbird. Explain how each part helps the bird complete its annual migration.

Body Part	Describe	Explain

Name \_\_\_\_\_

Date \_\_\_\_\_

**CONTENT ASSESSMENT: Fantastic Flier**

Record interesting details about how the rufous hummingbird gets, uses, and conserves energy before, during, and after its annual migration.

	Before	During	After
Get			
Use			
Conserve			

**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 a hummingbird's favorite food?  
A leaves  
B seeds  
C nectar
  
2. Why do hummingbirds use energy so quickly?  
A They can fly backward.  
B They have a high metabolism.  
C There is little energy in the food they eat.
  
3. What is torpor?  
A stored fat  
B a long migration  
C a deep sleep
  
4. How do hummingbirds know where to stop during their migrations?  
A They follow the group leader.  
B They have great memories.  
C They have a great sense of smell.
  
5. Tell how a rufous hummingbird has enough energy to complete its migration?

---

---

---

---

# A Star Is Born

## LANGUAGE ARTS

### Objectives

- Students will predict definitions and then write sentences to better understand unfamiliar words.
- Students will understand the series of events needed for a star to form.

### 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 matter is pulled together to create 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.

Using that background knowledge as a base, instruct students 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.

Display pages 12-13 of the projectable magazine. Invite volunteers to describe what they see. Then display the image of Barnard 68 on page 15.

Brainstorm ideas about why the photo of Barnard 68 is different from the others. **Then say:** *The first three photos show space clouds that have become nebulae. A nebula is a space cloud that is densely packed with dust and gases. This is where stars are born. The last photo also shows a space cloud. But this space cloud has yet to produce a star. To understand why, you need to understand how a star is made.*

Give each student a copy of the **Language Arts Assessment Master**. Instruct students to read the article on their own. As they do, instruct them to record the sequence of events needed for a star to be born. Have them explain why Barnard 68 hasn't yet produced a star.

# 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 contain enough matter for a star to form.) Encourage students to share other interesting facts they learned about the formation of stars. **Then ask:** *What has to happen before a star can form in Barnard 68?* (The cloud must collapse.)

- **Predicting Definitions** Have students turn and talk to discuss what they learned about the five vocabulary words. Encourage them to compare their results in small groups. Instruct students to discuss how examining the information they collected impacted their understanding of each term.

- **Recognizing a Series of Events** Inform students that a series of events does more than just tell the order in which events occurred. It helps readers establish logical connections between events in a text. It also helps them figure out what's missing. This is particularly helpful when trying to understand scientific concepts. Have students share their **Language Arts Assessment Masters** with a partner. Encourage them to compare notes to fine-tune their responses. Then rejoin as a class to discuss what must happen before Barnard 68 can produce a star of its own.

### 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 an nebula?*
- *Why can't all space clouds produce stars?*
- *What surprised you about what you read?*

# A Star Is Born

## SCIENCE

### Objectives

- Students will recognize the role of gravity in the formation of a star.
- Students will understand why some space clouds can produce stars when other cannot.
- Students will identify connections between constellations and star formation.

### Resources

- Content Assessment Master (page 16)
- "Constellations" poster (Teacher's Edition)
- Comprehension Check (page 17)

### 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 10-11 of the projectable magazine. Point out that each of these photos has bright spots. Those are stars. Each of these photos also has parts that look wispy or smoky. Inform students that those are areas of gases and dust. Brainstorm ideas about how gases and dust could combine to form a star.

### Set a Purpose and Read

Have students read the article to recognize the role of gravity in the formation of a stars, understand why some space clouds can produce stars when others cannot, and identify connections between constellations and star formation.

## EXPLAIN

### 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.

# A Star Is Born

## SCIENCE

### EXPLAIN

(continued)

#### Understanding Space Clouds

Gather some packing peanuts and Legos. Place the packing peanuts in front of one student, a single Lego in front of another, and the rest of the Legos in front of a third student. Tell each student to build a pyramid. **Say:** *What you see here is kind of like what you see in space.* Point to the single Lego. **Say:** *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 packing peanuts. **Say:** *Most space clouds are like this pile of packing peanuts. They're too fluffy. They can't produce a star, either.* Point to the pyramid 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 matter to make a star.* Give each student a copy of the Content Assessment Master. Instruct students to draw a diagram showing how molecules of matter combine in a space cloud to form a star.

#### 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. Instruct students to 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. Instruct students to 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.

- *Why are stars only born in dense space clouds?* (Starlight destroys molecules. The dust in a dense cloud hides molecules so they can survive.)
- *How does gravity help form a star?* (Gravity pulls the matter in a space cloud toward its center and causes the cloud to collapse.)
- *What is a molecule?* (two or more atoms joined together)

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.

<b>Word</b>					
<b>Predicted Definition</b>					
<b>Sentence</b>					
<b>Definition from the Article</b>					
<b>Sentence</b>					

**LANGUAGE ARTS ASSESSMENT: A Star Is Born**

Record the sequence of events needed for a star to be born. Explain why the space cloud Barnard 68 has not yet produced a star.

First:

Next:

Then:

Finally:

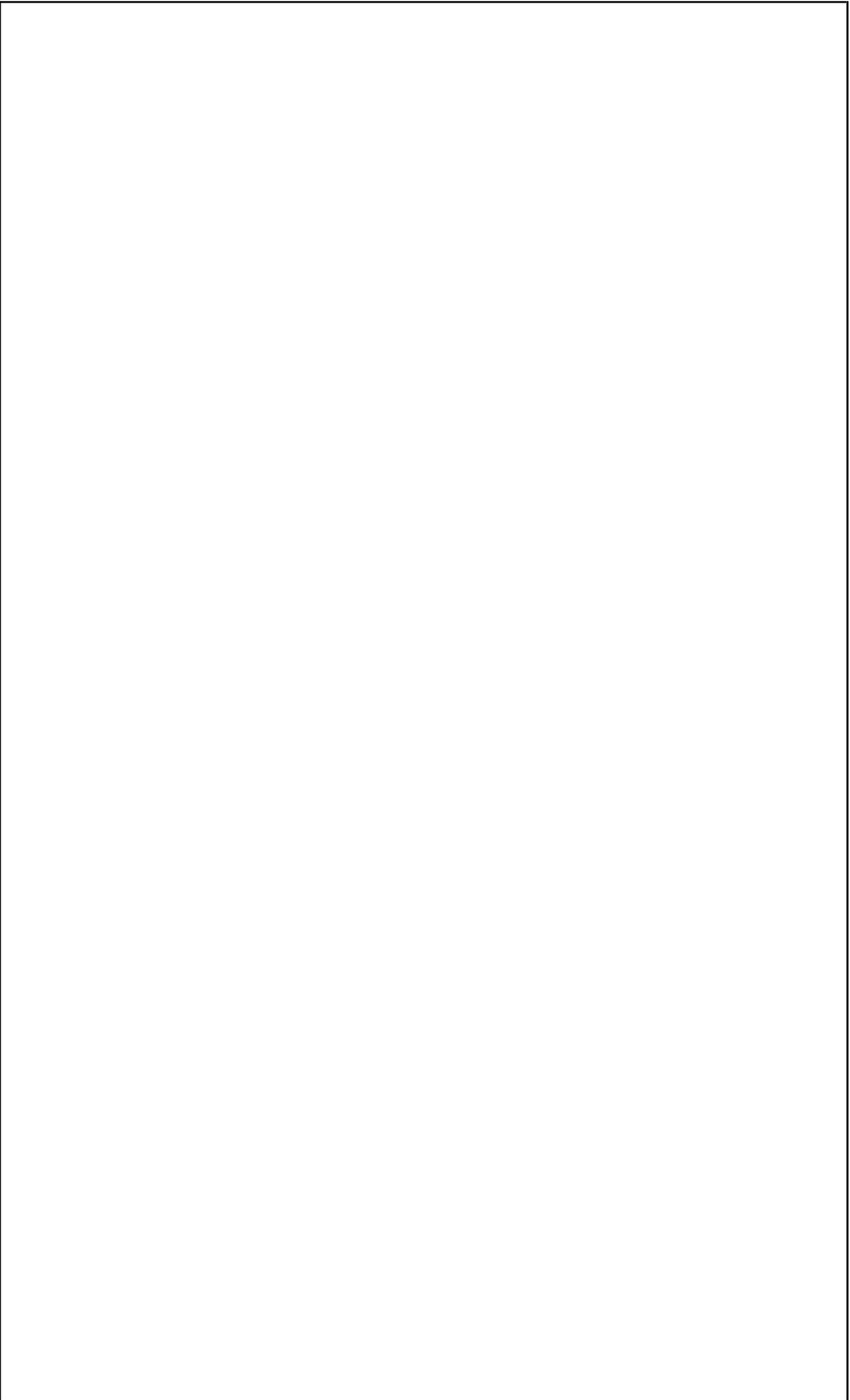
Explain:

Name \_\_\_\_\_

Date \_\_\_\_\_

**CONTENT ASSESSMENT: A Star Is Born**

**Create a diagram to show how molecules combine in a space cloud to form a star.**



**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. What pulls molecules together to create a star?  
A gases  
B dust  
C gravity
2. Where are stars born?  
A in dense space clouds  
B in fluffy space clouds  
C in small space clouds
3. What is one of the most famous nebulas in space called?  
A the Orion Nebula  
B the Crow Nebula  
C the Lobster Nebula
4. What makes stars shine?  
A They have radio waves.  
B The center gets hot.  
C They are made of light.

5. Summarize 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

- arthropod
- atoll
- corals
- herbivore
- 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 magazine. Have students write those definitions on their worksheets and compare them with the definitions they wrote.

### READ

Write the words reasons and evidence on the board.

**Then ask:** *What’s the difference between these two words?* Invite students to share their ideas. Guide the class to understand that a reason tells why something happened. Evidence shows how.

Tell students that valid reasons and solid evidence are crucial elements of any text. Writers use them to support key points on the topic.

Display pages 16-17 of the projectable magazine. Instruct students to examine the image. Then invite a volunteer to read aloud the headline, introduction, and caption. **Say:** *According to the writer, the Aldabra Atoll is astounding. Astounding is a strong word. To understand why he’d use that word to describe this place, you have to search for reasons and evidence in the text. Point out that the giant tortoise in the photo is a good clue. Say: These animals are rare. The fact that they live here is evidence that the Aldabra Atoll is astounding.*

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article on their own. As students read, encourage them to search for reasons and evidence that prove that the Aldabra Atoll is astounding. Have students summarize what they learned in their own words.

# 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 unique about the giant tortoises that live here?* (They are herbivores, but they are the largest land animals that live here.) *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** and their **Language Arts 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.

- **Identifying Reasons and Evidence** After reading the article, remind students that reasons tell why something happened. Evidence explains how. Invite students to share their **Language Arts Assessment Masters** in small groups. Challenge them to examine one another's results to determine that all reasons are valid, all evidence is solid, and both support the writer's point that the Aldabra Atoll is astounding.

### 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 do plants and animals survive on and around the Aldabra Atoll?*
- *Why is it important to protect large animals on the Aldabra Atoll?*
- *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 identify adaptations that help plants and animals survive on the Aldabra Atoll.
- Students will understand how the atoll ecosystem meets the needs of organisms living there.

### 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 km<sup>2</sup>. 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, recognize the importance of coral, and identify adaptations that help plants and animals survive on the Aldabra 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.

# A Tale of an Atoll

## SCIENCE

### EXPLAIN

(continued)

#### Investigating Aldabra Adaptations

Inform students that each of the plants and animals identified in the article has unique adaptations that help it survive on the Aldabra Atoll. The giant tortoise's size, for example, could help it survive. The fact that its droppings fertilize the soil so short grasses can grow helps all of the other animals that live there. As a class, review the article to identify adaptations of other plants and animals living on or around the Aldabra Atoll. Discuss how those adaptations affect the plant or animal involved as well as other organisms living nearby.

#### Understanding the Atoll Ecosystem

Remind students that the Aldabra Atoll is a harsh ecosystem. The land is made of jagged rocks. Ocean waves pound the shores. It's hot. And when it does rain, the rain quickly drains away. **Say:** *Even so, this ecosystem manages to meet the needs of the organisms that live there, whether they are found on land, in the lagoon, or around the coral reef.* Give each student a copy of the **Content Assessment Master**. Instruct students to select two plants or animals found in each area. Challenge them to describe how the atoll ecosystem meets the needs of each living thing.

### ELABORATE

#### Find Out More

Despite the fact that it's a herbivore, 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

Remind students that the four main islands of the Aldabra Atoll rise just 8 meters above the surface of the ocean. Yet there have been many reports indicating 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 reasons and evidence that illustrate how the Aldabra Atoll is an astounding place. Summarize what you learned.

Reasons

Evidence

Summary

Name \_\_\_\_\_

Date \_\_\_\_\_

**CONTENT ASSESSMENT: A Tale of an Atoll**

Identify two organisms that live in each part of the Aldabra Atoll ecosystem.  
Tell how the atoll meets the needs of each.

Land	Lagoon	Coral Reef

**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 created the Aldabra Atoll?  
A rocks  
B corals  
C sand
2. What kind of animal is a giant tortoise?  
A a carnivore  
B a decomposer  
C an herbivore
3. What predators hunt around Aldabra's coral reef?  
A sharks  
B coconut crabs  
C dugongs
4. What kind of tree lives in the lagoon?  
A oak  
B turtle turf  
C mangrove

5. Summarize how an atoll forms.

---

---

---

---

## 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 or body part that helps a plant or 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

Answers will vary depending on body parts students select. Information should come from the text.

#### Assess Content, page 8

Answers will vary, but students should note that the hummingbirds store energy as fat before they leave. They visit flowers along the way to refuel. They use energy quickly because they have a high metabolism. They also use massive amounts of energy when they fly. They go into torpor, or a deep sleep, to save energy. And, they conserve energy when they perch on twigs.

#### Comprehension Check, page 9

1. C; 2. B; 3. C; 4. B; 5: They store fat before they leave. They visit flowers in the nectar corridor as they fly south.

### 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 small 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

Possible response: First, atoms, or particles of matter, join together to form molecules. Next, molecules come together inside a dense nebula. Then gravity pulls everything toward the nebula's center. Molecules start to move and gain energy as they rush to the center of the nebula. Finally, the center of the nebula becomes so dense that a star forms. The hot star glows. Explain: Gravity hasn't pulled everything toward the center of Barnard 68 yet. Until that happens, this space cloud can't produce a star.

#### Assess Content page, 16

Students' diagrams should illustrate the steps outlined in the activity completed on their Language Arts Assessment Masters.

#### Comprehension Check, page 17

1. C; 2. A; 3. A; 4: B; 5: Molecules of gases and dust collect in a nebula. Gravity pulls the mixture toward its center until it collapses. The molecules gain energy and crash into one another. The hot, dense 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.

**arthropod:** an invertebrate that has an external skeleton, segmented body, and jointed appendages or limbs

**atoll:** a ring-shaped, coral reef that forms an island

**corals:** marine invertebrates that typically live in colonies

**herbivore:** an animal that gets its energy from eating plants

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

# Adventurer

## ANSWER KEY

### A Tale of an Atoll

(continued)

#### **Assess Language Arts, page 23**

Students should identify reasons and evidence that support the writer's point that the Aldabra Atoll is astounding. Answers may vary, but they should all come directly from the text. Students should summarize what they learned in their own words.

#### **Assess Content, page 24**

Answers will vary depending on which organisms students select.

#### **Comprehension Check, page 25**

1. B; 2. C; 3. A; 4. C; 5: Wind and water wear down the volcanic island. Coral polyps build a reef around the island as it sinks. Eventually, the island disappears. Water takes its place, forming a lagoon. The ring of islands forms an atoll.