

# Fantastic Frogs: A Study of Adaptations

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<b>Grade Level</b>	3
<b>Duration</b>	2 class periods

## National Geography Standards

### GEOGRAPHY

#### Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

#### Element 2: Places and Regions

4. The physical and human characteristics of places

## AZ Standards

### ELA

#### Reading

##### Key Ideas and Details

3.RI.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

##### Craft and Structure

3.RI.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.

#### Writing

##### Production and Distribution of Writing

3.W.4 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.

### MATHEMATICS

#### Measurement & Data

3.MD.B.3 Create a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

### SCIENCE

#### Life Science Standards

3.L1U1.5 Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.

## Arizona Standards

### GEOGRAPHY

The use of geographic representations and tools helps individuals understand their world.

3.G1.1 Use and construct maps and graphs to represent changes in Arizona over time.

## SIOP Elements

<b>Preparation</b> Adapting content	<b>Scaffolding</b> Modeling	<b>Grouping Option</b> Whole class
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## Fantastic Frogs: A Study of Adaptations

<b>Linking to background</b> Linking to past learning Strategies used	<b>Guided practice</b> <b>Independent practice</b> <b>Comprehensible input</b>	<b>Small groups</b> <b>Partners</b> <b>Independent</b>
<b>Integrating Processes</b> <b>Reading</b> <b>Writing</b> <b>Speaking</b> Listening	<b>Application</b> <b>Hands on</b> <b>Meaningful</b> <b>Linked to objectives</b> <b>Promotes engagement</b>	<b>Assessment</b> <b>Individual</b> <b>Group</b> <b>Written</b> Oral

### Arizona English Language Proficiency Standards

#### Stage III

#### Basic

#### Reading

**Standard 4: The student will analyze text for expression, enjoyment, and response to other related content areas. The student will demonstrate knowledge of reading comprehension by:**

B-03: answering literal (i.e., Yes/No, who, what, where, when, why, which and how) questions about text.

B-20: identifying content vocabulary within math, science, and social studies text.

B-24: locating specific information from external text in nonfiction text for a specific purpose.

#### Writing

**Standard 1: The student will express his or her thinking and ideas in a variety of writing genres as demonstrated by:**

B-4: writing an expository paragraph or a simple report containing a topic sentence, supporting details, and a concluding statement using a model.

#### Listening and Speaking

**Standard 1: The student will listen actively to the ideas of others in order to acquire new knowledge. The student will demonstrate understanding of oral communications by:**

B-5: responding to academic discussions by sharing one's view on facts, ideas and/or events using academic vocabulary.

## Overview

Frogs are amazing animals because they have developed adaptations that help them survive. From the arid, dry heat of Australia to the cold, thin air of the Andes, frogs use their adaptations to live in harsh environments and survive.

## Purpose

In this lesson students learn about frog adaptations and how important they are for survival. Students investigate five frogs and create a group poster to list adaptations for survival, draw a diagram with the adaptations labeled, and include a map to show its habitat. Students then explain how the environment the frog lives in coincides with the adaptations needed for its survival. Students conclude lesson by writing an essay describing how an animal of their choice has adapted to survive or inventing an animal and describing its environment

and adaptations. This lesson contains strategies for teaching diverse learners.

## Key Vocabulary

**absorb:** to take in or soak up

**adaptation:** a change in an animal or plant that helps it survive

**environment:** the natural world

**moisture:** small amount of water

**secrete:** to make and give off a special liquid

**surface:** the outside part

**transparent:** to be seen through

## Materials

- Chart Paper
- Markers
- Everything you need to know about Frogs and other Slippery Creatures buy the book or project from

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- <https://data4kid.files.wordpress.com/2011/11/dk-everything-you-need-to-know-about-frogs-and-other-slippery-creatures.pdf>
- Duct tape for making a big book
- Atlases and/or globes
- Pictures of Different Frogs and Toads
- Vocabulary Cards and Vocabulary Test
- Readings
  - Lake Titicaca Frog
  - Glass Frog
  - Wallace's Flying Frog
  - Amazon Horned Frog
  - Water-Holding Frog
  - Frog Skin
- Arizona Geographic Alliance maps
  - Australia and New Zealand  
<http://geoalliance.asu.edu/sites/default/files/LessonFiles/Aust-NZ2.pdf>
  - Latin America  
<http://geoalliance.asu.edu/sites/default/files/maps/LAT-AM.PDF>
  - South America  
<http://geoalliance.asu.edu/sites/default/files/maps/S-AMER3.pdf>
  - Southeast Asia  
<http://geoalliance.asu.edu/sites/default/files/maps/SEAsia.pdf>
- Fantastic Frog Anchor Chart Directions
- Frog Adaptations Anchor Chart Rubric
- Frog Gallery Walk Recording Sheet
- Fantastic Frogs: Origami Jumping Frog Contest Directions
- Pre-folded origami frog for demonstration
- Origami Jumping Frog Folding Directions
- Origami folding directions online  
<https://www.youtube.com/watch?v=oi7oitREUBQ>
- Origami paper in 3 different sizes: 6"X6", 8"X8", and 9 ¾"X 9 ¾"
- Measuring tape
- Origami jumping frog recording sheet
- Origami jumping frog graph
- Frog Vocabulary Test & Key
- Writing about Adaptations

## Objectives

The student will be able to:

1. Locate a frog's habitat on a map.
2. Demonstrate reading comprehension by answering questions.
3. Determine the meaning of general and domain-specific words by using context clues.

4. Write an essay about adaptations by including facts, definitions, and details to support their topic.
5. Explain adaptations by creating a labeled diagram.
6. Generate measurement data.

## Procedures

*Prior to this Session: Gather photographs of frogs and toads and hang them in the room. Look at the Frog Student Example to visualize how the big book made of anchor charts will look and be assembled.*

*Prerequisite Knowledge: Students know what an anchor chart is and have made them before.*

### SESSION ONE

#### Engage:

- a. Introduce the lesson by having students discuss with a partner what they know about frogs and toads. **(Preparation: Linking to Background, Grouping Option: Partners)** Then have the students respond as a whole class and record their responses on the white board or chart paper.
- b. Have the students do a gallery walk and look at the photos of frogs and toads hanging on the walls. **(Application: Promotes engagement)**
- c. As they are walking, ask students what they notice about the different photos. Encourage questions such as: "Why is that frog red? Why is that toad bumpy? What is the difference between frogs and toads? How far does it jump? What does it eat? Why is it so large? Why is it so small?" Towards the end of the gallery walk, ask this question, "How do you think these differences help frogs survive?" Tell students they might be able to answer some of those questions after they study, "Fantastic Frogs."
- d. Introduce the vocabulary words *adaptation* and *environment* and create a nonverbal movement for each. Post the vocabulary cards on the board or on a word wall. If students have a science journal, they can define the words and draw a picture to support the definition. **(Scaffolding: Comprehensible input)**
- e. Inform students they will be conducting a study of frogs and the adaptations they have developed to survive different environments. For ELLs, have a discussion of different environments and record what they look like, what the weather is like and establish nonverbal movements for each. **(Preparation: Adapting Content)**

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- f. Divide students into groups of 4-6, mixing abilities and including ELLs with English proficient students. **(Grouping Option: Small groups)**
- g. Give each group a copy of the book, Everything you need to know about Frogs and other Slippery Creatures or access the book online. Have students turn to pages 12-13.
- h. Tell the students that they will be making an anchor chart. Give each group a copy of Fantastic Frog Anchor Chart Directions, and Frog Adaptations Anchor Chart Rubric. For ELLs you can also give the adapted text: Frog Skin.) Review the directions with students and discuss the criteria on the rubric. **(Preparation: Adapting content, Scaffolding: Comprehensible input)**
- i. Use the Frog Skin reading as a model for how to create the anchor charts. For example, read aloud the Frog Skin reading and show them how to find the vocabulary word, “secrete” and how to include it in the anchor chart. Then have students create a nonverbal movement for “secrete” and add this vocabulary word to their science journal. Then show them how to cross check their work using the rubric and how to self assess. **(Scaffolding: Modeling, Guided Practice)**
- j. Explain that since the anchor charts will be combined to make a big book, they should make a rough draft first before they make the final copy. Emphasize working cooperatively will produce the best product. Post the example anchor chart on Frog Skin somewhere in the room.
- k. Assign groups their frogs. List the page numbers on the board if using the book or the online version. A third option is to distribute printed copies of the text. (See Glass Frog, Lake Titicaca Frog, Water-Holding Frog, Wallace’s Flying Frog, and Amazon Horned Frog readings)
- l. Inform students that they can create their anchor charts using either the book or the frog readings. Tell them the readings have context clues to define vocabulary but they can also refer to the word wall. Post the remaining vocabulary words (absorb, moisture, transparent, and surface) on the word wall, but tell students if they find the vocabulary word in their text, they must put it in their anchor chart and be prepared to explain what the word means. **(Scaffolding: Comprehensible input)**
- m. Show students where they can access atlases or globes when it comes time to create a map of their frog’s habitat.
- n. Place copies of the maps in one area of the room or pass out the appropriate map to each group.
- a. Give each group time to read their article, assign roles, and record notes in their science journal. **(Integrating Processes: Reading, Writing)** Then allow time for students to discuss how they will be creating their anchor charts. **(Application: Promotes engagement)**
- b. Remind students that they should produce a rough draft of their anchor chart and bring them up to you to get approval to move on to making the chart.
- c. Model making the Title Page and adding the Frog Skin page for the students. This allows them to see how their pages will be added to make a big book.
- d. Distribute chart paper for the final draft and encourage students to work cooperatively to create their assigned chart. Remind students to use vocabulary from vocabulary word wall if it applies to their frog as well as to include adaptations, a diagram, and map of the frog’s habitat.. **(Application: Hands on)** Refer to Frog Student Example if you need visuals to show the students.
- e. Move from group to group asking these questions:
  - o What special adaptations does your frog have? Why do you think your frog needs that adaptation to survive?
  - o Can you think of another animal that has a similar adaptation?
  - o What would happen if the environment changed from \_\_\_ to \_\_\_?
  - o What adaptations would your frog need to survive? How can I locate \_\_\_ habitat by using this atlas? What would be a good title for your map key? **(Application: Meaningful, Promotes engagement)**
- f. Post completed charts around the room.
- g. Model how to present using Frog Skin anchor chart as an example. Show how to introduce the name of the frog, point to its habitat and explain its environment. Then orally share three important adaptations slowly so classmates have a chance to record information. **(Scaffolding: Modeling)**
- h. Pass out Frog Gallery Walk Recording Sheet. Have students record information about their own frog on the worksheet before entering information about the other frogs so you can check for understanding.
- i. Give groups a few minutes at their chart to practice explaining their charts. One student from the group should volunteer to present the anchor chart to the other students. **(Scaffolding: Independent practice)**

**Explore:**

**Explain:**

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- The presenter for each anchor chart stays while the groups rotate in a clockwise direction. Each student presenter teaches the other groups about the adaptations of their frog. **(Integrating Processes: Speaking)**
- As groups rotate, they listen to presenter and record information on their gallery recording sheet. **(Application: Linked to Objectives) (Integrating Processes: Listening, Writing)** Each rotation should take 2 minutes.
- When groups get back to their poster, they rotate one more time. They teach the person who stayed behind about each of the frogs, and that student records information on their gallery recording sheet. **(Integrating Processes: Listening, Writing)**
- Ask each of the groups what vocabulary words from the word wall was in their reading. Have the group define the vocabulary word for the rest of the class. Then the students create a nonverbal movement for the vocabulary word and add it to their science journal.
- Close the session with student discussion about which adaptation they found the most interesting.

### SESSION TWO

*Prior to this Session: Remove the anchor charts and combine with duct tape to make a big book. To make the big book lay one anchor chart down face up, then take the second chart paper also face up and tape one half of the book to the back side of the first anchor chart. Keep repeating this step until all the pages are taped. Then tape around all the edges with duct tape. See Frog Student Example.*

Create an origami frog to use as a demonstration frog in the jumping contest.

#### Elaborate:

- Sit students on the carpet and read to them from the big book. **(Grouping Option: Whole Class)**
- Discuss adaptations from the previous day and how they help the frog survive. Explain that frog adaptation is their long, back legs. Ask students to share how they think the adaptation of long legs helps the frog survive. **(Scaffolding: Comprehensible input, Application: Linked to objectives)**
- Project or have students read page 10 from Everything you need to know about Frogs and other Slippery Creatures explaining how the frog's back leg bone structure is designed to help the frog jump a long way. **(Integrating Processes: Reading)**
- Introduce the experiment: Fantastic Frogs: Origami Jumping Frog Contest and discuss,

"Which size origami folding paper makes the best jumping frog?" **(Application: Promotes engagement)**

- Explain that origami is the Japanese art of folding paper into decorative shapes and figures. Show the three different sizes of origami paper (6X6, 8X8, and 9 ¾ X 9 ¾). Have students discuss their predictions if the small, medium or large origami paper will make the best jumping frog and their basis for their reasoning.
- Divide the students into groups of 3. Pass out origami folding directions. Each group will get one origami paper of each size. Students can take on roles such as folder, creaser, and helper to figure out the folding steps. **(Application: Promotes engagement)**
- Groups who struggle can access the Youtube video of how to fold an origami frog. <https://www.youtube.com/watch?v=oi7oitREUBQ>
- Review the Fantastic Frogs: Origami Jumping Frog Contest Directions. Emphasize the importance of following the directions otherwise the data is invalid.
- Model jumping rules using your pre-folded origami frog. Model how to record valid data on the Origami Jumping Frog Recording Sheet.
- Then begin the jumping experiment. **(Application: Hands on, Scaffolding: Modeling)**
- Have students make 5 jumps for each sized frog and record their data. Then have them calculate the median for each sized paper frog jumps and use the data to create a group bar graph that combines their experiment data. **(Application: Promotes engagement)**
- Combine group data by having students report the median of each group's data for each sized paper and create a class bar graph.
- Conduct a group discussion of why they think they were able to make the frog jump farther using \_\_\_ sized paper. **(Grouping option: Whole class)**

#### Evaluate:

- Review the adaptations of the 5 frogs studied, how a frog's legs helps it to survive, and the vocabulary words.
- Explain that they will have a choice for their final assessment. 1) They can think of another animal besides a frog and write about its special adaptations and how those adaptations help it survive in its environment. or 2) they can invent a new animal and write about its environment and its special adaptations. Distribute the Writing about Adaptations. **(Grouping Option:**



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**Independent, Assessment: Individual,  
Integrating Processes: Writing)**

## Assessment

### Geography and Reading

The Frog Adaptations Anchor Chart Rubric can be used to score the anchor charts created. Mastery will be considered 16 points or higher.

### Writing and Science

The final assessment can be scored with the Informative-Explanatory Essay Writing Rubric (Grades 3-5). Mastery will be considered 7 or higher.

### Reading

The Vocabulary Test can be used to measure language acquisition. Mastery will be considered 5 points out of 7 points on the vocabulary test.

### Math

The Origami Jumping Frog Recording Sheet and the Origami Jumping Frog Graph can be graded for correctness. Mastery will be considered 80%.

## Extensions

Students could:

- Continue the origami frog experiment but experimenting using different types of paper and other sizes.
- Create an animal with adaptations to live on the moon.
- Make a matching game with environments and adaptations needed to survive in that environment.
- Research a real animal and write about its adaptations.

## Sources

Everything You Need to Know about Frogs: and Other Slippery Creatures, DK Publishing, 2011

Everything you need to know about Frogs and other Slippery Creatures online pdf:  
<https://data4kid.files.wordpress.com/2011/11/dk-everything-you-need-to-know-about-frogs-and-other-slippery-creatures.pdf>

Map of Australia from Arizona Geographic Alliance  
<http://geoalliance.asu.edu/azga/>

Map of Latin and South America from Arizona Geographic Alliance <http://geoalliance.asu.edu/azga/>

Map of South America from Arizona Geographic Alliance <http://geoalliance.asu.edu/azga/>

Map of Southeast Asia from Arizona Geographic Alliance <http://geoalliance.asu.edu/azga/>

Origami jumping frog directions adapted from:  
<https://www.itsalwaysautumn.com/origami-jumping-frogs-easy-folding-instructions.html>

Origami youtube video for folding frog:  
<https://www.youtube.com/watch?v=oi7oitREUBQ>

### Extra information for teachers

Origami paper can be purchased from Oriental Trading Company

- Watson-Guption Fold'Ems Origami Paper 13645703 (\$16.99)
- Origami Colored Folding Squares 13646428 (\$7.49)
- Origami Colored Folding Squares 13646430 (\$11.99)