

Carmen and Ernie, Citizen Science: Frog and Toad Watch!

Overview

In this lesson plan students will:

- Research information about a frog or a toad
- Compare the life cycles of 4 frog/toad species from the Chihuahuan Desert
- Understand the adaptations frogs and toads may have to survive their environments
- Understand the role of Citizen Scientists to the Scientific Community

TEKS Alignment

3.10C The student is expected to investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady beetles.

4.10C The student is expected to explore, illustrate, and compare life cycles in living organisms such as beetles, crickets, radishes, or lima beans.

5.9A The student is expected to observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving components

5.9C The student is expected to predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways

5.10A The student is expected to compare the structures and functions of different species that help them live and survive in a specific environment such as hooves on prairie animals or webbed feet in aquatic animals.

THE SCIENCE BEHIND IT

In 3rd and 4th grade the knowledge and skills statements for life science address how organisms go through processes and structures that help them to survive in their environments. One such process is metamorphosis which is addressed in the following standards:

3.10 C the student will investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs and lady bugs

4.10 C the student will explore, illustrate and compare life cycles in living organisms such as butterflies, beetles, radishes or lima beans

Grades 3-5

Vocabulary

life cycle
egg
embryo
frogspawn
tadpole
froglet
gills
metamorphosis
brumate
estivate
niche
adaptation
invasive species
indicator species
citizen scientist

In this unit students will be learning about frog metamorphosis and the adaptations that our local species (both native and invasive) have made to survive the Chihuahuan Desert. Students will find that our native species of frogs have developed adaptations to help them survive as they go through metamorphosis in an arid environment.

The word metamorphosis when broken down means, meta: changing, morph: shape. This word is used to describe animals that go through a physical structure change during its lifetime. This could be a complete structure change, like larvae to adult creature, or a partial change like gaining body parts such as wings as an adult. The majority of the animals on earth go through some type of metamorphosis during their life cycle. This is because the majority of the animals on this earth are insects. However, insects are not the only animals that can go through a metamorphosis, other animals such as fish, crustaceans, jellyfish and in this unit, amphibians, go through metamorphosis as well. Biologists believe these animals have evolved to experience metamorphosis as an aid to survival. When these animals are in their different stages of metamorphosis, they do not compete for the same food source and fulfil a different niche in their environment. For example, caterpillars do not compete for nectar with butterflies because their food source is the leaf of plants, tadpoles live in water and feed on water plants and microscopic animals at the beginning of their life cycle, which doesn't compete with their adult carnivore parents and so on.

Amphibians in the Desert?

An amphibian is a creature that lives part of its life in water and part on land. It may be strange to think that these creatures would be found in an arid place such as a desert, but amphibians are found in all environments with the exception of Antarctica and they do so through adaptations.

If you are a native El Pasoan, then you may remember the bleeting of desert toads in an arroyo or reservoir after the summer rains. If you lived in the valley you may have seen frogs in the river, levees or irrigation ditches. You may have had an opportunity to collect tadpoles or small toads or frogs during the rainy season. However, when the rains dried up or the river stopped flowing, what happened to those toads and frogs when our desert became dry again?

Adaptations will be another focus for this lesson as we will be studying the adaptations that amphibians have made to survive in arid environments. In standard 5.10A students are asked to compare the structures and behaviors that help them survive within their environments. The student passages provided in this lesson will allow students to compare several species of frogs and toads not only through metamorphosis but also through adaptations in behavior, structures and functions.

El Paso Frogs and Toads

El Paso is home to several species of frogs and toads that are especially prominent during the rainy season and seem to disappear thereafter, however, just because a species isn't easy to see doesn't mean that it isn't there. For some of our local species, especially the toads, adaptations in behavior and structure have allowed them to flourish in our mountains and deserts without the need for a steady water source.

In this lesson students will be researching different species of frogs and toads from this area, and may have questions regarding where the animals go when there isn't a rain or water in the rivers and arroyo streams. They may have noticed that the river doesn't contain water for parts of the year, so in that time, where do the frogs go? Both frogs and toads have the ability to slow down their metabolism in times of both severe cold temperatures as well as during hot temperatures. The act of slowing down metabolism to adapt to cold temperatures is called **brumation**. Reptiles and amphibians (cold blooded creatures) brumate by slowing down their metabolism. They may only come up for air or water but can go for months without food. They can either do this by burrowing into the ground, into mud or sinking down to the bottom of ponds. Frogs will travel distances in search of water sources once the river runs dry. They have been known to frequent water troughs for cattle and other water sources in the desert. Toads will brumate in burrows during the winter but can also estivate during hot weather. **Estivation** is when animals will burrow into the ground and slow down their metabolism so that they can handle hot temperatures. Some species of toad such as spadefoot, may only come out during the rainy season and can remain in torpor (slowed metabolism) during most of the year. Tadpoles also have the ability to slow down metabolism encapsulated in mud until the next rain or release of water from local dams. The Red Spotted Toad, a small toad that lives in rocky or mountainous areas, will live in cool damp crevices in the rocks during the day and will come out at night to feed. Only estivating, when necessary, these small toads have the ability to absorb water through their skin from the tiniest drops of dew or dampness of sand in order to become hydrated. They also can lose up to 40% of their water weight during extreme drought.

Even with these adaptations and life-saving behaviors, frogs and toads can have a hard time of it in their environment, thus the reason for the amount of spawn they lay per individual. It is not unusual for communities of frogs or toads to die off once the river has dried up or through years of drought. It is the few that can survive the harsh changes of nature that can have the ability to replenish the population once the rains or river water has returned. For frogs and toads in the Chihuahuan Desert, water is life!

This research-based lesson will involve articles that students will use to study species from four different El Paso environments: Spadefoot Toads in the desert arroyos, American Bullfrogs in the Rio Bosque Wetlands Park, Red Spotted Toads from the Franklin Mountains and Rio Grande Leopard Frogs from the Rio Grande River. Students will be researching their assigned species, writing a report on their assigned animal and create a metamorphosis diorama. They will also be encouraged to take part in a Frog Watch on iNaturalist.

Safety in the waterways: It is important for students to make sure that if they explore the desert, mountains or waterways that they bring an adult with them, especially during the rainy season. Flash flooding can occur in arroyos from rain that is happening miles away. Many arroyo paths look like hiking paths in the desert and can fill with rushing water quickly.

It is also important to note that this unit is encouraging students to take pictures of frogs and tadpoles **and NOT COLLECT** frogs or tadpoles from their natural environments. Amphibians can carry salmonella which is a bacterium that can cause intestinal tract infections. Toads also secrete poisons, that although are not deadly to humans, can also cause allergic reactions or intestinal problems. Always wash your hands after a nature walk or hike.

Engage: Carmen and Ernie Frog Watch Booklet and Question Generator

The Carmen and Ernie Frog Watch! booklet is to be used so that students can be introduced to the four main species of frog that will be studied in this research unit.

Guiding questions:

- What types of frogs and Toads are found in the Chihuahuan Desert?
- What types of environments meet the needs of desert frogs and toads?
- How can questioning skills help writers to create content for informational texts?

Materials

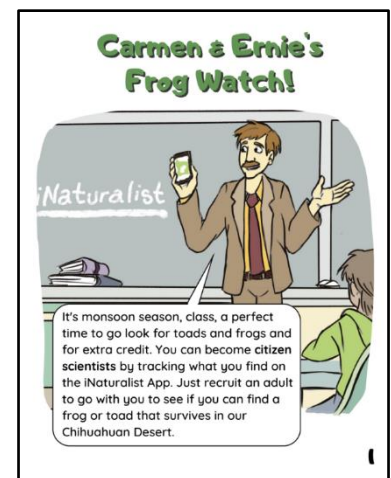
- Carmen and Ernie's Frog Watch Booklet (online or printed version)
- Carmen and Ernie's Question Generator Worksheet (one set of sheets per group of four students)
- Video: Chihuahuan Desert Frogs and Toads Diorama
- Chart paper, marker
- Video Screen picture of a Green Tree Frog (image search through google or other search engine)

Procedure: Carmen and Ernie Frog Watch Booklet

1. **Distribute the booklets or share on student device the slideshow version of the booklet "Carmen and Ernie's Frog Watch!"** Before reading pose the following questions for discussion

- **What is a monsoon season?** If the students are unaware of the monsoon season, take some time to research the internet to discuss rainy seasons that happen in the southwest. Wikipedia describes the North American monsoon season occurring in late June and early July to September in the Southwestern United States.
- **What type of frogs or toads have you experienced here in our environment?** Allow the students to share stories about frogs or toads that they have encountered while living in this area. Some students may not have stories to share depending on their neighborhood's location but as most neighborhoods are near some sort of drainage ditch, canal or arroyo, most students should have experiences to share with the class.

2. **Begin reading the booklet together in class. On page 2, Carmen and Ernie say that they will explore the area with a parent and an older brother. Pose the following question:**



- **Why do you think that it was important for Carmen and Ernie to go exploring with an adult?** Take this opportunity to discuss safety precautions while going out to the desert, mountains or near waterways.
- 3. **On pages 3, 4 and 5, Carmen and Ernie explore different locations such as the Rio Bosque Wetlands, the Franklin Mountains and desert arroyos to find toad and frog species from this area.** Take some time to allow students to share any experiences that they have had in these locations of the El Paso area.
- 4. **On page 8 of the booklet the students will read about the research assignment Have the students watch the video, “Chihuahuan Desert Frogs and Toads Diorama.”** Explain to the students that they will be working in groups of four to create a diorama about their assigned frog or toad, however, they cannot get started on the diorama until after they have completed their research paper.

Procedure: Carmen and Ernie Research Question Generator

1. Once the students have been divided into groups of four, assign a frog species to each person of the group to research (Spadefoot Toad, Red-Spotted Toad, American Bullfrog and Rio Grande Leopard Frog.)
2. Show the class a picture of a Green Tree Frog. Tell them that this species of frog is not from this area, but that we are using this species to discuss the types of questions that can be used to research an animal.
3. Using a chart paper and marker, have the students brainstorm as many questions as they can generate that they would like to know about the green tree frog. (questions will vary but may include: How large does it grow? Where does it live? What is it's environment like? What does it eat? etc. Try to have them generate at least 20-30 questions.
4. If the class get's stuck, go over question words like Who, What, Where, When, Why and How, to see if they can construct more questions. Go over these questions with the class and ask the students if they see any questions that might be hard to answer through research.
5. Now that the students have had the experience of generating questions, have the students look at the picture of the frog that they have been assigned. You will give them 10 minutes to jot down as many questions that they can think of that they would like to know about their frog. If they have more questions than there are lines on the paper, have them use the back of the sheet to write down the rest of their questions.
6. Put the questions aside to refer to later in the lesson. After each reading, the students will revisit their questions to see if their questions were answered.



EXPLORE: The Difference Between Frogs and Toads

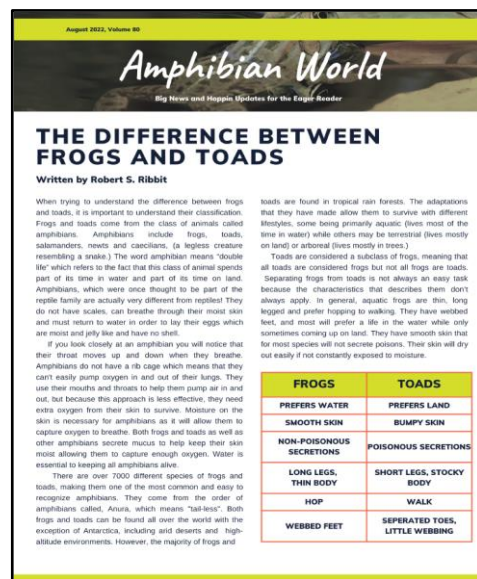
This article will be used to build content knowledge for the students on the topics of frogs and toads.

Guiding questions:

- What is an amphibian?
- What is the difference between frogs and toads?
- What problems might a scientist encounter when describing frogs and toads?

Materials

- The Difference Between Frogs and Toads Article



Procedure: Amphibian World Article, “The Difference Between Frogs and Toads”

Before reading the article, the teacher may want to have the students look over the article and discuss the title, pictures, tables and other text features. Discuss what type of text this is (**informational**) and what type of informational text structure that it has (**comparative**.)

The students may read the article alone, in groups or as a class and discuss it's content. The graphic organizer in the next activity will serve as a note taker for this article so that students can collect and remember information.

EXPLAIN: Informational Text: Compare and Contrast Venn Diagram

Guiding questions:

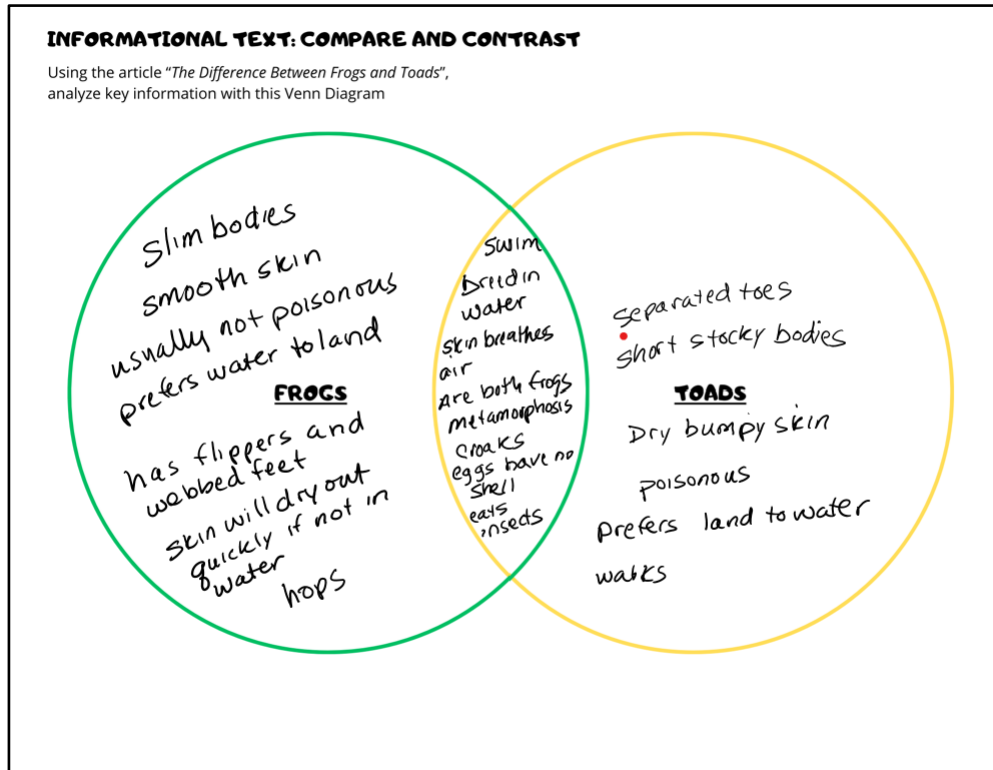
- How do comparative text structures help with author's purpose?
- What type of graphic organizers help us to organize comparative texts?

Materials

- The Difference Between Frogs and Toads Article
- Informational Text Compare and Contrast Venn Diagram
- Research Question Generator list of questions
- Pencil

Procedure: Informational Text: Compare and Contrast Venn Diagram

- Students will work in pairs using facts from the article to determine characteristics of frogs and toads, noting where the circles overlap is what both frogs and toads have in common. Possible answers are represented in the example below:



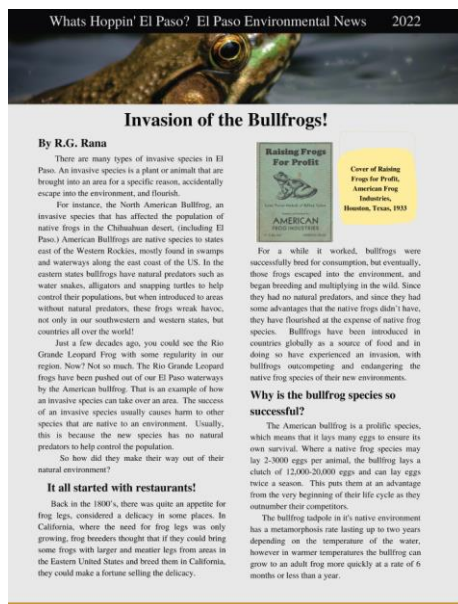
- Have student groups share out their answers with the class. Students may add information to their Venn Diagrams if they hear information that they hadn't considered for their Venn.
- Have the students get out their **Question Generator List** and review their questions. Students will place a circle symbol O next to any question that was answered by the information given in the article about frogs and toads. Example:

O How does it defend itself?

EXPLORE: What's Hoppin' El Paso? Invasion of the Bullfrogs!

Guiding questions:

- What is an invasive species?
- What are the effects of changes in ecosystems caused by living organisms, including humans?
- How can we compare the structures and functions of different species that help them live, survive and compete in a specific environment?



Materials

What's Hoppin' El Paso? Article, "Invasion of the Bullfrogs!"

Procedure: What's Hoppin' El Paso? Article, "Invasion of the Bullfrogs!"

Before reading the article, the teacher may want to have the students look over the article and discuss the title, pictures, tables and other text features. Discuss what type of text this is (**informational**) and what type of informational text structure that it has (**cause and effect**.)

The students may read the article alone, in groups or as a class and discuss its content. The graphic organizer in the next activity will serve as a note taker for this article so that students can collect and remember information.

EXPLAIN: Informational Text: Cause and Effect Graphic Organizer

Guiding questions:

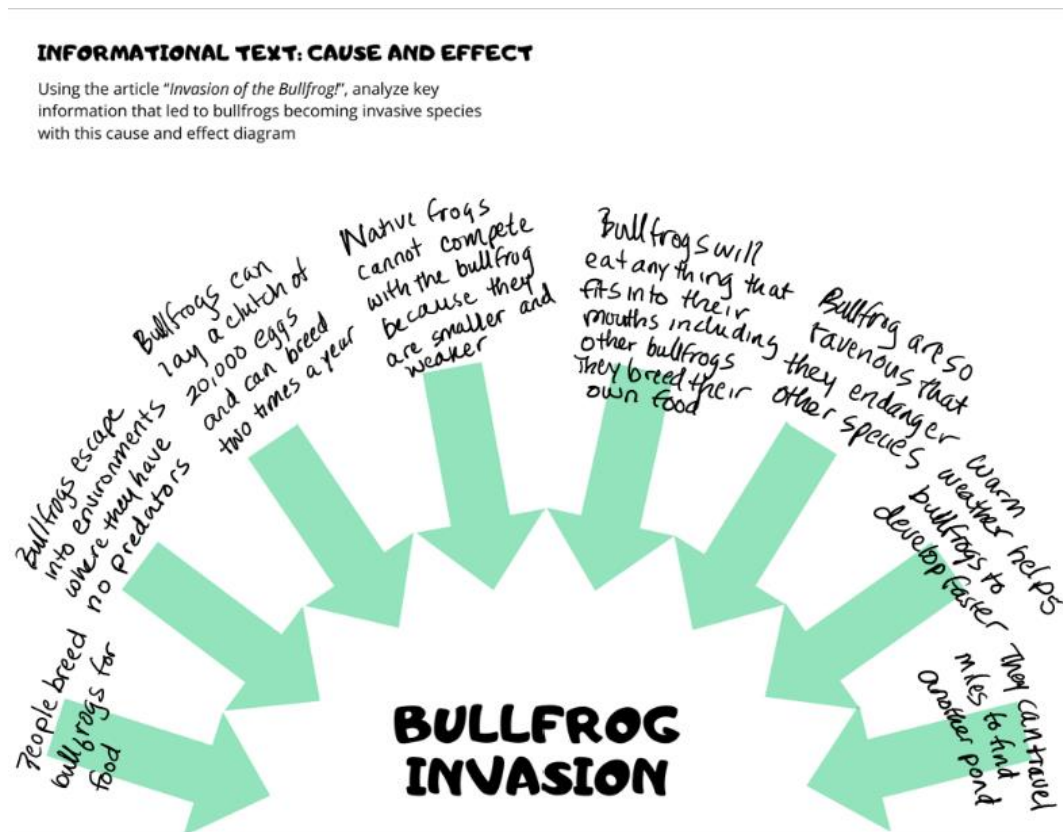
- How do cause and effect text structures help with author's purpose?
- What type of graphic organizers help us to organize cause and effect texts?

Materials

- Informational Text: Cause and Effect Graphic Organizer
- Carmen and Ernie's Question Generator Worksheet
- Pencil

Procedure: Informational Text: Cause and Effect Graphic Organizer

1. Students will work in pairs using facts from the article to determine the causes that led to a bullfrog invasion. Possible answers are represented in the example below:



2. Have student groups share out their answers with the class. Students may add information to their Cause-and-Effect Diagram if they hear information that they hadn't considered.
3. Have the students get out their **Question Generator List** and review their questions. Students will place an arrow symbol → next to any question that was answered by the information given in the article "Invasion of the Bullfrogs!" Example:

→ What do Bullfrogs eat?

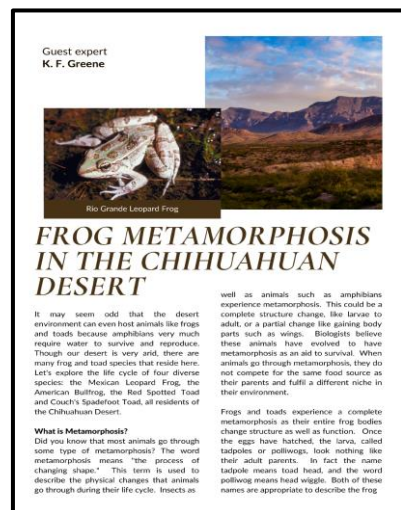
EXPLORE: Metamorphosis of Frogs in the Chihuahuan Desert

Guiding questions:

- What types of frogs and Toads are found in the Chihuahuan Desert?
- What types of environments meet the needs of desert frogs and toads?
- How do we compare how animals undergo a series of orderly changes in their diverse life cycles?

Materials

- Metamorphosis of Frogs in the Chihuahuan Desert Article
- Highlighters, pencils



Procedure: Metamorphosis of Frogs in the Chihuahuan Desert Jigsaw Activity

This is a multi-page article that will be used to provide information for their research paper writing activity. For this reason, it is not recommended that the students read the entire article. Instead, students will use a jigsaw activity to report out to their home group what they learned about their frog's metamorphosis.

1. Together as a class all students will read the article introduction up to the Rio Grande Leopard Frog sub header.
2. Using the same assigned groups that did the Question Generator activity, each student will be assigned a reading passage from the article based on their assigned frog. For example, if a student is assigned the Rio Grande Leopard Frog, he will only read the section about the Rio Grande Leopard Frog, the student assigned the American Bullfrog will read the section on the American bullfrog, and so on.
3. Jigsaw: In this activity, the students who have the same animal will meet in the four corners of the room to read and discuss their section (one frog per corner.) Their job will be to explain the four parts of their frog's life cycle to their home group. They must bring back information about the egg, tadpole, froglet and adult parts of the cycle. They can read the article passage together, out loud, take turns by paragraph, etc. Once they have finished reading, they will discuss the parts of the cycle with their home group. This activity will last 15-20 minutes.

EXPLAIN: Informational Text: Sequential Order Graphic Organizer

Guiding questions:

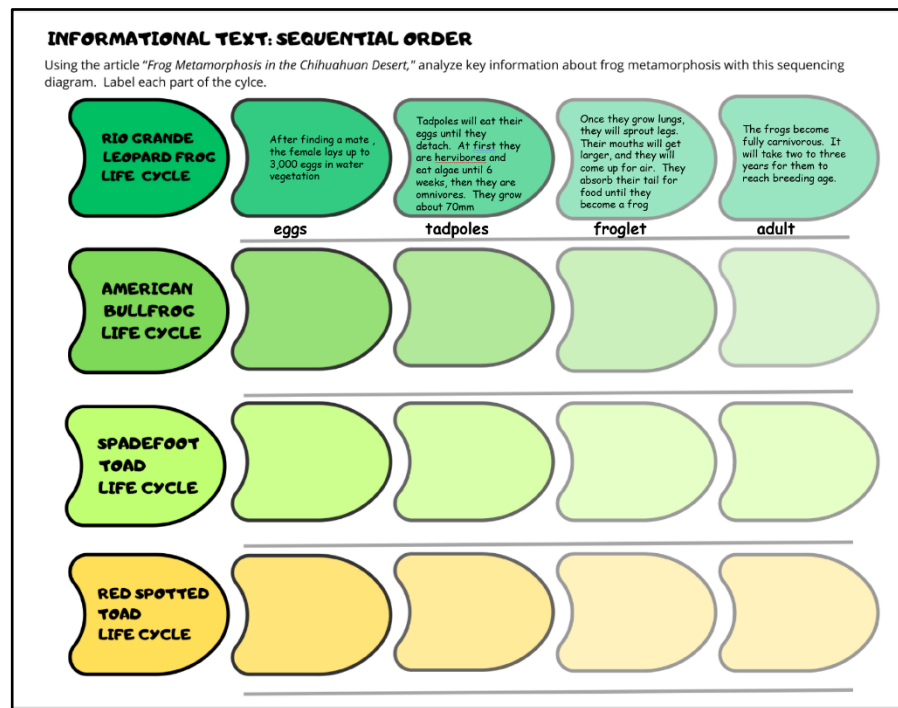
- How do sequencing text structures help with author's purpose?
- What type of graphic organizers help us in sequencing texts?

Materials

- Informational Text Sequential Order Graphic Organizer
- Metamorphosis of Frogs in the Chihuahuan Desert Article
- Pencil
- Carmen and Ernie's Question Generator Worksheet

Procedure: Informational Text: Sequential Order Graphic Organizer

1. Students will share out what they learned in the Jigsaw activity and as they share out they will take notes on each frog species metamorphosis by filling out the graphic organizer. Possible answers are represented in the example below:



2. Have student groups share out their answers with the class. Students may add information to their Sequencing Diagram if they hear information that they hadn't considered.

3. Have the students get out their Question Generator List and review their questions. Students will place an **M** symbol next to any question that was answered by the information given in the article “Metamorphosis of Frogs in the Chihuahuan Desert.” Example:

M What sounds does it make?

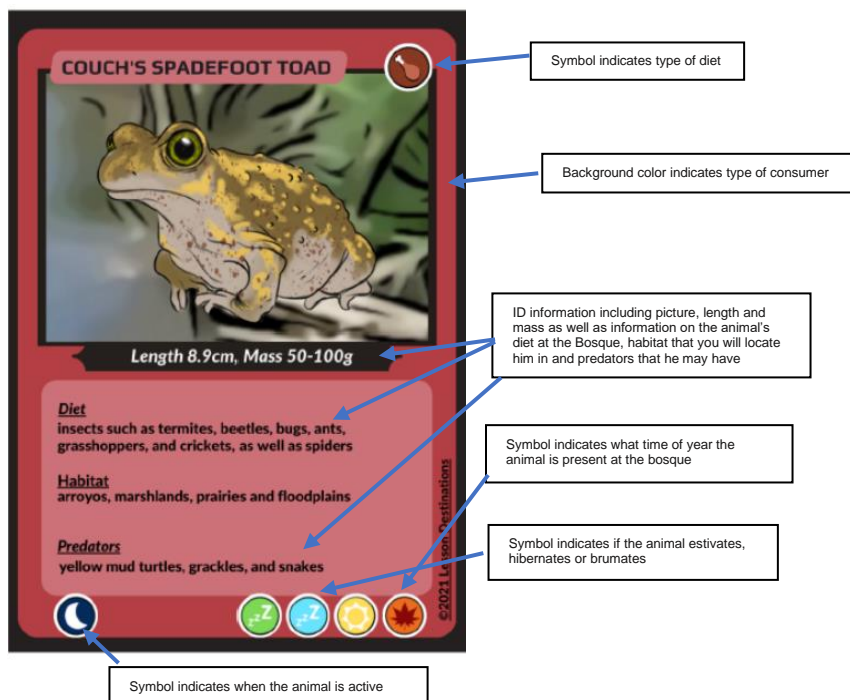
EXPLORE: Web Deck Cards

Guiding questions:

- What types of environments meet the needs of desert frogs and toads?
- How do desert frogs fit into the Chihuahuan Desert food web?
- How can symbols and colors help the author to convey meaning?

Materials

- Frog Web Deck Cards
- Rio Bosque Web Deck Cards (optional)
- Cardstock



Procedure: Informational Text Resource: Web Deck Cards

In the “Migration Station” unit, students were given a 72 card web deck card set to build food chains and food webs from the Rio Bosque Wetlands. The web deck provides information on animals in a food web, giving such information as diet, habitat and predators as well as average size and mass. In the booklet, “Carmen and Ernie’s Frog Watch”, Ernie is using web deck cards that he has collected to help him to identify native frogs. In this explore activity, each student will be given a web deck card depicting the animal that they are researching, and they will investigate them to determine what the information on the card means.

1. Make copies of the web deck cards on cardstock and have the cards cut out before distributing to students.
2. Pose questions to the class, such as “What type of information do you think that we can gather from the information on these cards?” Possible *answers may be: diet, habitat, predators, what their environment looks like, their name.*
3. Ask the question, “There are different symbols on these cards, what do you think that the symbols might mean?” *Possible answers may be: season, when they are active, if they are carnivores.*
4. Once the students have predicted what the card symbols might mean, it is time to introduce the Web Deck Card Key and Guide to the students.

Extension: Students can investigate the Rio Bosque Web Deck Cards to gather further evidence from the cards.

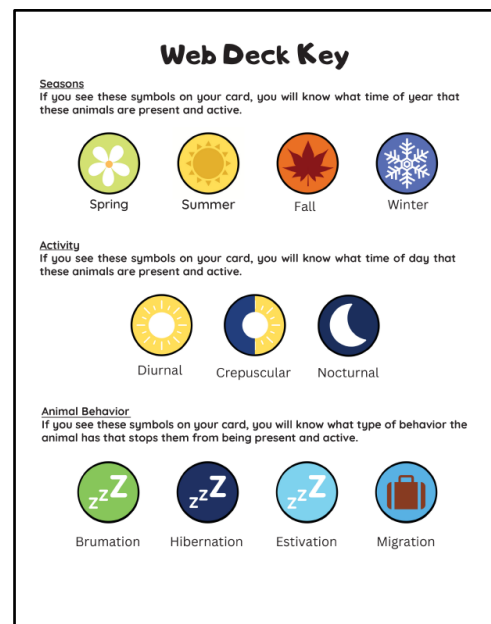
EXPLAIN: Web Deck Card Key and Guide

Guiding questions:

- What other types of resources other than written articles can be used to gather information about animals?
- What is the purpose of using symbols and colors to represent information?
- How can questioning skills help writers to create content for informational texts?

Materials

- Frog Web Deck Cards
- Web Deck Key and Web Deck Card Guide
- Rio Bosque Web Deck Cards (optional)
- Carmen and Ernie’s Question Generator Worksheet



Procedure: Informational Text Resource: Web Deck Cards Key and Guide

1. Have the students look at the Rio Bosque Web Deck Key to decode the cards and what they mean.
2. Pose the following questions to each group and have them answer each question regarding their frog:
 - What time of day is your frog most active?
 - What happens to your frog during the winter?
 - Does your frog brumate or estivate? What do these terms mean?
 - Is your frog an herbivore, carnivore or omnivore?Discuss what they found out about each species of frog with the whole class
3. Have the students get out their **Question Generator List** and review their questions. Students will place the symbol **W** next to any question that was answered by the information given by the Web Deck Cards. Example:

W Are they nocturnal?

ELABORATE: Chihuahuan Desert Frog and Toad Diorama

Guiding questions:

- In what ways do frogs change and go through their life cycles?
- How are the life cycles of different species of frog alike and different?
- What environmental factors have an influence on the frog life cycle?

Materials


- “Metamorphosis of Frogs in the Chihuahuan Desert” Article
- Sequential Order Graphic Organizer
- Frogs and Toads Diorama Procedure pages
- Chihuahuan Desert Frogs and Toads Diorama How To VIDEO
- Four copies of the diorama environment background (mountain, arroyo, river and bosque) printed on cardstock for each group
- Crayons, color pencils and or markers
- Green, brown or tan felt or construction paper
- Acrylic paint (different colors)
- Paint brushes
- Glue gun
- Glue sticks
- Various sized smooth and bumpy rocks
- Bubble wrap
- Black sharpie
- Small and medium sized googly eyes
- Miscellaneous craft items
- Ruled paper

- Pencil


Procedure: Chihuahuan Desert Frog and Toad Diorama

This activity can be done before or after writing the research paper on desert frogs, however, the students should do this activity after they have read the article about their frog's metamorphose cycle. This article is titled: "Metamorphosis of Frogs in the Chihuahuan Desert". In this article each species life cycle is described in detail, so if your students have not read this article or completed the graphic organizer used with the activity, it would help to do this prior to making the diorama as the information in this article will help your students to create their frog's life cycle model.

1. Gather materials for creating the diorama for the groups. Each group will need the procedures for creating the model as well as the environment for each frog printed on card stock so that the background will be able to stand on its own.
2. After reading through the procedure with the class it is a good idea to watch the accompanying video so that the students get an idea of how to construct their model.
3. Materials for building the frogs, eggs and tadpoles can be given to each group or a table can be set up with materials to construct the model so that students can choose which materials they would like to use to construct the life cycle.
4. Cool temperature glue guns work best for this project, but students will still need to be monitored while using this type of equipment.
5. Be sure to provide an area in the classroom dedicated to drying the painted rocks. Newspaper or plastic table coverings (like those used for parties) are great to use during this project so that the acrylic paints do not spill onto desks or tables.
6. Be sure to use acrylic paints and not tempera paints. Tempera will dry and flake off of the rock. Acrylic paints are more adhesive to the rock surface.
7. Each environment is a fourth of the diorama. When all four environments are back against each other they create a complete diorama. Each report can then be attached to the diorama and these projects can be shown during parent nights or in the school library.



Chihuahuan Desert Frogs and Toads Diorama Procedure




Procedure: In this group project, each student will be assigned one of four species of frogs and toads to research. Once they have written their research report on the frog or toad species, they will create a four-sided diorama showing the life cycle of that frog or toad in their natural habitat.

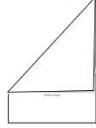
Materials:

- Four copies of the diorama environment background (mountain, arroyo, river and bosque) printed on cardstock
- Crayons, color pencils and or markers
- Green, brown or tan felt or construction paper
- Acrylic paint (different colors)
- Paint brushes
- Glue gun
- Glue sticks
- Various sized smooth and bumpy rocks
- Bubble wrap
- Black sharpie
- Small and medium sized googly eyes
- Miscellaneous craft items
- Ruled paper
- Pencil

1.) Color the diorama background using color pencils, crayons and or markers, making sure to color in water for the bottom part of the color sheet. The environment and water together make a square shape. We will be creating folds into this square shape.



2.) Fold the sheet along the dotted lines to create a border between the walls of the diorama and the floor of the diorama. (It should look triangular) Unfold the paper and lay it flat





EVALUATE: Frog/Toad Research Paper

Guiding questions:

- How can I collect, record and analyze research information using tools?
- Why is it important to find multiple sources of information when doing research?
- How can questioning skills help writers to create content for informational texts?


Materials

- Carmen and Ernie's Question Generator Worksheet
- Carmen and Ernie's Research Notecards (2 sheets per student) (or index cards)
- Frog Articles:
 - The Difference Between Frogs and Toads
 - The Invasion of the Bullfrogs
 - Metamorphosis of Frogs in the Chihuahuan Desert
- Web Deck Cards and Key Guide
- Graphic organizers for the articles
- Internet and computer
- Books on frogs or nature guides
- Scissors
- Pencils
- highlighters

CARMEN AND ERNIE'S RESEARCH NOTECARDS	
 Use these note cards to answer the questions you generated about your frog. Once you have completed your research, cut apart the cards and arrange them in a logical order to help you write your frog report. (See example)	
Question: How do frogs and toads breathe air? Research: Frogs and toads breathe air with their lungs, but they also breathe through their skin. The skin must be wet to breathe air. Source: The Difference Between Frogs and Toads Article, page 1, paragraph 2	Question: Research: Source:
Question: Research: Source:	Question: Research: Source:
Question: Research: Source:	Question: Research: Source:
Question: Research: Source:	Question: Research: Source:

Procedure: Carmen and Ernie's Research Notecards

In this activity students will be taking notes to answer questions that they generated on their Question Generator Worksheet. Throughout the lesson students will have indicated next to each question where they may have found the answer to the question through the resources given in this unit. Their Question Generator Sheet may look something like this:



Carmen and her dad found the the Red Spotted Toad on a hiking trail at Franklin Mountain State Park. It is a species of toad that can be found in rocky areas of El Paso after the rains. Using your questioning skills, generate as many questions as you can about the Red Spotted Toad. These questions will help you with your research paper.

<u>What is the scientific name?</u>	<u>Does it use camouflage?</u>
<u>W How big is it?</u>	<u>M Can it swim?</u>
<u>W What does it eat?</u>	<u>Does it burrow?</u>
<u>W Does it have predators?</u>	<u>M What sounds does it make?</u>
<u>M Where can you find it?</u>	<u>W Are they nocturnal?</u>
<u>How long do they live?</u>	<u>O How does it defend itself?</u>
<u>M Do they have babies like other frogs?</u>	<u>Does it have teeth?</u>
<u>Are they only found here?</u>	<u>W What is its food web/food chain?</u>
<u>M Do they hibernate?</u>	<u>M Do they have metamorphosis?</u>
<u>M How do they get water in the desert?</u>	<u>M How many babies can it have?</u>
<u>It is native or invasive?</u>	<u>How long can it go without water?</u>
<u>How can you tell a boy from a girl?</u>	<u>Are they endangered?</u>
<u>O Are they poisonous?</u>	<u>What color is it?</u>
<u>M Why does it have spots?</u>	<u>W What type of consumer is it?</u>

By writing a symbol next to the question indicating which article or resource gave the answer to the question, the student is now able to go back to the article and find the information.

Some of the questions may not be able to be answered through the articles. In this case the student may have to do their own research in order to answer the question.

1. Students will use the Question Generator Sheet questions to fill in each of the research question cards that they would most like to use for their research paper on their frog.
2. The symbols that they have made next to their questions will give them an idea of which resource that they will use to answer the question.
3. The students must site their source of information including title of article or card, page number and paragraph
4. If the question cannot be answered by the provided resources they can search for the answer on the internet, however, they must site their sources of information when they reach an answer
5. Students should be directed to answer the questions by putting the answer in their own words and to NOT copy down the answer verbatim so that they are not plagiarizing the information they have collected.

Once the questions have been answered it may look something like this:



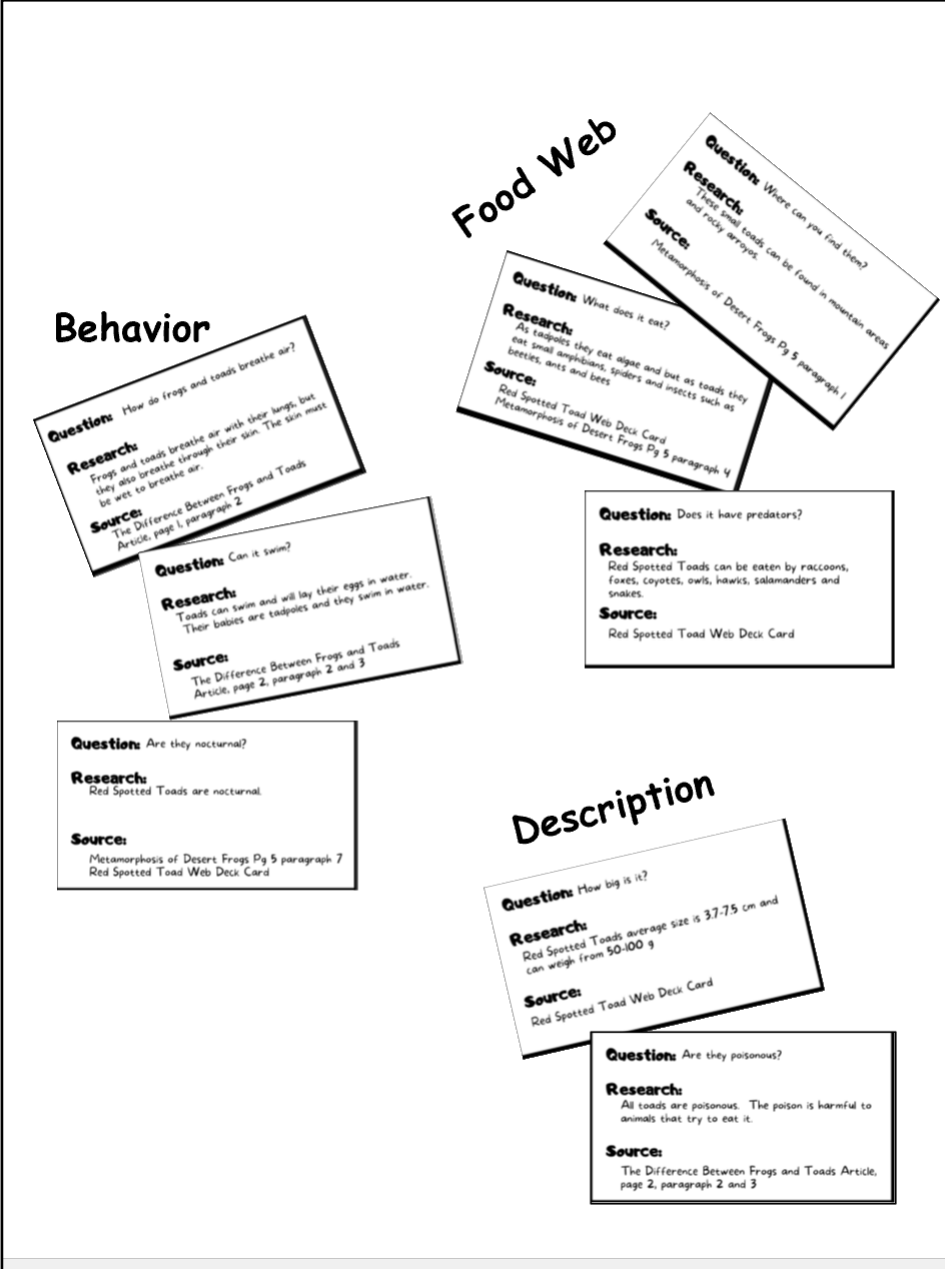
CARMEN AND ERNIE'S RESEARCH NOTECARDS

Use these note cards to answer the questions you generated about your frog. Once you have completed your research, cut apart the cards and arrange them in a logical order to help you write your frog report. (See example)



<p>Question: How do frogs and toads breathe air?</p> <p>Research: Frogs and toads breathe air with their lungs, but they also breathe through their skin. The skin must be wet to breathe air.</p> <p>Source: The Difference Between Frogs and Toads Article, page 1, paragraph 2</p>	<p>Question: How big is it?</p> <p>Research: Red Spotted Toads average size is 3.7-7.5 cm and can weigh from 50-100 g</p> <p>Source: Red Spotted Toad Web Deck Card</p>
<p>Question: What does it eat?</p> <p>Research: As tadpoles they eat algae and but as toads they eat small amphibians, spiders and insects such as beetles, ants and bees</p> <p>Source: Red Spotted Toad Web Deck Card Metamorphosis of Desert Frogs Pg 5 paragraph 4</p>	<p>Question: Does it have predators?</p> <p>Research: Red Spotted Toads can be eaten by raccoons, foxes, coyotes, owls, hawks, salamanders and snakes.</p> <p>Source: Red Spotted Toad Web Deck Card</p>
<p>Question: Where can you find them?</p> <p>Research: These small toads can be found in mountain areas and rocky arrayos.</p> <p>Source: Metamorphosis of Desert Frogs Pg 5 paragraph 1</p>	<p>Question: Can it swim?</p> <p>Research: Toads can swim and will lay their eggs in water. Their babies are tadpoles and they swim in water.</p> <p>Source: The Difference Between Frogs and Toads Article, page 2, paragraph 2 and 3</p>
<p>Question: Are they nocturnal?</p> <p>Research: Red Spotted Toads are nocturnal.</p> <p>Source: Metamorphosis of Desert Frogs Pg 5 paragraph 7 Red Spotted Toad Web Deck Card</p>	<p>Question: Are they poisonous?</p> <p>Research: All toads are poisonous. The poison is harmful to animals that try to eat it.</p> <p>Source: The Difference Between Frogs and Toads Article, page 2, paragraph 2 and 3</p>

- Students will cut apart the question cards and do a card sort. Students will sort the question cards based on how the information is related. This will provide topics to write their paragraphs for their research paper. Possible topics may include Animal Description, Life in the Food Web, Life Cycle, Behavior, Interesting facts, etc. The card sort may look like this:



Behavior

Question: How do frogs and toads breathe air?

Research: Frogs and toads breathe air with their lungs, but they also breathe through their skin. The skin must be wet to breathe air.

Source: The Difference Between Frogs and Toads Article, page 1, paragraph 2

Question: Can it swim?

Research: Toads can swim and will lay their eggs in water. Their babies are tadpoles and they swim in water.

Source: The Difference Between Frogs and Toads Article, page 2, paragraph 2 and 3

Question: Are they nocturnal?

Research: Red Spotted Toads are nocturnal.

Source: Metamorphosis of Desert Frogs Pg 5 paragraph 7
Red Spotted Toad Web Deck Card

Food Web

Question: What does it eat?

Research: As tadpoles they eat algae and but as toads they eat small amphibians, spiders and insects such as beetles, ants and bees

Source: Red Spotted Toad Web Deck Card
Metamorphosis of Desert Frogs Pg 5 paragraph 4

Question: Where can you find them?

Research: These toad toads can be found in mountain areas and rocky arroyos.

Source: Metamorphosis of Desert Frogs Pg 5 paragraph 1

Question: Does it have predators?

Research: Red Spotted Toads can be eaten by raccoons, foxes, coyotes, owls, hawks, salamanders and snakes.

Source: Red Spotted Toad Web Deck Card

Description

Question: How big is it?

Research: Red Spotted Toads average size is 37.75 cm and can weigh from 50-100 g

Source: Red Spotted Toad Web Deck Card

Question: Are they poisonous?

Research: All toads are poisonous. The poison is harmful to animals that try to eat it.

Source: The Difference Between Frogs and Toads Article, page 2, paragraph 2 and 3

7. Once the students have sorted their research cards, they can begin to start writing the first draft of their research paper.
8. Each group of cards will be a paragraph in the research paper, being careful not to plagiarize information drawn from the articles. Students should write an introductory paragraph for their paper as well as closing paragraph. The

Research paper should be 3-5 paragraphs in length or perhaps longer depending on the writer.

9. Peer Editing: Students will trade their first draft with group members to help edit their papers, find misspellings, grammar and other mistakes. They must have at least two group members give them feedback on their report before writing their final draft.

Final draft should be in their best handwriting with as little writing errors as possible. This final draft will be used to display with their frog diorama.

EXTEND: Carmen and Ernie's Frog Watch on iNaturalist

Guiding questions:

- What is an indicator species?
- What is a citizen scientist?
- How does iNaturalist help scientists to track species in an environment?

Materials

- Carmen and Ernie's Frog Watch Booklet
- Carmen and Ernie's Frog Watch Video
- Smart phone with camera
- Tablet or computer
- iNaturalist App (free download)



Procedure: Carmen and Ernie Frog Watch using iNaturalist

iNaturalist is a free app used by nature enthusiasts to track sightings of species around the world. When using iNaturalist with students for projects there are different angles of managing the project to consider before sending kids out to collect data. For example:

- If the teacher is asking students to use iNaturalist as part of a nature project or nature walk and all of the students will be together as a class, it may be a good idea to set up a class account for iNaturalist and have the students record their findings there. A generic student account would allow students to upload their sightings to one single account that the teacher can monitor and delete entries for, however it may be hard to figure out which student submitted if it is only going to one place. Once the project is finished the teacher can change the password to stop students from using this account.
- If the teacher is interested in just having the students use the app to help them identify living species in their surroundings, it may be a good idea to use Seek. Seek is an iNaturalist application that does not record the photos taken for research. This app just

helps people to identify species by picture. Great for beginner students to use without the need for adults to monitor their submissions.

- Another way to do this project is to set it up like it is modeled in this lesson plan, where the teacher has set up a Frog Watch project and students are going out with their parents to find species together. Some ground rules for this type of project may be:
 - Parents sign up for the iNaturalist account with the student to monitor submissions.
 - Only native animals and plants can be captured, no pictures of humans or domestic animals and plants should be reported.
 - Verification of the species cannot come from students in the classroom. All entries made must be verified from someone in the iNaturalist community that is NOT a member of the class.
 - Don't disturb wildlife, don't touch the organism and stay a safe distance. Be aware of your surroundings.
 - Only upload authentic pictures
 - Take multiple pictures at different angles if possible, to get a good identification.
 - Provide as much information as possible about the location of the species.

Carmen and Ernie's Frog Watch Using iNaturalist Booklet Procedure:

1. **Distribute the booklets or share on student device the slideshow version of the booklet "Carmen and Ernie's Frog Watch using iNaturalist"** Before reading pose the following questions for discussion:
 - **Now that we have completed our study on frogs and toads in the Chihuahuan Desert, look at the illustration on the cover of this booklet. What are Carmen and Ernie doing and what details in the picture give us information about the animal?** The frog that Carmen and Ernie are looking at are nocturnal, so they are finding it at night. It may be rainy season because they are wearing coats with hoodies, The area is grassy so it could be either a toad or a frog. Carmen is taking a picture so she might be sending this picture to the iNaturalist app.
2. **Begin reading the booklet together in class. On pages 2 and 3, there is a picture of a Spadefoot Toad and a Rio Grande Leopard Frog.**
 - **Since frogs and toads are indicator species, how can they be affected by the environment ?** Students may say that the leopard frog is being endangered by the American Bullfrog. People may pollute the river, waterways or desert arroyos which could affect the frogs. People are building in the desert and taking the toad environment.
3. **On pages 4 through 8, Ernie demonstrates the iNaturalist App and how it works.** Have the students brainstorm safety precautions when using the iNaturalist app

For more information about iNaturalist and how to use it in the classroom, please visit the iNaturalist website:

https://www.inaturalist.org/login?return_to=https://www.inaturalist.org/posts/20655-observing-wildlife-for-inaturalist