An online exploration of the biotic communities of Arizona with an emphasis on Language Arts and Social Studies

Exploring Arizona's Biotic Communities

Lesson 4: Which Team Are You On?

LESSON OVERVIEW

After reading and studying the information about Arizona's biotic communities, students design a trading card for a particular plant or animal. When the cards are completed, groups of students play a game in which they try to match up animals and plants that belong in the same biotic community.

SUGGESTED GRADE LEVELS

- 6 – 10

ENDURING UNDERSTANDINGS

- Plants and animals are adapted to the environment in which they live.

OBJECTIVES

Students will:

- Develop trading cards for a particular plant or animal.
- Use prior knowledge to decide in which biotic community various plants and animals belong.

ARIZONA DEPARTMENT OF EDUCATION STANDARDS

Grade	Reading	Writing	Social Studies
6	S3-C1-01; S3-C1-09	S1-C5-03; S2-C1-02; S2-C2-01; S2-C6-10	None
7	S3-C1-01; S3-C1-10		None
8	S3-C1-01; S3-C1-10		None
9	S3-C1-08	S1-C5-02; S2-C1-03; S2-C2-01; S2-C6-09	None
10	S3-C1-07; S3-C1-08		

Note: The full text of these standards can be found in Appendix A.

TIME FRAME

- 4 – 6 days (3 – 5 days of research and creation in or out of class, 1 day in class to play the game)

MATERIALS

- A few baseball or other sport cards or game cards (Harry Potter or Pokemon would work.)
- Computers with Internet access
- Index cards to provide support for animal/plant cards
- *Card Template* (one card per student)

- Envelopes (eight per team)
- *Biotic Communities Trading Card Rubric* (one per student)

TEACHER PREPARATION

- If your class has not worked on the "Day in the Life" research project, the students will need to complete the research portion of that activity for one plant or animal in their assigned biotic community.

SUGGESTED PROCEDURES

1. Show students a few sample cards: baseball, Harry Potter, Pokemon, etc. Be sure to point out features of the card that you want them to emulate: a picture, statistics, characteristics, etc. Sample wildlife cards are provided as well.
2. Tell the students that a card manufacturer has asked them to create a card for the plant or animal they have researched. Let them know that when everyone has made a card, the class will play a game with them. Distribute the card rubric and review the requirements to make sure everyone understands them.
3. Using available software and technology, students create an information card (like a sports card) about the plant or animal they researched for their "Day in the Life" essay. The card should include a photograph or sketch and enough information to allow a classmate to determine in which biotic community the plant or animal belongs. The name of the biotic community *should not* be included. The card should describe the area where its subject is found, the subject's size, color, habits, needed living conditions, special adaptations, and any interesting facts. For animals, include diet and whether it is a predator or prey. A card template is provided for your use.
4. Students can ask their "Day in the Life" teammates to check their drafts for accuracy and correctness.
5. Collect the cards. Review them and notify students who need to correct any obvious problems. When corrected, print out a complete pack for each team. A complete pack will include two plants and two animals from each biotic community. (You may choose to have students make multiple copies, or have them submit their cards electronically so you can make copies.) The students attach the cards to index cards for extra support.
6. On the day you've chosen to play the game, arrange students into teams of four. If the class completed Lesson 1: Mapping Biotic Communities, the same teams may be used.
7. Give each team a complete pack of cards.
8. Explain the rules:
    a. One student is the dealer and deals four cards to each team member.
    b. The remaining cards are placed in the middle.
    c. The student to the dealer's right picks one card from his or her own hand, lays it down face up, and announces the biotic community it belongs in.
    d. If the team agrees on the community, the player chooses another card and play rotates to the next team member. If the team disagrees, they make suggestions, the player keeps the card until next turn, and play rotates to the next team member.
    e. The next player can either add a plant or animal to a biotic community already represented on the table, or start another community.

f. Play continues until all cards have been dealt and each community has a set of four cards. This is a team goal, not an individual one, so teams that cooperate and communicate well will be rewarded.
g. When a team believes they have a complete set, they alert the teacher who checks for correctness.
h. The first team to gather all 8 sets wins. You may wish to provide a reward, such as hard candy.

ASSESSMENT

- Student cards using the rubric provided
- Observation as students play the game

EXTENSIONS

- Students may also use the cards to quiz themselves on the information.
- Each student could play independently with a certain number of cards (3 or 4). The rest are placed in a draw pile. The goal is again to create sets of plants and animals in a biotic community. Students draw one card on each turn. They can discard that card or another from their hand. A student who has a pair may lie those cards down or continue to hold them. Other players may discard onto sets laid down. Play ends when a student has no cards left.
- Other games may be played using the cards: A card could be put on each student's back and then students must mix and guess who they are by asking one yes or no question until they guess correctly.

Appendix A: Arizona Department of Education Standards – Full Text

Reading Standards

Grade	Strand	Concept	Performance Objective
6	3	1 – Expository Text	1 – Restate the main idea (explicit or implicit) and supporting details in expository text 9 – Draw valid conclusions about expository text, supported by text evidence
7	3	1 – Expository Text	1 – Restate the main idea (explicit or implicit) and supporting details in expository text 10 – Make relevant inferences about expository text, supported by text evidence
8	3	1 – Expository Text	1 – Restate the main idea (explicit or implicit) and supporting details in expository text 10 – Make relevant inferences about expository text, supported by text evidence
9	3	1 – Expository Text	8 – Support conclusions drawn from ideas and concepts in expository text
10	3	1 – Expository Text	7 – Make relevant inferences by synthesizing concepts and ideas from a single reading selection 8 – Support conclusions drawn from ideas and concepts in expository text

Writing Standards

Grade	Strand	Concept	Performance Objective
6, 7, 8	1	5 – Publishing	3 – Use graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product
	2	1 – Ideas and Content	2 – Provide content and selected details that are well-suited to audience and purpose
		2 – Organization	1 – Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay)
		6 – Conventions	10 – Use resources to spell correctly
High School	1	5 – Publishing	2 – Include such techniques as principles of design (e.g., margins, tabs, spacing, and columns) and graphics (e.g., drawings, charts, graphs), when applicable, to enhance the final product

Writing Standards Continued

Grade	Strand	Concept	Performance Objective
High School	2	1 – Ideas and Content	3 – Provide sufficient, relevant and carefully selected details for support
		2 – Organization	1 – Use a structure that fits the type of writing (e.g., letter format, narrative, play, essay)
		6 – Conventions	9 – Spell words correctly

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Appendix B: Suggested Research Web Sites

Below is the list of additional plants and animals to include in each biotic community as well as some suggested Web sites that the students may use for research. It is recommended that you review the Web sites before using them with students.

FIR FOREST

Arizona Bugbane
- http://www.azgfd.gov/pdfs/w_c/hdms/Plants/Cimiariz.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/cimiariz.gif

Arizona Frog Orchid
- http://www.azgfd.gov/w_c/edits/documents/Coelvivi.d.pdf
- http://www.azgfd.gov/w_c/edits/images/coelvivi.gif

Mexican Spotted Owl
- http://www.azgfd.gov/w_c/edits/documents/Strioclu.fi.pdf
- http://www.azgfd.gov/w_c/edits/images/strioclu.gif

Hammond's Flycatcher
- http://www.azgfd.gov/w_c/edits/documents/Empihamm.d.pdf
- http://www.bird-friends.com/BirdPage.php?name=Hammond's%20Flycatcher

PINE FOREST

Western Fairy Slipper
- http://www.azgfd.gov/w_c/edits/documents/Calybulb.d.pdf
- http://www.azgfd.gov/w_c/edits/images/calybulb.gif

Nevin Bird's-beak
- http://www.azgfd.gov/w_c/edits/documents/Cordnevi.d.pdf
- http://www.azgfd.gov/w_c/edits/images/cordnevi.gif

Long-eared Myotis
- http://www.azgfd.gov/w_c/edits/documents/Myotevot.fi.pdf
- http://www.azgfd.gov/w_c/edits/images/myotevot.gif

Mexican Gray Wolf
- http://www.azgfd.gov/w_c/edits/documents/Caniluba.d.pdf
- http://www.phoenixzoo.org/zoo/animals/facts/mexicanwolf.asp

PINYON-JUNIPER

Huachuca Milk-vetch
- http://www.azgfd.gov/pdfs/w_c/hdms/Plants/Astrhypo.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/astrhypo.gif

Roaring Springs Prickly-poppy
- http://www.azgfd.gov/w_c/edits/documents/Argeariz.fi.pdf
- http://www.azgfd.gov/w_c/edits/images/argeariz.gif

Arizona Night Lizard
- http://www.azgfd.gov/w_c/edits/documents/Xantariz.d_000.pdf
- http://www.azgfd.gov/w_c/edits/images/xantariz.gif

Narrow-headed Garter Snake
- http://www.azgfd.gov/w_c/edits/documents/Thamrufi.di_001.pdf
- http://www.azgfd.gov/w_c/edits/images/thamrufi_000.gif

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OAK-PINE

Chihuahuan Stickseed

- http://www.azgfd.gov/pdfs/w_c/hdms/Plants/Hackursi.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/hackursi.gif

Woodland Spurge

- http://www.azgfd.gov/w_c/edits/documents/Euphmacr.d.pdf
- http://www.azgfd.gov/w_c/edits/images/euphmacr.gif

Berylline Hummingbird

- http://www.azgfd.gov/w_c/edits/documents/Amazbery.D.pdf
- http://www.azgfd.gov/w_c/edits/images/amazbery.gif

Elegant Trogon

- http://www.azgfd.gov/w_c/edits/documents/Trogeleg.d.pdf
- http://www.azgfd.gov/w_c/edits/images/trogeleg.gif

OAK WOODLAND

Large-flowered Blue Star

- http://www.azgfd.gov/w_c/edits/documents/Amsogran.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/amsogran.gif

Chiltepin

- http://www.azgfd.gov/w_c/edits/documents/Capsangl.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/capsangl.gif

Yellow-nosed Cotton Rat

- http://www.azgfd.gov/w_c/edits/documents/Sigmochr.di.pdf
- http://www.azgfd.gov/w_c/edits/images/sigmochr.gif

Acorn Woodpecker

- http://www.birding.com/572aw.asp
- http://www.bird-friends.com/BirdPage.php?name=Acorn%20Woodpecker

CHAPARRAL

Flannel Bush

- http://www.azgfd.gov/w_c/edits/documents/Fremcali.d.pdf
- http://www.azgfd.gov/w_c/edits/images/fremcali.gif

Arizona Agave

- http://www.azgfd.gov/w_c/edits/documents/Agavariz.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/agavariz.gif

Madrean Alligator Lizard

- http://www.reptilesofaz.com/Lizards-Subpages/h-e-kingii.html
- http://www.anapsid.org/gerrhont.html

Coyote

- http://www.azgfd.gov/h_f/game_coyote.shtml
- http://www.phoenixzoo.org/zoo/animals/facts/coyote.asp

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MOUNTAIN GRASSLAND

Kaibab Beardtongue

- http://www.azgfd.gov/w_c/edits/documents/Penspseu.fi.pdf
- http://www.azgfd.gov/w_c/edits/images/penspseu.gif

Redflower Onion

- http://www.azgfd.gov/w_c/edits/documents/Allirhiz.d.pdf
- http://www.azgfd.gov/w_c/edits/images/allirhiz.gif

White Mountains Ground Squirrel

- http://www.azgfd.gov/w_c/edits/documents/Spertrmo.d.pdf
- http://www.azgfd.gov/w_c/edits/images/spertrmo.gif

New Mexican Jumping Mouse

- http://www.azgfd.gov/w_c/edits/documents/Zapuhulu.d.pdf
- http://www.azgfd.gov/w_c/edits/images/zapuhulu_000.gif

PLAINS GRASSLAND

Paper-spined Cactus

- http://www.azgfd.gov/w_c/edits/documents/Pedipapy.d_000.pdf
- http://www.azgfd.gov/w_c/edits/images/pedipapy_000.gif

Peebles Blue Star

- http://www.azgfd.gov/w_c/edits/documents/Amsopeeb.d.pdf
- http://www.azgfd.gov/w_c/edits/images/amsopeeb.gif

Black-tailed Prairie Dog

- http://www.azgfd.gov/w_c/edits/documents/Cynoludo.fi.pdf
- http://www.desertusa.com/dec96/du_pdogs.html

Milksnake

- http://www.azgfd.gov/w_c/edits/documents/Lamptria.d_001.pdf
- http://www.azgfd.gov/w_c/edits/images/lamptria_000.gif

DESERT GRASSLAND

Pima Indian Mallow

- http://www.azgfd.gov/pdfs/w_c/hdms/Plants/Abutpari.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/abutpari.gif

Arid Throne Fleabane

- http://www.azgfd.gov/pdfs/w_c/hdms/Plants/Erigaris.fo.pdf
- http://www.azgfd.gov/w_c/edits/images/erigaris.gif

Mexican Hog-nosed Snake

- http://www.azgfd.gov/w_c/edits/documents/Hetenake.d_001.pdf
- http://www.azgfd.gov/w_c/edits/images/hetenake_000.gif

Masked Bobwhite

- http://www.azgfd.gov/w_c/edits/documents/Coliviri.d.pdf
- http://www.azgfd.gov/w_c/edits/images/coliviri.gif

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GREAT BASIN DESERT

Fredonia Catseye

- http://www.azgfd.gov/w_c/edits/documents/Crypsemi.d_000.pdf
- http://www.azgfd.gov/w_c/edits/images/crypsemi_000.gif

Whiting Dalia

- http://www.azgfd.gov/w_c/edits/documents/PSORTHWH.fi_000.pdf
- http://www.azgfd.gov/w_c/edits/images/psorthwh_000.gif

New Mexico Banner-tailed Kangaroo Rat

- http://www.azgfd.gov/w_c/edits/documents/Dipospba.d.pdf
- http://www.desertusa.com/aug96/du_krat.html

Pygmy Rabbit

- http://www.azgfd.gov/w_c/edits/documents/Sylvidah.d.pdf
- http://www.glenoakzoo.org/pygmy_rabbit_fact.htm

MOHAVE DESERT

Grand Canyon Flaveria

- http://www.azgfd.gov/w_c/edits/documents/Flavmcdo.d.pdf
- http://www.azgfd.gov/w_c/edits/images/flavmcdo.gif

Brittlebush

- http://www.desertusa.com/april96/du_britbush.html
- http://www.fs.fed.us/database/feis/plants/shrub/encfar/all.html

Kit Fox

- http://www.azgfd.gov/h_f/game_foxes.shtml
- http://www.southwestwildlife.org/factsheets/kitfox.htm

Desert Iguana

- http://www.desertusa.com/april97/du_desiguana.html
- http://www.desertmuseum.org/books/nhsd_desert_iguana.html

SONORAN DESERT

Crucifixion Thorn

- http://www.azgfd.gov/w_c/edits/documents/Castemor.d.pdf
- http://www.desertusa.com/magdec97/dec_pap/du_cruxthorn.html

Gander's Cryptantha

- http://www.azgfd.gov/w_c/edits/documents/Crypgand.d.pdf
- http://www.azgfd.gov/w_c/edits/images/crypgand.gif

Crested Caracara

- http://www.azgfd.gov/w_c/edits/documents/Caracher.d.pdf
- http://www.azgfd.gov/w_c/edits/images/caracher.gif

Gila Monster

- http://www.azgfd.gov/w_c/edits/documents/Helosuci.d_001.pdf
- http://www.azgfd.gov/w_c/edits/images/helosuci_000.gif

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CHIHUAHUAN DESERT

Cob Corycactus

- http://www.azgfd.gov/w_c/edits/documents/Escotube.d.pdf
- http://www.azgfd.gov/w_c/edits/images/escotube.gif

Lechuguilla

- http://www.fs.fed.us/database/feis/plants/shrub/agalec/all.html
- http://www.explorenm.com/plants/Agavaceae/Agave/lechuguilla/

Greater Roadrunner

- http://www.phoenixzoo.org/zoo/animals/facts/roadrunner.asp
- http://www.desertmuseum.org/books/nhsd_roadrunner_new.html

Black-capped Gnatcatcher

- http://www.azgfd.gov/w_c/edits/documents/Polinigr.d.pdf
- http://www.azgfd.gov/w_c/edits/images/polinigr.gif

Appendix C: Worksheets and Overheads

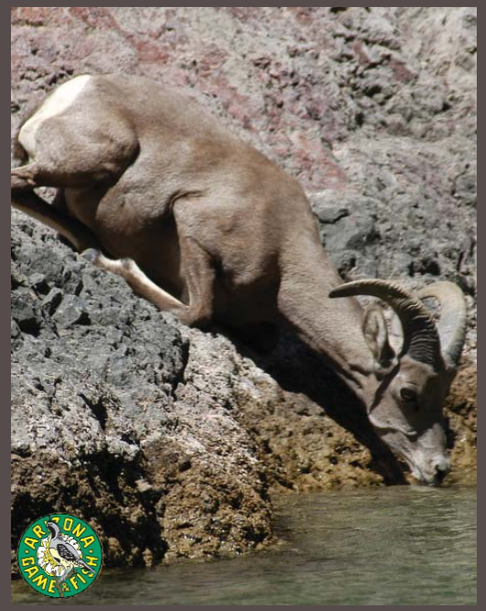
The pages that follow contain the worksheets listed below:

A. *Sample Cards* – Pre-made cards containing some of the animals from the "Exploring Arizona's Natural Resources" Web page (2 pages)

B. *Card Template* – A template that students can use to make their own cards (2 pages)

ARIZONA
GAME & FISH

ARIZONA
GAME & FISH


ARIZONA
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GAME & FISH

Gray Fox
Urocyon cinereoargenteus

Height: 1-1.25 ft.
Weight: 7-13 lbs.
Length: 2-3.5 ft.

Description:
- Grizzled gray on top
- Reddish sides and chest
- Dark brown mane on throat
- Prominent ears

Characteristics:
- A carnivore, feeding on rodents and rabbits
- Only American canid with climbing ability
- Most active at twilight and night
- Will bark, growl, and yap
- Young ready to hunt at four months

Tidbits:
A fur-bearing animal in Arizona, this fox has few predators. Although considered a carnivore, the gray fox can be seen eating nuts, berries, fruit, and grass. Grasshoppers are an important part of its diet in summer.

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Desert Bighorn Sheep
Ovis canadensis

Height: 2.5-3.5 ft.
Weight: 75-225 lbs.
Length: 4-4.5 ft.

Description:
- Muscular, thick neck
- Light-colored belly
- Males - massive brown curled horns

Characteristics:
- An herbivore
- Hooves are cork-like to aid in traction
- Live where few other animals can survive
- Excellent eyesight

Tidbits:
A big game animal in Arizona. During mating season, males will butt heads at speeds up to 20 mph creating a rifle-shot sound that can be heard up to a mile away. These battles can continue for 20 hours. Lions are the primary predator of bighorn sheep.

Note: Males substantially larger/heavier than females

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Pronghorn
Antilocapra americana

Height: 3-3.5 ft.
Weight: 70-140 lbs.
Length: 4-4.5 ft.

Description:
- Black horns
- White rump and white tail
- Tan or orange-brown body and white belly

Characteristics:
- An herbivore
- Fastest mammal in North America: 60 mph
- Can sustain 30 mph for long distances
- Can detect movement four miles away
- Will use sharp hooves to fight off predators

Tidbits:
A big game animal in Arizona. Numbers vary depending on food supply and predation. Coyotes are the biggest threat to the young. The Sonoran pronghorn, located in southwestern Arizona, is endangered.

Note: Males substantially larger/heavier than females

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Ringtail
Bassariscus astutus

Height: 5-8 in.
Weight: 2-3 lbs.
Length: 1-1.5 ft.

Description:
- Body resembles a cat and face of a fox
- Yellowish-gray fur above, whitish below
- Long, bushy tail with white and black rings
- Prominent dark, round eyes, rounded ears

Characteristics:
- An omnivore
- Grooms itself much like a house cat
- Most often will ambush prey
- A nocturnal animal that is rarely seen
- Likes rocky areas, such as canyons

Tidbits:
Also known as a 'miner's cat', the ringtail is the state mammal. The ringtail will feed on rodents, insects, cactus fruits and other vegetation. Part of its diet consists of snakes, scorpions, and centipedes.

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Merriam's Turkey
Meleagris gallopavo

Height: 2.5-3 ft.
Weight: 10-20 lbs.
Length: 3-4 ft.

Description:
- Iridescent (rainbowlike) brown
- Fan-shaped tail
- Spurs on feet; "beard" on breast of males
- Head and neck are featherless

Characteristics:
- Eats seeds, nuts, acorns, fruit, and insects
- Gobbling calls similar to domestic turkey
- Swift runners and quite wary
- Nest concealed in grass or shrubs
- Lives in oak woodlands or pine-oak forests

Tidbits:
The largest game bird in North America. This bird is native only to North America and Mexico. The male will strut and gobble to attract a hen during courtship. The call of the wild turkey can be heard up to a mile away.

Visit azgfd.gov

Javelina
Tayassu tajacu

Height: 1.5-2 ft.
Weight: 35-60 lbs.
Length: 2.5-3.5 ft.

Description:
- White-yellowish ring of hair around neck
- Pig-like snout
- Large canines. Small hooves

Characteristics:
- An herbivore
- Musk gland exudes skunky odor
- Can run at 25 mph
- Will swim from danger when necessary
- Very poor eyesight

Tidbits:
A big game animal in Arizona. Resembles a pig, but is not a member of the pig family. Will feed in gardens and on fallen bird seed, which can create potential conflicts with people. Its activity is strongly related to temperature, seeking shelter during midday heat.

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Elk
Cervus elaphus

Height: 3-5 ft.
Weight: 400-800 lbs.
Length: 5-8 ft.

Description:
- Heavy bodied with slender legs
- Large antlers on males
- Dark brown mane on throat

Characteristics:
- An herbivore
- Can run 35-40 mph
- Very vocal, including common 'bugle' call
- Herds can be composed of up to 400 elk

Tidbits:
A big game animal in Arizona that is a member of the deer family. They are the second-largest mammal in Arizona next to the bison. Antlers can reach a length of up to 5 feet. Primary predator is the mountain lion.

Note: Males substantially larger/heavier than females

Elk photo by Joe and Marisa Cerreta

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Bobcat
Lynx rufus

Height: 1.5-2.5 ft.
Weight: 15-40 lbs.
Length: 2-3.5 ft.

Description:
- Short, stubby tail, known as a bobbed tail
- Tan or grayish fur
- Ears are slightly tufted
- Strong resemblance to a house cat

Characteristics:
- A carnivore
- Lives only in North America
- Fur provides excellent camouflage
- Will stalk or wait and pounce to kill prey
- Calls can sound much like a house cat

Tidbits:
A fur-bearing animal in Arizona. Although small wildlife are their primary food source, a bobcat is capable of bringing down a deer. Bobcats are North America's most common wildcat.

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Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

Organism Name:	
Scientific Name:	
Physical Description:	•
	•
	•
Habitat Description:	•
	•
	•
Interesting Facts:	•
	•
	•
Created By:	

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Biotic Communities Trading Card Rubric

Use the following rubric to assist as you create your card of your assigned plant or animal.

CATEGORY	4	3	2	1
Picture	Picture shows the plant or animal clearly, is in focus, well cropped and appropriate for the card.	Picture shows the plant or animal, is in focus, but may not be well cropped.	Picture may be out of focus, poorly cropped or inappropriate for the card.	Picture is incorrect, sloppily done, or missing.
Content	Information is accurate and complete, addressing all required areas: size, color, special adaptations, habits, necessary living conditions, interesting facts, diet, predator or prey (for animals).	Information is accurate, but some required areas are not included.	Some information is inaccurate and/or many required areas are not included.	Much information is incorrect and/or most required areas are missing
Layout	Layout is attractive and neatly done. It is easy to read and visually pleasing.	Layout is neatly done, but could be more easy to read or visually pleasing.	Layout may be a little sloppy or poorly designed.	Layout is difficult to read because it is sloppy and poorly designed.
Spelling and Proofreading	No spelling or grammar errors in the final copy.	No more than 2 spelling or grammar errors in the final copy.	No more than 3 spelling or grammar errors remain in the final copy.	More than 3l spelling or grammar errors remain in the final copy.