Design Your Own Animal

YOUR JOB: Work in a group to design your own animal. You must use all that you have learned this year in science to design an animal that is **REALISTIC** and well adapted for its environment. You will be graded on your realistic design, creativity, teamwork, and your demonstration of the concepts we have learned this year. Good luck!

Directions:

1. **ASSIGN each member of your group one of the group jobs.**
2. **CHOOSE one topic for each group member to complete.**
3. **PLAN - take 5 minutes to plan out your animal. Take into account your biome, and the adaptations and qualities your animal would need to survive.**
4. **GET TO WORK - read over the directions for your topic and begin working. You will have a limited amount of time to complete your topic. If you finish early help out one of your group members.**
6. **PRESENT - tell the class all about your animal.**

Group Jobs

- **Time Keeper** - your job is to keep track of time for your group. You have only one period to complete the project. You must help your group finish on time.
- **Supplies Manager** - your job is to make sure that your group has all of the supplies it needs and that your area is 100% clean at the end of the period.
- **Mediator** - your job is to help your group work well together. You must make sure that everyone's opinion is heard and that everyone is able to contribute.
- **Spokesperson** - your job is to communicate any information between your group and the teachers.

Performance Assessment Rubric

Category	0-5 pts.	6-10 pts.	11-15 pts.	16-20 pts.	*TOTAL*
Realistic Design	Animal is completely unrealistic.	Animal is somewhat realistic.	Animal is realistic.	Animal is very realistic.	
Creativity	The project exhibits no creative thoughts or design.	The project exhibits some creative thought and execution.	The project exhibits creative thought and execution.	The project is very creative, both in your thoughts and design.	
Teamwork	Your team did not work together and not everyone contributed.	Your team worked well together but not everyone contributed equally.	Your team worked well together and everyone contributed.	Your team worked very well together and everyone contributed equally.	
Demonstration of Science Concepts	Did not demonstrate any knowledge of science concepts.	Demonstrated little knowledge of science concepts.	Demonstrate knowledge of science concepts.	Demonstrated strong knowledge of science concepts.	
Total Score.					***/100 pts***

Global Warming!!!

Global warming has caused a sudden and severe rise in temperature. Ice is melting, winter temperatures barely go below freezing and there is a drastic increase in precipitation!! Many new plants have started to grow, however much of the frozen hunting ground is now under water.

Step 5

For an additional 20 pts. you must explain how this change of environment will affect your animal and your ecosystem's food web, and you must predict the future of your biome and animal. Will it survive? If so then how?

- You must work together to write a future for your animal, a new drawing and a new food web.

Invasive Species!!!

A new species of tick has accidentally been brought into your region. The tick caries a rare disease that is killing many of the animals it bites. Many populations of rodents, deer and even birds are dying off!!

Step 5

For an additional 20 pts. you must explain how this change of environment will affect your animal and your ecosystem's food web, and you must predict the future of your biome and animal. Will it survive? If so then how?

- You must work together to write a future for your animal, a new drawing and a new food web.

Volcanic Eruption!!!

The large volcano in your region has just erupted after laying dormant for thousands of years! The entire region is covered in ash and cooled lava. Plants, trees and many small animals have died!!! Some plants are beginning to grow back and most of the larger animals have returned.

Step 5

For an additional 20 pts. you must explain how this change of environment will affect your animal and your ecosystem's food web, and you must predict the future of your biome and animal. Will it survive? If so then how?

- You must work together to write a future for your animal, a new drawing and a new food web.

Drought!!!

There has been no rain in almost three years! Much of the grass cannot grow, many trees are no longer alive and there are very few water holes for the animals to drink from. Much of the land is beginning to look like a desert!!! Although some of the larger animals are still alive, many of the smaller ones have died.

Step 5

For an additional 20 pts. you must explain how this change of environment will affect your animal and your ecosystem's food web, and you must predict the future of your biome and animal. Will it survive? If so then how?

- You must work together to write a future for your animal, a new drawing and a new food web.

Rain Rain Rain!!!

Your region has experienced a large amount of rain in the last several years. Many of the region's areas are flooded, and small rivers and lakes are starting to form! The days have become cooler however the nights are remaining hot. Many plants not adapted for rain are dying, however some new plants are starting to grow.

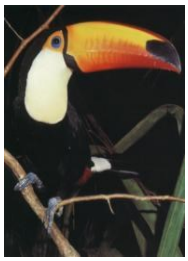
Step 5

For an additional 20 pts. you must explain how this change of environment will affect your animal and your ecosystem's food web, and you must predict the future of your biome and animal. Will it survive? If so then how?

- You must work together to write a future for your animal, a new drawing and a new food web.

The Rain Forest

Characteristics:



Climate: Temperature is on average 20-25° C and varies little throughout the year: the average temperatures of the three warmest and three coldest months do not differ by more than 5 degrees. It is the wettest biome, with an average annual rainfall exceeding 2,000 mm.

Plant Life: Highly diverse: one square kilometer may contain as many as 100 different tree species. Trees are 25-35 m tall, with rigid trunks and shallow roots, mostly evergreen, with large dark green leaves. Plants such as orchids, bromeliads, vines (lianas), ferns, mosses, and palms are present in tropical forests. There is plenty of fruit and edible vegetation.

Animal Life: Elephants, tigers, chimpanzees, monkeys, orangutans, bats, lions, eagles, many different species of birds, snakes, sloth, also brightly colored butterflies, mosquitoes, camouflaged stick insects, and huge colonies of ants.

Topography: Large mountains and valleys that are very steep. Filled with large flowing rivers, swamps and lakes, and many waterfalls. The ground stays wet all year around. There are very few clearings, most of the forest is densely covered in trees and smaller vegetation.

Grasslands

Characteristics:



Climate: Grasslands are found in warm or hot climates where the annual rainfall is from about 50 to 130 cm (20-50 inches) per year. The rainfall is concentrated in six or eight months of the year, followed by a long period of drought when water is scarce, plant life decreases and fires can occur.

Plant Live: Grasses cover most of the land, with few trees spread about the landscape.

Animal Live: Includes giraffes, zebras, buffaloes, kangaroos, lions, leopards, hyenas, and elephants. Also mice, moles, gophers, ground squirrels, snakes, worms, termites, beetles, blackbirds, grouses, meadowlarks, quails, sparrows, hawks, owls, snakes, grasshoppers, leafhoppers, and spiders.

Topography: The topography is mainly flat with small rolling hills and small mountains. The flat landscape is the cause of flooding during the rainy season. There are flowing rives during the rainy season, which are reduced to small ponds during the dry season.




FOOD WEB

Directions: Your job is to create a food web using the organisms (both plants and animals) from your biome. *On your Biome Characteristics sheet there is a list of organisms, feel free to work off that list but do not feel that you must use all of the ones listed*. The animal that your group has designed must fit into the ecosystem's food web. Your animal must have natural predators, meaning that there should be animals that eat it. Below write a brief description of how you animal fits into your web. (There is an example of a food web on pg. B27, however your food web should not have pictures).

FOOD WEB

Directions: How has your disaster affected your food web? What animals or plants have died? What new plants or animals have formed? How does the new food web affect what your animal eats? Write an explanation below of how your food web was affected. Fill in a new food web on you Post-Disaster FOOD WEB.

Temperate Forest

Characteristics:




Climate: Temperature varies from -30° C to 30° C. Precipitation (75-150 cm) is distributed evenly throughout the year. Has four distinct seasons, spring, summer, fall and winter.

Plant Life: Characterized by 3-4 tree species per square kilometer. Trees are distinguished by broad leaves that are lost annually and include such species as oak, hickory, beech, hemlock, maple, basswood, cottonwood, elm, willow, and spring-flowering herbs. Some of the shrubs are rhododendrons, azaleas, mountain laurel, and huckleberries. It also contains short plants such as herbal plants, lichen, club mosses, and true mosses.

Animal Life: Represented by squirrels, chipmunks, rabbits, skunks, birds, deer, mountain lion, bobcat, timber wolf, fox, coyote, and black bear. There are many different types of migratory birds, as well as land birds such as wild turkey. There are also a host of insects and spiders, and different types of snakes and amphibians.

Topography: Made up of mountains and flatlands. There are many streams, ponds, lakes and rivers. Vegetation is thick, however there are clearings spread throughout the forest. There is a rich layer of topsoil with a hard layer of rock just below.


The Tundra

Characteristics:



Climate: Extremely cold, averaging –34º C in the winter and only 10°C in the summer. There is an average of 10-15 mm. of rain per year.

Plant Life: Wide variety of plant life, mostly shrubs and other low growing plants. There is a short growing season of only 50 days a year. The ground remains frozen almost the entire year.

Animal Life:

- Herbivorous mammals: lemmings, voles, caribou, arctic hares and squirrels
- Carnivorous mammals: arctic foxes, wolves, and polar bears
- Migratory birds: ravens, snow buntings, falcons, loons, ravens, sandpipers, terns, snow birds, and various species of gulls
- Insects: mosquitoes, flies, moths, grasshoppers, black flies and arctic bumble bees
- Fish: cod, flatfish, salmon, and trout

Topography: The tundra contains ponds, lakes, bogs, marshes, and river and stream corridor wetlands. The land surface is gouged by ravines, gullies, troughs, and sinks and pockmarked by rises, hillocks, and mounds.



Performance Assessment Rubric

Group: Members:

Category	0-5 pts.	6-10 pts.	11-15 pts.	16-20 pts.	*TOTAL*
Realistic Design	Animal is completely unrealistic.	Animal is somewhat realistic.	Animal is realistic.	Animal is very realistic.	
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Demonstration of Science Concepts	Did not demonstrate any knowledge of science concepts.	Demonstrated little knowledge of science concepts.	Demonstrate knowledge of science concepts.	Demonstrated strong knowledge of science concepts.	
Step 5 "Adaptations"	Project did not apply or demonstrate knowledge of adaptations	Project demonstrated adaptations with questionable logic.	Project demonstrated and applied logical adaptations.	Project demonstrated and applied creative and logical adaptations.	
Total Score.					***/100 pts***

Comments:

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Animal Design Performance Assessment

Mike Kaufman

Lesson: 5th Grade Life Science, 20 Students, 90 min.

Objective: TLW demonstrate ability to synthesize concepts of an organism's role in a balanced ecosystem and an unbalanced ecosystem.

Standards:

NJ Science Process Standards:

- **5.1.8 B.1** Identify questions and make predictions that can be addressed by conducting investigations.

NJ Core Curriculum Content Standards:

- **5.5.6 B.2** Compare and contrast acquired and inherited characteristics in humans and other species.
- **5.10.6. A.1** Explain how organisms interact with other components of an ecosystem.

Materials: ecosystem handout, animal profile sheet, food chain, paper, markers, disaster cards,

Procedure:

- *Anticipatory Set* – The teacher will use the Elmo Machine to show pictures as a prompt to lead a discussion reviewing animal characteristics and adaptations. The class will explore the connection between organism's adaptation with the ecosystem, and living and nonliving causes of adaptation.
- *Cooperative Learning Activity* – The students will work in heterogeneous groups to create an animal based on their assigned ecosystem. The students must design the animal's characteristics, role in the food web, and how it maintains balance within its ecosystem. The students will then be given a card representing a living or nonliving thing that will disrupt the balance of the ecosystem. The students will predict how its animal and ecosystem will cope.
- *Closure Activity* – The students will answer an 'exit card' question about the connection between the many components of ecosystems. They will also comment on their role in their group and self-assess their group's work.

Assessment:

- 'Exit Ticket'
- Completed animal and accompanying sheets

Group Composition:

The class will be broken up into pre-selected heterogeneous groups, taking into account ability, skills, interests and compatibility. The group members will have group jobs for which they are responsible. They will include time keeper, supplies manager,

mediator, and spokesperson. The group jobs will ensure that the students take on certain clerical responsibilities. The students' specific responsibilities direct and hold the group accountable for certain management tasks. Each member of the group will also have a topic for which they are responsible. This will allow students to cover more material but also to hold them responsible for covering the assigned task.

This group project has a big emphasis on individual accountability. However the students must spend the time in the beginning of the project to plan and come up with a unified product. After the students cooperatively determine what it is the group will accomplish, they will have to work individually. The students must continually check in with their partners to make sure that they are all on the same page but the execution will come from each student.

Reflection:

The "Animal Design Performance Assessment" lesson was designed to push students to synthesize the concepts we had covered in science. The lesson was successful at posing different higher level questions to the students. The different topics as well as the variety of group jobs allowed students to then solve the problems in different ways. The 'natural and unnatural disruptions' given to the students after their original design worked well because it tested their animal's design against the forces of nature. The lesson also challenged the students to brainstorm different ideas together but to then divide the work and carry out the ideas individually. This cooperative learning dynamic was designed to have students balance codependence with each other at the same time as fostering independent accountability and work. The grading rubric for the lesson was very successful. Each category was given a large range of possible points to be earned. This gave the flexibility to determine a more accurate assessment.

The lesson was very challenging to the students both because of the content they needed to cover, and the type of cooperative learning they were asked to do. The students had a hard time going over each step of the lesson. Some groups jumped into the lesson without the proper guidance. Although the directions were written clearly for each topic, the students did not spend the time to read them over. Every group eventually understood what it was they needed to do, however some groups lost a lot of time before they reached that point. The 'Exit Ticket' was not as successful as I had hoped. I did not give the students enough time to reflect on the assignment and therefore many of the students did not get enough out of it.

Next time I would spend more time going over each job before the groups began to work. I would model the beginning steps the groups needed to do in order to be successful. Spending extra time in the beginning going over each part of the lesson in detail would have saved time in the end. I would also give the students more time to reflect on the lesson. I would also consider having the students do the project in smaller steps. This way they can go more into depth in each part.

Animal's Characteristics

Directions: Fill out the specific characteristics of your organism. Be as detailed as possible. REMBEMBER YOUR ANIMAL MUST BE REALISTIC!!

Name of Your Animal_____

Type of Animal (bird, mammal, fish, etc.)_____
Weight (lbs.)_____
Height/Length (ft./in.)_____/_____
Fur or Skin Type_____
Color_____

Describe the following parts of your animal and how it helps them in its environment.
Arms/Legs/Wings_____
_____
_____
_____

Tail_____
_____

Ears_____
_____

Eyes_____
_____

Nose/Smell_____
_____

Mouth/Teeth_____
_____

Paws/Claws/Hands_____
_____

Answer the following questions about your animal.
How does your animal move around? _____
_____
_____
_____
_____

Continued on back...

What does your animal eat?_____
_____
_____

How does your animal obtain its food? _____
_____
_____
_____

Is your animal intelligent? How does that affect its ability to survive?_____
_____
_____
_____
_____

Does your animal live alone or with a group? How does that affect your animal? _____
_____
_____
_____
_____
_____

Does your animal get along with other animals?_____
_____
_____
_____

How long does your animal live? _____
_____

How does your animal protect its young? _____
_____
_____
_____

Write any interesting facts about your animal. _____
_____
_____
_____
_____

YOU ARE FINISHED!!

The Desert

Characteristics:



Climate: Rainfall is usually very low and/or concentrated in short bursts between long rainless periods. Evaporation rates regularly exceed rainfall rates. Sometimes rain starts falling and evaporates before reaching the ground. Temperatures exhibit daily extremes, ranging from 45ºC during the day and –18ºC at night.

Plant Life: mainly ground-hugging shrubs and short woody trees. They tend to be small, thick and covered with a thick outer layer. Typical plants are cacti, which have leaves that are reduced to pointed spines.

Animal Life: Animals include small nocturnal (active at night) carnivores. The dominant animals are burrowers and kangaroo rats. There are also insects, arachnids, reptiles and birds. Examples are badgers, kit foxes, coyotes, great horned owls, golden eagles and the bald eagles, kangaroo rats, rabbits, skunks, insects like grasshoppers and ants, reptiles are represented by lizards and snakes.

Topography: Mountains and valleys covered with sand and rocks. Very dry earth with little to no sources of water.




ANIMAL PICTURE

Directions: Your job is to draw your animal. Use crayons, markers or colored pencils to illustrate your animal. Use arrows to describe any of the special or different features of your animal. Remember that you have a limited amount of time, so work quickly and neatly.

A BALANCED ENVIRONMENT

Directions: Your job is to explain the history of your animal and how it affects its environment. Write about how your biome's characteristics helped your animal form. Use the following questions to guide you. How is your animal adapted to fit its environment? What factors in the environment caused your animal to adapt? How do your animal and its environment remain balanced?

Continue onto the back of the paper

A BALANCED ENVIRONMENT

Directions: Your job is to explain the future of your biome. What is going to happen? What animals and plants are going to survive? Are they going to adapt, relocate or perish? How will your animal survive? Will it adapt, relocate or perish?

Continue onto the back of the paper