

Create Your Own Organism!

Loriana Caruso

Grade and Unit:

The following activity is designed to meet some of the expectations found in the Grade 6 and 7 Life Systems strand of study. As a teacher of a combined grade 6 and 7 class, I try to carefully design my lessons and assignments to meet the expectations of both sets of curriculum. The Grade 6 Life Systems strand focuses on “Diversity of Life,” while “Interactions within Ecosystems” is the focus of the Grade 7 strand; however, the two programs can be taught together since many of the concepts overlap and develop upon one another. This activity allows students to apply the concepts they have learned about diversity, adaptations, and interactions, while using their imagination to create an organism that is adapted to a particular habitat. Students must also focus their attention on the needs of the organism, the interactions of that organism with both the biotic and abiotic factors in the environment, and the effects the environment has on their organism.

Student Learning Expectations:

Grade 6:

- explain why formal classification systems are usually based on structural characteristics (e.g., type of skeleton, circulatory system, reproductive system) rather than on physical appearance or behavioural characteristics;
- identify and describe the characteristics of vertebrates, and use these characteristics to classify vertebrates as mammals, birds, amphibians, reptiles, and fish (the five main classes) **or** identify and describe the characteristics of invertebrates, and classify invertebrates into phyla (e.g., sponges, worms, molluscs, arthropods);
- formulate questions about and identify the needs of different types of animals, and explore possible answers to these questions and ways of meeting these needs (e.g., design an experiment to study whether certain insects will grow larger if given large quantities of food);
- describe specific characteristics or adaptations that enable each group of vertebrates to live in its particular habitat (e.g., fish in water), and explain the importance of maintaining that habitat for the survival of the species;

Grade 7:

- identify living (biotic) and non-living (abiotic) elements in an ecosystem;
- identify populations of organisms within an ecosystem and the factors that contribute to their survival in that ecosystem;
- identify and explain the roles of producers, consum-

ers, and decomposers in food chains and their effects on the environment (e.g., plants as producers in ponds);

- formulate questions about and identify the needs of various living things in an ecosystem, and explore possible answers to these questions and ways of meeting these needs (e.g., research the population levels of a species over time and predict its future levels on the basis of past trends and present conditions; determine how the structure of specific plants helps them withstand high winds, live on the surface of water, or compete for sunlight).

Position of the Topic within the Unit:

I would recommend that this assignment be one of the culminating tasks of the unit. Throughout the unit of study, students have spent several lessons learning about classification of organisms, interactions of biotic and abiotic factors within an ecosystem, and adaptations that enable an organism to survive in its environment. By this point in the unit, students should have a good sense of the meaning of the following terms: “diversity,” “adaptation,” “ecosystem,” “biotic,” “abiotic,” “classification,” “vertebrate,” “invertebrate,” “characteristics,” “food chain,” and “environment.”

As the unit progresses, the students will gain a better understanding of the diversity of life and how various organisms within the ecosystem interact and are dependent on one another. An essential component of this integrated Grade 6/7 unit is to help students develop their understanding of the interconnectedness of the various forms of life in the environment, from plants to microorganisms to invertebrates and vertebrates (including humans). It is essential that students understand that when a factor (either biotic or abiotic) in an ecosystem is disturbed or altered in some way, it can have a major impact on other aspects of its ecosystem. An assignment like this enables students to better understand this balance as they must create their own organism and determine its place in the environment—what it eats, how it lives, who/what it interacts with, what it needs to survive, and what can threaten its existence.

Brief Teaching Note:

This activity allows for cross-curricular integration. It allows the teacher to assess students in the following areas: Science (basis of design and explanation), Language Arts (speech description of the organism, its lifestyle, and the story of discovery), and Art (drawing the organism in its habitat). The rubric should be given at the same time the assignment is given so they understand expectations for the assignment.

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Rubric for “Create Your Own Organism!”

Area	Category	Level 4	Level 3	Level 2	Level 1
Speech	Reasoning	Expresses very well-developed original ideas Includes details that are relevant and convincing	Expresses many well-developed ideas Includes details that are relevant	Expresses a variety of simple ideas Includes some details that are relevant	Expresses only a few simple ideas Includes few details that are relevant
	Communication	Purpose is clear, effective and engaging Effective voice of scientist Very effective vocabulary Variety of effective sentences	Purpose is clear and effective Voice of scientist is clear A lot of effective vocabulary Variety of sentences used	Purpose is somewhat clear Little use of scientist's voice Some effective vocabulary Some sentence variety	Purpose is unclear No evidence of scientist's voice Ineffective vocabulary Little sentence variety
	Organization	Well-developed paragraphs are closely linked Speech is organized in a very clear and effective manner	Well-developed paragraphs Speech is organized in a clear and effective way	Simple paragraphs Speech is somewhat organized in a clear way	Little paragraph division Speech is not organized
	Conventions	Practically no errors/omissions Visual presentation is clear and enhances content	Only a few minor errors/omissions Visual presentation is clear	Several minor errors/omissions Visual presentation is not always clear	Several major errors/omissions Visual presentation is not clear
Scientific Approach	Understanding of basic concepts	Identifies many relevant biotic and abiotic factors in the environment Correctly depicts many interactions of components within the ecosystem Describes organism, adaptations, and habitat very effectively	Identifies several relevant biotic and abiotic factors in the environment Correctly depicts several interactions of components within the ecosystem Describes organism, adaptations, and habitat effectively	Identifies some relevant biotic and abiotic factors in the environment Correctly depicts some interactions of components within the ecosystem Describes organism, adaptations, and habitat somewhat effectively	Identifies a few relevant biotic and abiotic factors in the environment Correctly depicts a few interactions of components within the ecosystem Describes organism, adaptations, and habitat ineffectively
	Inquiry skills	Supports ideas with significant use of scientific facts	Supports ideas with adequate use of scientific facts	Supports ideas with some use of scientific facts	Supports ideas with limited use of scientific facts
	Communication of required knowledge	Clearly and precisely communicates understanding of interactions, adaptations, and diversity of life	Clearly communicates understanding of interactions, adaptations, and diversity of life	Communicates understanding of interactions, adaptations, and diversity of life with some clarity	Communicates understanding of interactions, adaptations, and diversity of life with limited clarity
	Relating of science and technology to the outside world	Describes food web and elimination of part of web very effectively Explains conservation threats and approach very effectively	Describes food web and elimination of part of web effectively Explains conservation threats and approach effectively	Describes food web and elimination of part of web somewhat effectively Explains conservation threats and approach somewhat effectively	Describes food web and elimination of part of web with limited effectiveness Explains conservation threats and approach with limited effectiveness
Drawing	Organism and characteristics	Clear and accurate drawing of organism and its characteristics	Clear drawing of organism and its characteristics	Somewhat clear drawing of organism and its characteristics	Unclear drawing of organism and its characteristics
	Organism in habitat	Clear and effective depiction of organism in its habitat	Effective depiction of organism in its habitat	Somewhat effective depiction of organism in its habitat	Ineffective depiction of organism in its habitat

Create Your Own Organism!

You are a scientist preparing to give a report to your colleagues about your recent trip spent exploring and studying various species. Your colleagues are anxiously awaiting your speech because they've heard that you've discovered a new organism!

Prepare a speech that you will present to your colleagues at the gala dinner being held in your honour. In your speech, address the following points:

- Where were you when you discovered the new organism? (e.g. continent, country, area, region)
- Describe the location to your colleagues. What did it look like? What was around you? What types of plants and animals are normally found there?
- How did you discover the organism? What did you decide to call it?
- What type of organism did you find? Vertebrate or invertebrate? Large or small? Cold-blooded or warm-blooded? Does it swim, walk, slither or fly? Describe your organism in detail.
- How would you classify your organism? Try to determine the kingdom, phylum, and order. Give your organism a binomial name (*Genus species*).
- Explain the type of habitat in which you found your organism. Describe both the biotic and abiotic factors that make up this habitat.
- What are the needs of this organism? Remember to explain what it does or needs for food, shelter, air, space, and interaction.
- How is your organism adapted to live in its environment? Identify and explain at least five adaptations that your organism has to survive in its environment.
- Is your organism a carnivore, omnivore, or herbivore? What organisms feed off of your organism? Draw a food chain to represent these relationships. How would the food chain be disrupted if one of the members was removed by either natural ways (e.g. drought destroys the habitat) or human-made ways (e.g. humans spray pesticides)?
- Describe in detail 10 different ways that your organism interacts within its ecosystem. Remember to include both the abiotic and biotic factors with which it interacts.
- How would you make sure your organism and its environment is conserved? What are the potential hazards to the survival of your organism? Remember to consider all possible threats, including humans.

Once you have written your speech, remember that your colleagues would like to see what your organism looks like. Please prepare two images for your colleagues: first, prepare a diagram of your organism in its natural habitat, and, second, prepare a close-up drawing of your organism, pointing out any important characteristics it has.