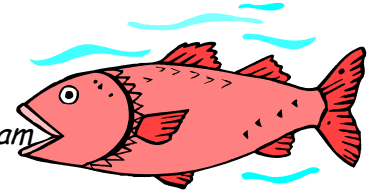


Exploring Animal Environments

forest - desert - grassland - rainforest - marshland - swamp - pond - river - ocean - stream



Background: In our studies of science, we have been investigating various water and dry-land environments to help us understand how these environments can support a diversity of plants and animals while sharing limited resources. You will use your research to complete the challenge below.

Design Challenge: Work with classmates who have researched the same environment. Choose a mammal, reptile, bird, amphibian, fish, or insect that lives there. Design and build a model of the animal. Make sure that we can identify the animal by looking at it and that a part of it can move without your hands touching the animal. You must provide a scenic background for your animal that represents the environment in which it lives.

Criteria:

Your animal must

- be identifiable by looking at it
- be the appropriate size for the background
- have at least one part that can move repeatedly without you touching the animal's body.

Your background must

- be no smaller than 12" by 24" and no larger than 24" by 36" when flat
- stand by itself behind your animal.
- All of your work must be colorful and neat.

Materials: You may select from the items below.

- | | | | | |
|----------------------|-------------------|-------------------|------------------------|------------------|
| • cardboard | • cardboard tubes | • paper fasteners | • general art supplies | • syringes |
| • construction paper | • paper clips | • 1 yard of tape | • newspaper | • plastic tubing |
| • poster board | • styrofoam | • egg cartons | • 1 yard of string | |
| • balloons | • straws | • craft sticks | • magnets | |

Targeted Standard of Learning: Science 3.6
Supporting Standards of Learning: Science 3.1, 3.2, 3.4, 3.10
Mathematics 3.14
English 3.1, 3.2, 3.3, 3.4, 3.6, 3.7

Targeted Standard for Technological Literacy: 9
Supporting Standards for Technological Literacy: 8, 10, 11

Exploring Animal Environments



Targeted Standard of Learning: Science 3.6

- The student will investigate and understand that environments support a diversity of plants and animals that share limited resources.

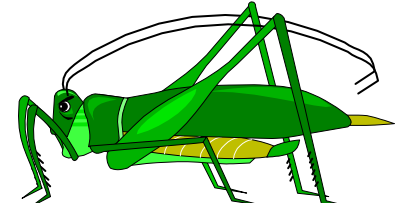
Targeted Standard for Technological Literacy: Standard 9

- Students will develop an understanding of engineering design.

Prior Knowledge & Skill	Materials & Preparation	Safety Issues	Class Management	Materials Provided	Time Management
<ul style="list-style-type: none"> • Some understanding of targeted Science Standard of Learning 3.6 • Completed KWL research • Some understanding of the design process • Exposure to simple mechanisms • Exposure to pneumatic systems 	<ul style="list-style-type: none"> • Check Design Brief for recommended materials. • Teacher may substitute materials. 	<ul style="list-style-type: none"> • Use only those syringes provided by the teacher. • Supervise cutting of styrofoam. 	<ul style="list-style-type: none"> • Small group • Each student keeps own Guided Portfolio. 	<ul style="list-style-type: none"> • Design Brief • Guided Portfolio • Rubric Assessments • KWL 	<ul style="list-style-type: none"> • Session 1: Introducing Design Brief and Portfolio (60 min.) • Sessions 2 & 3: Building (45 min. each) • Session 4: Sharing and evaluating (60 min.)

Name _____

Exploring Animal Environments



Group Members: _____

1. What is the problem? State the problem in *your own words*.

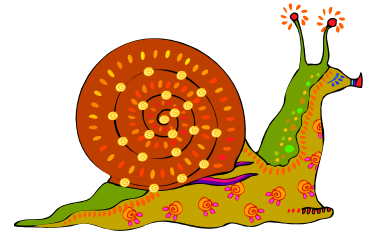
Targeted Standard of Learning: Science 3.6
Supporting Standards of Learning: Science 3.1, 3.2, 3.4, 3.10
Mathematics 3.14
English 3.1, 3.2, 3.3, 3.4, 3.6, 3.7

Targeted Standard for Technological Literacy: 9
Supporting Standards for Technological Literacy: 8, 10, 11

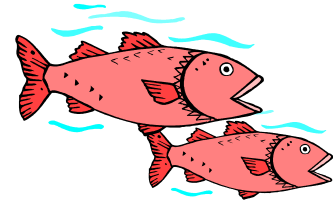
Name _____

2. Brainstorm solutions.

Draw or describe some possible solutions.

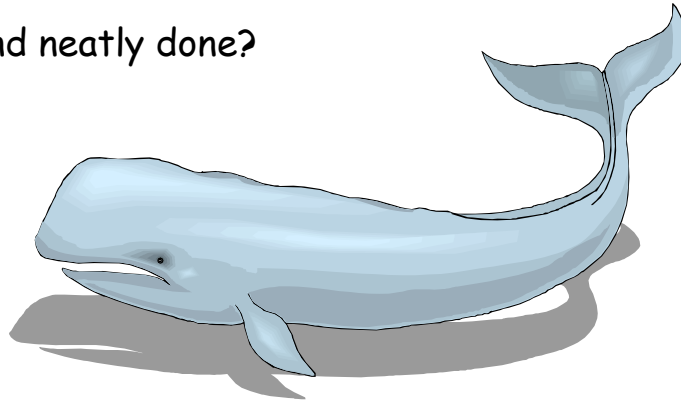


Name _____



4. Test your solution.

- Is your animal the appropriate size for the background? YES NO
- Is your animal identifiable by looking at it? YES NO
- Does your animal have at least one part that can move repeatedly without your hands touching the animal? YES NO
- Is the background no smaller than 12" by 24" and no larger than 24" by 36" when flat? YES NO
- Can the background stand by itself behind your animal? YES NO
- Is all of your work colorful and neatly done? YES NO



Name _____



5. Evaluate your solution.

Was it the best solution? Would one of your other ideas have been better? Why or why not?

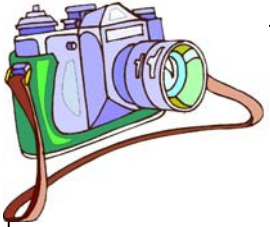
What would you have done differently?

Could you add to it to make it better? What would you add to it?

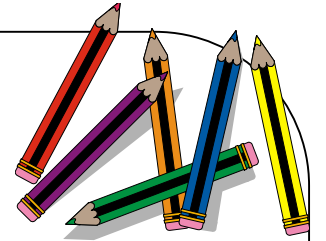
Guided Portfolio—6

Name _____

Attach a photograph of your final project here. If you do not have a photograph, draw a picture of your final project.



How would you make your project better? Draw a picture showing how it would look after you have made changes to it.



Name _____

KWL: Exploring Animal Environments



What we <u>K</u> now.	What we <u>W</u> ant to know.	What we <u>L</u> earned.
	<p style="text-align: center;">Sample Questions</p> <p>Where can this environment be found?</p> <p>What kind of animals live there?</p> <p>What kind of plants grow there?</p> <p>What is the climate?</p> <p>Note: The teacher should make sure that all required information is listed in question form on the "W" (what we want to learn) section of the KWL. Use your <i>Virginia SOL Teacher Resource Guide</i> to check what knowledge, skills, and processes are considered essential for the targeted Standard of Learning.</p>	

Targeted Standard of Learning: Science 3.6
Supporting Standards of Learning: Science 3.1, 3.2, 3.4, 3.10
Mathematics 3.14
English 3.1, 3.2, 3.3, 3.4, 3.6, 3.7

Targeted Standard for Technological Literacy: 9
Supporting Standards for Technological Literacy: 8, 10, 11,

Rubric for *Exploring Animal Environments*

Name _____

Date _____



<p align="center">Design Brief Rubric</p>	<p align="center">no evidence 0</p>	<p align="center">limited understanding 1</p>	<p align="center">some understanding with room for improvement 2</p>	<p align="center">good understanding with room for improvement 3</p>	<p align="center">substantial understanding 4</p>
The student restated the problem in his/her own words.					
The student brainstormed more than one idea.					
The student created and labeled a sketch to use as a "blueprint."					
The student included notes about problems that occurred and their solutions.					
<p>The student tested the animal to make sure</p> <ul style="list-style-type: none"> • it was identifiable • it was an appropriate size for the background • it had at least one part that can move without touching the animal's body • its moveable part could move eight times without breaking • it was colorful and neat. 					
<p>The student created a background that</p> <ul style="list-style-type: none"> • was the appropriate size • could stand by itself • was colorful and neat. 					
The student evaluated how he/she could make it better next time.					

Rubric for *Exploring Animal Environments*

Name _____

Date _____

<p style="text-align: center;">Oral Communication Rubric</p>	<p style="text-align: center;">no evidence 0</p>	<p style="text-align: center;">limited understanding 1</p>	<p style="text-align: center;">some understanding with room for improvement 2</p>	<p style="text-align: center;">good understanding with room for improvement 3</p>	<p style="text-align: center;">substantial understanding 4</p>
<p>3.1 The student will use effective communication skills in group activities.</p> <p>a) Listen attentively by making eye contact, facing the speaker, asking questions, and summarizing what is said.</p> <p>b) Ask and respond to questions from teachers and other group members.</p> <p>c) Explain what has been learned.</p>					
<p>3.2 The student will present brief oral reports.</p> <p>a) Speak clearly.</p> <p>b) Use appropriate volume and pitch.</p> <p>c) Speak at an understandable rate.</p> <p>d) Organize ideas sequentially or around major points of information.</p> <p>e) Use grammatically correct language and specific vocabulary to communicate ideas.</p>					



Standards of Learning

English (2002)

Oral Language

- 3.1 The student will use effective communication skills in group activities.
- a) Listen attentively by making eye contact, facing the speaker, asking questions, and summarizing what is said.
 - b) Ask and respond to questions from teachers and other group members.
 - c) Explain what has been learned.
- 3.2 The student will present brief oral reports.
- a) Speak clearly.
 - b) Use appropriate volume and pitch.
 - c) Speak at an understandable rate.
 - d) Organize ideas sequentially or around major points of information.
 - e) Use clear grammatically correct language and specific vocabulary to communicate ideas.

Reading

- 3.3 The student will apply word-analysis skills when reading.
- a) Use knowledge of all vowel patterns.
 - b) Use knowledge of homophones.
 - c) Decode regular multisyllabic words.
- 3.4 The student will use strategies to read a variety of fiction and nonfiction materials.
- a) Preview and use text formats.
 - b) Set a purpose for reading.
 - c) Apply meaning clues, language structure, and phonetic strategies.
 - d) Use context to clarify meaning of unfamiliar words.
 - e) Read fiction and nonfiction fluently and accurately.
 - f) Reread and self-correct when necessary.
- 3.6 The student will continue to read and demonstrate comprehension of nonfiction.
- a) Identify the author's purpose.
 - b) Make connections between previous experiences and reading selections.
 - c) Ask and answer questions about what is read.
 - d) Draw conclusions.
 - e) Organize information and events logically.
 - f) Summarize major points found in nonfiction materials
 - g) Identify the characteristics of biographies and autobiographies.
 - h) Compare and contrast the lives of two persons as described in biographies and/or autobiographies.

English (2002) continued

Reading

- 3.7 The student will demonstrate comprehension of information from a variety of print resources.
- Use dictionary, glossary, thesaurus, encyclopedia and other reference books, including online reference materials.
 - Use available technology.

Science (2003)

Scientific Investigation, Reasoning, and Logic

- 3.1 The student will plan and conduct investigations in which
- predictions and observations are made;
 - objects with similar characteristics are classified into at least two sets and two subsets;
 - questions are developed to formulate hypotheses;
 - volume is measured to the nearest milliliter and liter;
 - length is measured to the nearest centimeter;
 - mass is measured to the nearest gram;
 - data are gathered, charted, and graphed (line plot, picture graph, and bar graph);
 - temperature is measured to the nearest degree Celsius;
 - time is measured to the nearest minute;
 - inferences are made and conclusions are drawn; and
 - natural events are sequenced chronologically.

Force, Motion, and Energy

- 3.2 The student will investigate and understand simple machines and their uses. Key concepts include
- types of simple machines (lever, screw, pulley, wheel and axle, inclined plane, and wedge);
 - how simple machines function;
 - compound machines (scissors, wheelbarrow, and bicycle); and
 - examples of simple and compound machines found in the school, home, and work environment.

Life Processes

- 3.4 The student will investigate and understand that behavioral and physical adaptations allow animals to respond to life needs. Key concepts include
- methods of gathering and storing food, finding shelter, defending themselves, and rearing young; and
 - hibernation, migration, camouflage, mimicry, instinct, and learned behavior.

Living Systems

- 3.6 The student will investigate and understand that environments support a diversity of plants and animals that share limited resources. Key concepts include
- water-related environments (pond, marshland, swamp, stream, river, and ocean environments);
 - dry-land environments (desert, grassland, rainforest, and forest environments); and
 - population and community.

Science (2003) continued

Resources

- 3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include
- a) the interdependency of plants and animals;
 - b) human effects on the quality of air, water, and habitat;
 - c) the effects of fire, flood, disease, and erosion on organisms; and
 - d) conservation and resource renewal.

Mathematics (2001)

Measurement

- 3.14 The student will estimate and then use actual measuring devices with metric and U.S. Customary units to measure
- a) length-inches, feet, yards, centimeters, and meters;
 - b) liquid volume-cups, pints, quarts, gallons, and liters; and
 - c) weight/mass-ounces, pounds, grams, and kilograms.

Standards for Technological Literacy

Standard 8: Students will develop an understanding of the attributes of design.

Standard 9: Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Standard 11: Students will develop the abilities to apply the design process.