1999

Designing Collaborations Between Community Based Organizations and Schools to Produce Curriculum Models for Service- Learning Programs (Richardson Nature Center)

Richardson Nature Center

Designing Collaborations Between Community Based Organizations and Schools to Produce Curriculum Models for Service-Learning Programs

Purpose of project, as stated in RFP:

1. To connect community based organizations with schools to produce curriculum models that focus on the learning activities in the community.
2. To produce curriculum models that demonstrate how the learning in the community meets Minnesota graduation standards contained in the basic skills and Profile of Learning.

NSLC
c/o ETR Associates
4 Carbonero Way
Scotts Valley, CA 95066

Richardson Nature Center
Performance Package

Richardson Nature Center, located in Bloomington, Minnesota, is part of the Hennepin Parks System. Richardson Nature Center is working in collaboration with local fourth and fifth grade classrooms to teach environmental education in a variety of ways. Students in these classrooms learn about the environment through classroom lessons and experiences at Richardson. Teachers and Richardson naturalists team teach the lessons. The main goal of this program is to impart knowledge, awareness and positive values about the environment to students. Another goal is to familiarize students with Richardson Nature Center, in hopes that they will visit the center after having an academic connection with the place.

Package One: Sciences I.1

Content Standard: Sciences I.1
Level: Intermediate
Course: Life Science
Title of Package/Activity: Minnesota Animals: Survival in the Habitats*
***Partial**

Summary of Content Standard
Understand how individuals and objects interact in life, earth/space systems and physical systems, specifically:

1. Classify organisms and materials on the basis of their properties and relationships
2. Make systematic observations of objects, events and of/phenomena
    a. record data
3. Create a model to illustrate a concept, law, theory or principle
4. Identify personal behaviors (beliefs) that have impacts on the environment

Summary of Service-Learning Activity
Tasks and Activities

1. Identify personal beliefs (from which behaviors stem) that impact the environment.
    a. Values clarification exercise, focused on environmental issues
    b. Discuss personal perceptions of environment
    c. Discuss differences between a park and a reserve
2. Demonstrate an understanding of animal characteristics
    a. Focus on adaptations, through discussion and learning games
    b. Focus on basic needs of organisms, through discussion and learning games
    c. Focus on Minnesota animals, through discussion and learning games
    d. Field experience at Richardson Nature Center
3. Demonstrate an understanding of earth system patterns

a. Develop a model of Minnesota biomes and habitats
b. Create a bulletin board display of Minnesota biomes

4. Make systematic observations of, and record data on, habitats and organisms
    a. Students explore Richardson Nature Center with naturalist guide
    b. Discuss animal signs
    c. Visit three habitats and make observations
    d. Do transect activity
    e. Reflect on feelings about field experience
    f. Create visual or written presentation that includes direct observations and information from media resources

Package Two- Inquiry I.1

Content Standard: Inquiry I.1
Level: Intermediate
Course: Life Sciences
Title of Package/Activity: Minnesota Animals: Survival in the Habitats*
***Partial**

Summary of Content Standard
Answer questions using information gathered through direct observations, experiments, and other sources

1. Gather information from direct observations.
    a. Frame a question
    b. Collect, record and display data
    c. Identify patterns
2. Gather information from media sources
    b. Access information from electronic media, print, interviews and/or other sources
    c. Record and organize information
    d. Report findings in written, oral or visual presentation
3. Gather information through direct observation
    b. Write a rich and detailed description of the observation
    d. Record and organize information
    e. Evaluate findings to identify areas for further investigation

Summary of Service-Learning Activity
Tasks and Activities

1. Gather information from direct observations
    a. Same activities as Task 4, described above in Sciences I.1
2. Gather information from media sources
    a. Develop questions to research
    b. Identify appropriate media and data sources
    c. Take notes
    d. Design and organize final presentation (oral, visual and written)

e. Produce final presentation and present final product

Skills and Knowledge Goals

Students will learn about the environment through experiences in a classroom setting and in the natural setting of Richardson Nature Center. While learning about the environment, students will begin to clarify their own values and beliefs concerning the environment. Students will also conduct scientific inquiries, learning through field observation about basic needs of organisms, adaptations, earth cycles and Minnesota animals and habitats. Students will learn to make observations using multiple senses, practice recording observations and form hypotheses based on observations. In their environmental investigations, students will learn to gather and use information from media sources. Lessons will be team taught by school teachers and naturalists from Richardson Nature Center.

Richardson Nature Center, Hennepin Parks Performance Packages

Minnesota Animals: Survival in the Habitats

Table of Contents

Richardson Nature Center, Hennepin Parks

Content Standard: Sciences I.1 ____Honors
Course: Life Science __x_Partial
Title of Package Activity: Minnesota Animals:Survival in the Habitats ____Required

Summary Statement of Content Standard:

Understand how individuals and objects interact in life, earth/space systems and physical systems.

Description of Student Performances:

			Performance Record		Achievement*
Task 1:	Identify personal beliefs (from which behaviors stem) that impact the environment.	Date:		Grade:	
Task 2:	Demonstrate an understanding of animal characteristics.	Date:		Grade:	
Task 3:	Demonstrate an understanding of earth system patterns.	Date:		Grade:	
Task 4:	Make systematic observations of, and record data on, habitats and organisms.	Date:		Grade:	

FINAL ACHIEVEMENT GRADE/RATING 4 3 2 1

Task Management Skills:

Performance Record

Scoring Criteria
4 - Performance on this standard achieves and exceeds expectations of high standard work.
3 - Performance on this standard meets the expectations of high standard work.
2 - Work on this standard has been completed, but all or part of the student's performance is below high standard level.
1- Work on this standard has been completed, but performance is substantially below high standard level.

TASK 1
Minnesota Animals: Survival in the Habitats

Standard Code: Sciences I.1
Topic: Life Sciences
Amount of Time: One hour

_____Honors
__x__Partial
_____Required

Specific Statement(s) From the Standard:

What students should do:

4. Identify personal behaviors (beliefs) that have impacts on the environment.

Product:

1. Group discussion of personal beliefs about the environment and the way it should be treated.
2. Individual development of personal perspectives about the environment and the way it should be treated.

Central Learning:

- use reasoning and intuitive feeling to explain and support an idea
- identify and apply criteria to make judgments about a situation
- reflect on the discussion, other's perspectives, and develop personal beliefs about the environment and the way humans interact with it.

Task Description:

Overview:

Value clarification is a process that enables individuals to identify their perspectives and beliefs. Identifying beliefs and developing perspectives guides individuals in forming attitudes which, in turn, guide their behaviors. This value clarification provides an opportunity for introspective analyzation of beliefs about the environment. Establishing personal feelings about the natural world will enable you to place yourself within the context of the earth, its living and non-living systems, and enable you to relate to it.

Outline:

A. Introduction to the purpose of a values clarification exercise
B. Activity in which students identify their own perceptions of a variety of environmental conditions
C. Class discussion of perceptions about the environmental conditions
D. Reassessment of personal feelings and perceptions with regard to the environmental conditions
E. Discussion of the differences between a park and a reserve
    1. They will be visiting a park reserve

2. How they should behave when in a natural and protected area

See curriculum for further description

Special Notes:

For additional information and activities with respect to values clarification and the environment see:

Project Wild. 1992. Bethesda, MD: Western Regional Environmental Educational Council, Inc. (Chapter five: People, Culture and Wildlife, Chapter seven: Responsible Human Actions)

Performance Criteria:

Feedback Checklist for Task 1 (Science I.1)

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
____	Student demonstrates the use of reasoning and intuitive feeling to explain and support an idea during the class discussion	_____
____	Student identifies and applies criteria to make judgments about a situation during the discussion.	_____
____	Student reflects on the discussion, other's perspectives, and develops personal beliefs about the environment and the way humans interact with it.	_____
____	Student actively participates in the class by raising a value card appropriately.	_____
	OVERALL EVALUATION	_____

Notes following Performance:

Attach all documents that are appropriate to this performance task.

TASK 2

Minnesota Animals: Survival in the Habitats

Standard Code: Sciences I.1
Topic: Life Sciences
Amount of Time: Four weeks

_____Honors
__x__Partial
_____Required

Specific Statement(s) From the Standard:

What students should do:

1. Classify organisms and materials on the basis of their properties and relationships.

Product:

1. Worksheets that focuses on the identification of an animal's adaptations through observation.
2. A test that focuses on identifying how animals use their adaptations.
3. Presentation (visual or written) on an animal that is native to Minnesota that focuses on it's behavioral and physical adaptations.

Central Learning:

- Develop an understanding of concepts and apply them to real examples
- Integrate authentic field observation experiences into concepts learned in the classroom
- Relating the "what" to the "why" (adaptations to survival; also known as form to function)
- Hypothesize how adaptations enable survival
- Understand cycles and patterns of earth systems

Task Description:

Overview:

These tasks will be taught in three classes: "Adaptations", "Minnesota Animals: Survival in the Habitats" (at Richardson Nature Center) and "The Basic Needs of Organisms." The synthesis of the tasks will be completed in the course of developing the final presentation.

Outline:

A. Adaptations
   1. Discuss and define "adaptations"
   2. Watch video

2. Complete "Your Animal's Adaptations" worksheet

B. Basic Needs of Organisms
   1. Introduce the basic needs concept
      a. create a basic needs list
   2. Play "Oh Deer" game
   3. Concluding discussion
      a. revisit (reclassify) basic needs list and compare it to the game

C. Minnesota Animals: Survival in the Habitats (at Richardson Nature Center)
   1. Introduction
      a. review form equals function
      b. prepare for field experience
   2. Field experience
      a. discuss animal signs
      b. visit three habitats
      c. do (abbreviated) transect activity to make adaptation relevant to habitat
      d. spend time identifying feelings about experience in the field
   3. Conclusion
      a. students explain (and write about) adaptations as they relate to specific examples of animals and their habitats

See curriculum for further description

Special Notes:

For additional activities and information about these topics see:

Project Wild. 1992. Bethesda, MD: Western Regional Environmental Educational Council, Inc. (Chapter three: Ecological Principles)

For materials check the following catalogs:

Museum Products Co., 84 Route 77, Mystic Connecticut, 06355 1 (800) 395-5400

Nature Watch, 9811 Owensmouth Ave. #2, Chatsworth, CA 91311 1(800) 228-5816

For additional resources:

Contact the Minnesota Department of Natural Resources Resource Library at: (612) 858-8725

For definitions of terms see:

Tester, John. 1995 Minnesota's Natural Heritage. Minneapolis, MN: University of Minnesota Press. (available at the Bell Museums book shop in Minneapolis, the Blue Heron, for 29.95)

Performance Criteria:

Feedback Checklist for Task 2

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
____	Student demonstrates an understanding of the following concepts: adaptation, basic needs, and how adaptations are used with respect to habitat conditions.	____
____	Student demonstrates how to relate the "form" to the "function" (adaptation to survival) in the completion of the worksheets.	____
____	Student formulates a hypothesis during discussions.	____
____	Student actively participates in activities, including the game, video viewing, the field experience and the discussions.	____
____	Student participates in field experience as an active member of a team and shares the responsibilities with respect to recording data for each transect.	____
____	Student demonstrate an understanding of cycles and patterns in earth systems by exhibiting the ability to apply the concepts taught in class to the field experience worksheet and related discussions.	____

OVERALL EVALUATION _____

Notes following Performance:

Attach all documents that are appropriate to this performance task

TASK 3

Minnesota Animals: Survival in the Habitats

Standard Code: Sciences I.1 _____Honors
Topic: Life Sciences __x__Partial
Amount of Time: one hour _____Required

Specific Statement(s) From the Standard:

What students should do:

3. Create a model to illustrate a concept, law, theory or principle.

Product:

1. A bulletin board display (collectively created by the class) of Minnesota's biomes and the habitats that exist within them.

Central Learning:

- Relating living systems (biomes) to non-living systems (climate).
- Represent abstract ideas through a presentation.
- Identification of the characteristics of specific earth systems.

Task Description:

Overview:

You will, as a class, develop a model of Minnesota's biomes and the habitats that exist within them. Minnesota is an unusual region in that it has representative areas from three biomes. Based on the class discussion a bulletin board display will be made by the class that illustrates where the biomes and habitats are found within the context of the state.

Outline

(Team taught by a teacher and a naturalist in the classroom)

A. Introduction
    1. discuss the location of the biomes in the state of Minnesota
    2. discuss the relationship of climate to biome location
B. Create a bulletin board model of Minnesota biomes
C. Conclusion
    1. explain the difference between biome and habitat

See curriculum for further description

Special Notes:

For maps and further information see:

Tester, John. 1995 Minnesota's Natural Heritage. Minneapolis, MN: University of Minnesota Press. (available at the Bell Museums book shop, the Blue Heron, for 29.95)

Performance Criteria:

Feedback Checklist for Task 3 (Science I.1)

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
____	Student demonstrates the ability to relate living systems to non-living systems (understands that the placement of the habitats and the biomes is related to climate).	_____
____	Student is able to represent abstract concepts (biomes and habitats) through a graphic presentation.	_____
____	Student can identify the characteristics of specific earth systems: deciduous forest, coniferous forest, wetland and prairie.	_____
____	Student works with the rest of the class in a team effort to produce the bulletin board display.	_____
	OVERALL EVALUATION	_____

Notes following Performance:

Attach all documents that are appropriate to this performance task.

Task 4
Minnesota Animals: Survival in the Habitats

Standard Code: Sciences I.1 _____Honors
Topic: Life Sciences __x__Partial
Amount of Time: Four weeks _____Required

Specific Statement(s) From the Standard:

What students should do:

2. Make systematic observations of objects, events and/or phenomena.
   a. record data

Product:

1. Worksheet that will be completed during the field activity.
2. Final presentation (visual or written)

Central Learning

- Use multiple senses to make observations of objects and phenomena in an authentic setting
- Practice recording observations
- Form hypotheses about observations
- Formulating questions about observations

Task Description:

Overview:

The opportunity to make observations in an authentic setting is critical because otherwise the observations are the result of a contrived experience (an experiment, for instance, is the result of controlled conditions). It is therefore important that, when studying animals, they be observed in their natural settings. The skills involved in careful observation need to be developed in students. Skilled observation yields accurate data, which, when coupled with a solid understanding of the underlying concepts, can result in appropriate conclusions. Good observation skills support appropriate conclusions.

Outline:

A. Field experience at Richardson Nature Center
   a. discuss animal signs
   b. visit three habitats and make observations with the help of the naturalist
   c. do (abbreviated) transect activity to make adaptation relevant to habitat

(includes worksheet to record data)

d. spend time identifying feelings about experience in the field

B. Create a visual or written presentation that includes direct observations and information from media resources

See curriculum for further description

Special Notes:

For activities that sharpen sensory awareness and prepare students for making observations in authentic settings see:

Cornell, Joseph. Sharing the Joys of Nature CA: Ananda Publishers, Inc. [Available from Acorn Naturalists for $9.95 1 (800) 422-8886]

Performance Criteria:

Feedback Checklist for Task 4 (Science I.1)

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
_____	Student utilizes several senses to make direct observations in an authentic setting.	_____
_____	Student records data during direct experience.	_____
_____	Student forms hypothesizes about direct observations and records them on the field worksheet.	_____
_____	Student formulates a question about his/her observations.	_____
_____	Student participates in small group discussions and observations with naturalist and/or teacher and/or peers during field experience.	_____
	OVERALL EVALUATION	_____

Notes following Performance:

Attach all documents that are appropriate to this performance task.

MATRIX: SCIENCES I.1

Understand and apply scientific concepts: Understand how individuals and objects interact in life, earth/space systems and physical systems.

CONTENT STANDARD	HOW MET	WHERE MET
What students should know:		
1. Understand the characteristics of organisms. a. plants	basic needs determine where habitats and biomes exist	tasks 2, 3, 4
b. animals	basic needs, adaptations, in depth study of one animal	tasks 2, 4
c. micro-organisms		
2. Understand basic structures and functions of the human body.		
3. Understand cycles and patterns in: a. living organisms	behavioral adaptations that are repeated	tasks 2,4
b. earth systems	characteristics of biomes and habitats are patterns and cyclic	tasks 3,4
c. physical systems		
4. Understand how human behavior and technology impact the environment.	personal experience, value clarification (beliefs)	task 1
5. Understand characteristics of the physical world.		
What students should do:		
1. Measure and classify objects. organisms and materials on the basis of their properties and relationships	classify plants (in biomes) and animals (in habitats) based on relationships	tasks 2, 3, 4
2. Make systematic observations of objects, events and/or phenomena: a. record data	direct observations in an authentic setting	task 4
b. predict change		
3. Create a model to illustrate a concept, law, theory or principle	large group creates biomes bulletin board	task 3
4. Identify personal behaviors and the use of materials which have a positive impact on the environment	identify personal beliefs regarding the environment	task 1

Richardson Nature Center, Hennepin Parks

Content Standard: Inquiry I.1 ____Honors
Course: Life Science __x_Partial
Title of Package Activity: Minnesota Animals:Survival in the Habitats ____Required

Summary Statement of Content Standard:

Answer questions using information gathered through direct observations, experiments and other sources.

Description of Student Performances:

			Performance Record	Achievement*
Task 1:	Gather information from direct observations.	Date:		Grade:
Task 2:	Gather information from media sources.	Date:		Grade:

FINAL ACHIEVEMENT GRADE/RATING 4 3 2 1

Task Management Skills:

Performance Record

Scoring Criteria
4 - Performance on this standard achieves and exceeds expectations of high standard work.
3 - Performance on this standard meets the expectations of high standard work.
2 - Work on this standard has been completed, but all or part of the student's performance is below high standard level.
1- Work on this standard has been completed, but performance is substantially below high standard level.

TASK 1

Minnesota Animals: Survival in the Habitats

Standard Code: Inquiry I.1 _____Honors
Topic: Life Sciences __x__Partial
Amount of Time: Four weeks _____Required

Specific Statement(s) From the Standard:

What students should do:

1. Gather information from direct observations.
    a. frame a question
    b. collect record and display data
    c. identify patterns
3. Gather information through direct observation:
    b. write a rich and detailed description of the observation
    d. record and organize information
    e . evaluate findings to identify areas for further investigation

Product:

1. Field data worksheet which will be completed at Richardson Nature Center during the "Minnesota Animals: Survival in the Habitats" class by small groups of students
2. Final presentations which will be developed over a period of weeks in the classroom as a culmination of this curriculum by each individual student.

Central Learning:

1. Development of observation skills
2. Synthesis of observation into hypotheses and identifiable patterns

Task Description:

Overview:

Observation skills will be discussed and practiced during the "Minnesota Animals: Survival in the Habitats" at Richardson Nature Center. The observations will be recorded as data during that class. The data will be assimilated into the final presentation.

Outline:

A. Field experience at Richardson Nature Center
    a. discuss animal signs
    b. visit three habitats and make observations with the help of the naturalist
    c. do (abbreviated) transect activity to make adaptation relevant to habitat

(includes worksheet to record data)

d. spend time identifying feelings about experience in the field

B. Create a visual or written presentation that includes direct observations and information from media resources

See curriculum for further description

Special Notes:

For activities that sharpen sensory awareness and prepare students for making observations in authentic settings see:

Cornell, Joseph. Sharing the Joys of Nature. CA: Anandale Publishers, Inc.

Performance Criteria:

Feedback Checklist for Task 1 (Inquiry I.1)

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
____	Student makes, and records direct observations during field experience.	____
____	Student frames a question from direct observations.	____
____	Student identifies patterns in nature (such as: some animals uniformly use a given adaptation, or that several species adapt to given environmental conditions in a uniform manner)	____
____	Student writes a rich and detailed description of the observation (in the final presentation).	____
____	Student records and organizes field observations into the final presentation.	____
____	Student identifies areas for further investigation in the final presentation.	____
	OVERALL EVALUATION	____

Notes following Performance:

Attach all documents that are appropriate to this performance task.

TASK 2

Minnesota Animals: Survival in the Habitats

Standard Code: Inquiry I.1
Topic: Life Sciences
Amount of Time: Three weeks

_____Honors
__x__Partial
_____Required

Specific Statement(s) From the Standard:

What students should do:

2. Gather information from media sources:
   b. access information from electronic media, print, interviews and/or other sources
   c. record and organize information
   d. report findings in written, oral or visual presentation

Product:

1. Final presentation which will be developed over a period of weeks in the classroom as a culmination of this curriculum by each individual student. It will be a written, oral or visual project about a specific animal native to Minnesota and will include both data from direct observation and information from media sources.

Central Learning:

1. Identify, locate and utilize appropriate media resources.
2. Record pertinent information.
3. Utilize information from media resources in the development of the final presentation.

Task Description:

Overview:

Over several class periods the students will use a variety of media resources. The information gathered will be assimilated into the final presentation along with the direct observations.

Outline:

A. Develop questions to research
B. Identify appropriate media and data sources
C. Take notes
D. Design and organize final presentation (oral, visual or written)
E. Produce final presentation and present final product

See curriculum for further description

Special Notes:

One of the components of a final presentation could be entries from a nature journal (direct observation in an authentic setting). There are many examples of naturalists journals that have been published and could be used as examples and from which students could get ideas. Authors to search for include; Edwin Way Teale (easiest reading but not too interesting), Jim Gilbert (a Minnesotan), John Muir (founder of the Sierra Club, see John of the Mountains), Barry Lopez (Lessons from the Wolverine) and Siguid Olson (a Minnesotan publishing in the 1950-60's see Wilderness Days, it has photographs).

For a nature journal to be kept over a period of time the student will have to visit a site regularly over a period of time. An extension of this curriculum could include this kind of activity in which a student visits a site in a backyard or schoolyard over a period of time and journals (write and/or draw) about the changes that are observed.

Performance Criteria:

Feedback Checklist for Task 2 (Inquiry I.1)

Minnesota Animals: Survival in the Habitats

E= Excellent
S= Satisfactory
N= Needs Improvement

Student		Teacher
_____	Student identified and accessed appropriate media resources.	_____
_____	Student recorded and organized information from a variety of sources.	_____
_____	Student reported findings in a written, oral or visual presentation.	_____

OVERALL EVALUATION _____

Notes following Performance:

Attach all documents that are appropriate to this performance task.

MATRIX: INQUIRY I.1

Answer questions using information gathered through direct observations, experiments and other sources.

CONTENT STANDARD	HOW MET	WHERE MET
What students should know:		
1. Gather information from direct observations or experiments with a variable:		
a. frame a question	frame a question during direct observation	task 1
b. collect, record, and display data	collect and record data (display in final presentation)	task 1
c. identify patterns	apply concepts learned to specific examples in direct observation	task 1
d. compare individual findings to large group findings.		
e. identify further areas for investigation	identified in direct observation, written into final presentation	task 1
2. Gather information from media sources:		
a. select a topic and frame a question	frame a question in process of organizing final presentation	task 2
b. access information from electronic media, print, interviews and/or other sources	use a variety of resources (depending on time and availability)	task 2
c. record and organize information	over a period of weeks in order to create a final presentation	task 2
d. report findings in written, oral or visual presentation	final presentation will include data from direct observations and media resources	task 2
3. Gather information through direct observation and interviews:		
a. identify a topic or area for investigation		
b. write a rich and detailed description of the observation	to be included in final presentation	task 1,2
c. conduct an interview with follow-up questions or design and conduct a survey	*optional* (depending on resource availability)	task 2
d. record and organize information	from direct observation and placed into final presentation	task 1,2
e. evaluate the findings to identify areas for further investigation	include remaining questions into final presentation	task 1,2

Teacher Training Plan

Know these concepts and be able to define these terms*:

Adaptation (physical and behavioral)
Basic Needs
Biome
Habitat
Deciduous forest
Coniferous forest
Prairie
Wetland

*For resources from which to learn, see the "special notes" at the end of each task description

Presenting the Values Clarification Activity:

Look the pictures over carefully ahead of time and make your own judgments about them. Think about ways that you can introduce the activity without presenting any personal biases. Be sure that during the discussion you make sure the students understand that you are discussing the issues with them from your own perspective and that they are, of course, encouraged to have their own opinions. The most important component of this exercise is that everyone try to justify his/her perspectives. Peer pressure will likely be a problem during this exercise and to the extent that you can discuss this with students before the activity, you may be able to limit the effect it has on the class. However, the most important component of this class is the discussion during which the students will be identifying their own beliefs. If peer pressure is a problem during the initial part of the activity you may still be able to have a useful discussion provided you address the problem with the students.

Teaching the Concept of "Adaptation"

The physical and behavioral changes that organisms undergo over time to survive changing environments is called evolution. The characteristics themselves are called adaptations and this is the focal concept of the curriculum. Not everyone believes in these theories. They are just this - theories. It may help students feel more comfortable if you say something about the fact that they

are theories and not everyone believes in them however, it is important that students are exposed to a variety of ideas so that they are able to make their own decisions about what makes sense to them. In order to teach these concepts it is important to help the students understand *why* organisms develop adaptations.

Preparing for the Direct Experience in Authentic Settings:

Your students may not be accustomed to learning in a setting that is without walls and is full of distractions. Preparing the students for the field experience in the classroom will help but they will find themselves in a new environment during the field experience and there is no true way to acclimate them to forests, wetlands or prairies until they are exposed to the setting. In the case of schools that use outdoor education facilities (such as Richardson Nature Center) the instructors (naturalists) are accustomed to helping students acclimate to the new environment. Schools that use their own teachers to teach the field component of the curriculum should invest some time and energy in preparing those teachers for leading a field experience so that it can be as successful as possible. The teachers may want to do a series of acclimating activities so the students can learn, over a period of time, how to learn in an outdoor setting. Acclimating and sensory awareness activities can be found in Joseph Cornell's book Sharing the Joys of Nature.

Research for the Final Presentation

Resources vary greatly from one school to the next and as a result the methods and timing of the research for the final presentation about a Minnesota animal will vary. Additional resources are often available from the Bell Museum of Natural History in Minneapolis, the Department of Natural Resources in St. Paul and the many nature centers throughout the metro area. The web can be a tremendous resource but also time consuming. Interviews are highly encouraged, particularly if books and journals are in short supply in your area. However, be sure the students go into interviews prepared. Professionals could get overwhelmed with interview requests and frustrated with students who are not ready with appropriate questions. Local libraries may be your best source for books and journals.

Implementation Guide

Content Standards: Sciences I.1 (partial) Inquiry I.1 (partial)

When: This curriculum was designed so that it can be taught in the spring or in the fall. The field experience demands that students observe plants so it is not possible to do this component in the winter. The rest of the curriculum can be taught any time in the course of the year.

Where: The following is a list of sites necessary to complete this curriculum:
- a classroom
- a gym or outside area to play a running game (during the basic needs class)
- a natural area that has three habitats (a forest, a prairie, and a wetland) (during the Minnesota animals: survival in the habitats)
- a media center (or access to a variety of materials for every student) (for the research necessary to develop a final presentation

Grade level: This curriculum has been designed to work with 4th grade skills; however, it might fit into a fifth grade curriculum. It can be modified for third grade but the Content Standards are different for this grade.

Order of Classes: This curriculum was written with the intention that it be taught in the order presented in this package (starting on page 25). There is room for modification but the curriculum is developed to build knowledge progressively. (note: The Learning Profiles are not written to coincide with the progressive nature of the curriculum. The Learning Profiles do correlate with the state standards.)

Materials:
(By Class/Activity)

Value Clarification:
- large pictures of various environmental conditions and animals to show the class as a group
- red, yellow and green cards for every student
- tally sheets (one on overhead sheet and one on paper)

Adaptations:
- a picture of a Minnesotan animal for each student (this will be the animal on which they create a final presentation)
- Adaptations worksheets for each student
- Chart of horse adaptation changes

Basic Needs:
- cones (or lines on the gym floor)
- blackboard/chalk

Minnesota's Biomes:
- large map of Minnesota with the biomes designated on newsprint
- nature magazines to be cut for the pictures
- state rainfall data

Minnesota Animals: Survival in the Habitats:
- poster-size pictures of all four of Minnesota's habitats
- hoola hoops (1 for every three students)
- clipboard and pencil (for every student)
- three live animals or pictures of three Minnesotan animals (crayfish, tiger salamander and red-tailed hawk are 1 suggestions)

Report on an Animal Native to Minnesota:
- files of information at the appropriate reading level on many Minnesotan animals
- resources from which to research animals of Minnesota
- materials on which to take notes and with which to produce a final written, oral or visual report

Final Assessment Test (Rubric)

Assessment: Assessment of student's progress should be determined throughout the curriculum through the use of the feedback checklists.
Final assessment is accomplished through a review of the student's final assessment test and the checklist for the final presentation.

CLASSROOM CURRICULUM

Pre-Richardson Nature Center Visit Guide

Value Clarification: The Environment

55 minutes
4-5th grades

Objectives:

Students will be able to:

- Discuss, clarify and develop their perspectives about human treatment of the natural world.

Materials:

large pictures to show the class (a snake, a factory, a forest, a yard with green grass, a yard with native vegetation, an area that has litter in it, a lake -edge with lawn, a lake - edge with native vegetation, a wolf, a cottontail rabbit), green, yellow and red cards (one of each color for every student), a tally sheet for the teacher to keep track of "votes," and a duplicate tally sheet on overhead sheet for the students to view during the discussion, an audio recorder (optional)

Procedure:

1. Explain to the class that they are going to do a value clarification activity (note: this activity may need to be prefaced with a discussion of what beliefs and values are). Explain that the purpose is for each of them to develop their feelings about the environment. Each person in the class should have their own opinion and so this is a chance to discover what peoples opinions are and ask them about their opinions. We will be able to learn from each other during this class by asking each other questions.
2. Hand out the red, yellow and green cards. Each student should have one of each color.
3. Explain to the students that they will be shown a large picture. Once they have seen the picture they should put their head down on the desk and think about whether they had good feelings, bad feelings or mixed feelings about the picture. Explain that once every student has his/her head down they will be asked to hold up a card on command: green if the student has all good feelings about the picture, yellow if the student has good and bad feelings about the picture, and red if the student has only bad feelings about the picture. Tell the students that there should be no talking during the exercise but that all the pictures will be discussed after the activity.

4. Make sure that you (the teacher) or an assistant is ready with the tally sheet to keep score both on a paper (for comparison after the trip to the nature center) and on the overhead sheet (for the discussion). The overhead projector should remain off until the discussion begins.
5. Hold up the pictures one at a time. Allow the entire class to view each picture.
6. Once the students are all holding up their cards (you may have to encourage them to keep the cards up the whole time so you can get a count) count and record the "votes" on the tally sheets.
7. When all the pictures have been shown and "votes" recorded begin the discussion. Turn on the audio recorder for the discussion (for later comparison).
8. Remind the students that as they discuss their feelings the idea is not to judge each other as feelings are shared but to learn develop their ideas about the environment.
9. Turn on the overhead projector and show the results of the first vote only (cover the others with a piece of paper). Hold up the first picture again and ask students to share their feelings about the picture. Ask the students why they feel the way they do. If all the students who offer comments feel the same ask the class if there is anyone who feels differently and if that person would share his/her feelings with the class. Ask if anyone has mixed feelings about the picture if no one has offered this perspective.
10. Discuss the tally sheet and ask the students if they are surprised by the number of people who feel good about the picture, bad or have mixed feelings.
11. If it appears that students are shifting in their perspective of the picture ask the students to put their heads down again. Have them show their cards in response to the picture again and tally the results.
12. Share the results with the class and if anyone changed their "vote" ask them if they would be willing to explain why.
13. Repeat 8 - 12 with each picture.
14. Conclude by explaining that sometimes people believe something is the right thing to do and they do it even if it is not the popular thing to do. Richardson Nature Center (where they will be visiting soon) is in a park reserve. The park reserve district (now more than 15 parks and park reserves) was created by a group of people in the state government in the 1950's. Not everyone in the state government thought that this was a good thing to do with the land (some people wanted to build schools, for instance and houses which everyone needs) but eventually a park reserve was created. Ask the students who uses parks (people) and what they do there (recreation). What does the word reserve mean (save, preserve, put aside etc.)? Next ask the students for whom or what, do we reserve land for (animals, plants, nature).
15. Ask the students how they think people who visit a reserve should treat the plants and animals. Give them examples: should they be allowed to pull plants up and not use them? What happens if people pull bark off trees? Is it acceptable to

scare the animals on purpose? Why or why not? Should anyone be allowed to collect tadpoles in the pond, or only certain people with permission from the park management? Why do they think this? Should people be loud or quiet when they are walking around the nature center?

16. Ask the students what they think first and then explain that at Hyland Park Reserve there are certain rules that visitors must follow because the people who designed the park thought that nature needs to be protected.

Value Clarification Tally Sheet

	GOOD(GREEN)	MIXED(YELLOW)	BAD(RED)
Picture 1: _____ (name)			
VOTE 1			
VOTE 2			
Picture 2: _____ (name)			
VOTE 1			
VOTE 2			
Picture 3: _____ (name)			
VOTE 1			
VOTE 2			
Picture 4: _____ (name)			
VOTE 1			
VOTE 2			
Picture 5: _____ (name)			
VOTE 1			
VOTE 2			
Picture 6: _____ (name)			
VOTE 1			
VOTE 2			

Picture 7: _____ (name)

VOTE 1

VOTE 2

Picture 8: _____ (name)

VOTE 1

VOTE 2

Picture 9: _____ (name)

VOTE 1

VOTE 2

Picture 10: _____ (name)

VOTE 1

VOTE 2

The Basic Needs of Organisms

55 minutes
4-5th grades

Objectives:

Students will be able to:

list the four basic needs of all organisms (water, food, living space and shelter).

- recognize that humans have the same basic needs as other organisms.

Materials:

blackboard and chalk, four cones (or lines on the gym floor)

Procedure:

Introduction

1. Set up a scenario for the students: image that we all traveled to another planet that was just like earth but there were no humans on it. We all need to survive there, what do we need to find first? What are the most important things to find so we can survive the first few days?
2. Write down their ideas on the blackboard.
3. Help them narrow the list to the most critical items.
4. Ask them which of these items are critical survival needs of other animals? Of plants? Place a star next to those items needed by other animals and two stars by those needed by plants.

Activity

1. Announce that it is time for a game and go outside or to the gym.
2. Divide the class into two groups and have the groups stand facing each other in two lines.
3. Explain that after the rules are understood the two groups will each step back to the designated lines. One line represents an animal (choose one, say, a beaver) the other line represents the resources the beaver needs to survive. In this game the resources are: food (show the sign, both hands on your stomach, water (both hands on your mouth, shelter (fingertips meet over your head) and living space. Tell the students that there is living space all around us (gesture around your body). (Later, you can ask the students if living space is *really* a given for wildlife and discuss the creation of parks and reserves which provide living space for wildlife.) When the game begins, it is the goal of every beaver to find the resource that he/she needs to survive. Announce to the students that when you say "turn around, close your eyes and make your sign" **both** lines of students will turn around, close their eyes and make a sign. The students can choose to make **any** of the signs: food, water or shelter (review the hand movements with the students). Then, when you say "open your eyes, turn around and run!" The beavers will run towards the resources and tag a

resource that is making the same sign. The resources must not run (beaver food, i.e.trees, and water do not run away). If the beaver tags a resource, that beaver is a healthy beaver and gets to "reproduce," bring the resource to the beaver line and both students are beavers in the next round. If the beaver can not find a resource (a student on the resource line making the same sign) that beaver dies and becomes a resource.

4. Ask the students if this is realistic that beavers that find the resource they need are healthy and reproduce and beavers that die join the resources (point out, if the students do not, that dead animals decompose and become nutrients for plants which are resources for animals).

5. Have the students stand on the lines, say "turn around, close your eyes, and make your sign" (to both lines). Then "open you eyes, turn around, and run (beavers only should run)." Play several rounds of the game.

6. After the first couple of rounds start making comments about the relationship of the beaver population to the numbers of resources. Have the students count how many resources and beavers there are from one round to the next.

7. Have the students make predications as to what will happen to the beaver population and the numbers of resources from one round to the next. When the students seem to be making accurate predictions finish up the game.

Conclusion

1. Return to the classroom and settle down.

2. Look back to the list of needs that is on the board and discuss whether the items in the list are really basic needs. See if the list can be narrowed down any further.

Adaptations

55 minutes

4-5th grades

Objectives:

Students will be able to:

- explain that an adaptation is a characteristic of a living organism (plant or animal) that helps it to survive
- identify an example of an adaptation when discussing a common animal

Materials:

pictures of a variety of animals from Minnesota, the video "Adaptations ", pencil, worksheet, chart of changing horse adaptations

Procedure:

1. Ask the students what it means to "adapt." Discuss possible synonyms such as " to change."
2. Ask the students what an adaptation is. Explain that it is a physical characteristic or a behavioral change that helps living plants and animals survive.
3. Ask the students if they have any adaptations. Start with physical characteristics. Discuss the ways that human's thumbs, eyebrows, upright posture, binocular vision and so forth, help us to survive. Do they have any behavioral adaptations? Who puts on a coat in the winter? This is a behavior that help us survive.
4. View the video.
5. Ask the students if they have any questions about the video.
6. Ask the students why adaptations change (over very long periods of time). Give them the example of the horse which once had toes and now has hooves. Discuss the ways that the earth has changed over time (for example since the Cretacious period the earth's crust, though not the atmosphere, has generally cooled) and how plants and animals have had to adapt. Also discuss how an animal can move into a habitat and slowly adapt to it. Some scientists (like Stephen J. Gould), believe that adaptations can sometimes happen relatively quickly and this is a hotly debated issue in scientific circles. (For clarification explain that time is relative. Some insects can develop adaptations to chemicals in a matter of days because they have several generations within, what is to us a short period of time.)
7. Allow the students to pick from a list an Minnesota animal which they will be studying for the next few weeks.
8. Hand out the pictures of the animals so that each student has a photo or a drawing of the animal which they have chosen.
9. Pass out and read over the "Your Animals Adaptations" worksheet. Have the students fill in the worksheet.
10. Collect worksheet and end class.

Minnesota Animal List

Create a list from which the students can pick depending on information availability on each animal in your school

1. white-tailed deer
2. red fox
3. short-tailed weasel
4. coyote
5. raccoon
6. red-tailed hawk
7. blue bird
8. crow
9. Canada goose
10. ruby-throated hummingbird
11. monarch butterfly
12. mosquito
13. grasshoppers
14. honey bee
15. bumble bee
16. crayfish
17. garter snake
18. leopard frog
19. American toad
20. chipmunk
21. gray squirrel
22. meadow vole
23. mole
24. little brown bat
25. pocket gopher
26. black-capped chickadee
27. striped gopher

Northern Minnesota

28. gray wolf
29. black bear
30. porcupine
31. gray jay

Animals With Special Population Concerns

32. trumpeter swan (reintroduced in 1966)
33. woodland caribou (regionally extinct)
34. blandings turtle (in decline)
35. spring peeper (regionally extinct from the metro area)

Your Animal's Adaptations

Student Name_____

1. The animal I will be studying is _____.

2. Circle the adaptations that your animal has:

digs holes	climbs trees	swims	stings	runs
paws	wears clothes	feathers	scales	teeth
wiggles	grabs food with feet	pecks	growls	fins
claws	long tongue	wings	long legs	a tail
exoskeleton		antennae	shell	fur
strong back legs for jumping		camouflage	slimy skin	beak
long ears	echo location (bats)		whiskers	flies

3. Put a "p" next to the physical adaptations your animals has and a "b" next to the behavioral adaptations your animal has above.

p=physical (on the animal's body)

b=behavioral (what the animal does)

4. Can you think of any other adaptations that help your animal to survive? Write them here:

1.

2.

Minnesota's Biomes
(and an Optional Visit from a Naturalist)

4th -5th grade
55 minutes in the classroom

Objectives:
Students will be able to:

1. identify two characteristics of each of Minnesota's three biomes
2. will be able to list the three biomes: coniferous forest, deciduous forest and prairie
3. students will be able to identify and record on a map the three biome locations
4. students will be able to explain how biomes (living systems/cycles) are related to non-living systems/cycles of climate and water availability
5. students will be able to place each of the habitats (wetlands, prairie, deciduous forest and coniferous forest into the correct region of the state)

Vocabulary:

coniferous, deciduous, prairie, biome, wetland, habitat

Materials:

large map of Minnesota on a large sheet of newsprint with the biomes designated with lines, pictures of habitat types for students from magazines, pencils, rainfall data

Procedure: (note: this class may be team taught by a teacher and a naturalist)

1. Explain to the students that they will be learning how where living systems, like forests grow, depends on non-living systems, like the water cycle and climate. Ask them if they have ever been in a wetland (swamp, pond, marsh, bog, river flood plain etc.), a forest where the trees had leaves (deciduous), a forest where they trees all had needles (coniferous) or a prairie. Show the students corresponding pictures with each habitat type.
2. Ask the students what factors determine where and how plants grow (water, space, nutrients, growing season, sunlight, soil, temperature etc.). Discuss their experiences with observing plants.
3. Draw a chart on the board with two columns: living systems and non-living systems. In the living systems column write this list: deciduous forest, wetland, prairie and coniferous forest. In the non-living systems column write the suggestions of the students as to what factors affect them: temperature, water availability,

quantity of sunlight etc.

4. Show the large map of Minnesota biomes and discuss the corresponding growing season temperatures and precipitation. (The south western part of the state is warmest and driest so grasses and other prairie plants grow best here. Trees need more water than is available in this region. Through the mid section of the state and on a diagonal from west to east, is the deciduous forest. There is more rain in this area. In the northern part of the state, where the climate is coldest, is the coniferous forest. Wetlands are places where water accumulates and this can happen in a prairie, deciduous or coniferous forest. Wetlands can exist throughout the state.) Point out that they have been discussing an example of how non-living systems (climate) affect living systems (plants and habitats).

Activity

1. Determine what biome the metro area is in on the big map.
2. Have the students cut out pictures of the different habitats (no animal pictures) and lay them in the appropriate regions on the state map.
3. Discuss the students choices of pictures and placement with the class.
4. Glue the pictures in place and display in the classroom or on a bulletin board.

Conclusion

1. Ask the students what a habitat is and for some examples.
2. Explain that a biome is identified by the plants that grow there and the climate. A habitat, in contrast, is identified by what animals live there. (For instance, if I say " this area is a wetland it has many tadpoles and ducks in it" am I discussing a habitat, or a biome? If I say " this forest gets more rain every year than the prairie does," what am I discussing? A biome or a habitat? Discuss how habitats are a sub-set of biomes if this terminology has been introduced in math class.
3. Restate that they have been discussing how living and non-living systems interact.

Background Information:
(data for Minnesota over the last 30 years)

Average Annual Precipitation : Prairie - 19.6"
Forest - 25.1"

Average Annual Temperature : Prairie - 40 degrees F
Deciduous Forest - 38 degrees F
Coniferous Forest - 37 degrees F

A Visit From a Naturalist

(Can be integrated into Minnesota Biomes Class)

4th -5th grade
15 minutes in the classroom
(can be added on to the end of the Minnesota Biomes class)

Objectives:

Students will know:

- where Hyland Park Reserve is in relation to the school

Students will begin to make a personal connection with a member of the nature center staff.

Materials:

metro area map, large map of Hyland Lake Park Reserve

Procedure:

1. Introduce the naturalist.
2. The naturalist will discuss four topics:
   a. that the students will have an opportunity to explore three different habitats when they visit Hyland Lake Park Reserve and Richardson Nature Center.
   b. where the park reserve is in relation to the school's location with the help of maps
   c. where the nature center is within the park
   d. review the difference between a park and a reserve and how the students will be expected to treat the natural world during the visit to the park reserve
3. The naturalist will hand out a list of upcoming programs at the nature center to the students for them to take home to their families.

RICHARDSON NATURE CENTER CURRICULUM

Minnesota Animals: Survival in the Habitats

Grades 4 and 5

(2 hours)

For best results there are several concepts students should understand before this program (they may have been learned in previous years and they may be reviewed in pre-nature center classes) they are as follows: basic needs, adaptations, recognition of Minnesota's habitats (wetlands, prairie, deciduous and coniferous forest) from pictures

Objectives:

- Students will be able to:
  - list the defining characteristics of two Minnesota habitats.
  - list three possible animal signs that can be observed in the field.
  - hypothesize how an animal's adaptations enable it to survive.
  - name at least one animal that lives in each of the three Minnesota habitats (wetlands, prairie, deciduous forest)

Materials:

poster-size pictures of a wetlands,a prairie, a deciduous forest and a coniferous forest,clipboards and pencils (1 for every three students), hoola hoops (5 for every group of 15 students), Red-tailed hawk, salamander, large picture of a crayfish, field worksheet

Procedure:

1. Introduction:
   a. Welcome the students to Richardson Nature Center and Hyland Lake Park Reserve. Introduce naturalists and volunteers.
   b. Explain the agenda briefly (introduction, hike in the field, return to this room for a conclusion). Discuss the necessity for a special sense of awareness during the field experience in order to discover as much as possible about the natural world.
   c. Challenge the students not only to make better use of their five senses, but to enhance a sixth. Ask them if they have ever felt that someone was nearby, only to turn around and find that person there. Encourage the students to develop a heightened sense of awareness

during the field experience.

d. Ask the students what animals they expect to possibly see in the park. When they name an animal:

-ask the students what that animal eats and what habitat(s) (wetland, deciduous forest or prairie) provides the basic needs (food water, living space and shelter) for that animal.

- ask the students to discuss how that animal uses it's adaptations to survive in that habitat.

- ask the students to discuss, conversely, whether the animal could survive in another habitat (could a Canada goose live in a prairie, for example).

Repeat these series of questions with several animals (as time allows).

e. Explain that while on the hike the students will be modeling a scientific method of making observations about plant communities and the animals that live in those communities.

f. Explain the sampling method briefly and go over the worksheet carefully.

g. Inform the students that when they return from the field experience there will be two live animals (tiger salamander and red-tailed hawk) and a picture of an animal (crayfish). The students will be asked to write down a list of each animals adaptations that are visible and a hypothesis of what habitat(s) those animals use.

2. Field Hike

a. Student groups of about 15 exit the nature center with a naturalist.

b. Gather group into circle and have students say their names and the name of the animal that they are studying. Discuss behavioral expectations while the students are in the field.

c. Explain that often in the field, the animals themselves are not visible. Ask the students what signs of animals they should be looking for as they visit the different habitats.

d. Visit wetland, forest and prairie areas. As students walk the trails make observations about animal signs and why that animal can be found in that habitat. Use "teachable" moments as they arise as a result of the authentic setting.

e. At two sites (in two different habitats) have students get into work groups with a clipboard, worksheet and pencil. Lay the hoola hoops for them and explain how to complete the worksheet. Emphasize that each member of the work group is responsible for some part of the worksheet but they should discuss each answers together. Explain that each person in the group will need to circle the words that best describe their feelings about being in the habitats in the top section of the worksheet.

e. Return to Nature Center Classroom.

3. Conclusion

a. As the students file back into the classroom, have them (those that do not have a clipboard) pick up a clipboard and the final worksheet.

b. As the groups return the Naturalist leading the conclusion encourage students to talk among themselves about their experiences in the field.

c. Once everyone has returned to the classroom explain that you are going to show the first live animal. Warn the students how to behave before the hawk comes into the room.

d. Bring hawk in and ask the students to name its adaptations.

e. Ask the students to name what habitat(s) are necessary to red-tailed hawk survival.

f. Show the students a live salamander explain that it is an amphibian and ask them about the adaptations of that animal and it's habitat requirements.

g. Show the students a picture of a crayfish and ask them to:

    1. Write down a list of its adaptations and what habitats it uses and why.
    2. Write a hypothesis as to what habitat it lives in and why they think this.

h. Review a few answers and discuss crayfish briefly.

h. Teachers should collect papers and everyone says good-bye.

Animal Homes and Habitats Field Worksheet

Names of Students:

1._____ Circle the words that describe how you feel right now. sad happy scared excited relaxed interested bored confused not confused write your own word_____

2._____ Circle the words that describe how you feel right now. sad happy scared excited relaxed interested bored confused not confused write your own word_____

3._____ Circle the words that describe how you feel right now. sad happy scared excited relaxed interested bored confused not confused write your own word_____

Habitat Name:_____

1. Circle all the words that describe the area inside your hoola hoop.

tall	short	trees	grasses	flowering	colorful	prickly hard
soft	young	old	light	dark	warm	cold
breezy		wet	dry	waxy	fuzzy	smooth
narrow leaves		wide leaves		other words_____		

Circle the words that describe how the area smells:

sweet strong sour like hay like dirt

2. List the animal signs you see in the hoola hoop. What animal might have made them?

	Animal Sign	Animal Name
1.		
2.		

3. Find an animal in this habitat and name one adaptation that helps it to survive.

Animal Name	Adaptation	How it uses the adaptation

4. Write a question about something you have seen outside today.

Minnesota Animals
Survival in the Habitats
(conclusion worksheet)

1. Circle only the words that describe the adaptations of this animal.

hard shell fur feathers beak hooves

pinchers antennae big ears strong tail

write other adaptations here:_____

2. Circle the picture of this animal's habitat.

3. How do this animal's legs help it to survive?

TEACHER TRAINING GUIDE

Minnesota Animals: Survival in the Habitats

Grades 4 and 5

(2 hours)

For best results there are several concepts students should understand before this program (they may have been learned in previous years and they may be reviewed in pre-nature center classes) they are as follows: basic needs, adaptations, recognition of Minnesota's habitats (wetlands, prairie, deciduous and coniferous forest) from pictures

Objectives:

- Students will be able to:
  - list the defining characteristics of two Minnesota habitats
  - list three possible animal signs that can be observed in the field
  - hypothesize how an animal's adaptations enable it to survive
  - name at least one animal that lives in three of Minnesota's habitats (wetlands, prairie, deciduous forest)

Materials:

poster-size pictures of a wetlands,a prairie, a deciduous forest and a coniferous forest,clipboards and pencils (1 for every three students), hoola hoops (5 for every group of 15 students), Red-tailed hawk, salamander, large picture of a crayfish, field worksheet, conclusion worksheet

Preparation:

1. Set out materials in separate piles for each field group.
2. Set up classroom with materials for introduction and conclusion.
3. Determine which trails each field group will use to avoid overlap (each group will need to visit an area of forest, wetland and prairie).
4. Students should be divided into groups of 10-15 students and those groups should be divided into work groups of three students.
5. Students should have name tags on with the name of the Minnesota animal that they are studying written below the student's name.

Procedure:

1. Introduction:

   a. Welcome the students to Richardson Nature Center and Hyland Lake Park Reserve. Introduce naturalists and volunteers.

   b. Explain the agenda briefly (introduction, hike in the field, return to this room for a conclusion). Discuss the necessity for a special sense of awareness during the field experience in order to discover as much as possible about the natural world.

   c. Challenge the students not only to make good use of their five senses, but to enhance a sixth. Ask them if they have ever felt that someone was nearby, only to turn around and find that person there? Encourage the students to develop a heightened sense of awareness during the field experience.

   d. Ask the students what animals they expect to possibly see in the park. When they name an animal:

      -ask the students what that animal eats and what habitat(s) (wetland, deciduous forest or prairie) provides the basic needs (food water, living space and shelter) for that animal.

      - ask the students to discuss how that animal uses it's adaptations to survive in that habitat.

      - ask the students to discuss, conversely, whether the animal could survive in another habitat (could a Canada goose live in a prairie, for example).

   Repeat these series of questions with several animals (as time allows).

   e. Explain that while on the hike the students will be modeling a scientific method of making observations about plant communities and the animals that live in those communities. The students will be pretending to be wildlife biologists and they will be using real methods to study the habitats. (Play up the role play idea.)

   f. Explain the sampling method briefly. The students will be comparing two plots within two different habitats. Each plot will be the same size so the comparison is accurate. Each plot will be determined by using a hoola hoop as the measure of the plot size. The students will need to make careful observations about the plot to answer the questions on the field worksheet. Go over the worksheet carefully by reading and explaining it to the students.

   g. Inform the students that when they return from the field experience there will be two live animals (tiger salamander and red-tailed hawk) and a picture of an animal (crayfish) and that they will be asked to write down a list of an animal's adaptations that are visible and a hypothesis of what habitat(s) that animal uses.

2. Field Hike

   a. Student groups of about 15 exit the nature center with a naturalist and/or volunteer.

   b. Gather group into circle and have students say their names and the name of the animal that they are studying. Discuss behavioral expectations while the students are in the field (this will vary some depending on the leader). Most leaders ask that the students are

quiet, stay with the group at all times and help to make observations in the field.

c. Explain that often in the field, the animals themselves are not visible. Ask the students what signs of animals they should be looking for as they visit the different habitats (scat, footprints, chew and claw marks, dens, holes and so forth).

d. Visit wetland, forest and prairie areas. As students walk the trails make observations about animal signs and why that animal can be found in that habitat. Use "teachable" moments as they arise as a result of the authentic setting.

e. At two sites (in two different habitats) have students get into work groups with a clipboard, worksheet and pencil. Lay the hoola hoops for them and explain how to complete the worksheet. The hoola hoops should be placed on the ground in an area of vegetation that is representative of the habitat. Space the groups well enough apart that they can work independently of each other. Emphasize that each member of the work group is responsible for some part of the worksheet but they should discuss each answer together.

f. Before the students start working on the worksheet, the entire group should spend two minutes sitting near the hoola hoop, silent and just observing with their eyes and listening to the sounds of the habitat. After the period of silence is over, each person in the group needs to circle the words that best describe their feelings about being in the habitat (top section of the worksheet). The rest of the worksheet can be completed in the work groups of threes.

g. Two minutes of silence should be observed in the third habitat as well even though there are no worksheet questions for the third habitat.

h. Return to Nature Center Classroom.

3. Conclusion

a. As the students file back into the classroom, have them (those that do not have a clipboard) pick up a clipboard and the final worksheet.

b. As the groups return the Naturalist leading the conclusion encourage students to talk among themselves about their experiences in the field.

c. Once everyone has returned to the classroom explain that you are going to show the first live animal. Warn the students how to behave before the hawk comes into the room.

d. Bring hawk in and ask the students to name its adaptations.

e. Ask the students to name what habitat(s) are necessary to red-tailed hawk survival.

f. Show the students a live salamander explain that it is an amphibian and ask them about the adaptations of that animal and it's habitat requirements.

g. Show the students a picture of a crayfish and ask them to answer the questions on the conclusion worksheet "Minnesota Animals: Survival in the Habitats".

h. Review a few answers and discuss crayfish briefly.

i. Teachers should collect papers and everyone says good-bye.

j. Naturalist should remind students that they can come to the nature center with family and friends any day of the week from 9 am to 5 pm (Sundays 12-5 pm). The park reserve trails are always open dawn to dusk for walking and exploring.

Post Richardson Nature Center Visit Guide

Report on an Animal Native to Minnesota

4th -5th grade
Over several weeks

Objectives:

Students will know:

- facts about a specific animal that is native to Minnesota

Students will be able to:

- develop questions
- research, organize information, write and produce a written, oral or visual report
- display final product

Materials:

files on Minnesota animals, media sources, materials on which to take notes and produce a final report

Procedure:

Class 1

1. Determine that each student remembers what animal he/she was assigned during the "Adaptations" class.
2. Ask the students to develop, and write down, five questions about the animal.
3. Establish a research procedure using electronic and written media and have the students start the research and note taking process.

Class 2 (optional)

1. Explain to the students that they must include some information about the animal from an interview. Ask the students if they have ideas about who they could interview with regard to their animal (naturalists at nature centers, DNR biologists, wildlife rehab. centers).
2. Establish and demonstrate the interview process with the class (the students can practice by interviewing each other and the teacher can provide feedback on the practice session).
3. Have the students develop five questions to ask the interviewee.
4. Students conduct interview (phone, e-mail, in-person).
5. Students develop three follow-up questions and either recontact person or find the answers in a media source.

Ongoing for Several Classes

1. Continue research.
2. Demonstrate to students how to organize the research into a final report. The organizational process should include notes from the media research, the interview and the

direct experience in the outdoors at Richardson Nature Center (or other personal accounts).

3. Students organize and produce a final presentation (any unanswered questions should be included in the report). The report should include direct observation of the animal and/or the habitat as a result of the field experience at Richardson Nature Center.

OPTIONAL:

1. Students produce a diorama, painting, drawing or other form of artwork that depicts the animal and it's habitat.

2. Have students write a story from the perspective of the animal (for example: a day in the life of a ...)

Science Performance Assessment

Name _____
Date _____
_____

Minnesota Animals:Adaptations and Habitats

Name an animal that lives in Minnesota _____

Circle the habitat where it spends most of its time:

prairie deciduous forest wetland coniferous forest

Circle the adaptations that help this animal to survive:

feathers scales fur webbed feet special mouth parts

wings teeth skin long legs camouflage

Write a few sentences that describe how this animal uses a habitat.

Draw a picture of this animal in its natural habitat with a predator and a food source (label each). Use the back of this sheet for your drawing.

Rubric Score 4 - To exceed outcome standards write a paragraph that describes the animal's habitat and include how that habitat smells, feels, looks and sounds.

Final Presentation Checklist

Student name _____
Date_____

Circle those that apply: visual written oral

Project includes:
- direct observation data _____
- questions _____
- use of several sources _____
- sources are appropriate _____

Presentations:
- are clearly written _____
- are creative _____
- integrate direct experiences and media research _____

Student:
- used appropriate note taking procedure _____
- wrote and edited a rough draft (or preliminary design) _____

General notes:

Final Grade:_____

People Involved With This Project:

Dan Newbauer, Supervisor, Richardson Nature Center

Tim Keily, Naturalist, Richardson Nature Center

Bob Knight, Teacher, Oak Grove Elementary School

Andy Kubas, Teacher, Valley View Elementary School

Sue Olson, Teacher, Washburn Elementary School

Sarah Selikowitz, Naturalist Technician, Richardson Nature Center

Jane Votca, Naturalist, Richardson Nature Center

Distribution of Grant Funds:

Materials (copies etc.) - $50.00

Sarah Selikowitz (wrote text, organized and particpated in meetings, edited text, etc.) - $1,000.00

All other participants listed above received (for generating ideas, participating in meetings, editing and providing support) - $525.00