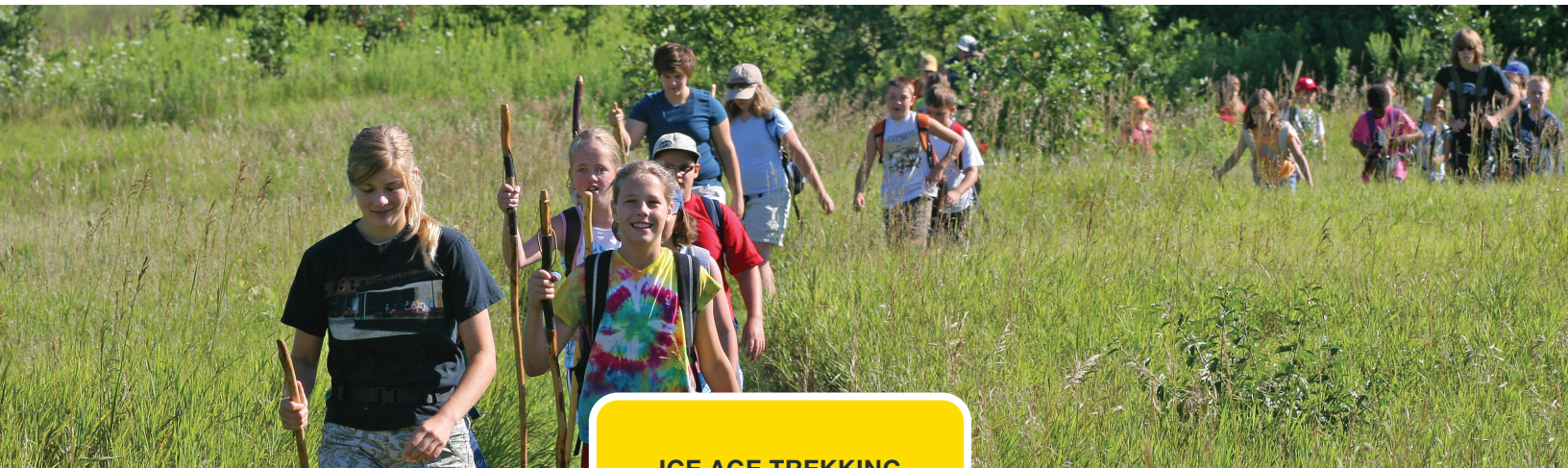


TRAILING ICE AGE MYSTERIES



ICE AGE TREKKING



CONTENTS

I. Enduring Knowledge	3
II. Teacher Background	3
III. Before Viewing this Video	5
IV. Viewing Guide.....	5
V. Discussion Guide.....	6
VI. Evaluation.....	6
Curriculum Standards	i, ii, iii

Note:

This topical must be accompanied with the Overview for complete understanding.

Overview:

During the past 2.5 million years, numerous continental glaciers advanced and retreated across much of the upper Midwest, with the last glaciers retreating some 10,000 years ago. All this glacial activity shaped and deposited both the topography and soil types that we see today. Combined, they greatly influence regional water cycle activity, lakes, rivers, forest cover, and land use. One way for students to gain first-hand knowledge and visual understanding of the features formed during glaciation is to walk sections of the Ice Age Trail. Planning a hike along the trail requires a combination of using common sense, safety, and research.

I. Enduring Knowledge:

Students will learn how to plan and prepare for a safe and smart field expedition.

Learning Targets:

1. Students should learn that a field expedition is important in any geological study.
2. Students should learn how to set up steps to prepare for the trip.
3. Students should learn the steps to consider: maps, safety, supplies, preservation, and record keeping.

II. Teacher Background:

A glacier is made up of thick layers of compressed ice formed from repeated snowfalls that has the ability to move. It flows like a slow river of putty and physically changes the shape of the land in the process. The size of a glacier can vary from as small as a football field to hundreds of kilometers.

A glacier forms when the amount of accumulating snow is greater than the amount that melts. This accumulation remains year-round and compresses the lower layers into ice. The extreme weight of the glacier deforms the lower layers of ice similar to putty, and this characteristic, along with the pull of gravity, causes the ice to move through mountain valleys or across plains. It can change speed and at times retreat, altering the land beneath by a combination of forces.

As a glacier moves, it carves away land by erosion and also sculpts and deposits new landforms. During the Wisconsin glaciation, continental glaciers formed moraines, kettles, drumlins, and eskers. These features are formed with glacial drift that is made up of sand, gravel, rocks, and boulders created and transported by the forces of the moving ice. The glacial melt water is a key component in the creation of depositional features, and also creates rivers and lakes.

ICE AGE TREKKING

A field expedition is an excellent way to view landforms created by glaciers. The Ice Age Trail is an excellent place to explore these features. After choosing a specific area, the hiker needs to make a list of tasks to complete to prepare for the trip. These tasks encompass safety, supplies, researching the conditions, rules, and plans for recording information.

1. **Safety:** adult supervision, plans left with someone, cell phone, maps, weather
2. **Supplies:** clothes, footwear, food, water, flashlights, matches, First Aid kits, whistles
3. **Leave No Trace:** take out waste; don't disturb nature or other hikers
4. **Record:** camera and journal for features, plants, wildlife

Online Resources:

- <http://dnr.wi.gov/org/land/parks/specific/iceagetrail/iceage.html>
- information about Wisconsin glaciers, also vocabulary
- <http://www.iceagetrail.org>
- about the Ice Age Trail itself
- www.lnt.org
- leave no trace principles for low-impact hiking
- http://wisconsingeologicalsurvey.org/ice_age.htm
- quick background info
- <http://www.intotheoutdoors.org>

Vocabulary:

1. **field expedition:** a trip to the actual site of the study, in this case the Ice Age Trail to study glacier features
2. **GPS:** (Global Positioning Satellite) tool to give exact location using satellites
3. **Alpine glacier:** glacier that is formed in a mountain valley
4. **continental glacier:** glacier formed as ice fans out across the land
These are much larger than alpine glaciers.
5. **moraine:** a ridge-like landform consisting of glacial debris that is created along the edges of a glacier
6. **kettle:** a depression formed when glacial ice breaks off and is buried
Over time the ice melts, creating a small depression.
7. **esker:** long ridge of gravel deposited in a tunnel under the glacier by its melt waters

8. **drumlin:** long, teardrop-shaped glacial drift formations that run parallel to the glacier's flow. It is unclear whether it forms from dragging sediment or from melt water movement.
9. **dell:** small valley
10. **foot:** the bottom (terminal) edge of the glacier – the edge that creates the terminal moraine
11. **geomorphology:** the study of the physical features of the surface of the Earth and how they formed or change
12. **terminal moraine:** a moraine deposited at the point of furthest advance (“terminus”) of a glacier, forming a ridge
13. **kame:** a mound-shaped deposit of sand and gravel formed by glacial melt water flowing into a hole in the glacier.

III. Before Viewing this Video:

Ask students to:

Think of a trip or vacation you have taken with your family. Make a list of all the things you needed to do in preparation for the trip. Share with the class.

What are some scientific observations we are likely to make when looking at a glacial landform? How can we tell one landform from another? Share with the class.

IV. Viewing Guide:

Ask students to answer the following questions while you watch the video:

1. What are 2 safety precautions you should take before your expedition? (Take an adult, leave planned trek time and location with 2 adults, carry cell phone, check weather)
2. What are the 3 important clothing items to pack? (long pants, hiking boots, rain gear)
3. What do you need so you don't get lost? (map, compass, GPS)
4. Name 1 other item you should take along (water, flashlight, matches, First Aid kit, whistle)
5. Name one way to show respect for nature. (Don't pick plants, don't leave any garbage, don't get off the trail, don't alter nature)
6. What should you record in your journal? (description of glacial features, plants, animals, take photographs or make sketches)

V. Discussion Points:

Discuss questions from viewing guide

In small groups, plan a field expedition along the Ice Age Trail. Make sure each group member writes down the information for one of the questions below. Include:

- A. Section to hike (use Ice Age Trail website). Download map
- B. Safety preparation (leave info with adult, take map, compass, cell phone, GPS, check for decent weather)
- C. Supplies to pack (hiking clothes, adequate food and water, flashlight, matches, First Aid kit, whistle)
- D. Rules to follow while hiking (stay on trail, carry out garbage, don't disturb nature or take anything, respect other hikers, be aware that additional rules may apply to each section)
- E. Set up page for recording information in a journal (date, location, observations, sketches, photos)
- F. Be prepared to share with class

VI. Evaluation:

Review small group activity based on the following criteria:

1. Complete information in Section V
2. Contribution of each member – one section written by each
3. Ability to work together as a group (Use 21st Century Skills Rubric)
4. Use of time (Use 21st Century Skills Rubric)
5. Active participation in discussions and in a group.

Suggestions for extended learning:

1. Act on the plan you created and share your scientific observations with the class.
2. While sitting for 20 minutes each day, write a 5-day journal recording plants and wildlife you see in a nearby park or in your backyard. Include at least 2 sketches.
3. Write a short guide of do's and don'ts on the Ice Age Trail. Look at other sources.
4. Plan a 2-day expedition to look at geological features in Yellowstone Park. Get maps and plan which sites you would visit and materials you would need to take with you. Evaluate similarities and differences between visiting the geological features of Yellowstone National Park and the features of Wisconsin.

The following Wisconsin Student Proficiency Standards can be met by teaching Ice Age Trekking:

SCIENCE

1. **Connections:** How evidence explains phenomena
2. **Inquiry:** Understanding how questions direct research
3. **Earth Science:** Earth history & structure of Earth
4. **Physical Science:** Motion & Forces

SOCIAL STUDIES

- A. **Geography:** “Students in Wisconsin will learn about geography through the study of the relationships among people, places, and environments.”
 - **8th grade:** A.8.1, A.8.6, A.8.8
- B. **History:** “Students in Wisconsin will learn about the history of Wisconsin, the United States, and the world, examining change and continuity over time in order to develop historical perspective, to explain historical relationships, and analyze issues that affect the present and the future.”
 - **8th grade:** B.8.8, B.8.12



LANGUAGE ARTS

Reading - Informational Text

- **Key Ideas and Details** • 8.Rit.3
- **Craft and Structure** • 8.Rit.4, 8.Rit.5
- **Integration of Knowledge and Ideas** • 8.Rit.7, 8.Rit.9

Writing

- **Text Types and Purposes** • 8.W.2, 8.W.3,
- **Production and Distribution of Writing** • 8.W.4, 8.W.5, 8.W.6,
- **Research to Build and Present Knowledge** • 8.W.7, 8.W.8, 8.W.9,

Speaking and Listening

- **Comprehension and Collaboration** • 8.SI.1, 8.SI.2
- **Presentation of Knowledge and Ideas** • 8.SI.4, 8.SI.6

Language

- **Conventions of Standard English** • 8.L.1, 8.L.2
- **Knowledge of Language** • 8.L.3
- **Vocabulary Acquisition and Use** • 8.L.4, 8.L.5

Wisconsin Teacher Standards which can be met with this curriculum

Standard 1: Subject matter

This curriculum provides information not readily available in other forms.
A teacher using this material will be well-informed about the subject matter.

Standard 2: Broad range of ability

This curriculum provides instruction that supports their intellectual, social, and personal development.

Standard 3: Adapt instruction

This curriculum provides suggestions for learners with a variety of intelligences and levels of ability.

Standard 4: Instructional strategies

This curriculum includes the use of technology to gain information and suggestion for using research in extending learning.

Standard 5: Individual and group motivation

Both prior knowledge and carefully designed group projects promote motivation for students to learn.

Standard 6: Verbal and nonverbal communications

Instructional media and technology that promote active learning are key parts of this curriculum.

Standard 7: Organizes and plans systematic instruction

This curriculum is organized to support teacher knowledge, to draw on and motivate students to engage in active learning, and promotes active inquiry, collaboration, and supportive interaction in the classroom.

Standard 8: Formal and informal assessments

Suggestions for a variety of assessments, both formal and informal, are offered in the curriculum.