

# Examining Landscapes Produced by Glaciers

## Introduction:

In this lab you will be examining images of landforms created by ice. Gravity causes ice to flow downhill slowly over time. Flowing ice or a glacier is thought to be the most powerful agent of erosion. Glaciers can transport almost any size sediment and can carry massive amounts of rock debris. They can scour the surface of the Earth, abrade rocks, polish bedrock, transport rocks thousands of miles, and deposit a large amount of sediment when they melt.

Almost all of New York State was once covered by a continental glacier that melted away about 10,000 years ago. There have been many “ice ages” in the past. The most recent one (100,000 to 10,000 years ago) in North America is known as the Wisconsin Glacial Episode. The continental glacier that covered New York State was up to a mile thick and could easily carry sediment and shape the land beneath it. It moved south from Canada carrying with it igneous and metamorphic rocks that would not have been found in NYS otherwise.

In this lab you will be examining the different erosional and depositional landscape features created by glaciers. Look carefully at the images as they will help you to gain a better understanding of glaciers.

## Materials:

- Prezi of landscape features produced by glaciers

The following is a list of ways that you can **improve** your science lab write-ups.

- \_\_\_ I used complete sentences when appropriate.
- \_\_\_ I answered all questions with complete ideas.
- \_\_\_ I am neat, including using a pencil to erase mistakes.
- \_\_\_ I reviewed the lab to make sure all questions are answered correctly.
- \_\_\_ I asked the teacher for help when needed.

**Directions:** With the help of your notes and the Earth Science textbook, use the slides to answer all questions.

**Questions:**

*When you see this fella, use the textbook page indicated if you need help!*



**Slide #1**

1. Is this an image of a *continental glacier* or an *alpine glacier*? \_\_\_\_\_

2. **Explain** the difference between these two types of glaciers?

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3. What are the features labeled **A**? \_\_\_\_\_



4. What are **three** more landform features created by valley glaciers in slide #1?

- 1.) \_\_\_\_\_
- 2.) \_\_\_\_\_
- 3.) \_\_\_\_\_

5. **Compare** the erosion strength of the glacier to the erosion strength of the stream in slide #1.

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**Slide #2 + Video**

1. How does the **shape** of the valley in slide #2 indicate that it was created by a glacier?

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2. Slide #2 video shows a glacier advancing and retreating. **What could cause this to happen?**

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**Slide #3**



1. What are the **features** on the bedrock shown in slide #3? Be specific, glacial abrasion is not enough to answer this question. \_\_\_\_\_

2. How are these features **created**?

\_\_\_\_\_  
\_\_\_\_\_

**Slide #4**

1. What are the boulders in slide #4 called? \_\_\_\_\_
2. What **2** pieces of **evidence** indicate that the boulders were transported a long distance by ice and eventually deposited where they are now?

Evidence 1 - \_\_\_\_\_

Evidence 2 - \_\_\_\_\_

**Slide #5**



**194**  
**Fig. 9**

Identify 4 characteristics of sediment deposited by a glacier known as **glacial till**.  
*(Include information about sorting, layering, composition, and shape ....)*

Characteristic 1 – \_\_\_\_\_

Characteristic 2 – \_\_\_\_\_

Characteristic 3 – \_\_\_\_\_

Characteristic 4 – \_\_\_\_\_

**Slide #6 a-b**



1. What is the glacial feature in the images on slide #6a? \_\_\_\_\_

2. How does the **shape** of this feature indicate the direction a glacier **moved**?

\_\_\_\_\_

3. Slide #6b shows a topographic map view of many drumlins in Western New York. Based on their shape, in what compass direction did the glacier move through the map area?

\_\_\_\_\_

**Slide #7**

1. What is a **moraine**?

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2. **List** the 3 types of **moraines** shown in slide #7

- 1.) \_\_\_\_\_
- 2.) \_\_\_\_\_
- 3.) \_\_\_\_\_



**If you have difficulty reading the labels on slide 7, use page 197 in the textbook.**

3. Why is it important to know the position of a glacier's **terminal end moraine**?

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**197**  
**Fig. 12**

**Slide #8**

1. What is the glacial feature pictured in slide #8 \_\_\_\_\_

2. How did this feature **form**? \_\_\_\_\_

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**Slide #9**

What is the **feature** shown in this slide and how does it **form**?

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**Slide #10**

1. Was the **kame** pictured in slide #10 deposited by ice or running water? \_\_\_\_\_

2. Do you expect the kame to have **sorted** or **unsorted** sediment and **why**?

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**Slides #11, 12, and 13**

In these slides you will be **comparing** an aerial photo to a topographic map of a section of Mendon Ponds. Identify features **A**, **B**, and **C**.

A.) \_\_\_\_\_ B.) \_\_\_\_\_ C.) \_\_\_\_\_

**Slide #14**

1. Where would you go if you wanted to see an area of land that was **not** affected by glaciers in New York State? \_\_\_\_\_
2. What **evidence** did scientist use to draw the map showing the **maximum extent** of glacial ice in North America?

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**Slide #15**

*In this slide, note the position of the ice through time. New York State has also been roughly outlined to help you locate yourself on the maps.*

1. About **how long ago** did the continental ice **START** to melt away? \_\_\_\_\_
2. About **how long ago** did the glacier retreat completely from New York State?  
\_\_\_\_\_
3. Would you expect to find the shoreline of **Lake Ontario** to be in the same place today as it was 12,000 years ago? **Explain** your answer.

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**Slide #16**

1. What major **evidence** do we have that glaciers once covered the Rochester area?

\_\_\_\_\_

2. Use ESRT page 2 to locate where the Adirondack Mountains are on slide 16. What **evidence** would you find that glaciers covered the Adirondack Mountains?

\_\_\_\_\_

3. Still looking at page 2 in the ESRT, which **landscape region** do the Finger Lakes belong to? \_\_\_\_\_

**DONE EARLY?**

**Check your work with the teacher and then...**

Sign in and watch the BrainPOPs titled *GLACIERS* and *ICE AGE*. After each video, complete the Review Quiz.

**[WWW.BRAINPOP.COM](http://WWW.BRAINPOP.COM)**

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