

A C T I V I T Y G U I D E

Splash of Salt

SECRETS OF **GREAT SALT LAKE**

SEE IT IN **IMAX** AND GIANT SCREEN THEATERS



SURVIVE THE LAKE / ACTIVITY GUIDE

Introduction

Nestled between the desert and mountains of northern Utah, Great Salt Lake is the largest saltwater lake in the Western Hemisphere.

Its high salinity creates a unique ecosystem that supports brine shrimp and attracts millions of migratory birds each year. As a vital natural resource, the lake plays a key role in regional climate regulation, industry, and recreation.



Map of Utah



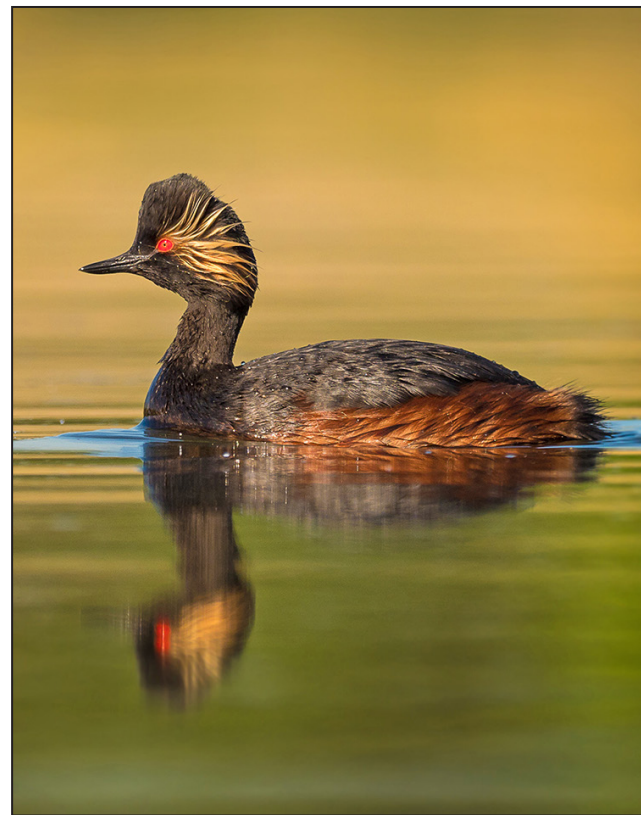
SECRETS OF GREAT SALT LAKE

SPLASH OF SALT / ACTIVITY GUIDE

From the Film

In *Secrets of Great Salt Lake*, we explore the fascinating features of the lake, from its high salinity levels to the lake-effect snow it causes. Great Salt Lake is a terminal lake, a body of water that does not have an outlet to other external bodies of water such as rivers or oceans.

Water in terminal lakes is retained within an endorheic basin and can only be lost through evaporation or percolation into the ground, which can cause interesting changes in the region's water cycle.



Eared Grebes use Great Salt Lake for staging during migration.

A view of the majestic landscape surrounding Great Salt Lake.

SPLASH OF SALT / GRADE LVL. 5-8 / **ACTIVITY GUIDE**

Activity Overview

This activity explores the unique aspects of the water cycle around Great Salt Lake. Learners paint with salt water and then observe the dried art, making connections to the salinity of Great Salt Lake with the glittering crystals left behind.

Learners will break into groups to build, write, or create art representing a specific part of the water cycle while discussing environmental impacts caused by humans. Then, they will come together to present the full “story” as a class.

These activities prompt learners to make observations and inferences regarding terminal lakes, the impact of salinity on the water cycle, and how the hydrosphere influences the environment of Great Salt Lake.

Estimated time for activity: 20-30 minutes

Materials:

- Paintbrushes (1 per learner)
- Cups to hold salt water and dip brushes (1 per table)
- Non-glossy dark construction paper (black and blue work best)
- Pencil or white crayon to write learners' names on the papers
- Saturated salt water solution (around 100 mL per class)
- Scratch paper (2 sheets per learner)
- Markers or other writing utensils (1 per learner)
- Trash can target for snowball fight
- Three-part chart

Preparation



- Add salt to warm water with continuous stirring and let it dissolve. Continue adding salt until it begins to accumulate at the bottom of the container. A fully saturated solution will use around 190 grams of salt for every 500 mL of water. Salt solution can also be purchased.
- Fill cups with salt water and set out paintbrushes.
- Sort the dark construction paper so that each learner gets at least one piece. To limit waste, larger sheets can be cut in half.
- Clear a designated drying area where learners can set their papers to dry overnight.

Instructions

PART I: 10-15 minutes

1. Begin a brief discussion with learners to get them thinking about Great Salt Lake and its features by kicking things off with a snowball fight with a twist.

Give each learner a sheet of paper, then explain they will be asked three questions but that after each question, they will crumple their paper and throw it somewhere in the room, like a snowball fight! They will then grab a paper from the floor and prepare to answer the second question, then repeat for the same process for the third.

“What is a terminal lake?” Learners should each write one answer at the top of their scratch paper, then wait for your countdown. Once all learners have finished writing, prompt them to crumple their papers and toss them around the room. Each learner should find one new paper, unfold it, and prepare to answer the second question: *“How do you think the level of salt in a body of water influences its temperature?”* Once they’ve written their answers, have them crumple and throw them again.

Finally, each learner should find one more new paper, unfold it, and record their answer to the question, *“Why do you think we’re having a ‘snowball fight’ to kick-off this discussion?”*

Instead of throwing them around the room after the third question, challenge learners to hit a target, such as an empty trash can or bin in the center of the room. The papers that land inside the target are the ones you’ll read aloud.

Once everyone has attempted to reach the target, have learners return to their seats. Read the “winning” snowballs aloud and discuss the answers as a class.

Answer 1: A terminal lake is a lake with only inlets, no outlets. This means that any minerals, pollutants, or debris that gets swept into the lake by rivers stays there. The only way water leaves a terminal lake is through evaporation or human intervention. Great Salt Lake is an example of a terminal lake.

Answer 2: Salt water has a lower freezing point and higher boiling point than fresh water. This impacts its temperature and the rate of freezing and evaporation. Great Salt Lake remains warmer in winter and cooler in summer than most other lakes due to its high salinity.

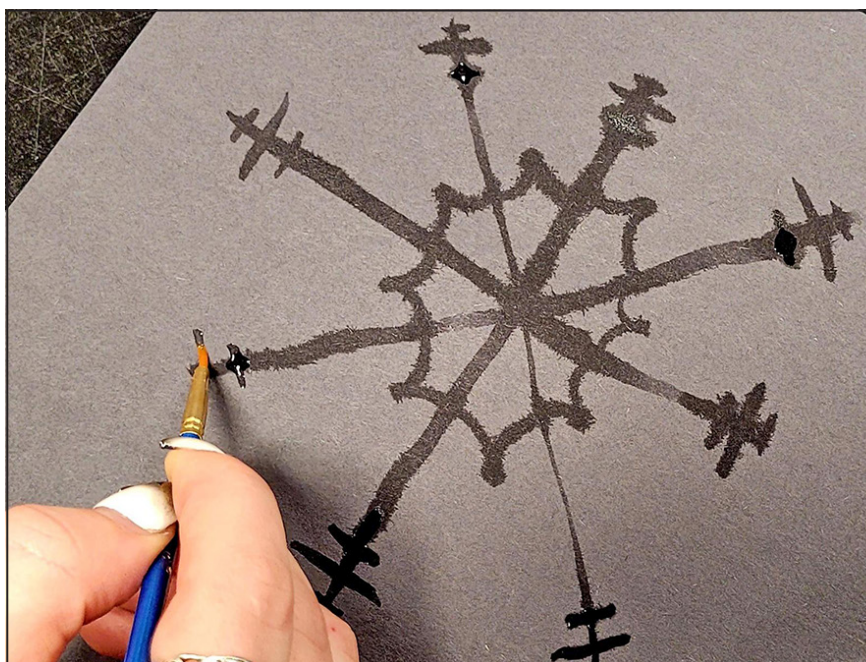
Answer 3: Because Great Salt Lake stays warmer in winter, it is known for causing lake-effect snow in the surrounding areas. Warm, moist air from the lake feeds into cold fronts and increases the amount of water in the clouds, causing extra snow to fall, so it seemed only fitting that we opened with a “snowball fight!”

Group Discussion: *How might a change in the climate change the type and amount of precipitation? How would this impact Great Salt Lake?*

2. Explain to learners that they will create salt water paintings to visualize what happens when the salty water of Great Salt Lake evaporates.

Give each learner each a paintbrush and a piece of paper, and each table a cup of salt water. They should dip their paintbrushes into the salt water and then “paint” a design on their paper.

Leave the design up to the learners, or prompt them to paint something that relates to what they’ve been learning about Great Salt Lake and the water cycle.



Snowflakes look impressive once they dry, and relate to the lake-effect snow caused by the lake.

Once learners have been given instructions, pass out the supplies and give them time to work on their creations. For the best results, encourage them to paint over the same spots two or three times to make sure lots of salt gets deposited.

Using the pencil or white crayon, make sure each paper has the learner's name visible, then set them in the drying area to dry for approximately one to two hours.

Instructions

PART II: 5-10 minutes

Revisit the dried papers the next day. Learners should be able to see their design in white and if they look closely, they should also be able to see small, glittering grains of salt. They might even see the beginnings of larger crystals starting to form.

Here are some additional points:

- Magnifying glasses are a great addition to the observation portion of the activity.
- Learners can gently touch their paintings but you may wish to remind them that the paper and salt crystals are fragile.
- **Halite** crystals, made from lots of sea salt, are commonly found on the shores of Great Salt Lake.



Salt crust exposed along the north arm of Great Salt Lake.

Image courtesy of: www.geology.utah.gov

Debrief the activity with the learners by having them complete a **three-part chart** in small groups or individually.

Hand out some scratch paper and markers to learners. They should divide the paper into three sections and use it to answer the questions listed below. After small group discussions, you can then discuss as a whole group and/or collect their charts as an informal assessment or entry/exit ticket.

Observations: “What did you observe with your paintings? What changes did you see?”

Answers should involve the loss of water, drying of the paper, and visible white streaks/crystals left on the paper.

Analysis: “What do you think the white crystals are made of, and why do you think this?”

Answers should cite salt (crystals and/or residue). Learners can explain how they began with salt water and that if the water evaporated, then it would make sense that the solid left behind is salt.

Application: “Why does Great Salt Lake stay salty, and what are some impacts of its salinity?”

Answers should involve the idea that because Great Salt Lake is a terminal lake and has no rivers or streams leaving it, any salt that comes from upstream accumulates in the lake, much like it does in the ocean. The only way water leaves is through evaporation, meaning the evaporated water leaves salt behind, just like we saw on the paper.

Impacts could include lake effect snow, change in population of extremophile species, and changes to freezing and boiling points.

Clean Up

- Rinse paintbrushes and cups to reuse.
- Wipe down desks with a cleaning solution to break up dried salt water residue.
- Recycle used papers or let learners take them home.





Buffalo grazing on the shore.

SPLASH OF SALT / BONUS ACTIVITY GUIDE

Extension Activity

Preparation: Learners break into groups to build, write, or create art representing a specific part of the water cycle while discussing some environmental impacts caused by humans, then come together to present the full “story” as a class.

These activities prompt learners to make observations and inferences regarding terminal lakes, the impact of salinity on the water cycle, and how the hydrosphere influences the environment of Great Salt Lake.

Procedure: Give a small refresher of the parts of the water cycle and start to introduce the flashcards you have prepared for the number of groups.

Materials:

- Markers, crayons, colored pencils
- Glue sticks/liquid glue
- Scissors
- Tape (masking for wall display)
- Labeled index cards or prints of water cycle terms (for group reference)
- Lined paper or poster paper

Build Materials:

- Construction paper, tissue paper
- Pipe cleaners, string, beads

Direct the learners to sit with their new groups based on which part they are most excited about or want to learn more about.

“Great! Now that we have our new groups, we’re going to create the entire cycle.

Each of you have a part of the water cycle. Your job is to design an art or written piece of work for the part you are assigned. This is a story! Think about the part you have and the overall cycle. Where does it fit into the larger cycle and how do we as humans impact that part of the cycle?”

Ask learners to identify the main effects of their part of the cycle: what is produced, how do humans impact this part of the cycle, how can we limit our impact, and what is needed for this part to occur or how does the environment affect it?

Give the learners time to build, draw, or write. As they work, walk through the tables and ask them guiding questions about their part of the cycle.

Possible questions may include:

- *How are they going to represent their piece of the water cycle?*
- *What is the main idea they are trying to convey?*
- *What colors are they using to represent flow or how water is moving through the part they are explaining?*

Bring everyone back together and sit so that everyone can see one another. Go around the room, encouraging learners to explain what they came up with to represent their part of the Water Cycle and how humans and environmental changes impact their part of the cycle.

Wrap up/debrief as a class.



There is a vast variety of rock formations on the shores of Great Salt Lake.

ACTIVITY GUIDE CREDITS

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