

Guide for Teachers and Caregivers: Salinity

Key Concepts students should already understand

- [Basic map reading skills](#)
- [Reading/creating graphs](#)

Key Concepts learned from this activity

- The effect of salinity on freezing point
- Tides and their effect on salinity
- How salinity affects animals around New York City

Questions to Test Understanding

Use these questions to determine your student's understanding of the topic after the activity is complete.

Q: What is salinity?

A: Students should be able to state: The amount of salt in water

Q: Does adding salt to water raise or lower the freezing point?

A: Students should be able to say: Salt lowers the freezing point

Q: Why is salinity important around New York City?

A: Students should be able to state: It determines which animals and plants can live in the water

Vocabulary

Salinity: The amount of salt in water

Saltwater: Water that contains as much salt as the ocean contains

Freshwater: Water that contains no salt

Brackish water: A combination of freshwater and saltwater

Tides: The rise and fall of water, twice a day in New York City, because of the gravitational pull of the moon and sun.

Flood tides: Incoming (rising) tides; these tides bring in saltwater from the ocean and increase salinity

Ebb tides: Outgoing (falling) tides; these tides allow freshwater to flow from rivers, streams and creeks into an area and decrease salinity

Migrate: Move from one area to another, usually when seasons change.

Freezing point: The temperature that a liquid becomes a solid. For freshwater, this temperature is 32° F or 0° C.

Answer Key

Before Experiment Questions

Q: Which cup of water do you think will take the longest to freeze? Why?

A: Students may guess that the: saltwater cup will take longest. The more salt added, the lower the freezing point.

**it is okay if students don't guess correctly, that's why they are doing the experiment!*

Q: How long do you think it will take each up to freeze?

A: This answer depends on your freezer temperature. Have your student make predictions about how long they think it will take.

Post-Experiment Questions

Q: Describe your graph. What do you notice? Does anything stand out?

A: Students should be able to describe: freshwater froze the quickest, brackish water froze second, and saltwater took the longest time to freeze. **Bar height from tallest to shortest should be: saltwater, brackish water, freshwater.*

Q: Which cup took longest to freeze? Why do you think that is?

A: Students should be able to explain: The saltwater cup should take longest because it has more salt, or “higher salinity”.

Q: Are the results what you expected? Why or why not?

A: Students should: refer to their answer to question 2 in the “Before Experiment” questions. Compare their guess to their results.

Q: What do you think would happen if you used a different amount of salt? What about other materials instead of salt? Try it!

A: Students should be able to correctly guess: The amount of time to freeze would change depending on how much salt you use. Other substances will have different or no effects on freezing point. If you try other materials, let us know how it went!

Q: What do you think this means for animals that live in the water around New York City?

A: Students should be able to identify: Some animals like birds that live on the water, saltwater and brackish water provide important habitat in the winter when other lakes and river are frozen. Some animals can only tolerate certain ranges of salinity so they must also move as the tides come in and go out. Some fish start part of their lives in one type of water and then gradually adjust and migrate to another type.

Additional Resources

[Department of Environmental Conservation Resources on Estuaries](#)

[Curious Kids: How do tides work?](#)

[Frontiers for Young Minds: Fish Migrations](#)

[PBS Kids Splash and Bubbles: What is Brackish Water](#)

Have Questions? Want to share your student's project with us! Email naturalareas@randallsisland.org or share directly to social media by tagging @RandallsIsland