

# Air Quality and Sense of Place: A Place-Based Educational Toolkit

## Introduction

---

**Purpose Statement:** The goal of this toolkit is to inspire curiosity around students' relationship with air quality through place-based education methods at Antelope Island State Park. In the Great Salt Lake basin, air quality is often presented and perceived in a negative light. Through inquiry, this toolkit intends to facilitate a positive connection between students and their local environments, fostering engagement in collaborative solutions to social and ecological issues like air quality in their communities. **Previous research indicates that “a sense of place” refers to the meanings and attachments people hold for a specific place, and the transformative capacity deep relationships with a place can have on stewardship.** Using tools, lessons, activities, and questions that facilitate a sense of place in youth will inspire them to find how they can become stewards of the land, water, air, and communities they care about.

**Toolkit Contents:** The activities within the toolkit will vary and include focuses on mindfulness observations, art, science, and movement (kinesthetic learning). All activities will draw on the uniqueness of Antelope Island and are designed to create a connection to the island and consequently encourage stewardship of the island, the lake, and the Great Salt Lake Basin.

- **Questions to get students thinking** - What do you see on the bus?
  - Setting up their sense of place, specifically for Antelope Island and how that interacts or is connected with their larger community.
- **Activity 1:** Engaging the Senses and Observation-Based Learning
- **Activity 2:** Air Quality and Art
- **Activity 3:** Physical Observations and AQI Index
- **Activity 4:** Thinking About Dust and Smoke
- **Activity 5:** Ranger Says
- **Fact Sheet :** Take home messages

The toolkit is designed for teachers to pick and choose activities. The activities do not build off of each other, but when taught together provide multiple ways of learning/knowing and a more comprehensive place-based education.

This toolkit was created by graduate students: Fiona Summer, Baylee Olds, Douglas Tolman, Jenna Fisher and Tara Hetz as part of a graduate course supported by the University of Utah's Global Change and Sustainability Center.

## Questions to get students thinking - What do you see on the bus?

---

- How far are we traveling?
- What do you see out of the windows?
- Can you see your house from the island?
- Can you see the city?
- Can you see the mountains? Is there snow?
- Who else do you see on the roads?
- Where do you think they are traveling?
- How are they traveling? Bike? Train? Bus? Car?
- How is the landscape changing?
- How is the landscape different or similar to where you live? The school?
- What kinds of plants do you see?
- What animals do you see?
- Can you see the Great Salt Lake?
- What do you smell? How does that compare to the bus? Your house?
- What is the weather like?
- What is the air like?

## Activity 1 - Engaging the Senses and Observation-Based Learning

---

### Where Am I?: Fostering a Sense of Place through Guided Sensory Observations

#### Objectives:

- Encourage students to engage in intentional observations of place using different senses
- Students will practice using tools in order to orient themselves and investigate their surroundings
- Students will make connections between what they observe on Antelope Island and air quality

#### Materials:

- Compass (8)
- Magnifying glass (8)
- Windsock (1)

#### Lesson Plan:

Have students break out into groups with one adult per group (ideally one compass and magnifying glass per group), and separate to a distance where they can hear each other, but also the instructor(s) in the middle. Place the windsock in the center near the instructor(s)

- As a group, use the compass to identify each direction (north, south, east, and west). What do you see in each direction? Are there any plants or animals?
- Close your eyes and take three deep breaths. Can you feel the air flowing in and out of your lungs? What do you smell? Can you identify any different smells?
- Now, everybody be as quiet as you can for 30 seconds. Pay attention to the sounds around you. What can you hear?
- What is the temperature outside? Does it feel warm? Cool? Is the air dry or humid?
- Look up. What does the sky look like? Are there clouds? Is it sunny? What observations can you make? Take turns sharing with your group.
- Is it windy? Use the windsock to identify from which direction the wind is blowing. Is it blowing towards your school or away from it? Is the wind blowing strong or is it just a small breeze?
- Use your magnifying glass to look closely at the soil. Feel it with your fingers. What color is it? Is it moist or dry? Is it fine or sandy? Do you see any insects or other small organisms?
- Look out as far as you can to the horizon in any direction. Is it clear or hazy? What is the furthest thing you can see? Based on this, do you have any observations about today's Air Quality on Antelope Island?
- Now, with your group, point towards where you think your school is. What do you notice in that direction?

- Based on our observations today, what do you notice about the Air Quality here? Is today's Air Quality on Antelope island healthy and good for us? If not, can you think of any changes we could make to help improve the Air Quality?

## Activity 2 - Air Quality and Art

---

The Great Salt Lake lies upwind of the Salt Lake City metro area. As the lake shrinks due to drought, warming climate, and a growing population of water users, the dry lakebed left behind contributes to dust storms that enter the Airshed.

### Objectives:

- Students will model the local environment including the city, surrounding mountain ranges, and Antelope Island + Great Salt Lake
- Students will identify the relationship between the Great Salt Lake and Air Quality in surrounding metropolitan areas
- Students will understand the implications of an exposed dry lakebed to the air quality in the valley

### Materials:

- Fact sheet (10)

### Lesson Plan:

- In a large circle, ask students what they believe art is. How does art help us learn about things? How does art make us feel? What are some of the types of art forms? How can we use the materials in front of us to make art?
- Give students an overview of what they will be doing. Describe to the students that they will create a model of the surrounding environment including the mountain ranges, the bodies of water, the city within the valley, the Great Salt Lake, and Antelope Island.
- Break the students into smaller groups to start creating their models.
- Once in small groups, have students start creating their **home** environment. What do they see when they walk outside? Are there roads, buildings, and homes? How many mountain ranges surround their home? Are there any bodies of water nearby?
- Now, ask students to model the Great Salt Lake next to the city. How big is the lake? Is it deep? Are there islands within the Great Salt Lake?
- How does their home environment interact with the Great Salt Lake? Talk about bodies of water and the airshed! Describe how the water from the rivers in the Wasatch feed into the GSL. What happens if we divert too much water from getting to the lake?
- Once they have come to the conclusion that when all the water is diverted, the Great Salt Lake will become a dry lake bed. Then, ensuring that students are not throwing dirt at each other, have students pick up the "dry lake bed" and carry it through a dust storm

into the Salt Lake Valley. What happens to the air quality? How does the dust from the dry lake bed affect the air we breathe?

- Have students list ways we can prevent the Great Salt Lake from drying up! Refer to the wrap-up sheet for ideas!

### Activity 3 - Physical Observations and AQI Index

---

#### Objectives:

- Introduce the air quality index (Located on backside of the fact sheet)
- Explain inversion/air quality events, under what conditions they occur, what they think the conditions are today.

#### Materials:

- AQI legend (10) - on backside of fact sheet
- Pictures of different air quality days on the island (10)
- Windssock (1)

#### Lesson Plan:

- Does anyone know what a green air day is? Or a red air day? Scientists and government agencies use the Air Quality Index (AQI) to report air quality. The particulate matter concentration in the air (i.e. how many tiny particles of soot, dust, smoke, etc. are in the air) can be classified into 6 different categories.
  - Green = Good
  - Yellow = Moderate
  - Orange = Unhealthy for Sensitive Groups
  - Red = Unhealthy
  - Purple = Very Unhealthy (not included on card)
  - Maroon = Hazardous (not included on card)
- Split into 5 groups and distribute AQI legend and pictures.
  - Have the students classify what AQI level each picture represents using the AQI legend. Have each group assign a color (corresponding to the AQI index) to each picture. **Have each group explain their reasoning and what activities they might do during those days.**
- What is the air like today? Can you see very far into the distance? What kind of air quality day is it today? Is it the same here as it is at school? What color would you use to describe today's air quality?
- What is an inversion? We live in a valley surrounded by mountains. The air gets trapped in the valley, causing air pollution to stay here. What physical measurements can we take, other than the observations we have made so far, to describe air quality? Is it

windy? Describe the weather. Are there clear skies? What does the wind and weather tell us? In what direction is the wind blowing? Take note of the wind using the windsock.

- Inversions (warm air trapping cold air and a build up of particulate matter from burning fossil fuels) typically form when there are calm winds (no displacement of air/mixing of cold and warm air), clear skies (increase temperature above) and snow covered ground (decreases temperature near the surface), and sources of air pollution.

## Activity 4 - Thinking About Dust and Smoke

---

### Objectives:

- Describe air quality issues related to Great Salt Lake.
- Explain air quality issues beyond inversions (i.e. describe air quality days relating to dust and smoke).

### Materials:

- White tarp

### Lesson Plan:

- Go out onto the dried-up lakebed (beach). Have them point in the direction they live. What did they see on the school bus on the way here? The city? Cars? Smokestack? Oil refineries? The mountains? Snow? Talk about what they can see. Picnic tables? Cars? Something in the distance? Smoke? Haze? Clouds? The level of the lake?
- What are we standing on? Salt? Dirt? Explain how the water level of the lake is receding and how what we are standing on used to be underwater.
- What happens when the wind blows? Spread out and pick up a handful of sediment. What do you feel? Are they small particles? What would happen if we breathed these small particles into our lungs?
- Put down a white tarp and toss the handful (if windy, toss in wind direction, away from people). Where did it go? How far did it travel? Explain how the dust and wildfire smoke can travel as far as the snow on the mountains, causing the snow to melt faster. Why would it melt faster? Look at the sediment on the white tarp. Did it make the tarp darker? Are black things hotter than white things in the sun? Darker objects absorb more of the sun's energy. Lighter objects reflect more of the sun's energy.
- If the snow is melting faster, less water makes it to the Great Salt Lake and the water level keeps getting lower, exposing more lakebed and therefore more dust. If the snow can travel as far as the snow, could it travel to the city? Your school? How could we help the lake from exposing more dust? It is important to conserve water. What can you do to conserve water? Turn off the water while you are brushing your teeth or lathering your hands with soap, take a shower instead of baths, water your yard in the morning and not in the heat of the day, etc.

## Activity 5 - Ranger Says

---

### Lesson Plan:

Read the instructions carefully to familiarize yourself with the rules. You may want to lay out tape or sticks on the ground in the shape of the island, but it isn't necessary. It is very similar to Simon Says.

### Make It Matter:

- 1) **Opening Discussion**- Ask the group if they have ever been to Antelope Island before? Are there any special vocabulary about Antelope Island or air quality that they know?
- 2) **The challenge**- Can you be the last person standing on the island? Listen carefully to instructions and do just as the ranger says!

### Make it Happen:

1. The game is played with the entire group. Before you start, explain to the group that you are on the island and there are certain instructions which everyone will need to learn.
2. Show your students the area that makes up the island. All your students need to fit on this island and have room to run around. You can draw on the ground or put down sticks.
3. Begin by pointing out the four sides of the island- North, South, East and West. Send them all to the South side of the island and then have them come back to the North.
4. For the first round, you will stand on the North side of the island and be the "ranger". Everyone must do whatever the ranger says.
5. Give your students the other instructions that they will need to follow and end by explaining the most important rule- what do when Ranger Says... When the caller yells out a command it is stated as the following: "Ranger says... and then the command." If the caller does not say "Ranger says" before the command and a student moves then he or she is out of the game. Just like in the game "Simon Says" where the caller can try to trick players by giving commands without saying "Simon says".
6. Make sure to act out all the commands to demonstrate to the students.

### The Basic Rules:

If The Caller Says – Then Each student Does:

- **North** – Go to the North side of the island

- **South** – Go to the South side of the island
- **East**– Go to the East side of the island
- **West**– Go to the West side of the island
- **Cloud**- Float around like a cloud in the sky
- **Green AQI** – Pretend to be running/or actually run around
- **Red AQI**– Sit down on the ground and place your arms in a triangle above your head like you are under a roof
- **Tandem bike ride**– Quickly find a partner (2 kids total), stand behind one another and pretend to be peddling.
- **Canoe trip**- quickly find 2 partners (3 kids total) and pretend that you are in canoe paddling on the Great Salt Lake
- **Carpool** – Quickly find 3 partners (4 kids total) and sit like in a car and pretend to be driving
- **Bus ride** – Everyone gets together to ride the bus :)
- **Ranger's Coming** – Freeze, you can't move.

With “Carpool”, “Bus ride”, and “”, if there are odd numbers, those in odd numbered groups are out of the game. Ex. If you find a bus ride with 7 or 9 people in it, the whole group is out (life is tough on the island...). Any student who does something different from what the caller said is out of the game. When there is 1 player left, the game is over. If there are several players left and it seems like it will be too difficult to “trick” them, you can also declare multiple winners and end that round.

#### **Make it Click:**

After playing once, gather everyone together to talk about the game. Was it easy or hard to remember the instructions? What was their favorite command to do? How does it relate to air quality? How does it relate to the island?

#### **Make it Better:**

Play the game again with you as the caller, or reward the last round's winner by asking if they would like to be the caller. After players have mastered the basic commands, you can try adding new ones. Ask you students to come up with some new commands, but stick with the theme of being on Antelope Island and air quality.



## Fact Sheet - Take Home Messages

---

We hope this curriculum cultivates a deeper connection between the students and air quality, specifically in relation to the Great Salt Lake. As a result, we hope this deeper connection develops into a sense of stewardship to the health of this ecosystem. We used many different frameworks for students to learn, interact, and embody the environment in order to create action as community members. Below are resources and other information about the Great Salt Lake and how we can all work towards cleaner air in the Wasatch Valley.

### Ways to improve air quality:

- Implementing alternative ways for transportation other than individual vehicles such as public transit, bicycles, carpooling
- Conserve energy at home and work
- Getting involved in local politics (educators/parents)

### Ways to conserve water and help the lake level from receding:

- Water Sense for kids (<https://www.epa.gov/watersense/watersense-kids>)
- Visit [saveourgreatsaltlake.org](http://saveourgreatsaltlake.org) to learn more

### Local resources for education/getting involved:

- [Air.utah.gov](http://Air.utah.gov)
  - This is a website from the Utah Department of Air Quality that describes local efforts in legislation, what you can do at home to improve air quality, and real time air quality conditions.
- [@AirQualitySLC | Linktree https://linktr.ee/airqualitySLC](https://linktr.ee/airqualitySLC)
  - This is a really great collection of resources in Salt Lake City about improving indoor Air Quality.
- Community groups:
  - [HEAL Utah](#) (Healthy Environment Alliance of Utah)
  - [UCAIR Utah Clean Air](#)
  - [Friends of Great Salt Lake](#)
  - [Volunteer at Antelope Island State Park](#)

### Facts about Great Salt Lake from the United States Geological Survey:

- Remnant of Lake Bonneville, a prehistoric freshwater lake that was 10 times larger than the Great Salt Lake
- Largest lake west of the Mississippi River
- Relatively shallow lake with a maximum depth of about 35 feet
- Typically 3 to 5 times saltier than the ocean
- Too salty for fish
- Important source of brine shrimp
- Critical part of the Western North America migratory bird flyway