Precipitating Change – Alaska Mainland

Science Notebook

Indigenous Peoples and Languages of Alaska

Table of Language-Groups

[Table content provided for the table]

Diagram of language distribution across Alaska, showing different language groups and their respective regions.
Introduction

Your challenge is to determine if the Native Youth Olympics (NYO Games) in Anchorage will be able to take place as planned or if it should be postponed or canceled due to weather causing problems for participants traveling to Anchorage from across Alaska. This Science Notebook will provide you with all of the data and resources your Research Team will need to make your prediction. Feel free to write and draw in these notebooks to capture your thoughts, questions, and reasoning and to answer activity questions. Your teacher will be collecting the Science Notebook after the unit is complete and will consider the answers and work completed in this notebook in your final grade.
Lesson 1
Lesson 1, Activity 2: Weather Station Data

### Weather Station Data

#### Utqiagvik
- **April 21, 7am**: 44°F, 6°, 218°
- **April 21, 9am**: 46°F, 6°, 210°
- **April 21, 11am**: 46°F, 6°, 228°
- **April 21, 1pm**: 47°F, 7°, 270°
- **April 21, 3pm**: 48°F, 7°, 300°
- **April 21, 5pm**: 49°F, 7°, 305°
- **April 21, 7pm**: 50°F, 7°, 315°
- **April 21, 9pm**: 42°F, 5°, 330°
- **April 21, 11pm**: 37°F, 4°, 330°
- **April 22, 1am**: 33°F, 3°, 315°
- **April 22, 3am**: 32°F, 3°, 315°
- **April 22, 5am**: 31°F, 3°, 320°
- **April 22, 7am**: 30°F, 3°, 320°

#### Noorvik
- **April 21, 7am**: 48°F, 7°, 203°
- **April 21, 9am**: 49°F, 7°, 210°
- **April 21, 11am**: 50°F, 8°, 231°
- **April 21, 1pm**: 50°F, 8°, 286°
- **April 21, 3pm**: 52°F, 8°, 305°
- **April 21, 5pm**: 53°F, 8°, 312°
- **April 21, 7pm**: 53°F, 7°, 318°
- **April 21, 9pm**: 48°F, 6°, 323°
- **April 21, 11pm**: 42°F, 5°, 321°
- **April 22, 1am**: 38°F, 4°, 320°
- **April 22, 3am**: 37°F, 4°, 315°
- **April 22, 5am**: 37°F, 4°, 324°
- **April 22, 7am**: 38°F, 4°, 325°

#### Nome
- **April 21, 7am**: 43°F, 5°, 160°
- **April 21, 9am**: 43°F, 5°, 165°
- **April 21, 11am**: 43°F, 5°, 170°
- **April 21, 1pm**: 44°F, 6°, 157°
- **April 21, 3pm**: 43°F, 6°, 177°
- **April 21, 5pm**: 43°F, 6°, 167°
- **April 21, 7pm**: 44°F, 6°, 170°
- **April 21, 9pm**: 45°F, 7°, 168°
- **April 21, 11pm**: 47°F, 7°, 180°
- **April 22, 1am**: 49°F, 8°, 190°
- **April 22, 3am**: 49°F, 8°, 178°
- **April 22, 5am**: 50°F, 8°, 200°
- **April 22, 7am**: 51°F, 8°, 213°

#### Air Moisture Scale

<table>
<thead>
<tr>
<th>Moisture</th>
<th>Very Dry Air</th>
<th>Very Moist Air</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>1</td>
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<td>10</td>
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Wind direction is determined by what direction the wind is coming from and recorded in degrees.
Lesson 1, Activity 2: Radar Map: April 21, 7 am - Alaska Mainland

April 21st at 7 am
Lesson 1, Activity 2: Radar Map: April 21, 1 pm - Alaska Mainland

April 21st at 1 pm
Lesson 1, Activity 2: Radar Map: April 21, 7 pm - Alaska Mainland

April 21st at 7 pm
Lesson 1, Activity 2: Radar Map: April 22, 1 am - Alaska Mainland
Lesson 2
Virtual Storm Tracker

Designate one person in your Research Team to track the Virtual Storm and record the data from the Weather Map Grids posted in your classroom onto this sheet. Be sure to mark where there is precipitation.
Lesson 3
Lesson 3: Research Team Questions

Look at your classroom weather map for 3 pm. What patterns do you see when looking at both precipitation and temperature?

Look at your classroom weather map for 3 pm. What relationships do you see between temperature, air moisture, and rain?
Lesson 4
Lesson 4, Activity 1: Weather Map 7 pm with Precipitation & Air Moisture Content

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tbody>
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<td>35°F</td>
<td>35°F</td>
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<td>59°F</td>
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<td>63°F</td>
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</tbody>
</table>

Wind Direction

- North 360°
- Northeast 45°
- East 90°
- Southeast 135°
- South 180°
- Southwest 225°
- West 270°
- Northwest 315°

Moisture Content

Temperature

City Locations:
- Noorvik
- Bettles
- Nome
- St. Mary's
- McGlath
- Anchorage
- Kasigluk
Lesson 5
Lesson 5, Activity 1: Wind Table

Your teacher will assign your Research Team a Wind Table Position number. Place wind tunnel #1 and wind tunnel #2 according to the diagram below for your assigned Team. Keep the following things in mind as you explore patterns of the wind:

- **BE CAREFUL NOT TO PUT YOUR FINGERS NEAR THE FAN**
- Graph paper represents a region.
- A wind vane can be placed anywhere on the graph paper to determine what direction the wind is coming from.
- Record the wind direction by drawing an arrow in the direction the wind vane is pointing. (Recall that wind is always recorded showing the direction the wind is coming from.) If there is not a clear determination where the wind is coming from, then leave the square blank.
- Place a Styrofoam on the wind table to see the interaction between the two air masses.

Record your observations below.
Lesson 5, Activity 2: Additional Weather Station Data
Lesson 5, Activity 2: Weather Stations 7 pm Readings
Lesson 5, Activity 2: 7 pm Weather Station Data and 7 pm Radar Map

Discuss the questions below with your Research Team and write your answer in the spaces provided. When you are happy with your answer, enter it into the online student activity.

Question #5.1. Using the 7 pm Interpolated map and the 7 pm Radar Map below, write a general statement that answers the question, “How do air masses affect where it rains?”

<table>
<thead>
<tr>
<th>Redraw the air masses below on the interpolated map.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Interpolated Map" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The radar map shows where it is raining.</th>
</tr>
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<tbody>
<tr>
<td><img src="image2.png" alt="Radar Map" /></td>
</tr>
</tbody>
</table>

Question #5.2. What properties of the air masses cause it to rain? Example answer: If….and if…then it rains?
Lesson 5, Activity 2: 7 am Weather Station Data

Question #5.3. Circle the air masses on the 7 am Weather Station data map and make a prediction where you think it could be raining at 7 am and draw rain drops in that area on the map. Explain why you think it could be raining in the area you selected. When you are happy with your answer, enter it into the online student activity.
Lesson 6
Lesson 6, Activity 1: How Do Fronts Move?

Review the Lesson 1, Activity 2, Weather Radar Maps below to answer the question “What do we need to know about the front to predict where it will be in the future?” and write your answer below:
Lesson 6, Activity 2: Tracking the Front

Based on the Virtual Model that your teacher demonstrated that showed the movement of the front, discuss with your Research Team and answer the question, “In what direction is the front moving?” below:

Front on April 21, 11 am

Front on April 21, 9 pm

Front on April 22, 7 am
Lesson 6, Activity 2: Front on April 21, 11 am
Lesson 6, Activity 2: Front on April 21, 9 pm
Lesson 6, Activity 2: Front on April 22, 7 am
Lesson 7
Lesson 7: Analyzing Data and Making a Prediction

Your team’s task for this lesson is to create a Weather Forecast by writing a script and then presenting it using Screencast-o-matic for the Alaskan Native Youth Olympics (NYO Games) planning committee. You will use information and the skills you have developed in previous lessons. In the spaces provided below write a tip that you learned from each lesson that you may want to include in your forecast. Please see examples below:

Lesson 1: Making a predication without data can be difficult...

Lesson 2: What we learned about interpolation...

Lesson 3: There is a connection between air moisture and precipitation...

Lesson 4: The rule we created to test in the model is...

Lesson 5: Air masses affect weather by or because...

Lesson 6: The front is estimated to be moving at a speed of...

Please use the space below to write your script for your presentation:
Script: