

WEATHER RATS LEARNING GOALS, K-12

What will all students learn from Weather RATS, regardless of grade level? How will we know they have learned these things? Following are some guidelines from Understanding By Design by Grant Wiggins and Jay McTighe (Association for Supervision and Curriculum Development, 1998). UBD, or backwards design, begins from the position of identifying desired results for student learning. In other words, what do we want students to know? From there, we determine what will be acceptable evidence of learning, so we know they actually learned it. After we know what constitutes acceptable evidence of learning, we plan the learning experiences and instruction that will lead students to the desired understandings and academic performance.

We can consider each of these three basic stages in order.

1. **Identify desired learning results.** This is where we examine our goals, analyze state and national content standards, and review curriculum expectations.
 - To what extent does the idea or topic represent a “big idea” having enduring value beyond the classroom?
 - To what extent does the idea or topic reside at the heart of the discipline?
 - To what extent does the idea or topic require uncoverage? Is the idea or topic difficult or prone to misconception? Is the idea or topic difficult to grasp or counterintuitive?
 - To what extent does the idea or topic offer potential for engaging students?

2. **Determine acceptable evidence of learning.** How will we know students have achieved the desired results or understanding? Think of assessment throughout a unit of study as a body of evidence that documents the student’s progress toward the desired learning goal. This keeps us from thinking of units as a series of activities or a stretch of content to be covered.
 - Pre-test or baseline assessment.
 - Informal checks for understanding.
 - Observation/dialogue/journaling.
 - Quiz/test.
 - Academic prompt.
 - Performance task/project.

3. **Plan learning experiences and instruction.**
 - What enabling knowledge (facts, concepts, etc.) and skills (procedures) will students need to achieve the desired results?
 - What activities will give students the necessary knowledge and skills?
 - What will need to be taught/coached, and how should it be taught, in light of performance goals?
 - What materials and resources are best suited to accomplish these goals?
 - Is the overall program design coherent and effective? Does it lead directly toward ultimate learning goals?

1. ***Identify desired learning results. All students K-12 will:***

- Be able to track local weather and compare it to weather in diverse geographic locations;
- Use emerging weather measurement and instructional technologies as tools to examine and address real-world problem situations, such as data collection, tracking and analyzing patterns in weather events.
- Develop an appreciation for the global nature of the atmosphere.
- Collect, analyze, and graph daily weather data for an extended period of time.
- Use mathematics as a tool for making sense of weather data.
- Increase their understanding of how local weather and climate patterns affect the course of everyday life for people living in those places.
- Increase their understanding of students living in different cultures and geographic regions by communicating with them.
- Improve communication skills, including oral presentations and writing.

2. ***Conceptual Framework: Chief Seattle's Poem***

*Teach your children what we have taught our children -
That the earth is our mother.*

*Whatever befalls the earth befalls the sons and daughters of the earth.
If men spit upon the ground, they spit upon themselves.*

*This we know. The earth does not belong to us, we belong to the earth.
This we know. All things are connected like the blood which unites one family.
All things are connected.*

*Whatever befalls the earth befalls the sons and daughters of the earth.
We did not weave the web of life, we are merely a strand in it.
Whatever we do to the web we do to ourselves.*

- Attributed to Chief Seattle

Chief Seattle (b. 1790, d. 1866) was the chief of the Duwamish, Suquamish, and other Puget Sound tribes in what is now Washington state. The Suquamish tribe was and is a fishing tribe. He befriended white settlers and remained loyal to them even though other tribes waged war against the whites in 1855-1858. He is best known for his beautiful poetry and speeches which describe Native American wisdom about people and their relationship to the earth.

Chief Seattle's words can be interpreted on many levels of understanding, which fits with the developmental progression of student understanding of weather and climate implicit in this project. His expression of the connectedness of our planet and its denizens, including us, represents Weather RATS' stated goals of cultural connection and appreciation for the global nature of the atmosphere. Elements from Chief Seattle's poem can be used to set the theme or direction for curriculum work on different developmental levels within the K-12 span of the project. For example, younger students can focus on the connectedness of the

weather patterns and cultures by studying weather and climate data from our member schools and communicating with peers from different areas. Older students can focus more on the degradation to the atmosphere due to acid rain, pollution, ozone depletion, and the greenhouse effect, all of which are causing significant long-term damage to the planet, and all of which are caused by human activities.

Furthermore, Chief Seattle's poem could be the springboard to developing "big questions" that guide and focus learning for all students K-12.