

## What is the "Winter Count"?

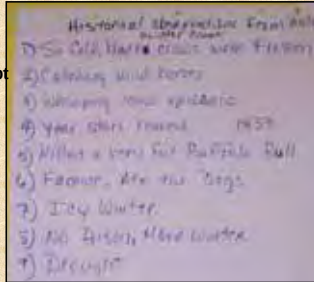
The "Winter Count" is a Native American tradition of recording major ecological events and other observations as symbolic images on animal hides (Howard 1960; Thornton 2002). The information archived within these accounts provides rich data and offers insight into the historic ecology of the North American ecosystem, as well as culturally significant natural resources as well. The Winter Count is an excellent illustration of recording keen observations, which is a fundamental basis of western science and ecological investigation.

# The traditional Native American "Winter Count" as a model for teaching ecological observation and inquiry.

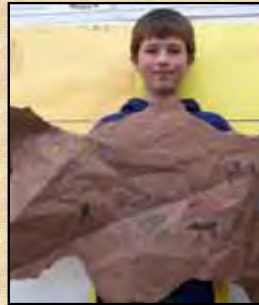
## What is Traditional Ecological Knowledge (TEK)?

- Comprised of the knowledge, practice, and beliefs regarding relationships of living and non-living beings (e.g. rocks, geological features, weather, and celestial features) to one another within the physical environment (Kimmerer 2002).
- Recognized as a source of information that can contribute to biological studies and management plans for natural resources (Berkas et al. 2000).

1. Prior to introducing the Winter Count concept to the students we initiated discussion relative to the key role of making and recording **observations** in ecological inquiry.



2. Students were provided with images of historic Winter Counts. They analyzed the images and gleaned historic ecological information from these accounts.



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### Abstract

The integration of Traditional Ecological Knowledge (TEK) into GK-12 science programs can allow us to bridge the gap between ecology, natural history, the scientific method, and indigenous cultures. It can provide a creative approach to meeting National Science Standards, while offering relevancy to other topics such as social studies. The "Winter Count" is a Native American tradition of recording major ecological events and other observations as symbolic images on animal hides. The information archived within these accounts can provide rich data and offer insight into the historic ecology of the North American ecosystem, and culturally significant natural resources as well. Oral traditions, ceremonies, and traditional lifestyles of Native American tribes are directly tied to subsistence upon local natural resources. In this system, success is determined by one's ability to survive, which requires an intimate knowledge of the local ecosystem acquired through observation. The Winter Count is an excellent illustration of recording keen observations, a fundamental basis of western science and ecological investigation. We used the Winter Count as a model for teaching 1st and 5th grade students, on the Flathead Indian Reservation, Montana, about the crucial role of observation in learning about the local environment, and western science. Students were introduced to historic Winter Counts, by providing examples of images and data gleaned from these accounts. They were asked to draw images to represent their own interpretations of historic and current ecological observations. During the winter, each classroom recorded observations and major events. These observations were then depicted by symbolic images to create their own Winter Count. Each class evaluated their observations with respect to climate change at local and global scales. The Winter Count model proved to be an insightful tool for teaching elementary students about the role of observation in ecological inquiry, and integrating TEK in science education.

### Introduction

- The use of TEK provides a creative approach for meeting the National Science Education Standards while crossing cultural boundaries;
  - Life Science, Earth and Space Science, Science in Personal and Social Perspectives, History and Nature of Science (National Academy Press 2004).
  - Indigenous subsistence cultures rely on an intimate knowledge of local resources, landscape and weather patterns to successfully provide food and other resources for their survival (Pierotti and Wildcat 2000).
  - This knowledge is acquired in a fashion similar to the scientific method. Observations of wildlife or other resources lead to hypotheses with respect to the most efficient means to using them, which are then tested.
  - Conclusions result in established protocols for efficiently accessing resources without depleting them entirely (Pierotti and Wildcat 2000; Kimmerer 2002).
- ❖ We used the Winter Count as a model for teaching 5th grade students, on the Flathead Indian Reservation, Montana, about the crucial role of **observation** in learning about the local environment. It is an excellent illustration of recording keen **observations**, which is a fundamental basis of western science and ecological investigation.

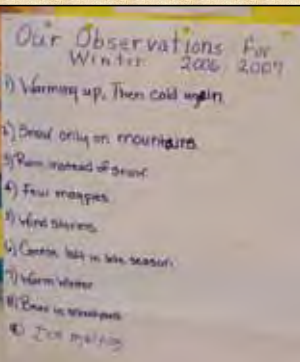
5. The Winter Count model proved to be an insightful tool for teaching elementary students about the role of **observation** in ecological inquiry, and integrating TEK in science education.



6. The students were able to relate their winter count **observations** to local effects of global warming within their own community. These observations were considered and discussed in the larger context of global climate change.



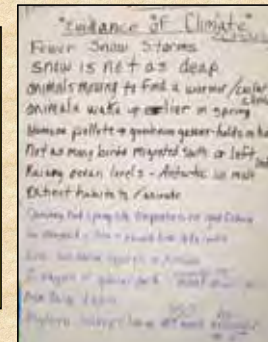
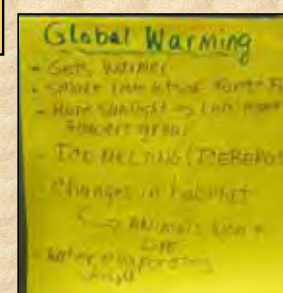
3. They were asked to draw images to represent their own interpretations of historic and current ecological **observations**.



4. During the winter, students recorded **observations** and major events. These observations were then depicted by symbolic images to create their own Winter Count.



1st grade class Winter Counts



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