Introduction

In this series of five videos, Noah Anderson interviews his father, Jeff Anderson, who is a hydrologist with the Natural Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture (USDA). This series talks about measuring snow to determine how much water will be available for us to use.

View or download videos [online](https://www.youtube.com/playlist?list=PLGdlCTs4dQTdFThAVQn_yZYcp_8ZMbTLf) at: <https://www.youtube.com/playlist?list=PLGdlCTs4dQTdFThAVQn_yZYcp_8ZMbTLf>

Video 1: Why we measure snow (1:50)

Video 2: How do we measure snow with snow tubes (1:42)

Video 3: How SNOTEL weather stations measure snow (1:59)

Video 4: Dr. Church, the father of snow surveying (1:34)

Video 5: What is a hydrologist? (1:58)

These videos support the following lesson plans in this unit:

* Relationship of Snowpack and Water Supply
* History of Nevada Water
* Importance of Water to Agriculture
* Conservation Aware

Grade Level(s)

3 - 5

Estimated Time

10 minutes per video

Purpose

Students will be able to understand the basic geography of a watershed, how and why we measure snowpack, the impact of snowpack on Nevada’s citizens and wildlife, and careers in this field of study.

**Materials**

* Videos 1-5
* Student worksheets to accompany each video

Instructions

In this document you will find a set of comprehension questions for each of the five videos and an accompanying answer sheet. It is suggested that the teacher reviews the questions with the class before watching a video, so they can be active listeners during the video clip. Students may write answers to the questions and then watch the video again to go over the answers. You may also need to stop at various points throughout the clip to allow time for students to process what they are hearing and complete the worksheet.

Educational Standards Addressed

**Nevada Academic Content Science Standards/Next Generation Science Standards**

4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth’s features.

5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that

occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Nevada Academic Content Standards for Social Studies

SS.4.24. Examine how and why Nevada’s landscape has been impacted by humans.

SS.4.25. Analyze how technological changes have impacted the environment and economy of Nevada.

**National Agricultural Literacy Outcomes**

T1.3-5b Explain how the interaction of the sun, soil, water, and weather in plant and animal growth impacts agricultural production.

T1.3-5e Recognize the natural resources used in agricultural practices to produce food, feed, clothing, landscaping plants and fuel.

T4.3-5b Describe how technology helps farmers/ranchers increase their outputs (yields) with fewer inputs (less water) while using the same amount of space.

T4.3-5d Provide examples of science being applied in farming for food, clothing, and shelter products.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Snowpack video Series: Why we measure snow

1. What is a hydrologist?

2. When do we get most of our precipitation and what type of precipitation is it?

3. What does Noah’s dad do?

4. How do we measure snow?

5. Why is it important that we measure snow?

6. In what ways is our water used?

Snowpack video Series: Why we measure snow
ANSWERS

1. What is a hydrologist?

 A hydrologist is a scientist who studies water.

2. When do we get most of our precipitation and what type of precipitation is it?

 60-80% of our precipitation comes in the winter time. The towns mostly get

 rain and some snow. The mountains get almost all snow.

3. What does Noah’s dad do?

 Noah’s dad, Jeff, measures how much water is in the snowpack.

4. How do we measure snow?

 There are 2 ways we measure snow: one way is manually with snow tubes, and

 the other way is by a special weather station just for measuring snow.

5. Why is it important that we measure snow?

 By measuring snow, we know how much water will be in our rivers in the spring

 and the summer.

6. In what ways is our water used?

 We use water in our houses, for our lawns and gardens, the farmers use water

 irrigate their crops, and to replenish lakes and rivers, which we also use for

 recreational purposes.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Snowpack video Series: How do we measure snow with snow tubes?

1. What was in Mr. Jeff’s backpack?

2. What are the tubes used for?

3. What did he compare the tubes to?

4. What were the steps to measuring the snow using the snow tubes?

Snowpack video Series: How do we measure snow with snow tubes?

ANSWERS

1. What was in Mr. Jeff’s backpack?

Noah’s dad had a set of snow tubes in his backpack.

2. What are they used for?

 The tubes are used to measure how much water is in the snowpack.

3. What did he compare the tubes to?

 Mr. Jeff compared the tubes to cookie cutters because they are pushed into the

 snow to get a core sample of snow.

4. What were the steps to measuring the snow using the snow tubes?

 The tubes are stuck down into the snow and used to take a core of the snow.

 They are pushed all the way down to the ground, then pulled back out. The

 tubes are weighed with the snow and then the snow is taken out of the tubes,

 then the tubes are weighed by themselves. The difference between the two

 weights tell us how much water is in the snowpack.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Snowpack video Series: How SNOTEL weather stations measure snow

1. What does SNOTEL mean?

2. What is the snow pillow?

3. Which weighs more, frozen water or liquid water?

4. How many SNOTEL sites are in Nevada?

5. What does a SNOTEL site do?

**Snowpack video Series: How SNOTEL weather stations measure snow**

ANSWERS

1. What does SNOTEL mean?

 SNOTEL means snow and telemetry. Telemetry means transmitting data using radio

 signals. The SNOTEL site has antennas that transmit data to the internet.

2. What is the snow pillow?

 A snow pillow is a sensor that tells how much the snow weighs to figure out how

 much water is in the snowpack.

3. Which weighs more, frozen water or liquid water?

 Both frozen water and liquid water would weigh the same.

4. How many SNOTEL sites are in Nevada?

 There are 60 SNOTEL sites in Nevada

5. What does the SNOTEL sites do?

 The SNOTEL sites measure water content, snow depth, air temperature, and

 precipitation.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Snowpack video Series: Dr. Church, the father of snow surveying**

1. Who was Dr. James E. Church?
2. What is special about Nevada about snow measurement?

**Snowpack video Series: Dr. Church, the father of snow surveying**ANSWERS

1. Who was Dr. James E. Church?

 Dr. James E. Church was a professor at the University of Nevada ,2Reno. He

 invented the snow tubes that are used when measuring snow. He would use those

 tubes to predict how much Lake Tahoe would rise every spring. He became

 known as the father of snow surveying.

1. What is special about Nevada about snow measurement?

Nevada was the first state to use the snow tubes and Dr. Church’s technique spread to other states and all over the world. As a result, Nevada has the longest data recording of snow measurements.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Snowpack video Series: What is a hydrologist?

1. What is Mr. Jeff’s primary job in the winter?

2. What subjects in school helped Mr. Jeff the most prepare for his job?

3. How is math used in his job?

4. How are computer skills used in his job?

5. How are English skills used in his job?

6. What did Mr. Jeff say was the favorite part of his job?

Snowpack video Series: What is a hydrologist?
ANSWERS

1. What is Mr. Jeff’s primary job in the winter?

Jeff’s primary job in the winter is to measure how much water is in the snowpack in Nevada and use the numbers from the measurements to write reports to let people know how much water will come down the rivers.

2. What subjects in school helped Mr. Jeff the most prepare for his job?

He stated that hydrology is a science, but he also needed math and computer skills as well as, English and writing.

3. How is math used in his job?

 Math is used when measuring the snow.

4. How are computer skills used in his job?

 Computer skills are used to help analyze the data.

5. How are English skills used in his job?

Jeff uses English skills when he writes reports, talks to people, and does media interviews for local news stations.

6. What did Jeff say was the favorite part of his job?

 Jeff likes being outdoors in the mountains, but he said his favorite part is getting

 to the sites by skiing, snowshoeing, snowmobile, and has even gotten to ride in

 a helicopter and by horseback.

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