

## Meet Extension Agent Deb Alpe



Deb Alpe, the Extension Agent and County Director in Jackson County offers a variety of programs in natural resources, ag, family consumer science and especially 4-H! She has a B.S. and M.A. in Sociology from Northern Arizona University in Flagstaff, AZ where her academic emphasis was natural resources and rural sociology. Sociologists love to observe people and groups in different environments to understand how they work together to make a society tick.

After college, Deb did a stint with AmeriCorps and became the Executive Director of the YWCA of the Palouse in Moscow, Idaho, operating a homeless shelter, food bank, and a hugely successful thrift store to support the program.

Deb's passion is and always has been working with people to improve the quality of life in their communities. Early on, Deb and her husband Mike lived in Jackson County where they horse logged and worked in a small lumber mill. They raised three kids...now adults...Alyssa, Aaron and Jared and enjoy living and playing in the remote mountain community of Walden.

Deb began her Extension career in 1996 as the Family and Consumer Science/4-H Youth Development agent in Routt County where she worked for 8 years before moving over the mountain and back to Jackson County in 2004. Deb especially enjoys expanding the horizons of her 4-H members by encouraging them to participate in District, State and National 4-H events. She believes 4-Hers learn more if they are having fun with friends!

# STEM Connections



Activity provided by  
Deb Alpe

Colorado  
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Connecting Science, Technology, Engineering, and Math concepts to our everyday lives.

## We All Scream, "Ice Cream!"

What are states of matter? What does ice cream have to do with states of matter?

### How does it work and what does the salt do?

**Solids, liquids and gases** are the three most common states of matter on Earth. Matter is made from atoms. The faster the atoms vibrate, solid matter **melts** to a liquid, and as the atoms vibrate more, evaporates to a gas. As the atoms slow down, the gas matter condenses to a liquid, and as they slow down even more, **freeze** to a solid.

Water is very common on Earth, and we know that it freezes at 32°F and boils (and also evaporates in to water vapor) at 212°F.

During winter, we can sprinkle salt on our sidewalks, and the snow and ice will melt—unless it is really cold. That happens because salt changes the temperature that water freezes to below 32°F. For example, out in the open ocean, the salt water will freeze at 28°F, or 4 degrees colder than freezing point of water.

When we use salty ice to make ice cream, some of the ice melts, and it gets the heat to melt from the cream, making the cream colder until it freezes.

### EXPLORE IT - DESIGN IT - DO IT

1. Fill the gallon zip-lock bag half full with crushed ice.
2. Add 1/2 cup of rock salt to the ice. Seal the plastic bag and wrap it in a towel. Shake the ice and salt for five minutes. The temperature of the rock salt and ice mixture gets down to about 14 degrees F (-10 degrees C)!
3. Add the following ingredients to the 1 quart-zip-lock bag and shake to mix:
  - 1/2 cup of half & half
  - 1 tablespoon sugar
  - 1/2 teaspoon vanilla extract
4. Zip the lock closed, and just before you finish the seal, try to squeeze out as much of the air in the bag as you can. Double check that your 1 quart zip-lock bag is completely sealed. Seal tightly, allowing as little air to remain in the bag as possible.
5. Place this bag inside the other quart zip-lock bag, and as you zip the second bag closed, remove as much air as you can. Double check the seal.
6. Place the two bags inside the gallon zip-locked bag with the ice and seal the bag. Wrap the bag in the towel again. Shake, rock, roll, and mix that can! Your ice cream should be ready after about 15-20 minutes.
7. Once mixed, remove the inner bags from the gallon zip-lock bag and rinse them well with water. You don't want any salt water accidentally getting into your ice cream.

### Ice Cream

**Age Appropriate:**  
4th—HS grades

**Time Required:**  
45 minutes

### Materials:

- 1 gallon zip-lock bag
- 2, 1-quart zip-lock bags
- Half & Half
- Crushed ice (or snow!)
- Rock salt
- Vanilla
- Sugar
- Towel
- Optional:
  - Add your favorite flavors like mint extract and mini-chocolate chips or fresh strawberries

### The Set-up:

- Gather materials

### The Clean-up:

- Throw away the bags

### Power Words

- **freeze:** changing state of matter from a liquid to a solid
- **gas:** matter's atoms moving so quickly that they will spread apart and fill the entire container
- **liquid:** matter's atoms moving faster than solid matter but slower than gas matter and will fill the bottom of the container.
- **melt:** changing state of matter from a solid to a liquid
- **solid:** matter's atoms moving slower than liquid and maintains a definite shape within a container.

### Did You Know?

In 1846, Nancy Johnson invented the hand-cranked ice cream churn and ice cream surged in popularity. Then, in 1904, ice cream cones were invented at the St. Louis World Exposition. An ice cream vendor ran out of dishes and improvised by rolling up some waffles to make cones!!

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