



NSDL/NSTA Web Seminar

**Beyond Penguins and Polar Bears: Integrating
Science and Literacy in the K-5 Classroom--
Physical Science from the Poles**



Wednesday, October 29, 2008
6:30 p.m. to 8:00 p.m. Eastern time



Agenda:

1. Introductions
2. Tech-help info
3. Web Seminar tools
4. Presentation
5. Evaluation
6. Chat with the presenters



Supporting the NSDL Presenting Team is...



For additional Tech-help
call:

Illuminate Support,

1-866-388-8674 (Option 2)

Jeff Layman
Tech Support
NSTA

jlayman@nsta.org
703-312-9384



<http://nsdl.org>



Screenshot

The screenshot displays the Edlluminate Live web seminar interface. The main window is titled "Whiteboard - Main Room (Scaled 105%)". The whiteboard content features the NSTA logo in blue and red, followed by the text "WEB SEMINARS" in red, and "LIVE INTERACTIVE LEARNING @ YOUR DESKTOP" in black. A mouse cursor is positioned over the text. The interface includes a menu bar (File, Session, View, Tools, Window, Help), a toolbar with various drawing and editing tools, and a "Participants" list on the left showing "Flavio Mendez (Moderator)" and "Leia Fitzwilliam (Me)". A chat window at the bottom left shows a message from the moderator: "Joined on August 24, 2007 at 4:14 PM. Moderator: This is the chat window." The audio section at the bottom shows microphone and speaker controls. The status bar at the bottom right indicates "In session for 4 minutes."

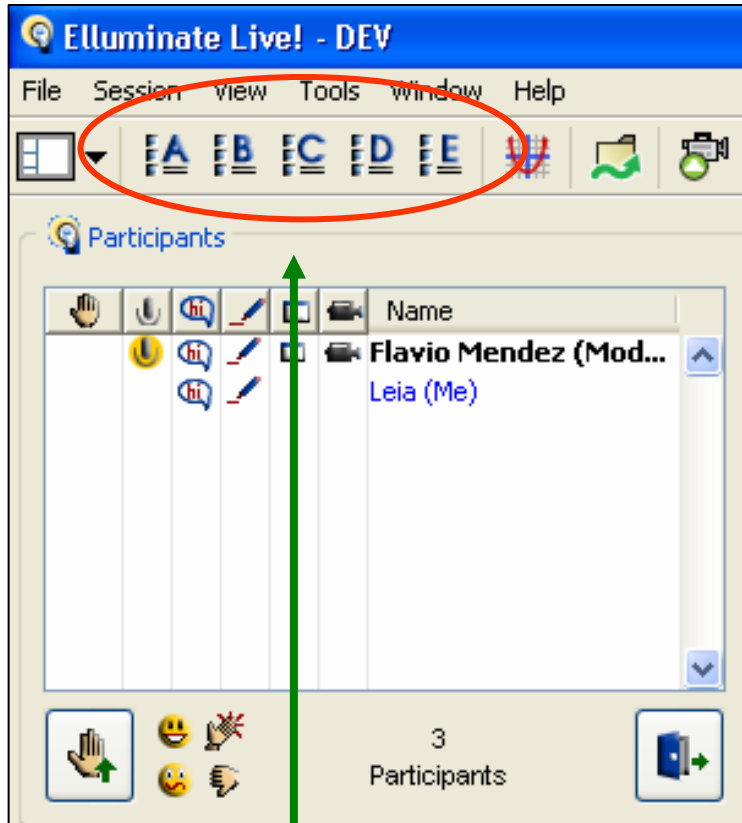


We would like to know more about you...





How many NSTA web seminars have you attended?



A. 1-3

B. 4-5

C. More than 5

D. More than 10

E. This is my first web seminar

Use the letters A-E located at the top left of your actual screen to answer the poll



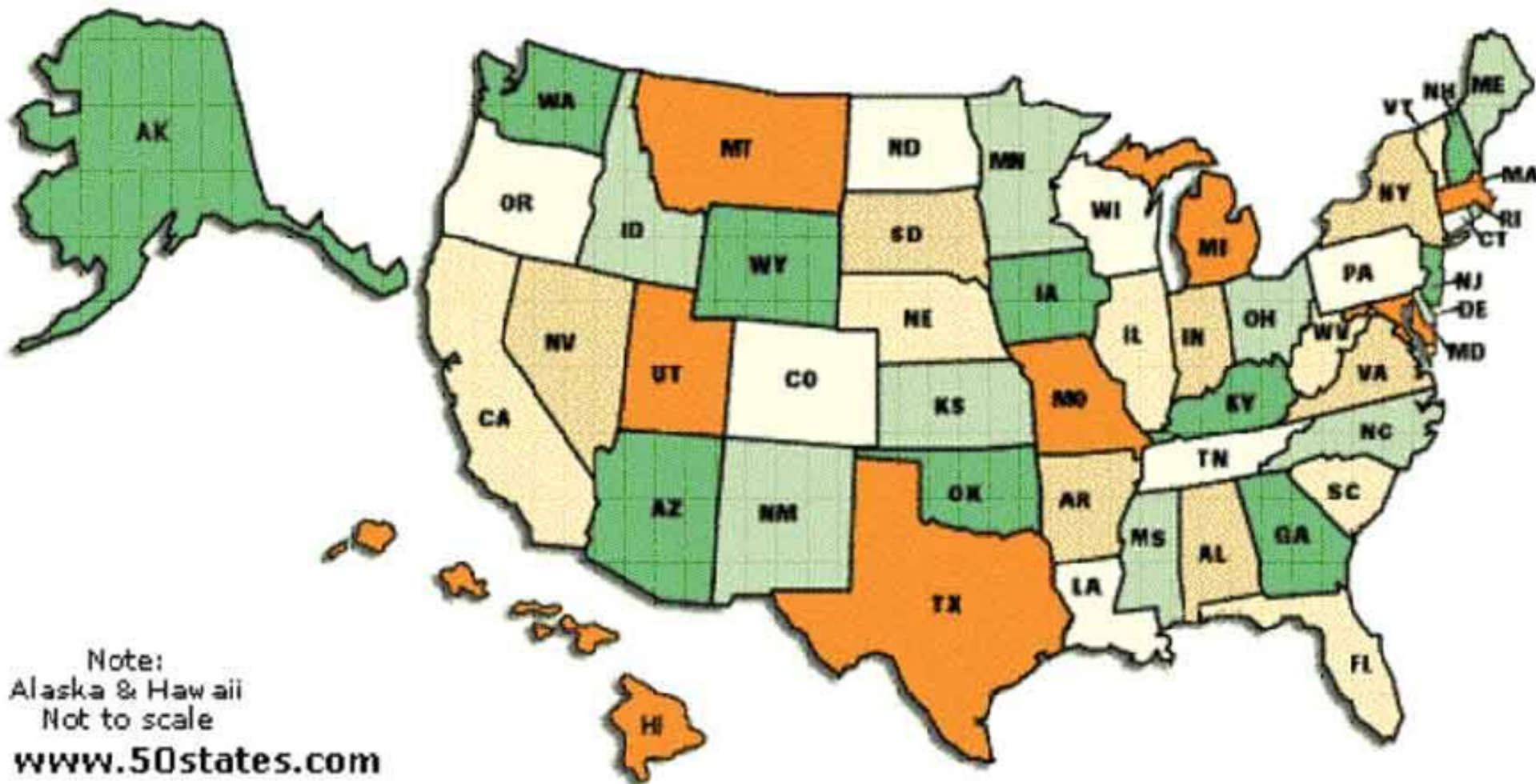
How many NSTA web seminars
have you attended?



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- C. More than 5
- D. More than 10
- E. This is my first NSTA
web seminar



Where are you now?



Note:
Alaska & Hawaii
Not to scale
www.50states.com



What grade level do you teach?



- A. Elementary School, K-5.
- B. Middle School, 6-8.
- C. High School, 9-12.
- D. I teach college students.
- E. I am an Informal Educator.



NSDL/NSTA Web Seminar

**Beyond Penguins and Polar Bears: Integrating
Science and Literacy in the K-5 Classroom--
Physical Science from the Poles**



Wednesday, October 29, 2008

Today's NSDL Experts



Jessica Fries-Gaither, *Beyond Penguins and Polar Bears* Project Director and Elementary Resource Specialist, Ohio State University



Dr. Carol Landis, Education Outreach Specialist, Byrd Polar Research Center, Ohio State University



<http://beyondpenguins.nsd.org>



Overview of Presentation

1. Physical properties of ice
2. Geography of ice
3. Teaching strategies and K-5 resources
from *Beyond Penguins and Polar Bears*

<http://beyondpenguins.nsd.org>



an online magazine for k-5 teachers

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SCIENCE AND LITERACY

ACROSS THE CURRICULUM

IN THE FIELD: SCIENTISTS
AT WORK

POLAR NEWS AND NOTES



WATER, ICE, AND SNOW - ISSUE 5, AUGUST 2008

Did you know that the water cycle includes ice and snow? Every elementary student learns about this cycle, yet water storage in glaciers, ice sheets, and snow is often excluded. In this issue, we'll examine what the polar regions can teach us about the water cycle and the states and changes of matter. We'll trace the water cycle through the many forms of water, ice, and snow found in the polar regions and will highlight lessons that provide hands-on experiences with these forms. Science notebooks - permanent records of learning and tools for integrated literacy and science - are the literacy focus of the issue.

Photo: Icebergs in McMurdo Sound, off the coast of Antarctica. Photo courtesy of Kris Kuenning, National Science Foundation.

Today's presentation: Featuring material related to Issue 5: Water, Ice, and Snow, August 2008



States of matter: Solid, Liquid, Gas



Photo by Chris Linder,
Woods Hole Oceanographic Institution

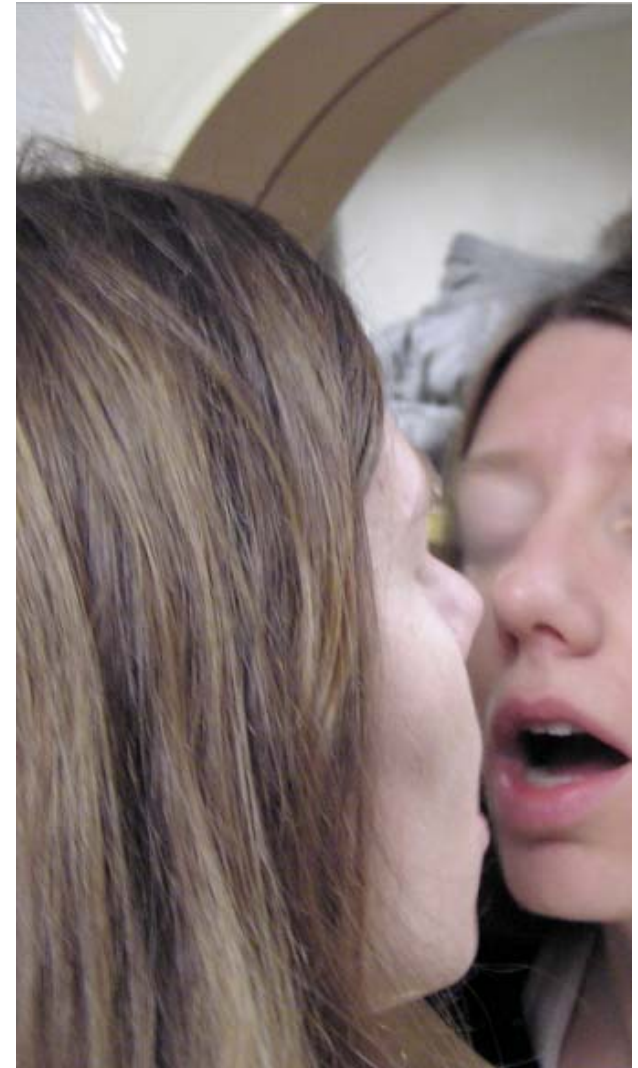
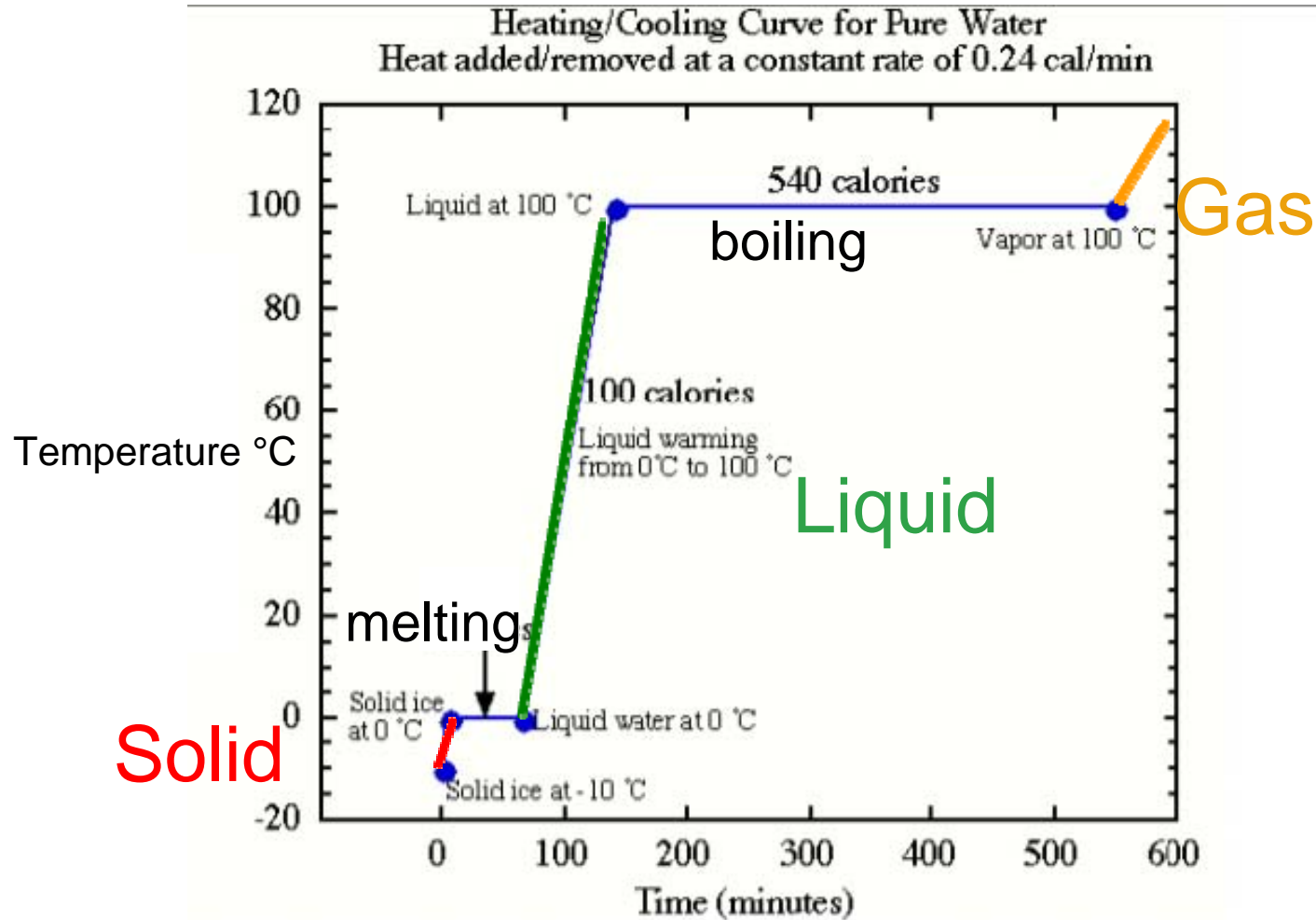


Photo by C. Landis,
Byrd Polar Research Center



Change in state (or phase) of water

Addition or loss of heat is required to change from one state to another.



http://www.geo.umn.edu/courses/1006/Fall00_night/H2O_heating_curve.JPG

States of matter

Stamp your answers.



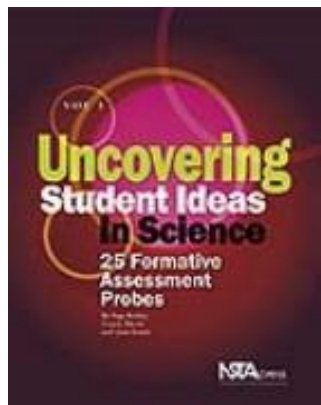
A change of state does not mean a change in mass.

True	False

Solids can only melt with heat.

True	False

Misconceptions: States and Changes of Matter



Formative Assessment: Mass conservation
“Ice Cubes in a Bag” (Vol. 1)



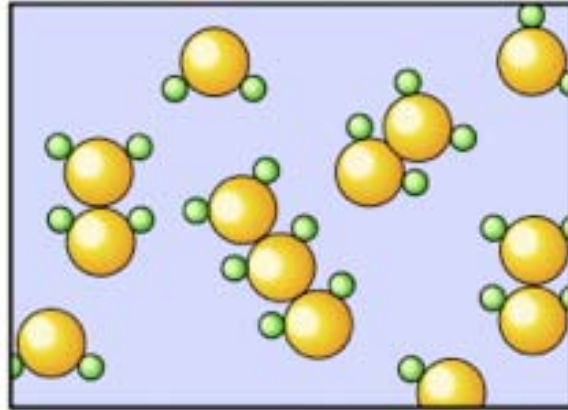
Blue Ice Melt:
Ice can melt with pressure.



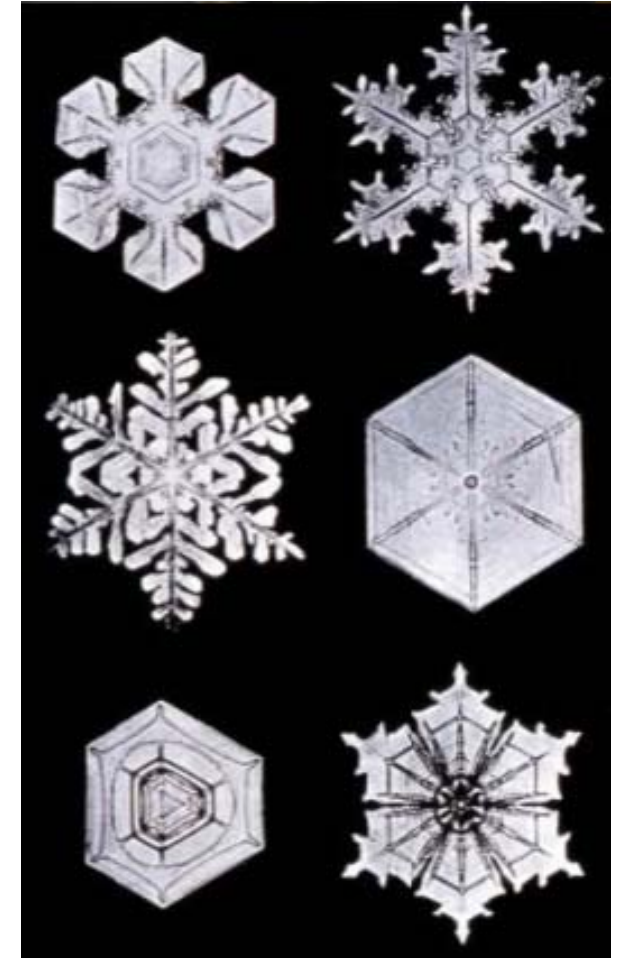
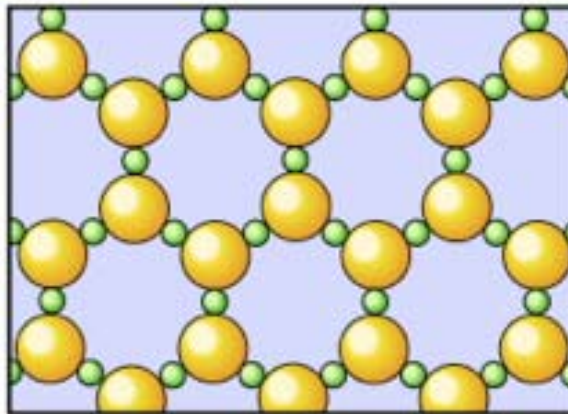
Admiring snowflakes



Liquid
water



Solid
water



<http://www.classzone.com>

Pidwirny, M. (2006). "Physical Properties of Water". *Fundamentals of Physical Geography, 2nd Edition*. Date viewed: October 16, 2008.
<http://www.physicalgeography.net/fundamentals/8a.html>



<http://nsdl.org>



Stamp your answer

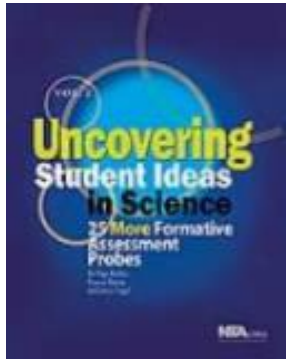
Does the size of an ice cube affect the temperature at which it freezes?



Yes	No



Misconception: The more water there is to freeze, the lower the temperature is required to freeze it.



Formative Assessment: “Freezing Ice” (Vol. 2)

Instead: The temperature of the freezing point is independent of the amount of liquid.



Density is the mass per unit volume of a substance.



Buoyancy is the force of a liquid pushing up to keep something afloat.



Photo: www.dkimages.com



True or False: Stamp your answer

Water expands as it freezes because the molecules become larger.

True	False



Misconceptions about Density & Buoyancy



Floating or sinking is based on an object's weight.
Water expands as it freezes because the
molecules become larger.

Instead:

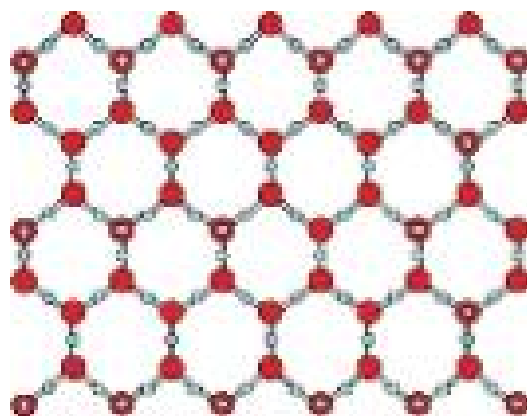
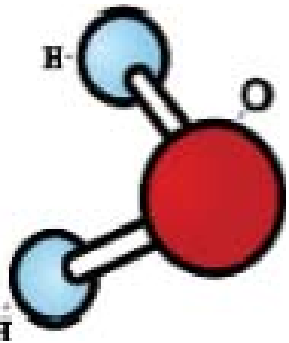
Floating or sinking is based on an object's
density.

Water expands as it freezes because the
molecules are locked into place in a crystalline
structure.



Formative Assessment: “Floating Logs” & “Floating High and Low” (Vol. 2)

Model and read about water and ice





Let's pause for
questions from
the audience....



Ice formation



Ice on land is usually from precipitation, unless it is freezing water that is present in saturated soil.



Ice forming on water develops at the liquid surface of the water...and therefore on the bottom of any ice layer at the surface.



Geography of Ice

Land-based ice:

- ice sheet
- ice field
- glacier
- ice stream



A glacier in the Transantarctic Mts.
<http://photolibrary.usap.gov/index2.htm>

Ice on/in the ocean:

- ice shelf
- ice floe
- sea ice
- iceberg



Ross Sea ice edge, 1957
<http://photolibrary.usap.gov/index2.htm>



Glaciers



Diagram: <http://www.answers.com/glacier>



Photo: Glenn Grant, NSF



Studying Ice Cores



Photo: Robert R Stewart, Texas A&M

<http://oceanworld.tamu.edu/resources/oceanography-book/evidenceforwarming.htm>

Ice Cores:

- Trap gases and wind blown materials
- Can show layering, especially dust layers in dry seasons
- Some date back to almost 800,000 years before present



Effects on sea level: Land ice vs. sea ice

Land-based ice is perched above sea level. If it melts, the water drains downward, potentially adding water into the ocean. The water that reaches the ocean will thereby raise sea level.



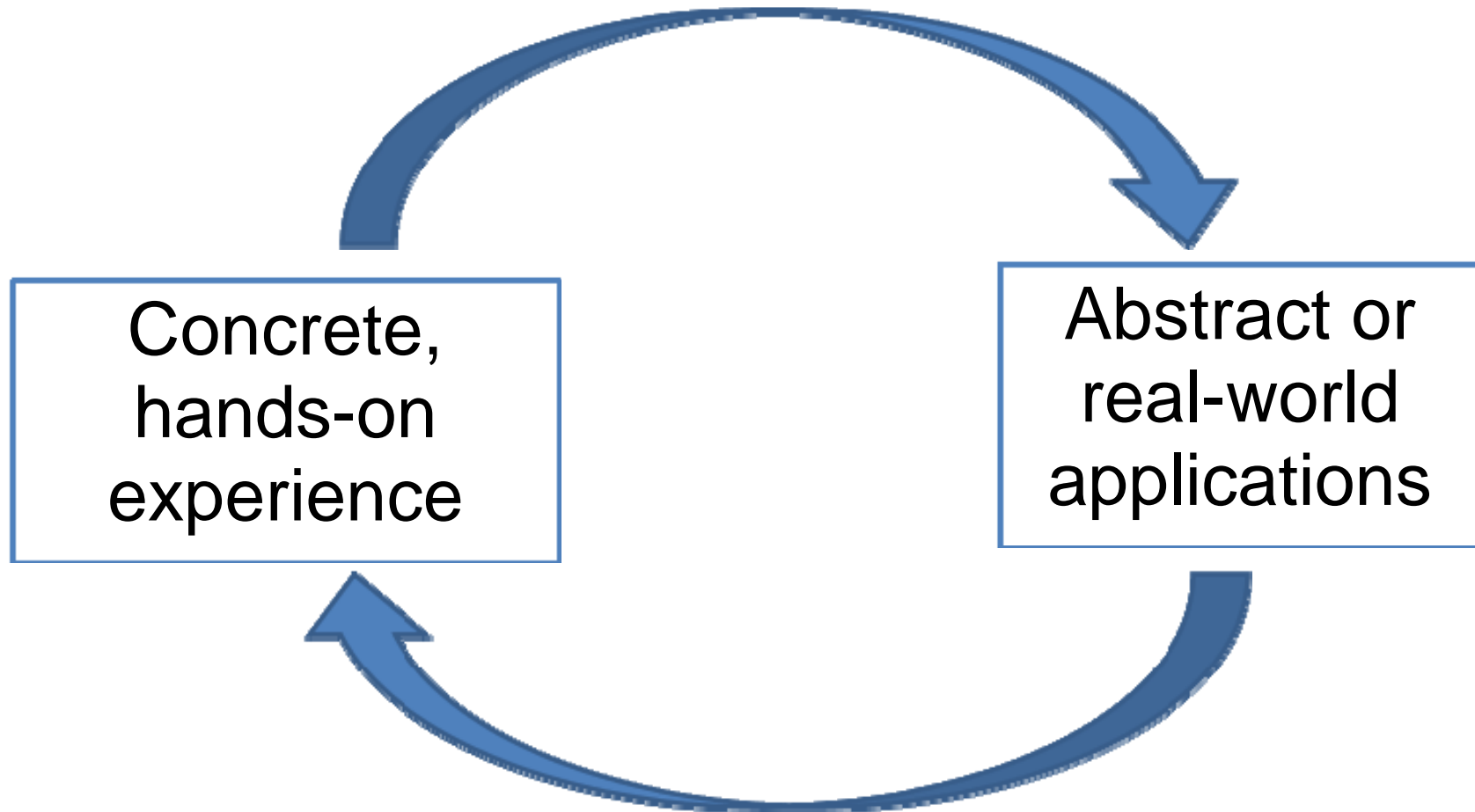
Photo: JasonBox, Byrd Polar Research Center



Photo: Zee Evans, NSF

Sea ice is already floating (displacing its mass) and it was formed from sea water. Melting of sea ice will not raise sea level appreciably.

Which comes first?

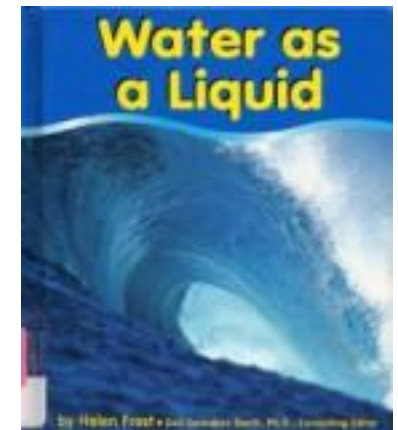
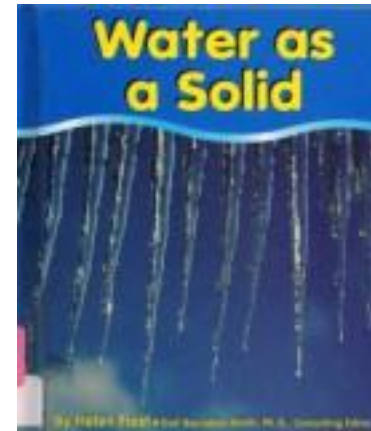


Stamp one of the boxes

Activities: States & Changes of Matter



Hands-on investigations
and content area reading

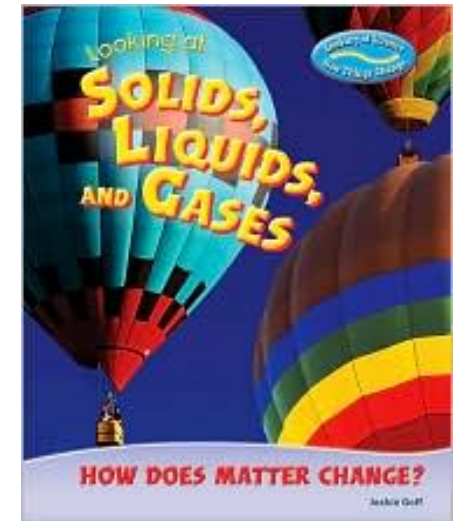


Water and Ice

Students in grades K-2 observe water as it changes states.

Heat Energy and Water

Students in grades 3-5 investigate heat's effect on water.



<http://nsdl.org>



Activities: States & Changes of Matter



Polar Connections:
glaciers, icebergs, sea ice

How Do Snowflakes Become Ice?

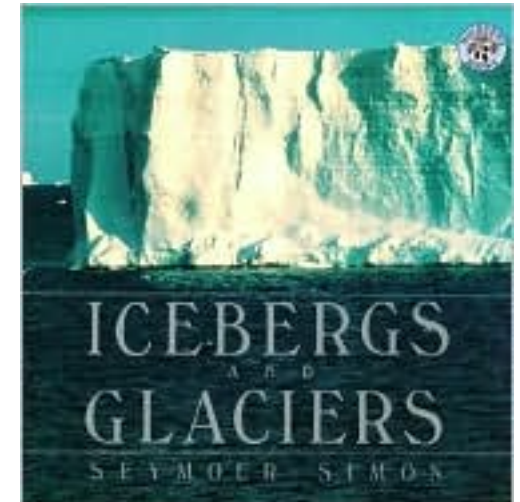
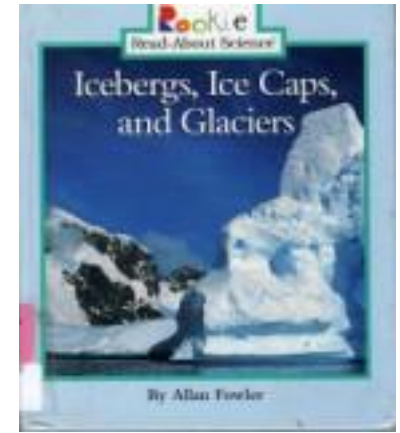
Model glacier formation with marshmallows.

Do It Yourself Iceberg Science

Create icebergs with film canisters.

Sea Ice Set

A collection of images and video.



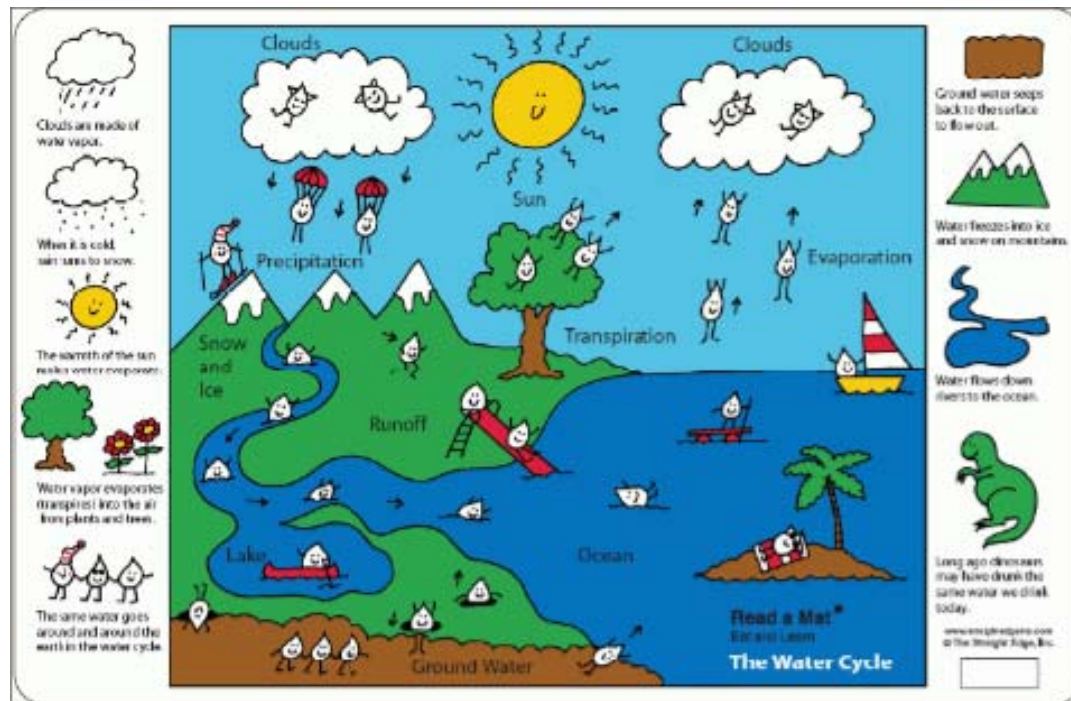
<http://nsdl.org>



Tie to the global Water Cycle

Don't forget about ice and snow!

Beyond Penguins and Polar Bears Issue 5
(August 2008): [Water, Ice, and Snow](#)



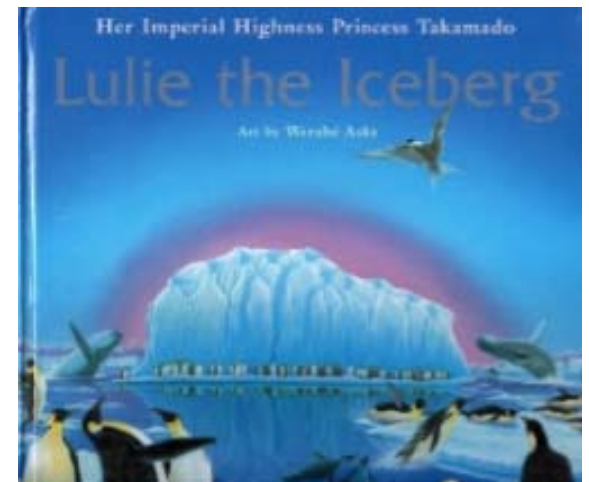
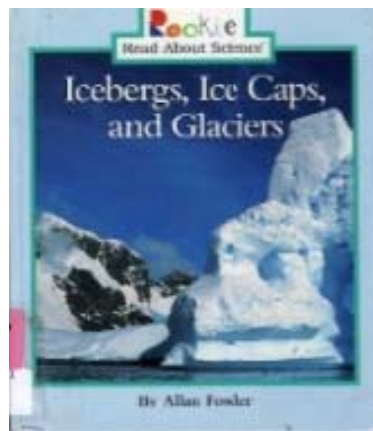
Density and Buoyancy: Grades K-2

Sink or Float?

Students determine whether objects sink or float in water. Include ice in various shapes and sizes!

Do It Yourself Iceberg Science

Create icebergs with film canisters, watch them float.



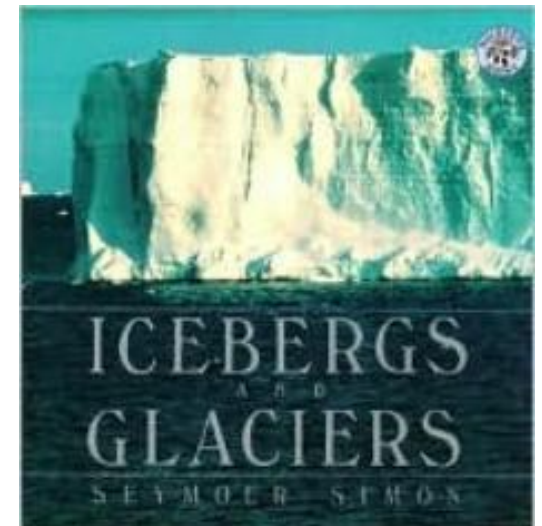
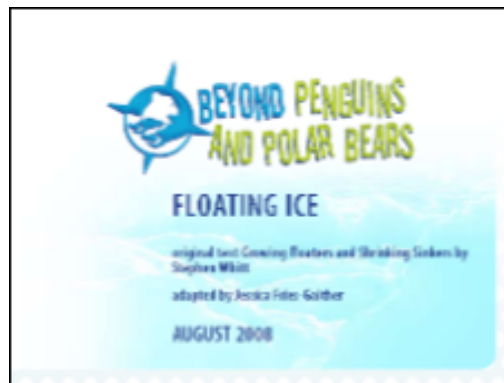
Density and Buoyancy: Grades 3-5

Water Molecule Pockets

Demonstrate liquid water's molecular structure with a discrepant event and a model.

The Magic Trick with Ice

A discrepant event – an ice cube floats in water but not rubbing alcohol.

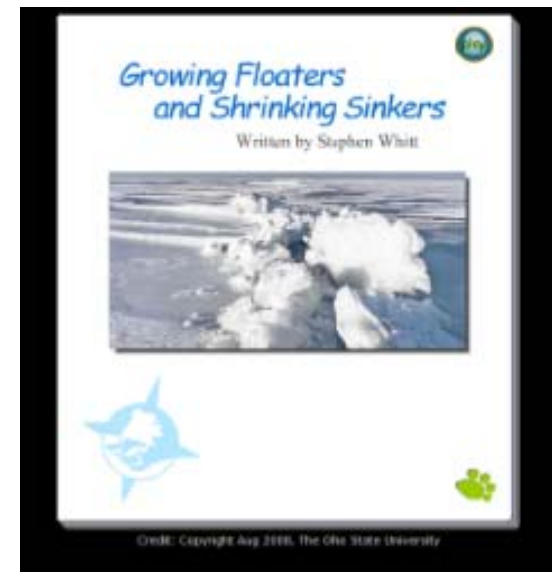


Nonfiction stories for students

Feature Story column of the magazine

Available at three grade levels (K-1, 2-3, and 4-5)

Available as text, illustrated book, and electronic book





Let's pause for
questions from
the audience....



Interested in learning more?



Beyond Penguins Web Seminar Series:
November 13th--Energy and the Polar Environment



Beyond Penguins and Polar Bears Blog
<http://beyondpenguins.nsd.org/2008/10/29/physical-science-from-the-poles/>



Beyond Penguins and Polar Bears,
August 2008, Issue 5
<http://beyondpenguins.nsd.org>



<http://nsdl.org>





<http://beyondpenguins.nsd.org>



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**THANK
YOU!**



Go to <http://nsdl.org> and click on the K-12 audience page to:

- Download our Seminar Resource List
- Find resources from archived seminars

Learn about new tools and resources, discuss issues related to science education, find out about ways to enhance your teaching at: <http://expertvoices.nsdl.org/learningdigitalK12>



<http://nsdl.org>





<http://www.lluminate.com>



Welcome to Your Professional Development

The Learning Center is NSTA's e-professional development portal to help you address your classroom needs and busy schedule. You can gain access to more than 2,600 different resources that cater to your preference for learning. Over 700 hundred resources, such as journal articles, science objects and web seminars are available **for free**. A suite of practical tools such as My Library, My Transcript, and My Professional Development Plan and Portfolio tool help you organize, personalize, and document your growth over time.



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By State Standards

Many resources now permit you to select your grade, standard document, and state to view the standards that align to the resource you've selected.

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Learn at your own pace online with these 1-2 or 6-10 hour interactive activities.

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Learn online from certified instructors with your colleagues. 1-2 hour seminars, week and month long courses are available. Earn state and university credit.

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In Person Experiences

Attend an NSTA workshop in person to learn hands-on techniques with other teachers. Earn state and university credit.

Multimedia Overview

[View Overview of the NSTA Learning Center](#)

Flash Player Required

Free Learning Resources



[Plate Tectonics: Layered Earth](#)

2 hr
Do-It-Yourself
Science Object



[Oceans Effect on Climate and Weather: Global](#)

<http://learningcenter.nsta.org>

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- *Toshiba/NSTA ExploraVision Awards: How to Submit Quality ExploraVision Entries*

November 5, 2008

- *NSTA: The Learning Center – Focus on Education Leaders*

November 12, 2008

- *NSDL: Beyond Penguins and Polar Bears: Energy and the Polar Environment*

November 13, 2008

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Click on the URL located on the
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