**Review of *Lab 2:* *Sea Ice Thermodynamics***

**Reviewer Information**

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**Technical Review** (Does the lab function properly?)

1. On what platform are you testing the lab (i.e. Macintosh, PC)?
   1. Testing on PC laptop and PC desktop.
2. What is your operating system and browser (i.e. Mac OS 9.1/Netscape 4.75, Windows XP/Internet Explorer 6, etc.)?
   1. Current operating system – laptop – Vista/Internet Explorer 7 and Firefox 2.0.
   2. Desktop is XP/Internet Explorer 7
3. Excel 8.0, Windows Media Player 11, QuickTime 7, etc.)?
   1. Laptop Excel is Microsoft 2007
   2. Desktop Excel is Microsoft 2000.
4. Did you experience any broken links? If so, provide the title(s) of the page(s) and the name(s) of the links. Be as specific as possible when identifying a page location (e.g., Lab 1, Part A, “Click here” link to open NASA animation).

Lab 2 – Additional Resources - [Sea Ice Yearly Minimum with Graph Overlay 1979-2008](http://svs.gsfc.nasa.gov/vis/a000000/a003500/a003563/2008SeaIceSequencesparta1280x720_30.mp4)<http://svs.gsfc.nasa.gov/vis/a000000/a003500/a003563/2008SeaIceSequencesparta1280x720_30.mp4>

Would not launch in IE. New window would open, but would remain blank and say “Done.”

1. Describe any other technical difficulties you experienced while reviewing the lab. Be specific and detailed in describing the issue(s).

**N/A**

**Additional Technical Review Comments:**

**Structural Review** (Does the structure of the lab make sense?)

1. How easy or difficult did you find it to navigate the lab?

Navigation was very easy. No problems.

1. Is there any feature that would have made the lab easier to navigate?

No.

1. If you became lost during the lab, describe the steps that led to the occurrence.

N/A

1. Did you understand how to navigate between the separate sections of the lab (i.e., Educator Information page, Student pages, external links, etc.)?

Yes.

1. If you experienced navigation difficulties, in what section(s) did you experience them?

N/A

1. How do you feel about the overall length of the lab?

Length is fine. Should take about 1-3 class periods, depending on whether we would utilize dry ice to decrease the freezing time.

**Additional Structural Review Comments:**

**Pedagogical Review**

1. How useful is the Educator Information page?

Page was adequate.

1. How useful are the **Additional Resources**?

Helpful for support and information.

1. Is there any information you would like to have seen included on the Educator Information page that is not present?

No.

1. Are the learning goals of *Lab 2:* *Sea Ice Thermodynamics* clearly stated?

Yes.

1. Are the stated learning goals well-aligned with the expected learning outcomes of *Lab 2:* *Sea Ice Thermodynamics*

Yes.

1. Does *Lab 2:* *Sea Ice Thermodynamics* provide enough background information and support for you to be able to implement the lab effectively in your classroom?

Yes.

1. Do you think *Lab 2:* *Sea Ice Thermodynamics* provides enough information and support for your students to effectively complete the activities?

Yes.

1. Please provide any teaching tips you think might be useful for a teacher leading *Lab 2:* *Sea Ice Thermodynamics*.

See “**Additional Pedagogical Review Comments.”**

1. Will the embedded assessment strategies allow the teacher to determine if the stated learning goals of *Lab 2:* *Sea Ice Thermodynamics* have been met?

Yes.

1. Does *Lab 2:* *Sea Ice Thermodynamics* contain an appropriate balance of guidance vs. exploration?

Yes. Having actual laboratory experiences are a plus.

1. Does *Lab 2:* *Sea Ice Thermodynamics* include enough opportunity for students to reflect, discuss, and synthesize what they have learned?

See “**Additional Pedagogical Review Comments.”**

**Additional Pedagogical Review Comments:**

**Need a space between Thermodynamics and is - Thermodynamics**is the study of heat and energy exchange. Thermodynamic processes involving heat transfer among sea ice, the ocean, and the atmosphere influence how sea ice grows and melts.

Perhaps to phrase this as a thought questions: Before you perform this investigation, predict what two factors are the primary factors driving sea ice thermodynamics. Record these predictions in your journal. Then, as you perform this investigation, either confirm or revise your predictions with supporting evidence from observations and data.

Instead of: As you will see in this investigation, the temperature and salinity (saltiness) of ocean water are the primary factors driving sea ice thermodynamics.

Part2B –

Another place to put in a thought stop –

This saltier water is more dense and therefore sinks. Instead, maybe write this as a “thought” question – What happens to this saltier water? What physical property is the cause of the vertical sinking of this saltier water?

Part 2D -

Using graph paper or a spreadsheet program such as Microsoft Excel, make a plot of Antarctic sea ice extent vs. time in months for 2008.

Corrections and additions to the above instruction. Add a comma between “program” and “such.” Add directions to use this data for answering the Checking In questions.

On graph paper or a spreadsheet program, such as Microsoft Excel, make a plot of Antarctic sea ice extent vs. time in months for 2008. Use this information to answer the following questions.

**Content Review**

1. Does the lab description on the Educator Information page adequately summarize the lab? If not, what information would you add?

Yes.

1. Is the curricular applicability of the lab apparent from the description? If not, what information would you add?

Yes.

1. Does the placement of the lab fit well within the full sequence of Cryosphere labs?

Yes.

1. Does the lab make sense within the larger context of Change Over Time?

Yes. These are time-frames that the student can grasp.

1. Do you think *Lab 2:* *Sea Ice Thermodynamics* will motivate students to learn about the cryosphere?

I believe that this module will contribute to answering questions that students will have about how things move in the oceanic part of the cryoshpere.

**Additional Content Review Comments:**

**Overall Impression**

1. Describe your overall impressions of *Lab 2:* *Sea Ice Thermodynamics*, and provide any additional comments you have about the lab.

I feel that this is a good module to use to reinforce several physical properties that pertain to chemistry. I like how the student can use the information to discover how this is a world-wide effect.