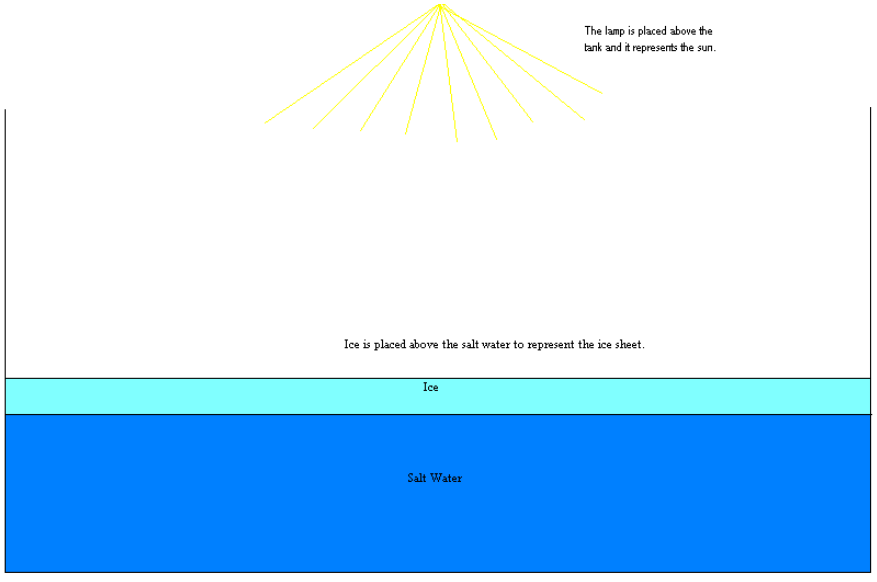
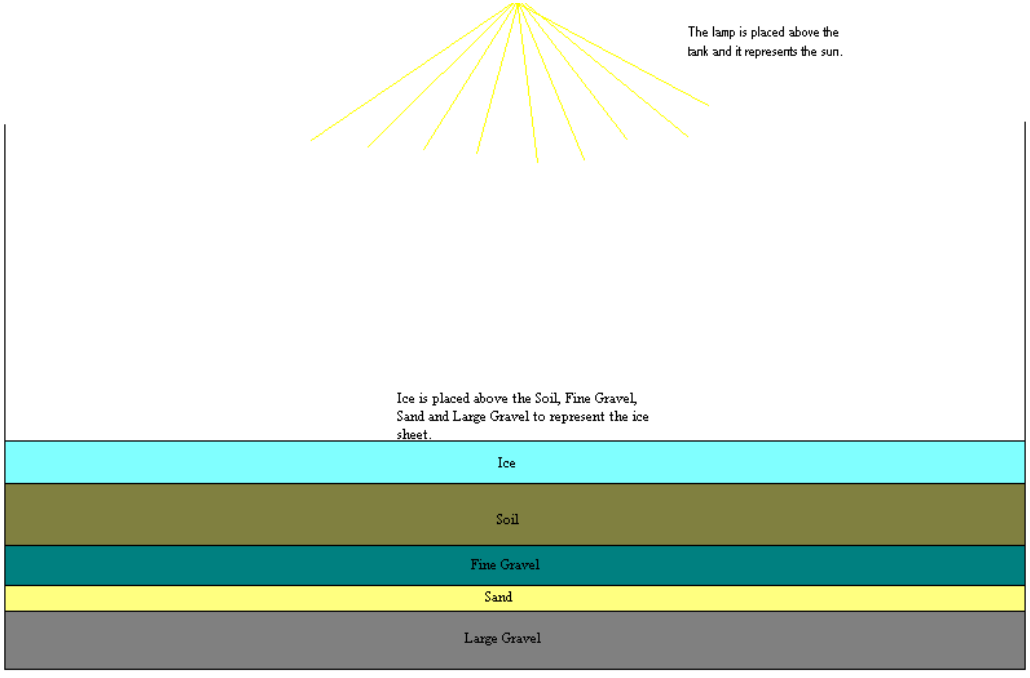
In my expo project I compared the difference between land based, sea based and sea and land based ice melting. I did this because I wanted to know if Greenland (which is mostly land based ice) melting will be anything like how the North American ice sheet melted. (The North American ice sheet that formed over North America in the last ice age which was land and sea based ice). I also did this to find out if water based ice melts faster than land based ice. These are the diagrams I made of the experiment I preformed:

This is Sea based ice


The lamp is placed above the tank and it represents the sun.
Ice is placed above the salt water to represent the ice sheet.
Ice
Salt Water
Salt water is poured on the bottom of the tank to represent the water under water based ice.

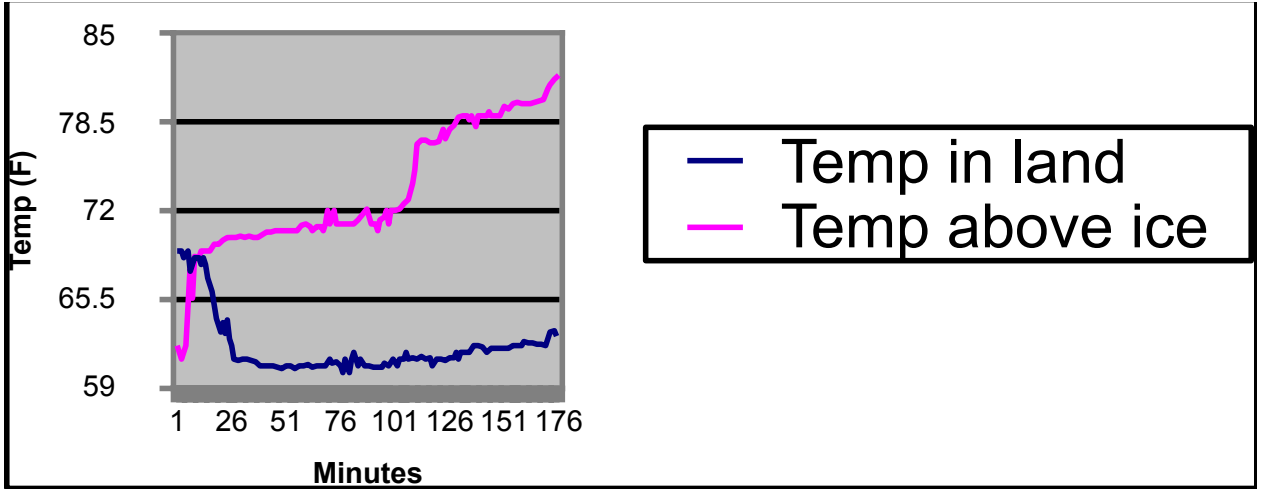
I did the sea based ice experiment to find out what ice takes longer to melt, Land based or Sea based.

This is Land based ice

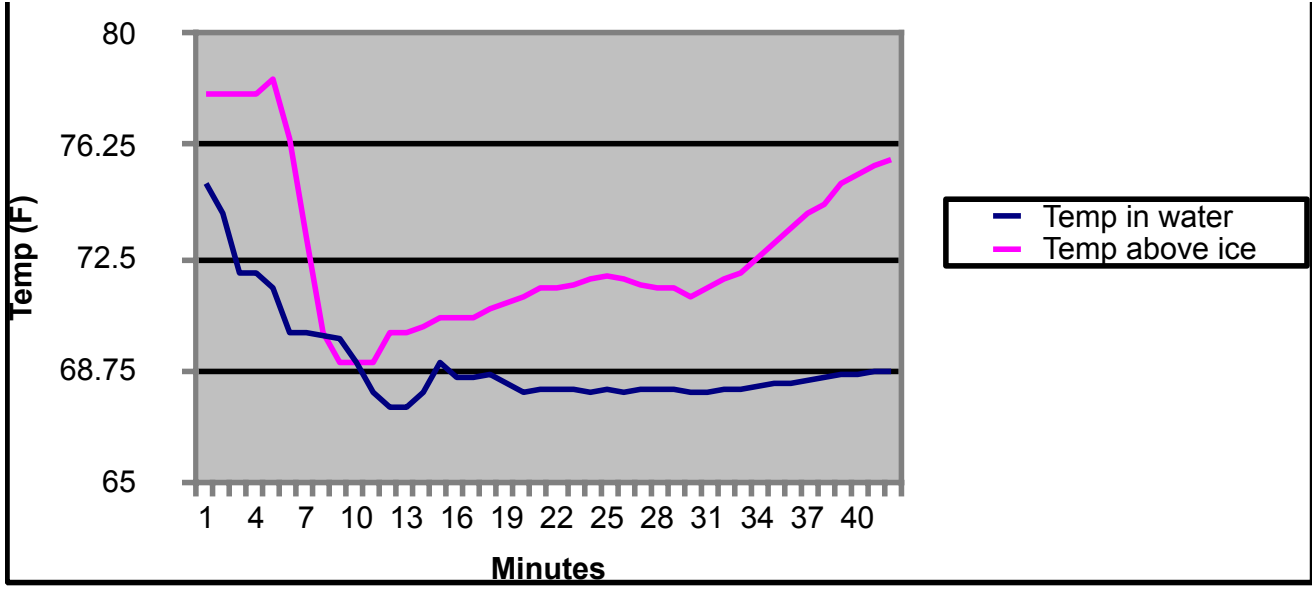

The lamp is placed above the tank and it represents the sun.
Ice is placed above the Soil, Fine Gravel, Sand and Large Gravel to represent the ice sheet.
Ice
Soil
Fine Gravel
Sand
Large Gravel

I measured the temperatures above the ice and in the soil or in the water. These are the two graphs that I made using the information I collected:

This is the land based ice graph



This is the sea based ice graph

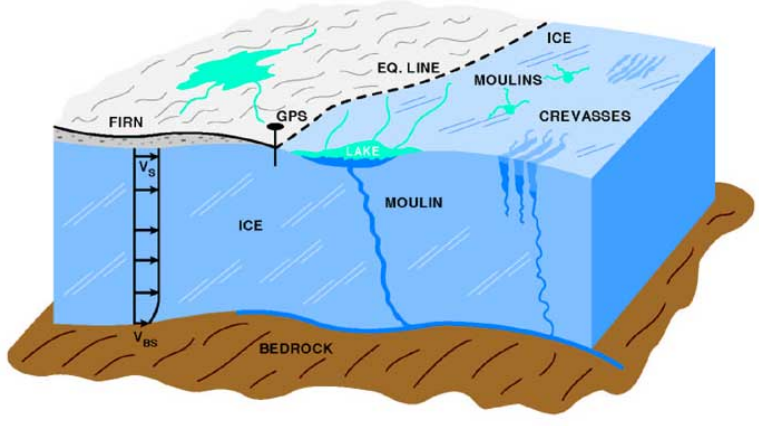


As you can see the land based ice took a lot longer to melt, around 134 minutes longer. So I concluded that water based ice melts faster

than land-based ice. When I was observing the land based ice melting I noticed that the water that was forming on the surface of the ice as a result of melting had carved small paths in the ice. After around twenty minutes or so I saw that the water had created a hole in the ice that scientist call a Moulin. It traveled all the way through the ice. This is a picture of the ice:

I rubbed charcoal on it so that the indents and hole would be easier to see: (Picture)

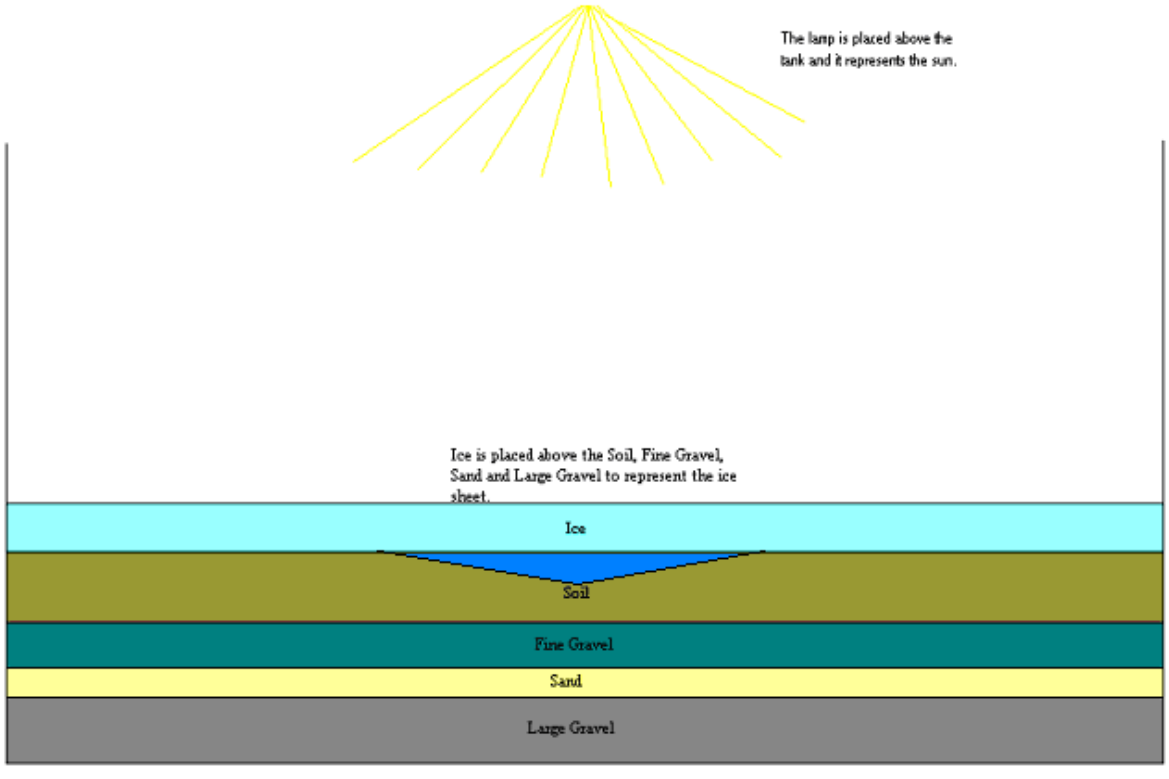
The exact same thing is happening in Greenland. As you can see in this picture adopted from an inconvenient truth.



In Greenland small lakes are forming in the lower elevated areas on the surface of the ice sheet as a result of melting. The lakes form Moulin that eventually flow down to where the ice sheet meets the bedrock and lubricates the surface of the bedrock and destabilizes the ice mass, raising fears that the ice will slide more quickly into the ocean and melt even faster. This is a picture of a Moulin in Greenland that is heading straight down to bottom of the ice sheet: (Book)

These are Greenland's melting patterns: (Book)
As you can see Greenland is melting from the outside to the inside, as opposed to the North American ice cap that melted from the inside to the outside forming a giant pool of freshwater with a small layer of ice around it. And I was trying to reenact the North American ice sheet melting by adding soil to a tank and put water into it to

represent the Hudson Bay. As you can see in this diagram:


The lamp is placed above the tank and it represents the sun.
Ice is placed above the Soil, Fine Gravel, Sand and Large Gravel to represent the ice sheet.
Ice
Soil
Fine Gravel
Sand
Large Gravel

Unfortunately I was unsuccessful, there was no difference between the land based ice melting and the water and land based ice melting. So I concluded that Greenland melting will probably be like a smaller version of the way the North American ice cap melted. Because as Greenland melts from the outside to the inside, the sun also melts the surface of the ice, even though the ice reflects 90% of the sunlight that 10%, combined with the rising temperatures due to global warming can melt the ice, creating a pool of water in the center the same way the North American Ice cap did. (However the

North American ice cap didn’t melt because of human induced Global Warming but Natural warming). So I concluded that water based ice melts faster than land based ice because water absorbs 90% of the light that shines on it and when the light shines on the land all it does is evaporate the moisture that is why the water based ice melts faster than land based ice. And I concluded that Greenland melting will probably be like a smaller version of the way the North American ice cap melted.