

39.1 Vapor Pressure and Boiling Point

Chemistry

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the pressure surrounding the liquid. At this point, liquid changes into a vapor.

Recall that we define 1 atmosphere of pressure (1 atm) as the average atmospheric pressure at sea level. The normal boiling point of a liquid is the special case in which the vapor pressure of the liquid equals the defined atmospheric pressure at sea level, 1 atm.

Evaporation and boiling point are similar – but not exactly the same thing. Liquids may change to a vapor at temperatures below their boiling points through the process of evaporation.

Evaporation is a surface phenomenon in which molecules located near the liquid's edge, not contained by enough liquid pressure on that side, escape into the surroundings as vapor. Boiling is a process in which molecules anywhere in the liquid escape.

Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

Vapor Pressure and Boiling Point

The pressure of vapor present at equilibrium with its liquid is called the equilibrium vapor pressure – or, more commonly – the vapor pressure of the liquid.

Vapor pressures of liquids vary widely. Liquids with high vapor pressures are called volatile – that is, they evaporate rapidly.

Vapor pressure of a liquid at a given temperature is determined by the intermolecular forces acting among the molecules. There is a relationship between vapor pressure and boiling point of a liquid. This topic explores vapor pressure, and its relationship to boiling point.

Honeycutt Science – online virtual textbook.

Re-write words you underlined

Using a complete sentence, summarize or rephrase the passage

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

Question:

Some students pose the question “What is the difference between evaporation and boiling?”

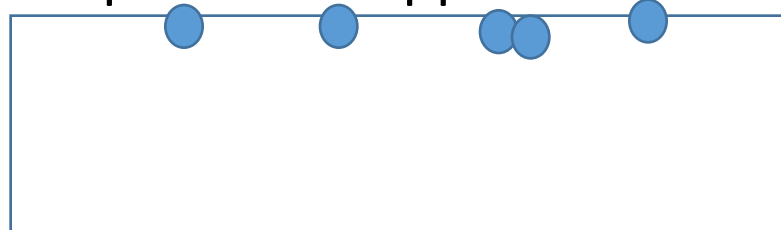
Phases of Liquids:

A quick reminder is helpful in answering this question. Remember there are three states of matter (ignoring plasma, for the moment). Matter is anything that has mass and takes up space. Matter can be in a solid state, a liquid state, or a gas state. There are particular temperatures for each of these change, such as when ice melts to water.

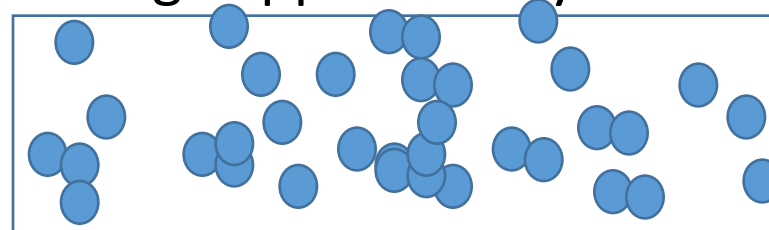
Further Explanation:

The difference between evaporation and boiling is that evaporation occurs on the surface of a liquid when a liquid changes to gas. Boiling is when all of the particles inside a liquid are heated up enough that they move around throughout the entire liquid.

Evaporation happens here ...



Boiling happens everywhere ...



You might think of boiling whenever you are heating liquids, such as water or soup, on a stove. Stoves use gas or electric heat to warm up a liquid enough to make the particles inside it move fast. These particles are moving very rapidly throughout the entire pot. You can actually even watch the gas bubbles form at the bottom of the pot of water and move to the surface. The boiling point for each substance is different. Water will boil at 212 degrees Fahrenheit (100 degrees Celsius).

Evaporation is when a liquid changes to a gas. Evaporation can happen at any temperature and only takes place on the surface or top of a liquid. When water evaporates, it occurs as part of the water cycle. Each day, water from lakes, ponds, streams, and the oceans is evaporating. The surface water is being heated up by the Sun's rays, causing the liquid to turn into water vapor.

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Draw Illustration



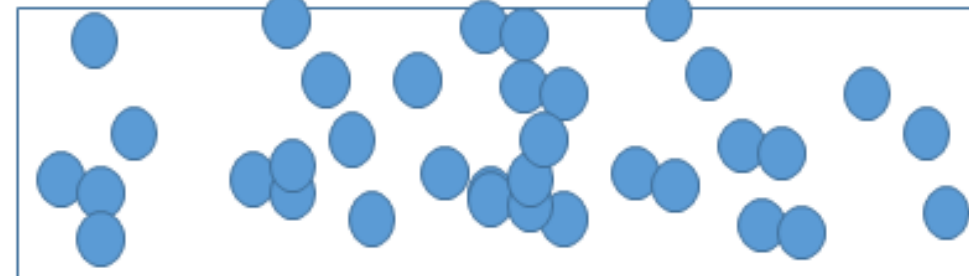
Copy and Label the Illustration in the Space Provided

Illustration

Evaporation happens here ...



Boiling happens everywhere ...



Draw (Copy) the Illustration Here

Illustrate this concept by drawing a pond, lake, or ocean.

Interpret a Graph



Write the title of the graph _____

Circle the type of chart this represents

Bar Chart Line Chart Pie Chart Other

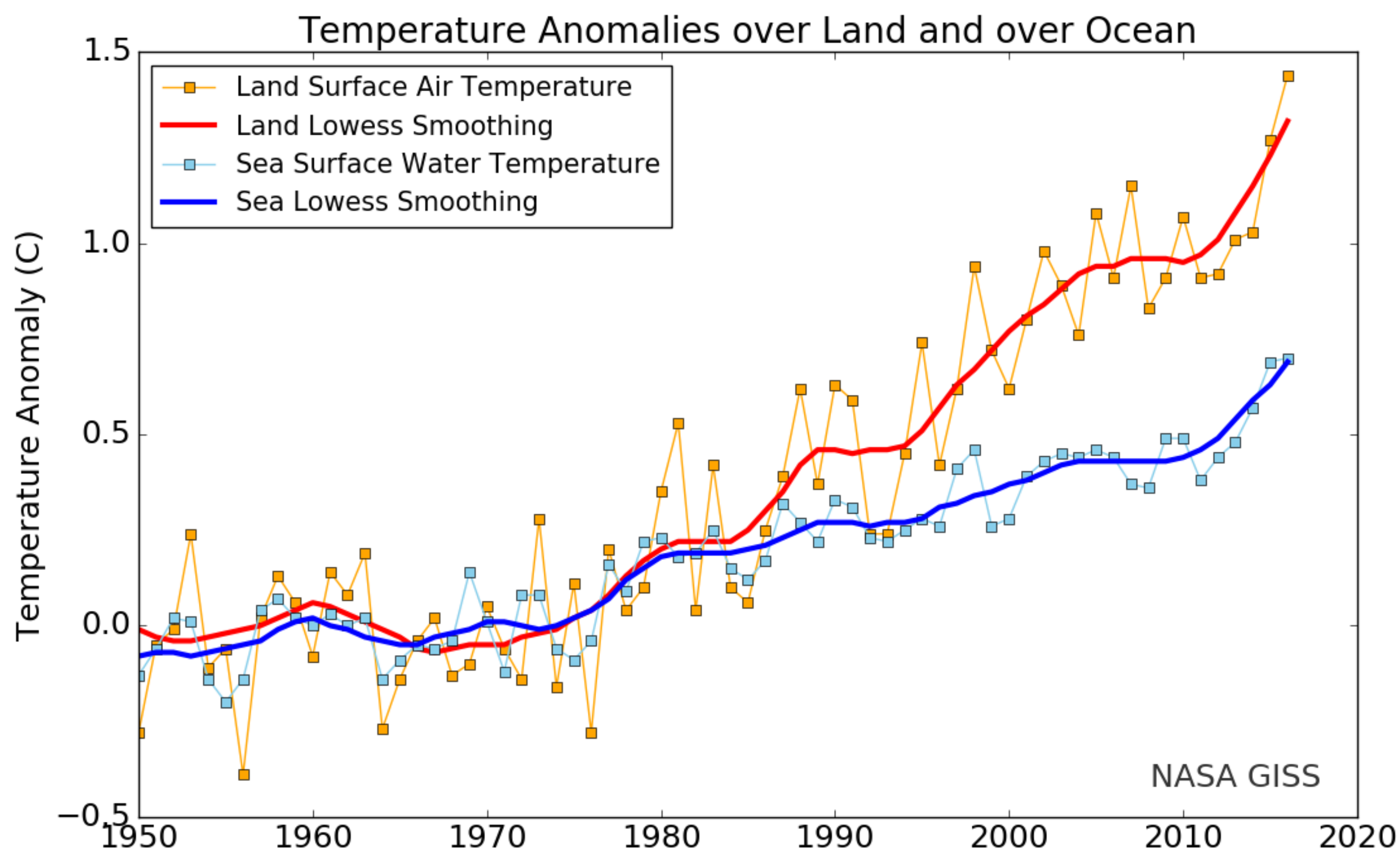
If applicable,

What does the X-axis represent _____

What does the Y-axis imply _____

Summarize what this graph represents or conveys

https://en.wikipedia.org/wiki/Sea_surface_temperature



Show-Off Your Smarts!



Q1. Imagine that evaporation ONLY occurs at the boiling point. Describe some of the impact this would have on Earth.

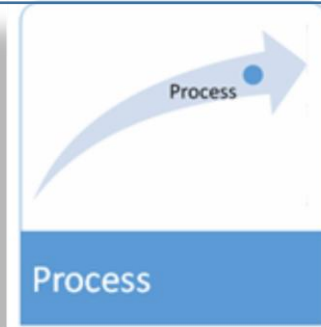
Hint: life (as we know it) ... would not exist (or, at a minimum, would not be the same).

Aim for 50-70 total words. Use additional paper, if needed.

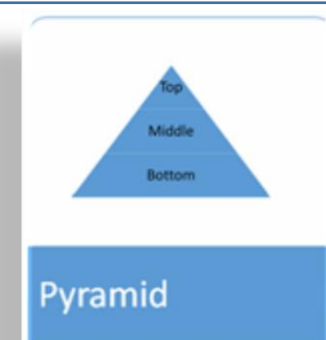
Make a Poster

In the space provided, illustrate concepts presented in *Vapor Pressure and Boiling Point* using the four diagram types suggested.

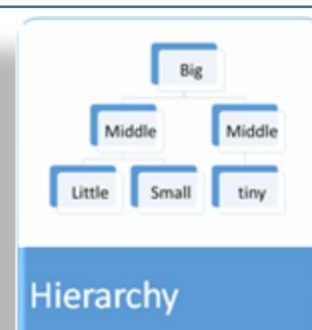
Process



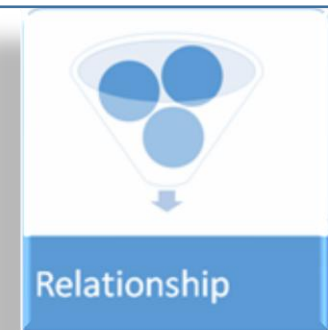
Pyramid



Hierarchy



Relationship



Suggestion: A process diagram might be used to illustrate/explain water evaporation in the oceans.