Name: Date: Class Period

Hot Weather Survival

https://youtu.be/0sV-YB4SajQ

What do you think: Would you pick clear plastic, black plastic, white plastic or foil plastic as your material for a lightweight sun shelter? Explain why you would make this choice.

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Initial Observation:

What did the video maker experience when he walked past the foil tent? Do you think this is a good or bad indication of how the foil will perform? Why?

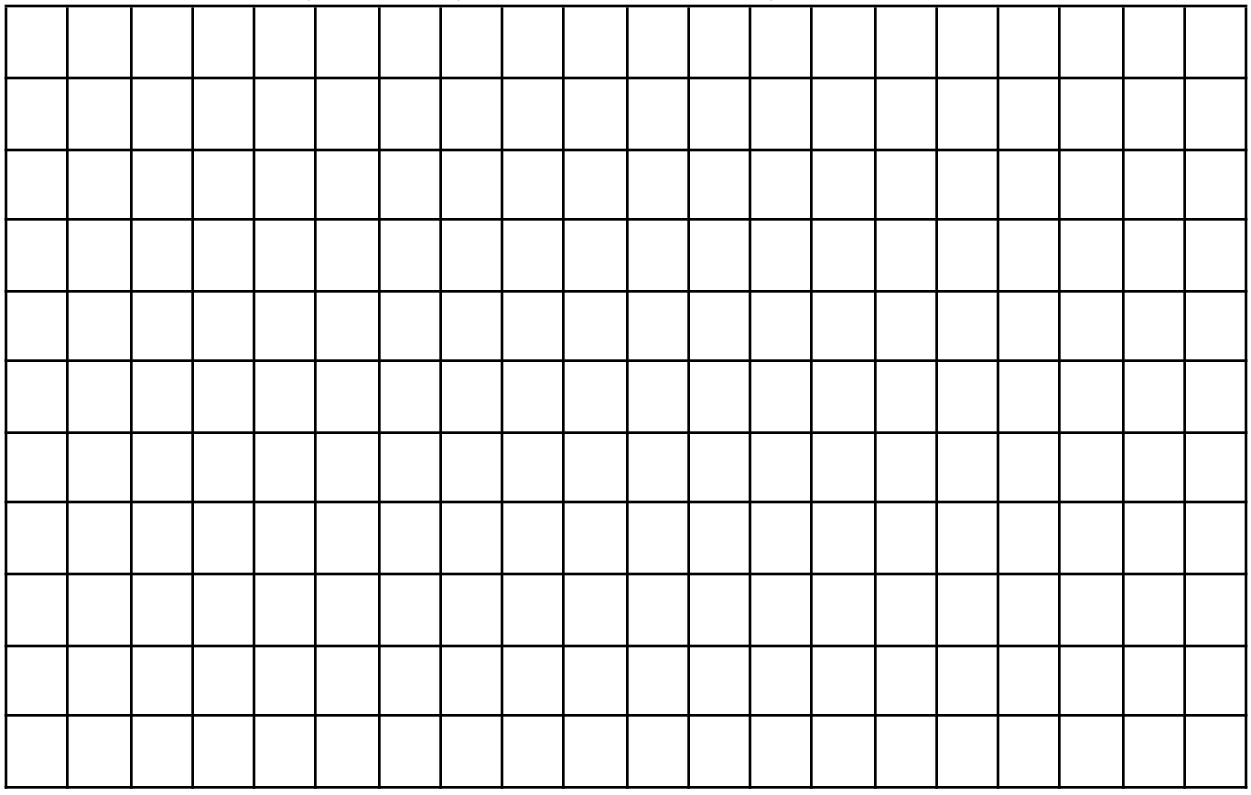
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Graphing: the Change in Temperature over Time

Create a multiple line graph. Plot the 4 tent temperatures over 20 minutes.



The Results:

The biggest loser was the _____ plastic.

Transparent materials _____ light. They allow it to pass right through, which is why we can _____ through transparent materials. The sun's energy passes right through and gets _____ inside the microtent.

The second worst performer in the competition was the _____ plastic. However it may have failed for a very different reason. The black plastic was mostly _____ - a term that refers to materials that do NOT allow _____ to transmit through them. However, black materials _____ a lot of light and convert it into _____ (scientifically speaking they convert it into thermal/kinetic energy). This energy is then transferred to the inside of the tent.

The second place material which still lost by a large margin was the _____ plastic. The ultra thin material still allowed a lot of _____ to pass through it. Now the white material was not transparent, instead it had a property known as _____. Translucent materials transmit light but _____ it as it passes through.

The uncontested winner of the competition was the plastic _____. The foil is largely _____ (that means light does not pass through it). The foil is also highly _____, which means the sun's energy _____ back off the surface and is not absorbed.

Application Questions:

1. Give an example of a transparent, translucent and opaque material (don't use examples from the video)

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   _____

2. What would be an example of an opaque material with a white surface?

   _____

3. After rapidly climbing for the first five minutes the temperature of the white tent in particular dropped as it moved toward the 10 minute mark. What could have caused this? Are there any other observations that support your conclusion?

   _____

   _____

4. On a separate sheet of paper write a paragraph explaining how you could apply what you learned in this video to designing a device to minimize thermal energy transfer.

5. On a separate sheet of paper or on flash cards write the Latin words and definitions shown at the end of the video. Put a star by the Latin prefixes that come up multiple times or that you have encountered in other words.