

Student Worksheet: The Science of Ice Cream

Researcher _____

<p><u>Key Questions</u></p> <p>List the 5 Basic Components of Ice cream.</p> <p>Why are smaller ice crystals better in ice cream? Knowing this, would you suggest freezing the ice cream slowly or quickly? Which method would produce smaller ice crystals and why?</p>	<p>NOTES:</p>												
<p>Complete the table to the right.</p>	<table border="1"> <thead> <tr> <th><u>Basic Component</u></th> <th><u>Contribution to the Ice Cream</u></th> </tr> </thead> <tbody> <tr> <td>1. Ice crystals</td> <td></td> </tr> <tr> <td>2. Fat</td> <td></td> </tr> <tr> <td>3. Sweetener</td> <td></td> </tr> <tr> <td>4. Air</td> <td></td> </tr> <tr> <td>5. Other solids</td> <td></td> </tr> </tbody> </table>	<u>Basic Component</u>	<u>Contribution to the Ice Cream</u>	1. Ice crystals		2. Fat		3. Sweetener		4. Air		5. Other solids	
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<p><u>What are the roles of emulsifiers and stabilizers?</u></p>													



Predict the ice crystal size and texture of the various techniques.

Technique	Predicted Ice Crystal size	Predicted Texture	Explain your prediction
Place in freezer			
Use ice cream ball			
Flash Freeze			



One way to rate ice cream is by mouthfeel, which is how the product interacts physically with your mouth as you eat it. Use the table below to rate your various products.



Give each criteria a ranking of 1-3, 3 being the best rating

Criteria	Freezer	Ice Cream Ball	Flash Freeze
Iciness			
Creaminess			
Roughness			

Reflection

1. **Explain** how the study of colloids is important to the ice cream industry.

2. **Explain** how the study of nucleation and growth of ice crystals can lead to creamier ice cream.



3. What does nanotechnology have to do with ice cream?

4. What fact did you learn about ice cream that you did not know before?

5. Which ice cream did you enjoy the most? Explain why.

6. What is your favorite ice cream flavor?



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Development and distribution funded by the **National Science Foundation**