

## Close Reading and Text Dependent Questions in Science

### The Chemistry Of Popcorn-It's All About 'Pop-Ability' (Chemistry – HS)

The text selection, *The Chemistry Of Popcorn-It's All About 'Pop-Ability'*, can be found at the following link: <http://phys.org/news3722.html>

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Look in the Student Learning Outcome (SLO) Documents for guidance on when this should be taught. These can be found on the BPS Science Department's website: <http://bpsscience.weebly.com/> You will find the Student Learning Outcomes documents organized there by grade level.

## **The Chemistry Of Popcorn-It's All About 'Pop-Ability' (Chemistry – HS)**

### **Student Questions**

1. Based on the first paragraph, what are the food chemists at Purdue University studying?
2. According to paragraph 4, what are the four reasons popcorn manufacturers might want to reduce the number of unpopped kernels?
3. What key factor was found to influence popping quality?
4. Paraphrase the explanation given by the author of how the corn pericarp acts like a pressure cooker.

6. Based on the evidence provided in this article, what could you conclude about corn with low kernel pressure?
7. There is an organic produce farm called Hurricane Flats in South Royalton, Vermont. If Hurricane Flats popcorn has only 2% “old maids”, what can be inferred about the pericarp structure of their popcorn?
8. The author mentions three techniques to improve the “pop-ability” of popcorn. Briefly describe the characteristic scientists are interested in and the three potential methods identified in the text that researchers could pursue.

## The Chemistry Of Popcorn-It's All About 'Pop-Ability' (Chemistry – HS)

### Sample Answers

- 1. Based on the first paragraph, what are the food chemists at Purdue University studying?**  
*They are studying the crystalline structure in popcorn that determine its popping quality.*
- 2. According to paragraph 4, what are the four reasons popcorn manufacturers might want to reduce the number of unpopped kernels?**  
*In addition to being a nuisance, unpopped kernels can break teeth, destroy fillings, and cause choking.*
- 3. What key factor was found to influence popping quality?**  
*The chemical structure of the pericarp, or outer hull is a key factor influencing popping quality.*
- 4. Paraphrase the explanation given by the author of how the corn pericarp acts like a pressure cooker.**  
*Pericarp acts like a pressure cooker that locks heated moisture inside the kernel, which causes pressure to build up until the kernel eventually pops.*
- 5. According to text, describe the relationship between crystalline structure of the pericarp and popping performance and explain why.**  
*The stronger the crystalline structure of the pericarp the fewer unpopped kernels there will be. This is because the stronger structures retain more moisture for longer, leading to a more explosive and complete popping of the kernel.*
- 6. Based on the evidence provided in this article, what could you conclude about corn with low kernel pressure?**  
*Kernels with low kernel pressure have a weaker pericarp and therefore will not pop as well as those with stronger pericarps/higher pressure.*
- 7. There is an organic produce farm called Hurricane Flats in South Royalton, Vermont. If Hurricane Flats popcorn has only 2% “old maids”, what can be inferred about the pericarp structure of their popcorn?**  
*The Hurricane Flats popcorn has a stronger pericarp, which is why the percentage of old maids is 2%.*
- 8. The author mentions three techniques to improve the “pop-ability” of popcorn. Briefly describe the characteristic scientists are interested in and the three potential methods identified in the text that researchers could pursue.**  
*The characteristic scientist are interested in is to generate corn kernels with strong pericarps. The techniques researchers could pursue are selective breeding, chemical modification, and genetic engineering.*