

Close Reading and Text Dependent Questions in Science

Why a Molecule's Shape Matters (Chemistry – HS)

The text selection, *Why a Molecule's Shape Matters*, can be found at the following link:

http://onecellonlighthtradio.files.wordpress.com/2013/04/2011reading_why_shape_matters_short.pdf

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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.

Why a Molecule's Shape Matters (Chemistry – HS)

Student Questions

1. According to the article, why is a sense of smell necessary for survival in rats?
2. Based on the first paragraph of the section, Smell, what do you think the meaning of the word primal is in this context?
3. What three properties must a molecule possess in order to fit into a receptor site? What happens next if the molecule binds to the receptor?
4. What questions do scientists have about the receptor site model?

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5. Vanillin and Eugenol have a similar shape (see Figure 3) but have very different smells and tastes. What can be inferred about the receptors that these molecules bind to?
6. According to the reading, how are taste and smell related?

Why a Molecule's Shape Matters (Chemistry – HS)

Sample Answers

1. **According to the article, why is a sense of smell necessary for survival in rats?**

A rat without its sense of smell can't mate or find food.

2. **Based on the first paragraph of the section, Smell, what do you think the meaning of the word primal is in this context?**

Primal means the most basic.

3. **What three properties must a molecule possess in order to fit into a receptor site? What happens next if the molecule binds to the receptor?**

The three properties a molecule has to possess are to be polar, the right size, and the right shape to fit a receptor site. Next, if the molecule binds to the receptor, the receptor site transmits impulses to the brain.

4. **What questions do scientists have about the receptor site model?**

Scientists are unsure of how many receptor sites are in the nose or how many different shapes they represent.

5. **Vanillin and Eugenol have a similar shape (see Figure 3) but have very different smells and tastes. What can be inferred about the receptors that these molecules bind to?**

The receptor sites for Vanillin and Eugenol should be similar in size and shape.

6. **According to the reading, how are taste and smell related?**

The text states "Seventy to seventy-five per cent of what we perceive as taste actually comes from our sense of smell."