

Assigned Reading and Scoring Exercise

HOW TO WRITE A GOOD ANSWER TO AN ESSAY QUESTION

I. EVALUATE DIFFERENT ANSWERS. Below you will find three different student answers to the cell size question. Please read the three answers and decide which answer (and what about the answer) makes more sense to you.

QUESTION: Why is cell size limited? Explain.

Answer A:

Cell size is limited because if cells get too big they would burst.

Answer B:

Cell size is limited because of the surface area/volume problem. As cells grow bigger their volume increases faster than their surface area. Therefore a cell cannot just continually keep growing because it needs to maintain a certain SA/V ratio.

Answer C:

As cells increase in size their volume (the cytoplasm with organelles) increases faster than their surface area (cell membrane). Since the volume of the cell and its need for nutrients increases faster than the surface area, which supplies the nutrients, the demand will eventually outgrow the supply. The point at which the supply is just keeping up with the demand determines the upper limit of cell size.

II. WHAT MAKES A GOOD ANSWER?

When evaluating the 3 answers keep in mind that a complete answer should make sense to someone with no background in biology. So don't assume that the reader has any background knowledge. All the relevant information has to be part of the answer, and you have to be as specific as possible. Also remember that this question is being asked in a structure-function context (think cause-effect, NOT purpose!).

1. List your criteria for evaluating each answer. What do you like about each answer, what do you dislike and why?
2. Which elements should be there to answer the question fully? Discuss with a class mate and make a list.

III: PRACTICE ASSIGNMENT: GRADING DIFFERENT ANSWERS

1. After agreeing on a list, decide how you would distribute 6 points to different parts of what you require (list your answer key here).

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2. With this answer key in hand, grade the following five students answers (note why you graded each answer how you did): **Why is cell size limited?**

Answer A:

Cell size is limited because of the surface area/volume problem. As cells grow bigger their volume increases faster than their surface area. Therefore a cell cannot just continually keep growing because it needs to maintain a certain SA/V ratio.

Answer B:

As cells increase in size their volume increases faster than their surface area. Since the volume (=cytoplasm with organelles that need nutrients for their metabolism) increases faster than the surface area (=cell membrane that takes up nutrients to supply the cell), the demand will eventually outgrow the supply. The point at which the supply is just keeping up with the demand determines the upper limit of cell size.

Answer C:

Cell size is limited because if they get too big they would burst

Answer D:

Cell size is limited in order to keep the integrity of the cell intact. If the cell became too large, basic functions could not be carried out.

Answer E:

Cell size is limited simply because of supply and demand. The cell membrane is the source of the cells food supply, and the cytoplasm is where the metabolism occurs, and thus demands food. As a cell's size increases the volume increases while the surface area does not. The high SA/V ratio cannot supply enough nutrients to the cytoplasm and the cell will perish.

IV: NOW WRITE YOUR PERFECT ANSWER HERE

V: WHAT HAVE YOU LEARNED FROM THIS EXERCISE FOR ANSWERING ESSAY QUESTIONS? WRITE DOWN ANY REMINDERS TO YOURSELF THAT WILL HELP YOU WRITE A GOOD ANSWER AND THAT YOU CAN USE TO REFRESH YOUR MEMORY BEFORE EXAMS.