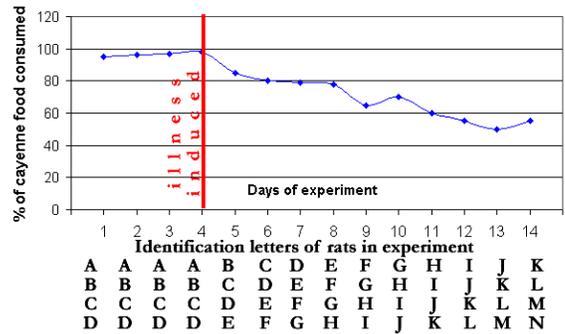


Read each question carefully and don't hesitate to ask if a question seems unclear. If possible, answer each question in the space provided, but if needed, continue on the back. If you use a drawing as part of your answer, be sure to also include a written explanation. These questions have specific answers, although for some, more than one answer is possible. To receive full credit you must clearly and fully answer the question being asked. The points for each question are noted in parentheses totaling 103 points.

1. When Volcanoes erupt they can release particulate matter into the atmosphere that can block incoming sunlight. Would this increase or decrease surface temperatures? Why? (10 pts)  
*Decrease, by limiting incoming light and heat it would decrease surface temperatures.*
2. How could rainfall cause problems in an urban creek? What is one solution to help mitigate the problem? (10 pts)  
*Without too much impervious cover the water runs directly into the stream. This causes flooding in the stream and also brings waste with it. Filtering the runoff would decrease waste delivered, and some type of water retention design would limit flow and help filter waste.*
3. What is one problem that exists with genetically modified plants that does **not** exist with plants produced by artificial selection? (10 pts)  
*They cannot be distinguished from other plants. Inability to propagate them due to patents. Increased herbicide application due to HT plants.*
4. Why do people who live along the coast need to be concerned about rising atmospheric CO<sub>2</sub> (carbon dioxide)? (10 pts)  
*Increasing CO<sub>2</sub> is leading to increasing temp., which is melting the polar ice caps and increasing sea levels.*
5. The amount of water in an urban stream has been restored to the levels that existed before urbanization, but only a small fraction of the species that used to live in the stream are able to live there. Why? (10 pts)  
*Either: Conditions have changed so the resources those organisms need no longer exist. OR IF the stream has been straightened, channelled, and/or homogenized in some way, that reduces habitat diversity reducing niche availability.*
6. If you could produce some chimpanzees that were **not** self-aware, would that resolve the ethical dilemma regarding the use of animals in research? Explain. (10 pts)  
*It depends on what you think the ethical dilemma is. If it is troubling to induce fear into an individual, and self-awareness is an indicator of an ability to feel true fear, then yes. If harming animals is acceptable to help humans, then no.*
7. You are feeding some genetically modified plants to mice, and you find that the mice that have eaten the genetically modified plants for a long time are no different from the mice that ate non-genetically modified plants. Based on this evidence, are these genetically modified plants safe for human consumption? Why or why not? (10 pts)  
*Who knows? Different species react differently to different chemicals etc.*
8. You are in charge of setting the number of bald eagles to be maintained in Texas. How would you know if you set the number of eagles too low? (10 pts)  
*If the population continues to decrease because of a lack of genetic diversity. IF reproductive rates fall.*
9. Plants with what trait would help ease the crisis in Darfur? Why would plants with this trait help? (10 pts)  
*Drought, heat, and or salt tolerant plants would help increase agricultural productivity which has fallen due to drought.*

10. In the figure below, would the researchers have been able to reach the same conclusion if rats A, B, C, and D were the only rats used in the experiment? Why or why not? (10 pts)  
*No, they were studying the rats ability to communicate information, and rats A, B, C, and D all had direct contact with the illness inducing food.*



**Bonus:** Why would plants with reduced lignin produce more net energy? (3 pts)

*Energy is required to remove the lignin, and even if the energy produced stays the same, reductions in energy needed to produce the energy would result in more net energy produced.*