

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 100 points.

1. Would a P value of 0.1 or 0.01 give you more confidence in your results? Why? (10 pts)
0.01 is a 1% chance of a random difference while 0.1 is a 10% chance of a random difference. So less randomness give more certainty about the data. 0.01 gives more confidence.

2. You are studying grizzly bears, and want to avoid stressing them. (In other words you do not want them to be nervous.) In large enclosures you have several bears including a mother with two cubs, a single female grizzly, and a male grizzly. Why are your grizzly bears **not** being kept in a low stress environment? (10 pts)

Any one of: The female with cubs will feel protective of her cubs in close proximity to other bears, especially the male that might try to kill the cubs. The grizzlies are used to being able to roam freely, and the enclosure prevents that. Grizzlies are used to being alone, and in the enclosure they are in close proximity to other bears.

3. Does the study showing rats ability to communicate second-hand information imply that the rats also have an ability to feel fear or love similarly to humans? Why or why not? (10 pts)

No. Communication and emotions/self-awareness are not necessarily related. Self-awareness is tied to emotions. Communication ability can show some other types of similarities, but not directly about emotions.

4. You have been working for many years on restoring a field that was used for farming. You have brought in both plants and animals that existed before the farm, but your restoration has been a failure with a level of biodiversity not much above what existed when the field was used as a farm. Why? (12 pts)

Any one of: The climate has changed so that the original organisms cannot survive. Some essential resource, like water, is missing. Invasive species have moved in, thereby outcompeting the original organisms.

5. Would monitoring the number of grizzly bears be a good measure of how many primary consumers (herbivores) exist in an area? Why or why not? (12 pts)

No. Grizzlies eat both plants and animals. Even if herbivores decline, the grizzlies could just eat more plants. So the change might not be reflected in grizzly bear numbers.

6. You have been asked to vote on a plan to help keep duckbilled platypuses from going extinct. The plan only has enough money to support 700 platypuses. A study done in conjunction with developing the plan says that 700 platypuses are enough to keep the platypuses from going extinct, but not enough for the platypuses to perform any significant ecological role. What additional information would help you determine whether to vote for or against this plan? How would this additional information help you decide how to vote? (12 pts)

Any one of: The confidence or certainty of the numbers. If the proposed numbers have high uncertainty, then voting for the plan might not make sense. OR Whether platypuses serve a vital ecological role. If they do, then just saving enough to keep them from going extinct will not be much help to the overall ecosystem.

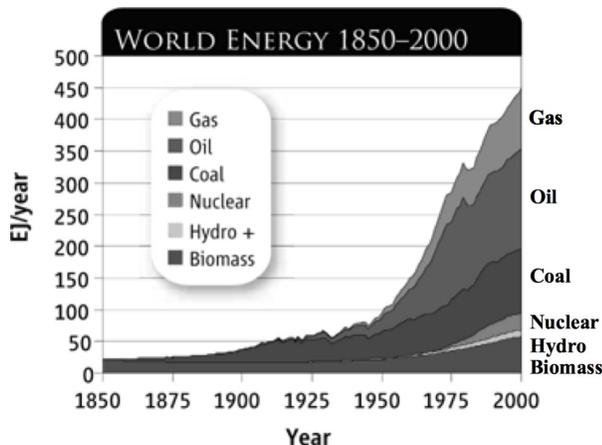
7. Are increases or decreases in precipitation more likely to lead to conflicts between people? Why? (12 pts)

Decreases in precipitation cause a lack of resources that can lead to conflicts over the remaining resources.

8. A parking lot has been constructed near a creek. A retention pond has been installed that holds water for a day, and then releases that water to the creek. This has reduced flooding in the creek, but has not done much to resolve **two** other problems affecting urban creeks. What **two** problems still exist for this creek, and what changes need to be done to the retention pond to alleviate these **two** problems? (12 pts)

The creek is receiving polluted water. Also later when it is not raining, there is not much water to supply the creek. To help with the contaminants, they can add a filter. For both problems holding the water and releasing it slowly will allow contaminants to settle out and provide water over a longer time.

9. How does this graph explain recent increases in global temperatures? (10 pts)



The increases in burning of fossil fuels, gas, oil, coal, have released carbon dioxide into the atmosphere thereby increasing the greenhouse effect.