Pre- and post-course assessment instrument and scoring rules

ENV 101: Environmental Science
Spring, 2006

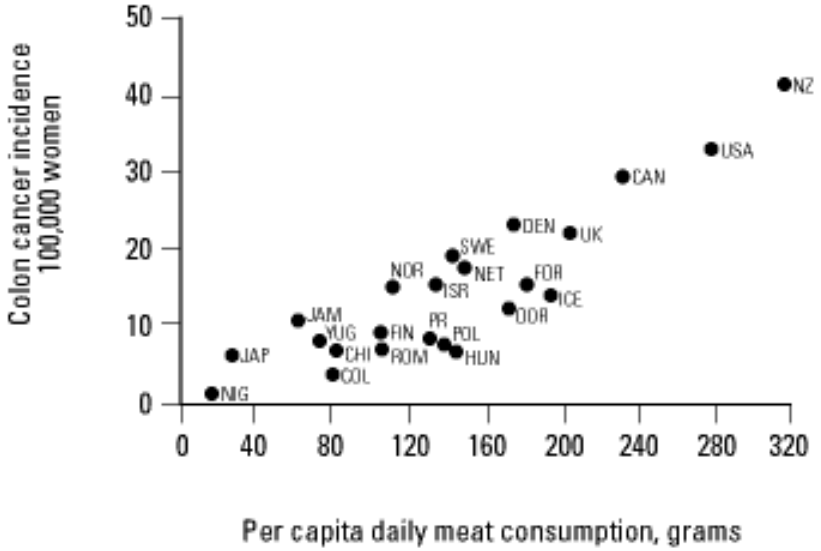
Name: _____ Date: _____

1. Gender, circle one: *male female*
2. Academic year, circle one: *freshman sophomore junior senior*
3. Major _____
4. Have you taken ISP 120? Circle one: *yes no*
5. How many college science courses have you had? _____
6. How many of these science courses have had a lab? _____ (skip if answer to #5 is 0)

Please circle how you feel about each of the following statements:	Strongly Disagree				Strongly Agree
7. In college, only science majors should have to take science classes.	1	2	3	4	5
8. Creativity plays a large role in science	1	2	3	4	5
9. If an experiment shows that something doesn't work, that experiment is a failure.	1	2	3	4	5
10. When scientists disagree, one of them must be correct.	1	2	3	4	5
11. Scientific observations are factual and lasting unlike scientific explanations which are tentative and can change.	1	2	3	4	5

Please circle how you feel about each of the following statements. How confident are you that you could…	Not at all confident				Totally confident
12. analyze a table of numbers and see the relationships.	1	2	3	4	5
13. analyze a graph and see the relationships.	1	2	3	4	5
14. find data to defend an argument you have about a controversial environmental issue.	1	2	3	4	5

Continue on to the next pages…

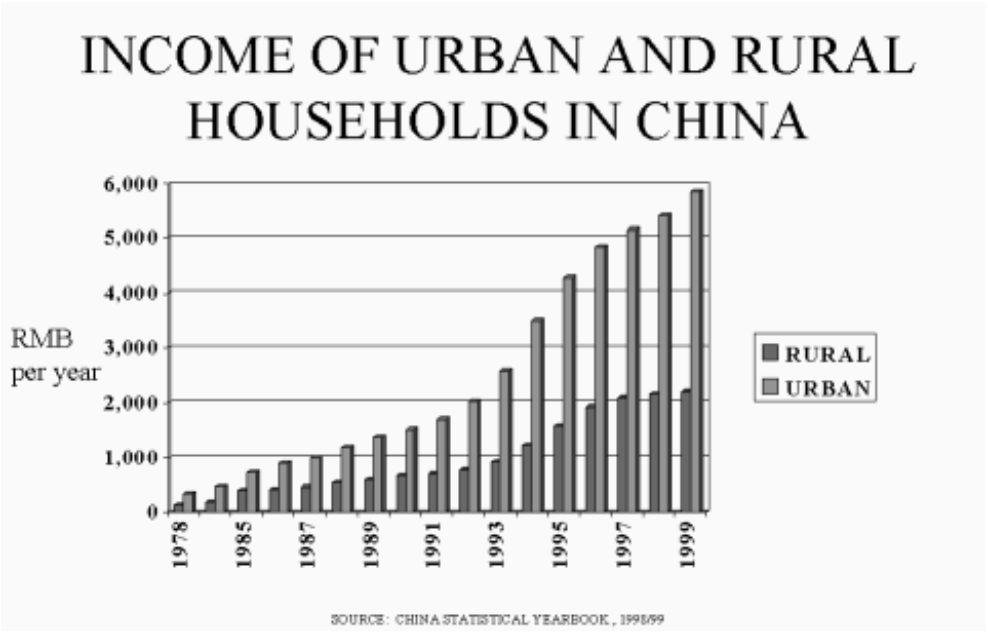


Adapted from: Armstrong B, Doll R. Environmental factors and cancer incidence and mortality in different countries, with special reference to dietary practices. Int. J Cancer 15:617-631 (1975).

1. What does this graph tell you?

Scoring rubric (max possible: 4 points): *Students received a base score of either 1 or 2 based on their ability to distinguish between correlation and causation. The score increased for additional insights (as indicated by +1) and decreased for errors. No students received a 4 for this (the faculty wondered if they would), but many scored a 3 with one or the other additional point. A score of 2 (minimally acceptable) required that students distinguish between correlation and causation.*	
1	student says that meat causes colon cancer
2	student says that there is a positive relationship between meat consumption and colon cancer but does not imply a direct causal relationship
+1	student reads data off the chart to make statements about relationships between countries
+1	student discusses importance of variation in data (some countries with high meat consumption have low levels of colon cancer)
-.5	each incorrect statement

2. How confident are you that you fully answered this question? (circle your choice)
   a) I gave a really good answer
   b) I did a pretty good job
   c) It could go either way
   d) I mainly guessed at it
   e) I have no idea what this graph shows



3. What does this graph tell you?

Scoring rubric (max possible: 4 points): *Each element below provided one point toward the maximum of 4. Correctly mentioning two elements (most frequently, the increase over time and the difference between rural and urban) gave a score of 2, a minimally acceptable response.*	
+1	student describes an increase in income over the period from 1978-1999
+1	student says that urban incomes are higher than rural incomes
+1	student says that urban income has been increasing faster than rural incomes (increasing gap between rural and urban)
+1	student says that the change in income has increased for both rural and urban (although especially for urban) in the early 1990s
-.5	each incorrect statement

4. How confident are you that you fully answered this question? (circle your choice)
   a) I gave a really good answer
   b) I did a pretty good job
   c) It could go either way
   d) I mainly guessed at it
   e) I have no idea what this graph shows