Current Event Assignments for Human Biology/BIO9

All of us must be able to think critically and be capable of evaluating scientific and other research claims. We encounter such claims daily whether in anecdotes told to us by friends, family or colleagues, in the news, and/or in advertisements. Often, we often make decisions based on these claims. Many of us, however, don't have the background to critically evaluate them nor the time to keep up with the emerging research in science and medicine. Further complicating the issue is that most journalists don't have the background either and tend to confuse "balance" with accurate reporting of scientific findings in the popular press. The journalistic norm of "balance" or presenting "both sides" has no equivalent in science and can lead to the distortion or misrepresentation of what the research actually tells us (Mooney, *Columbia Journalism Review*, November 2004). These current event assignments are designed to help you evaluate scientific information.

1. Keep your eyes and ears out for information about **scientific research** projected in the media. For some current events, you will be assigned articles. Otherwise, choose one headline or article that talks about primary research for each of the four current events assignments throughout the semester. For the fifth current event, an article will be assigned to you.
2. The information you choose must be current! *(After January 1, 2011)*
3. Remember you are looking for a report about a **primary research study**. Avoid very brief abstracts or summaries without much detail. Avoid review-type articles that talk about many different findings. If you choose something brief or without much detail you will have to search for related material to supplement the information.
4. Use **reliable** written or Internet sources such as those listed below. If you hear something on the radio or on television, you should be able to find corresponding written information in one of these locations.

   Example Acceptable Sources (links are up on course website):

   a) ***Scientific Journal or other science-related periodicals are best****.*
      - *Science, Nature, Scientific American, Science News, Discover*
      - ***Major newspapers*** *are okay if the article gives reliable information and is in-depth.*
      - *New York Times, San Francisco Chronicle & USA today have science sections.*
      - *Sometimes Time and Newsweek have reliable science information.*

   b) ***Online versions of any of the above are recommended.*** *Here are some URL's:*
      - *Scientific American – http://www.sciam.com/*
      - *Science News Online – http://www.sciencenews.org/*
      - *The Scientist – http://www.the-scientist.com/*
      - *Discover – http://www.discover.com/*
      - *New York Times: Science - http://www.nytimes.com/pages/science/*
      - *USA Today – http://www.usatoday.com/*

   c) Podcasts that discuss current research
      - *"Science Friday" www.sciencefriday.com*
      - *"60 Second Science" www.sciam.com/podcast/podcasts.cfm?type=60-second-science,*
        ***note: you'll need to find more information, but this is a starting point*
      - *"Science Talk" www.sciam.com/podcast/podcasts.cfm?type=science-talk*
      - "Groks Science Radio Show Podcast" http://home.uchicago.edu/~chuckles/
      - "The Naked Scientists" http://www.thenakedscientists.com/
      - "Nature Podcast" http://www.nature.com/nature/podcast/index.html
      - "This Week in Science" http://www.twis.org/TWIS-science-podcast.html

   d) ***Other sites*** *that may work* (you can always check with me for approval if you use any source not listed)
      - *biologynews.net., sciencedaily.com, nsf.gov – biological sciences (bio) discoveries, http://www.newscientist.com/*
5. Read/listen/watch and think about the SCIENCE and SCIENTIFIC METHOD behind the research. Use a medical dictionary or textbook to look up new vocabulary words and aid in your understanding.

6. After reading, watching, or listening to the information, complete and/or answer each of the following items to turn in using proper grammar and providing proof that you read and understood the elements of scientific method in the study (typed assignments are appreciated):
    A. A proper citation for all resources read/watched/listened to. (using APA or MLA format similar to the requirement in the bibliography of your project).
    B. Where was the research done and by whom? (usually a university or college)
    C. Determine the question that the scientists were investigating and write that question. Remember that questions have a question mark as the punctuation.
    D. What was the scientists' hypothesis? This may not be explicitly stated in the article but you should be able to infer the hypothesis. A hypothesis IS NOT a question; a hypothesis is a statement, a potential answer to the question from C.
    E. How does the research fit into the context of its field? Is it, for example, attempting to settle a controversy? Showing the validity of a new technique? Opening up a new field of inquiry? A continuation of previous studies?
    F. What were the subjects of the research? (i.e. humans, mice, bacteria)
    G. What were the "control" and "experimental" groups? Refer to "The Variables" handout for assistance.
    H. What is the one main factor that is different between the control and experimental groups? This is your independent variable – are there different levels of the independent variable? If so, list the different levels. Refer to "The Variables" handout for assistance.
    I. What is the dependent variable(s)? Refer to "The Variables" handout for assistance.
    J. Are there "confounding" variables? More than one factor that is different between the "control" and "experimental" groups? Please describe. Note: your answer should most likely be "YES!
    K. What was the **one** major conclusion or finding according to the scientists?
    L. Do you agree with the conclusions drawn from the data? In other words does the data that was collected lead to the conclusion statement? Support your answer.
    M. Do you think that the journalist accurately described the study's conclusions? Support your answer.
    N. Were the scientists completely objective when describing the experimental results? Could one or more of the confounding variables you identified in Part "J" have unintentionally influenced the results? If so, did the scientists take this into consideration when presenting the results?
    O. Think of at least one further question that scientists could investigate to continue this research or to answer remaining questions?
    P. Do you think this research is/was worth investigating? In other words, if you had money for research would you give these researchers the money for their study? Why?

7. *In order to reduce the amount of paper used in the world, the instructor will happily accept current event assignments through Insight by **10:00 pm on the due date**. Please send the assignments in Microsoft Office Word, PDF, .txt, .rtf, .pages, or .odt format. Google Docs is a FREE way to do this. You DO NOT need to turn in the article with this assignment. The instructor can find the article using the citation you provided in question "A". The instructor will grade assignments submitted through Insight by responding through Insight with comments and points earned. Please be reminded that Internet access or e-mail programs can occasionally crash/be under maintenance/not work; therefore, waiting until the last minute is not advised. Students are responsible for submitting assignments ON TIME and no late current event assignments will be accepted. Additional current event assignments can be completed for a potential 5 points of extra credit per assignment. Early assignments are also happily accepted, and a student may only earn extra credit points for Current Event Assignments **after** the required submissions are completed.*

A CONTROLLED EXERIMENT: THE VARIABLES

A well-thought out scientific study almost always has the following components:

- The *control* and *experimental* groups
- The *independent* and *dependent* variables

The two sets are NOT the same. In other words, the control group is not the independent variable and the experimental group is not the dependent variable. Understanding the relationship within and between these two components is key to really understanding and analyzing the findings of a scientific study. As scientists manipulate the independent variable, they want to know if anything happens to the dependent variable. Usually the dependent variable is what is measured and comparisons are made between the experimental and control group(s).

Control & Experimental Groups

The control group is a required component of a scientific study. It provides the reference point, something to compare to. Sometimes it is based on a standard measurement (i.e. body temperature) but there is almost ALWAYS some sort of control group. The experimental group is compared to the control group. Usually there is one experimental group, but there may be more than one.

Here are some situations that come up frequently:

CONTROL GROUP	EXPERIMENTAL GROUP
Reference point	The altered group
"normal"	"abnormal"
No condition or disease	With the condition or disease
A standard or average value (i.e. body temperature is 37°C or the average of a larger group of people)*	This value in a subset of the population (i.e. people who live in California have a higher incidence of ____)*
No treatment	Treatment
Normal genetic make-up	Altered genetic make-up
Original time point	Subsequent time points
Young	Old
Original technology	New technology
Time = 0	Time = 1 minute, 2 minutes, etc.
Before	After

*Often used in epidemiological studies

Independent & Dependent Variables

The independent variable is the difference between the control and experimental group(s). It is the factor that is being tested. There can be different levels of the independent variable (i.e. different time points, different amounts of a drug, etc.)

Another way to think of the independent variable and its relationship to the dependent variable is the equation: $y = mx+b$
The scientists set or manipulate the value of x (the independent variable). If you change x, then y (the dependent variable) changes, too. The scientists are investigating the values of y through the experiment. Please note that this equation is an EXAMPLE to understand the relationship, but the relationship between the two variables may NOT always be linear.

As the scientists manipulate the independent variable, they want to know if anything happens to the dependent variable. Usually the dependent variable is what gets measured or quantified and then that value is compared between the control and experimental groups.

Usually the question a scientist is asking fits into:

As the independent variable changes (goes up or down), what happens to the dependent variable?
If I set the independent variable at a certain value, what happens to the dependent variable?

OR think about "cause and effect", where the cause is the independent variable and the effect is the dependent variable.

Here are some situations that come up frequently:

INDEPENDENT VARIABLE	DEPENDENT VARIABLE
Treatment (medication, surgery, nutritional supplementation, diet, looking at pictures, listening to music, etc.)	Health/recovery/mortality/heart rate/body temperature
Time	The changes that happened over time
Aging	The changes that happened through aging
Genetic make-up	The changes in health/response

An example:

Does amount of time studying affect students' final grades?
Control Group = no studying
Experimental Group = studying
Independent Variable = amount of time studying, different levels (1 hour, 2 hour, 3 hour, etc.)
Dependent Variable = final grades