

1) **Abstract** “Effects and sources of environmental contaminants”; Terri Stilson (ANP, nutrition) terri.stilson@edcc.edu; Math/Science

This is a group activity for students in the ANP series (BIOL&241, 242). Each group will choose an environmental toxin (mercury, lead, dioxins etc) at the beginning of the series. Throughout each quarter, groups will research their toxin specific to the body system/s we are studying, and provide a short write-up periodically (every 2 weeks) about the effects of the toxin on the current body systems. At the end of each quarter, each group will prepare a short presentation to demonstrate how the multiple effects of their toxin can have body-wide and often indirect effects on many systems; the presentation will also include explanation of how/why the toxin is produced/released, the most likely routes of exposure, and specific strategies the consumer can use to help reduce exposure and production/use of the contaminant. We will finish with a discussion of possible cumulative effects of multiple exposures.

This assignment will incorporate the ideas of **systems interdependence** within the organism and throughout the ecosystem; the **multicellular organism as a result of specific biochemical events** whose whole is more than the sum of its parts. Sustainability “big ideas” addressed with this assignment include **Systems Thinking, Cumulative Impacts, and Precautionary Principle and/or Environmental Stewardship.**

2) **Introduction/overview**

Anatomy and Physiology (BIOL&241 and 242) introduces majors-level students to each component of the human body, from atoms through organ systems. As the courses progress, the body as organism begins to emerge: each part can and often does have impacts on other parts. Of course, as organism we are part of ecosystems, on which we depend for survival.

This assignment would introduce students to our dependency on our ecosystem, and how contamination of such with toxins affects the functioning of systems within the organism (the body). Students will be asked to choose an environmental contaminant (mercury, lead, PCBs, etc). Working in groups, students will design a short write-up (one page or less) to follow each unit of the class (cells and tissues, bone and cartilage, muscles, nervous system, etc). This presentation will include specific information about how their chosen contaminant affects the body system we have been examining, from a cellular level to functioning level. Researching the systems malfunctioning should help students understand normal functioning.

At the end of the quarter, each group will design a short presentation that presents an overview of how their chosen contaminant affects the body as a whole, taking into account how each of the separate systems work together. This may reveal indirect effects of the contaminant. The final presentation will also include information about how/why the contaminant is produced/released, the most likely routes of exposure, and specific strategies the consumer can use to help reduce production/use of the contaminant. We will finish with a discussion of possible cumulative effects of multiple exposures.

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**Time Frame:**

During the quarters, write-ups will be due approximately every 2 weeks. Laboratory time will be used to allow groups to consult with each other and with me. One class period at the end of each quarter will be used to allow students to give their presentations.

**Teaching/Learning Activities:**

Students will be given guidelines about the type of information to include in each of their write-ups, with sufficient freedom to allow them to focus where their interests lie. Write-ups will be copied and shared with the class.

Exams will include questions referencing information in the write-ups, either easy/general questions or extra credit questions.

**Resources:**

Online research resources will be provided (and monitored for legitimacy), including

[www.emedicine.medscape.com](http://www.emedicine.medscape.com),

[www.themedicalbiochemistrypage.org](http://www.themedicalbiochemistrypage.org),

<http://www.atsdr.cdc.gov/toxguides/>