**Biology 112 Virtual Labs 3 and 6   
 Winogradsky Columns**  
 Winogradsky columns are built to mimic microbial ecosystems. They are made by   
combining the sediment from a body of stagnant water (pond) to a clear cylindrical container, adding enriching supplements and providing the growing ecosystem with sunlight. Over time, gradients can be seen within the column that are home to a diverse array of heterotrophic and chemo/autotrophic bacteria.  
  
**Step 1:**  
Go to this page:  
  
<https://media.hhmi.org/biointeractive/click/winogradsky/>  
  
a. Click on “Background” on the header bar.  
Read the Introduction, Gradients and Zonation, and Metabolic Strategies.  
  
b. Click on “Interactive Column” on the header bar.  
Explore the virtual Winogradsky column by clicking on each zone and reading about the microbial life found in each zone.   
   
**Step 2:**  
Access the pdf posted on our lab 3 web page with instructions on assembling and monitoring your Winogradsky columns. Read through the instructions and begin the lab by assembling your columns. **You must have at least 8 weeks of data so it is very important you assemble your columns February 21st.**  
**Step 3**. As the semester progresses, follow the protocol by recording changes weekly in your columns as directed by the protocol and developing answers for the questions found at the end of pdf.   
  
**Step 4:** Submit the results of your completed Winogradsky lab, including answers to the questions found at the end of the pdf, on **Monday, April 25th**. You may submit your results electronically OR submit a paper document but not both. The protocol requires you to take pictures of your columns weekly *and* sketch the changing contents of your columns. If you choose to submit a paper document, please make sure it is typed and your printed photos are in color. If you choose to submit an electronic document, all photos should also be in color and all sketches scanned in color and attached to the typed body of your document.   
 **This virtual lab is worth up to 50 points = 5% of your Biology 112 grade. Since the submission date is near the very end of the semester, late   
submissions cannot be accepted.**