WORKSHEETS FOR BIOLOGY 105, UNIT 7, STEP 2
REMOTE SENSING INTERNET ASSIGNMENT

NAME: _________________________________ DATE: ____________________

The introduction, instructions, and web links for this assignment are on the Biology 105 website. This web assignment is worth a total of 12 points and has four parts. You do NOT have to complete this assignment before you take your Unit 7 test. Please see your syllabus and/or the class website for the deadline to turn in this assignment.

When you have completed the entire Remote Sensing Internet Assignment (Parts 1-4), turn in these worksheets and initial and date the Assignment Check-In list at the front desk in the Biology Learning Center. Your instructor will grade the worksheets and return them after the deadline.

Did you work with another student in Bio 105 on this assignment? If so, whom: ______________________________ . Working with another person can be a great way to help both of you to learn better and to enjoy yourself more while you do so. However, there are rules for working together that you both must follow. These are available at http://dtc.pima.edu/blc/105/group_work.html and in the Student Code of Conduct. Submitting answers using your own words is one of the most important rules.

Part 1: The History of Remote Sensing

1. In layperson’s words, what is remote sensing?

2. What were some of the downsides of using pigeons for aerial photography and military reconnaissance?

3. What is the Montreal Protocol, and how did remote sensing technology assist in its development?
4. What 1986 event, uncovered by US and French remote sensing satellites, proved to have global consequences?

5. In addition to more satellites with remote sensing capabilities being launched into orbit, what three other technological advancements have allowed wider use of remotely sensed data?

6. As noted, remote sensing technology is being used for a range of issues. Drawing on the examples provided in this section, provide three examples of how you think remote sensing could be applied to regional issues in southern Arizona.


Part 2: The Science of Remote Sensing

7. What characteristic is the same for all forms of electromagnetic radiation?

8. Regarding the electromagnetic spectrum, what is the relationship between wavelength and energy level?
9. Look at the electromagnetic spectrum figure. Does visible light represent a large or small portion of the entire electromagnetic spectrum? What is the range of wavelengths (i.e., shortest to longest) of visible light? (use units!)

10. Consider two objects made of the same material, mass and volume but at different temperatures. Which one will emit a longer peak wavelength of energy?

11. What are the three things that may happen to electromagnetic energy when it encounters a surface or object?

12. What is the basic concept behind multi-spectral remote sensing?


Part 3: Remote Sensing Technology

13. What is the difference between passive and active remote sensing?
14. What is the difference between a radiometer and a spectroradiometer? Both are examples of what "class" of remote sensing instrument?

15. With respect to active remote sensing instruments, what is the difference between radar and lidar?

16. You are a scientist and need to collect two different sets of remotely sensed data. First, you want data on daily weather patterns for just Arizona. Second, you need data for the amount of ozone in the upper atmosphere for the entire globe. Which kind(s) of satellite, polar orbiting and/or geostationary, would satisfy these requirements?

That is the end of questions for Part 3: "Remote Sensing Technology". You may proceed to the Part 4: "Resolution and Pixels" web page.

Part 4: Resolution and Pixels

17. What is the relationship between pixel size and resolution?
18. Consider two remotely sensed images that cover the same 10km² area of Tucson. The first image has a resolution of 1 meter and the second image has a resolution of 10 meters. What is the area of each pixel for the 1-meter resolution image? What is the area for each pixel for the 10-meter resolution image? How many pixels in the first image can fit into one pixel in the second image?

19. What is the difference between spatial resolution and spectral resolution?

That is the end of questions for Part 4: “Resolution and Pixels”. Turn in your worksheets for all of Unit 7 Step 2 and initial and date the Assignment Check-In list at the front desk in the Biology Learning Center. Your instructor will grade the worksheets, and return them in a few days.