Problem Set #10 Light and the Carbon Cycle
Due Thursday February 27 A/B and Friday February 28 C/D

Name: Key

I worked with:

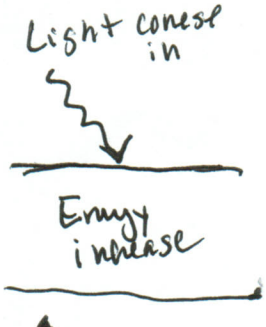
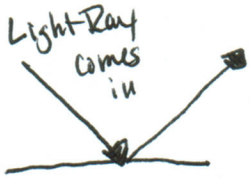
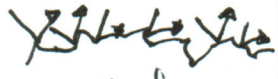
Equations:

Force:	F = ma
Force due to Gravity on Earth:	F = mg
Acceleration due to gravity on Earth:	g = 9.8 m/s^2
Work	W = F*d

Waves

Simplified Wave Equation	$x = Asin(\omega t)$
Angular Velocity to Frequency	$\omega = 2\pi f$

1. In the boxes below please use pictures AND words to describe the following ways that light interacts with materials.

Absorption	Reflection	Scattering	Transmission
 Material takes in energy increasing its internal Energy	 and bounces off surface if surface is smooth a spectular reflection.	surface scatter/ Diffuse Reflection  Rough surfaces Reflect Light Rays in different directions  Internal Scattering Light enters material and scatters off internal structures	and Refraction  Light Passes through a material and bends due to the differences in the speeds of the wave in the different materials

2. Find the frequency and Amplitude of the wave below and write the wave equation that describes its motion.

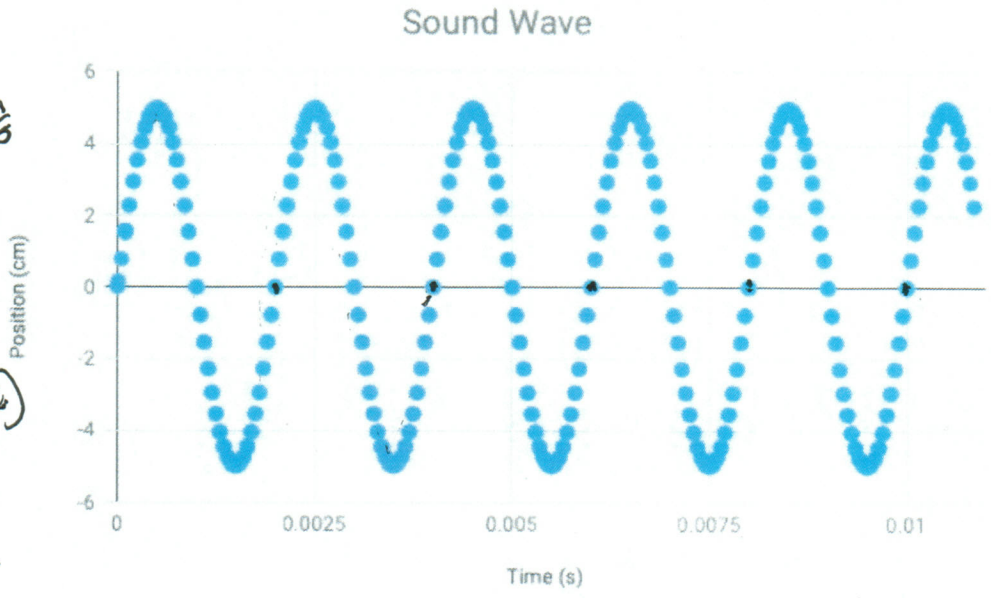
$A = 5$

$f = \frac{5 \text{ waves}}{0.01 s} = 500 \frac{1}{s}$

$\omega = 2\pi f = 2\pi \times 500$

$= 1000\pi$

$X = 5\sin(1000\pi t)$



3. Read the NASA Carbon Cycle article and Watch the Carbon Cycle video and answer the following questions:

- What new words, phrases, equations or ideas did you find? Provide a brief description of each here, if you don't know them look them up and record your findings.
- Where does the material that makes up a tree come from?
- How does the sun's energy become a lion?
- How does the sun's energy create fossil fuels?
- What are the ways that oxygen consuming organisms (such as humans and other animals) return carbon to the atmosphere?
- What do so-called greenhouse gases like Carbon Dioxide do in our atmosphere? Why is this a good thing? Why is it a bad thing?
- What have humans done to destabilize the Carbon Cycle how does this lead to climate change?