Science Study Guide #3
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PLEASE, DO NOT LOSE THIS STUDY GUIDE AND REMEMBER TO STILL STUDY YOUR NOTES! I DO NOT KNOW WHAT IS ON THE TEST AND ALL INFORMATION INSIDE IS INCLUDED BASED ON PURE SPECULATION. I AM NOT RESPONSIBLE FOR ANY INCORRECT OR MISINTERPRETED INFORMATION!

Waves
1. Sound
2. water
3. sine
4. heat
5. square
6. triangle
7. sawtooth
8. microwave
9. infrared
10. electromagnetic
11. AC current
12. FM radio
13. AM radio
14. Clock frequency
15. Gamma radiation
16. Light
17. Compression
18. transversal
19. X-Ray
20. Seismic
21. Visible light
22. Ultraviolet
23. Radar
24. Sonar
25. Cardiogram
26. Tidal

Light vs. Sound
- Light travels faster than sound
- You would witness the flash before the sound
  - Sonic boom
  - Bull whip
- Where's the worst place to be in a thunderstorm?
  - A tree

Path of Travel from the Sun

- Light comes in waves from the sun
- Light travels 300,000 km/sec
    - Therefore, the image you have of the Sun is 500 seconds (8.3 minutes) old
        - Thus, that image of the sun no longer exists!

Sunlight and Protection

- Skin cancer is the #1 cancer in Australia
    - Cancer is unregulated cell growth
- Sunlight affects the DNA (in the nucleus) of the skin cell
- Use sunscreen with a high SPF
- Protect your eyes from harmful UV light using glasses with UV protection

Sunlight and Protection

- Skin cells have a pigment chemical called melanin, which changes color to protect the skin from sun damage
    - A man from Ecuador would have more melanin in his skin than a Swiss woman
    - The climate of your environment determines the amount of melanin in your skin/eyes/hair

Plants and Sunlight

Plants have chlorophyll instead of melanin
Plants change color in the winter to conserve energy
As days get shorter, there is less available sunlight
Eventually the leaves will fall off to protect the trees from heavy snowfall
Pine trees have specialized needles which collect sunlight but don't catch as much snow

Glucose - The Fountain of Energy

- Glucose = C(6)H(12)O(6)
- Mass = 180 amu
- Composed of 24 atoms
- The source of energy for our solar system is the sun
- Humans eat to consume sugar
- This is stored in the form of ATP

Adenosine Triphosphate, ATP

- A = Adenosine
    - Made of 5 carbon sugar, ribose
- And Adenine, a base
    - TP = Triphosphate

(A)-(P)-(P)-(P) => [Enzymes] =>
(A)-(P)-(P) + (P) + ENERGY = APD + Inorganic Phosphate P(i)

- Thee third bond was broken because it's the easiest to break and produces the most energy
- All of this generation is occurring in the mitochondria
- More specifically, in the cristae
- This process is known as cellular respiration
- This is how the cell generates energy

Cellular Respiration

ATP <=> ADP + Pi + Energy

Enzyme is Reversible

- Plants go from right to left, animals go from left to right
- Breaking bonds (Catabolic reaction)
- Creating bonds (Anabolic)
- Breaking and forming bonds = metabolism
- Plants (producers) obtain energy from the sun
- Animals (consumers) obtain energy from food
- Autotrophs - Make their own food
  - Auto - Self
- Heterotrophs - Consume food
- Humans are heterotrophs and animals
- Chemical change vs physical change
  - Burning tortilla = both
  - Tearing paper = Physical