	A	B	C	D	E	F
1	**BHR ATOM MODEL: Hydrogen**		**Research question:**	What happens when an electron moves fr		
2			**Answer:**	"Light" happens. But can you see it?		
3	**Constants**					
4	Speed of light (c) =	2.99E+08	m/sec			
5	Ryberg constant (R) =	-2.18E-18	J			
6	Planck's constant (h) =	6.63E-34	J•sec			
7						
8	Initial n =	3	4	5	6	7
9	Final n=	2	2	2	2	2
10	Initial E (J)=	-2.42E-19	-1.36E-19	-8.72E-20	-6.05E-20	-4.45E-20
11	Final E (J)=	-5.45E-19	-5.45E-19	-5.45E-19	-5.45E-19	-5.45E-19
12	ΔE (J) =	3.02639E-19	4.08563E-19	4.5759E-19	4.8422E-19	5.003E-19
13	Frequency (v, /sec) =	4.56E+14	6.16E+14	6.90E+14	7.30E+14	7.55E+14
14	Wavelength (lambda) (nm) =	655	485	433	409	396
15	**What light do you "see"?**	Red	Blue	Violet	Violet	Violet
16						
17						
18	**Electromagnetic Spectrum**					
19						
20	**Wavelength Range (nm)**	**Color**				
21						
22	185-380	Ultraviolet				
23	380-450	Violet				
24	450-495	Blue				
25	495-550	Green				
26	550-570	Yellow-Green				
27	570-590	Yellow				
28	590-620	Orange				
29	620-750	Red				
30	750-2500	Near Infrared				
31						
32	G:	Gamma				
33	X:	X-ray				
34	U:	Ultraviolet (UV)				
35	V:	Visible	"ROYG			
36	I:	Infrared				
37	M:	Microwave				
38	R:	Radiowave				
39						
40						
41						

$$E = \frac{R}{n^2}$$

$$\Delta E = \text{Abs}\left(E_{final} - E_{initial}\right)$$

$$v = \frac{\Delta E}{h}$$

$$\lambda = \frac{c}{v}$$

THE ELECTROMAGNET

	G	H	I	J	K
1					
2					
3					
4					
5		$n = 3$			
6					
7					
8		$n = 2$			
9					
10		$n = 1$			
11					
12		+Ze	$\Delta E = h\nu$		
13					

ELECTROMAGNETIC SPECTRUM

10^{-5} 10^{-6} 10^{-7} 10^{-8} 10^{-9} 10^{-10} 10^{-11} 10^{-12} shorter

Cell Bacteria Virus Protein Water Molecule

INFRARED VISIBLE ULTRAVIOLET "HARD" X RAYS "SOFT" X RAYS GAMMA RAYS

People Light Bulb The ALS X-Ray Machines Radioactive Elements

10^{13} 10^{14} 10^{15} 10^{16} 10^{17} 10^{18} 10^{19} 10^{20} higher

10^{-1} 1 10^{1} 10^{2} 10^{3} 10^{4} 10^{5} 10^{6}