

Stars Through Light and Color

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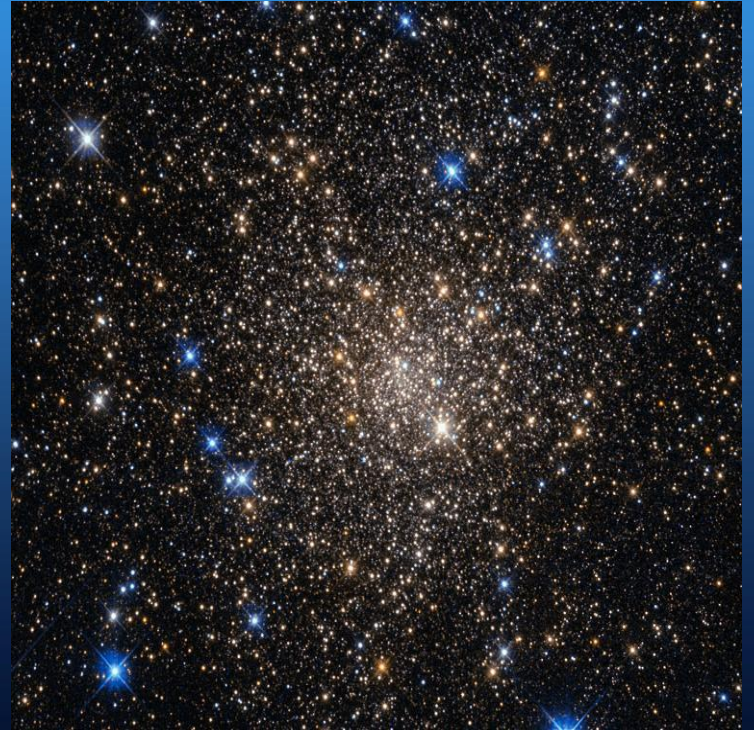


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Introduction

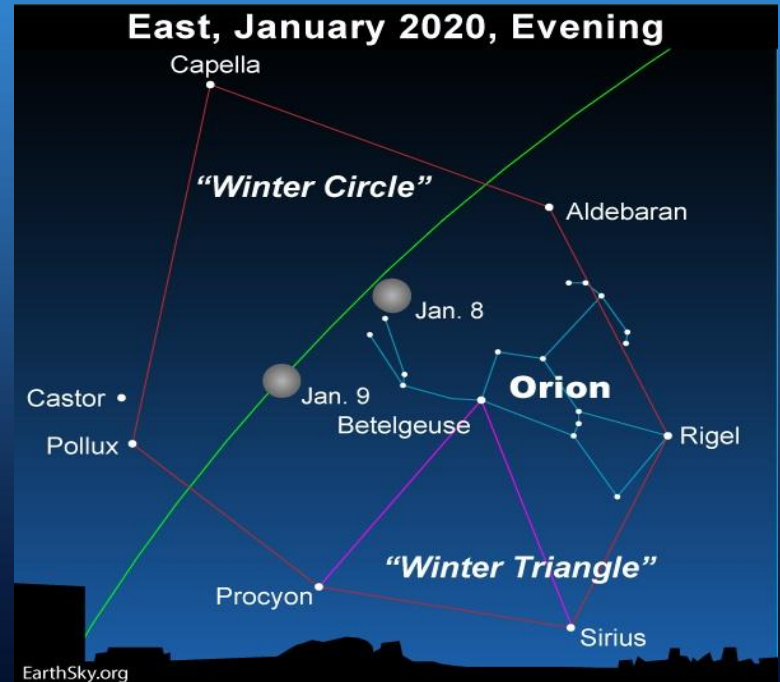
- Star- an astronomical object consisting of a luminous spheroid of plasma held together by its own gravity.
- Light- electromagnetic radiation that can be detected by the human eye.







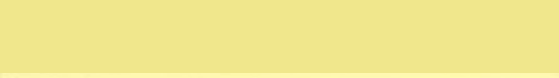



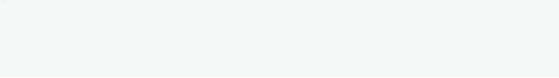

Observing the Stars

Google Sky Map

TEMPRATURE	COLOR	STAR
11000k	White	Rigel
9940k	Blue	Sirius
6530k	Yellow	Procyon
3590k	Red	Betelgeuse
3910k	Orange	Aldebaran
4970k	Yellow	Capella



First Experiment

Color	Electrical voltage
	0.5v
	0.7v
	0.9v
	1.1v
	1.3v
	1.5v
	1.7v
	1.9v
	2.1v
	2.3v



0.5v



0.7v



0.9v



1.1v



1.3v



1.5v



1.7v



1.9v



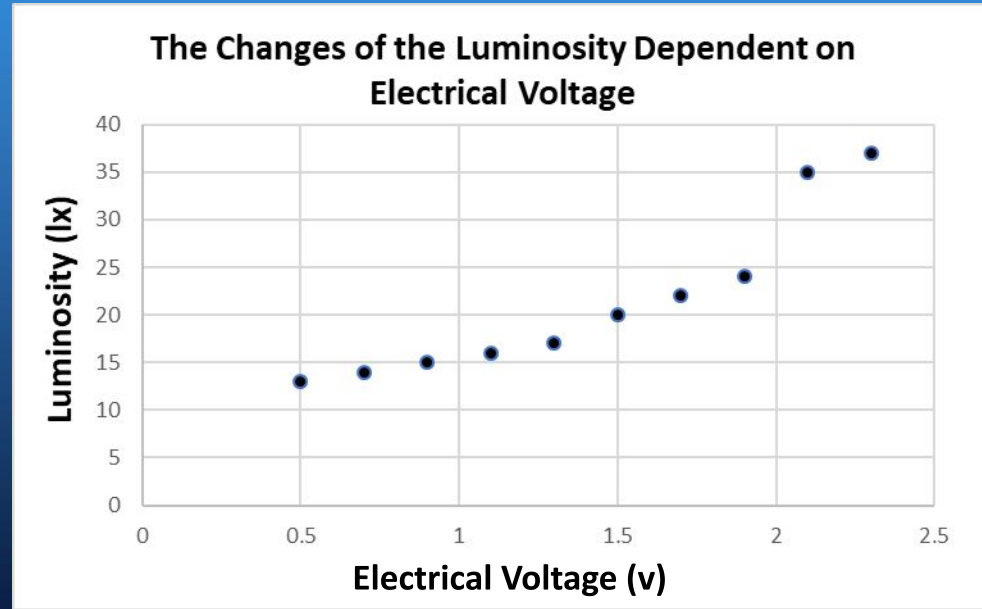
2.1v



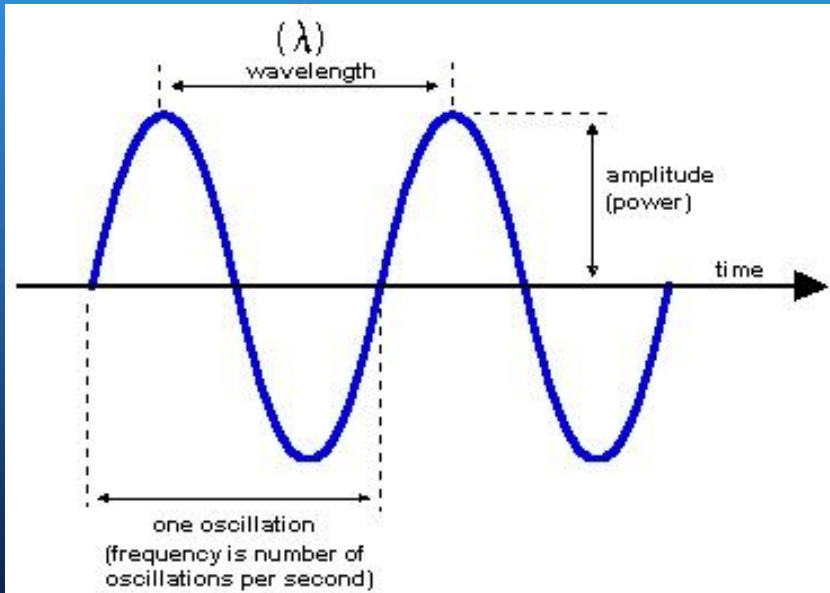
2.3v

Electrical Voltage Effect on Luminosity

Electrical Voltage	Luminosity
0.5 v	13 lx
0.7 v	14 lx
0.9 v	15 lx
1.1 v	16 lx
1.3 v	17 lx
1.5 v	20 lx
1.7 v	22 lx
1.9 v	24 lx
2.1 v	35 lx
2.3 v	37 lx



Waves and Wavelength

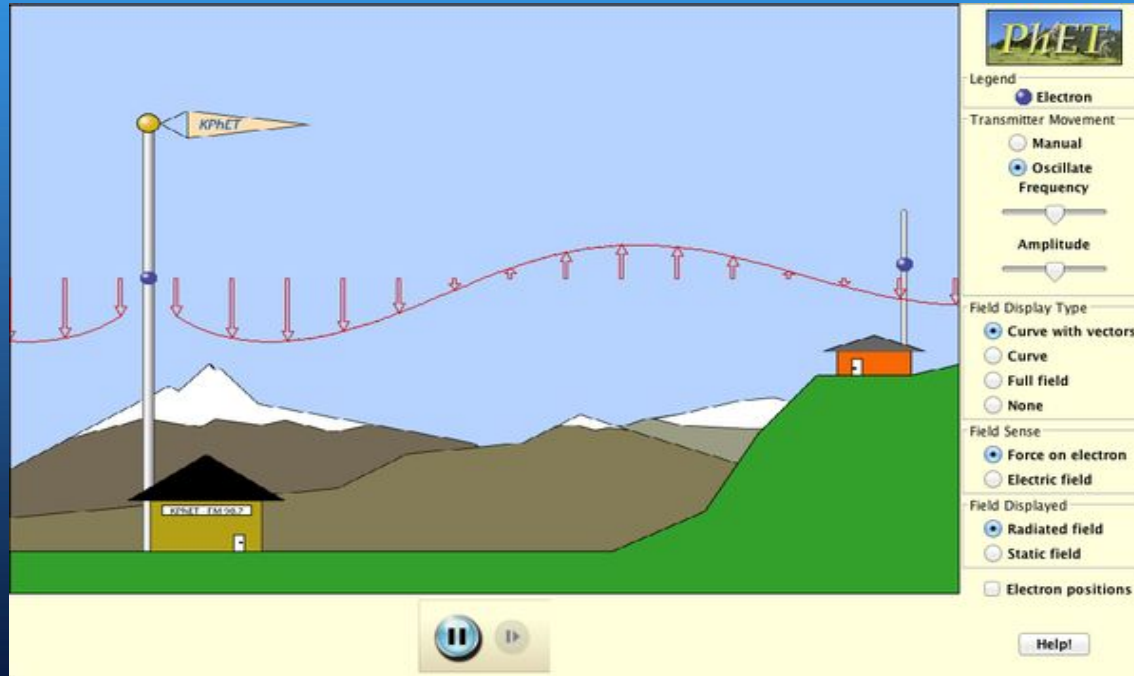


Wave- propagation of disturbances from place to place in a regular and organized way

Amplitude- the maximum displacement or distance moved by a point on a vibrating body or wave measured from its equilibrium position.

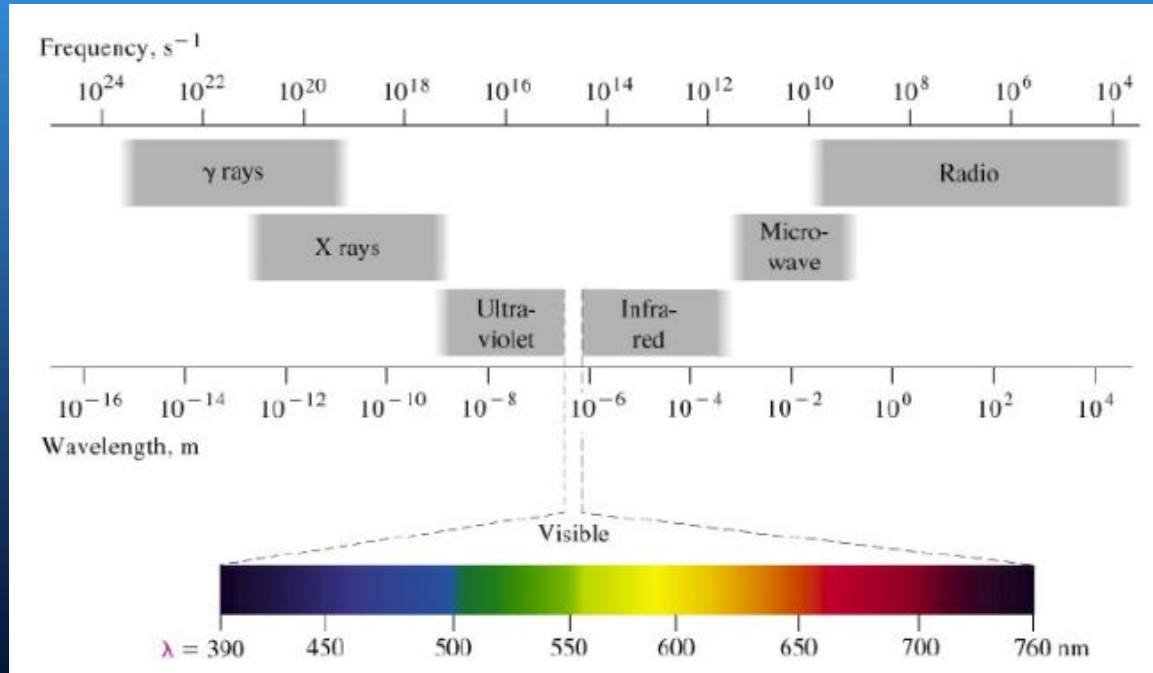
Wavelength- distance between corresponding points of two consecutive waves.

Electromagnetic Waves



□ <https://phet.colorado.edu/en/simulation/legacy/radio-waves>

Spectrum



Spectrum- the arrangement according to wavelength of visible, ultraviolet, and infrared light.

color	wavelength Interval
red	~ 630–700 nm
orange	~ 590–630 nm
yellow	~ 560–590 nm
green	~ 490–560 nm
blue	~ 450–490 nm
violet	~ 400–450 nm

Second Experiment



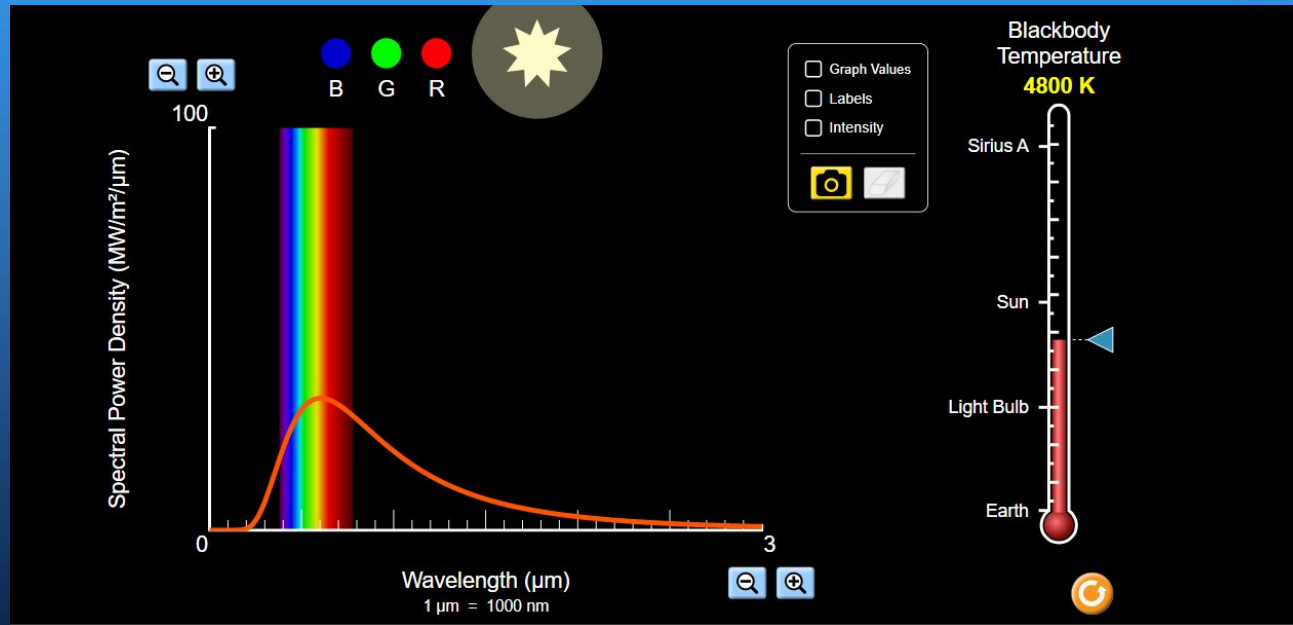
Second Experiment *(Continue)*



Second Experiment *(Continue)*



Blackbody Spectrum



□ https://phet.colorado.edu/sims/html/blackbody-spectrum/latest/blackbody-spectrum_en.html

Conclusion



The amount of LIGHT produced by an object at EACH WAVELENGTH depends on the TEMPERATURE of the object producing the light.

- ☐ Stars cooler than the sun put out most of their light in the red and infrared regions of the spectrum.
- ☐ Stars hotter than the sun put out most of their light in the blue and ultraviolet regions of the spectrum.



- How to measure a wavelength by using a spectrometer?
- How are wavelength and temperature related?