



Wing-Chi Poon - self-made; at Jasper National Park, Alberta, Canada (along Yellowhead Highway 16 between intersection to Malign Valley Road and intersection to Snaring River Campground, overlooking Colin Range in the south).

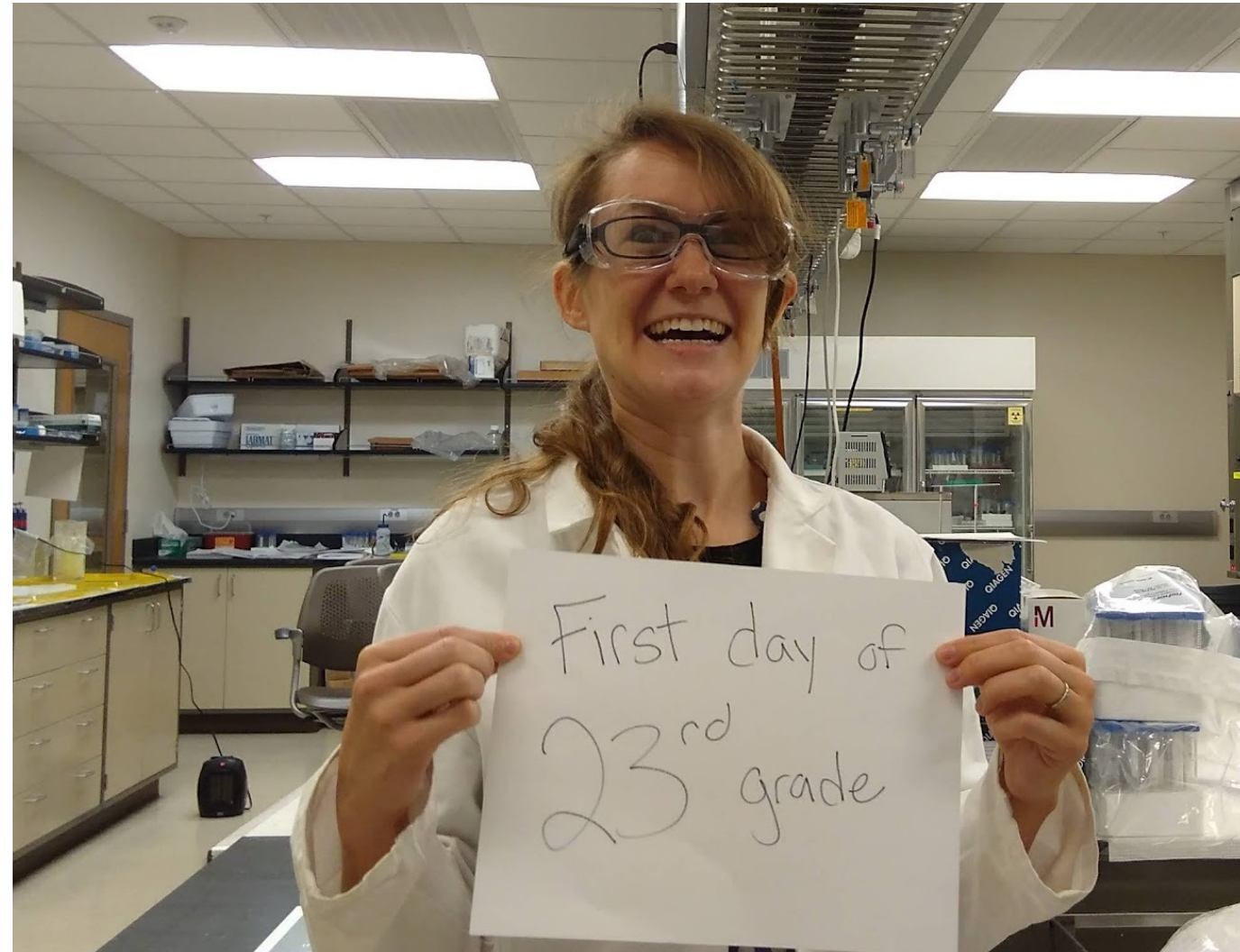
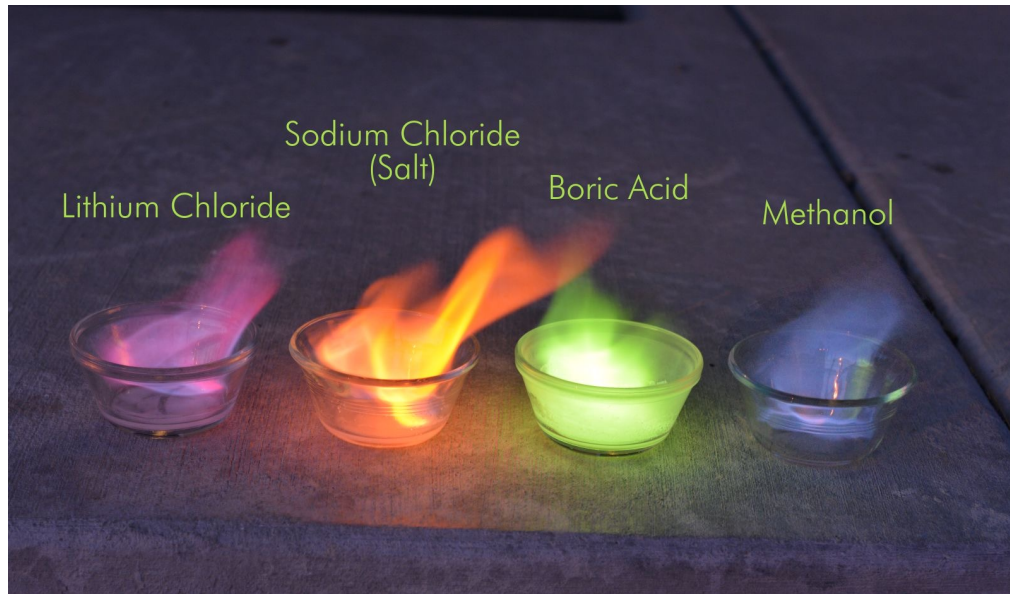
Light from the Sun

Megan Browning



About me!




I'm a doctor.

Started in science
with burning things.

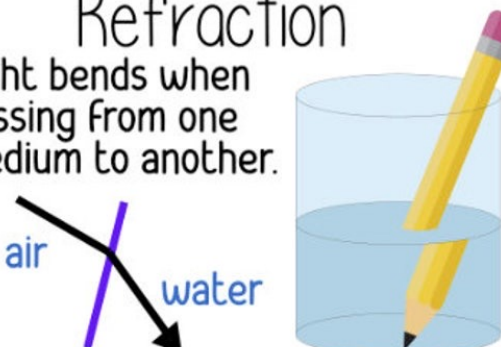


LIGHT ENERGY

Artificial Light  Natural Light 


MEDIUM =  SOLID,  LIQUID,  GAS

Refraction
Light bends when passing from one medium to another.



air water

Absorbs
Light goes into & stops.



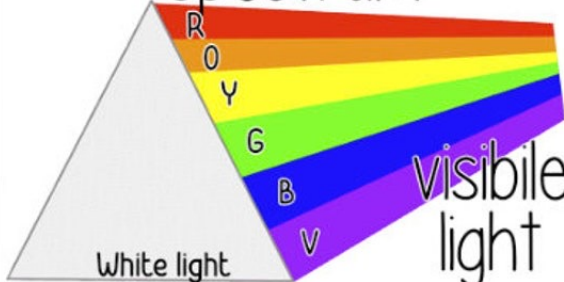
dark colors

Light travels in a straight line



Until it strikes an object or travels from one medium to another.

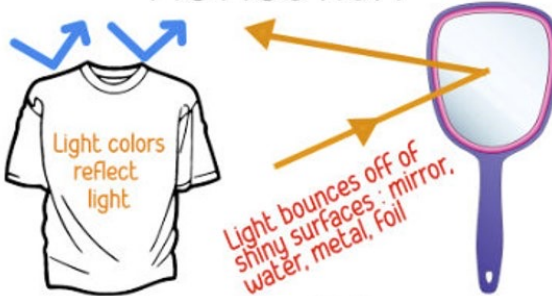
Electromagnetic Spectrum



White light

visible light

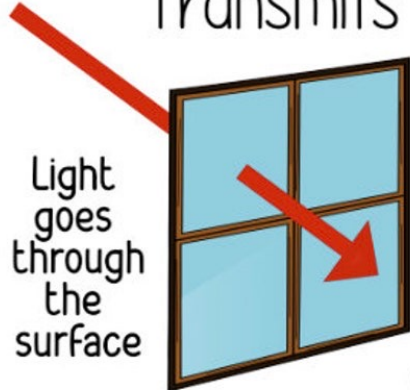
Reflection
Light bounces off the surface and changes direction.



Light colors reflect light

Light bounces off of shiny surfaces: mirror, water, metal, foil

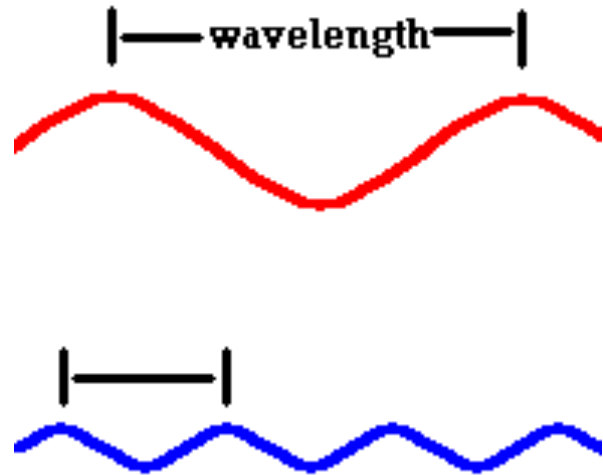
Transmits
Light goes through the surface



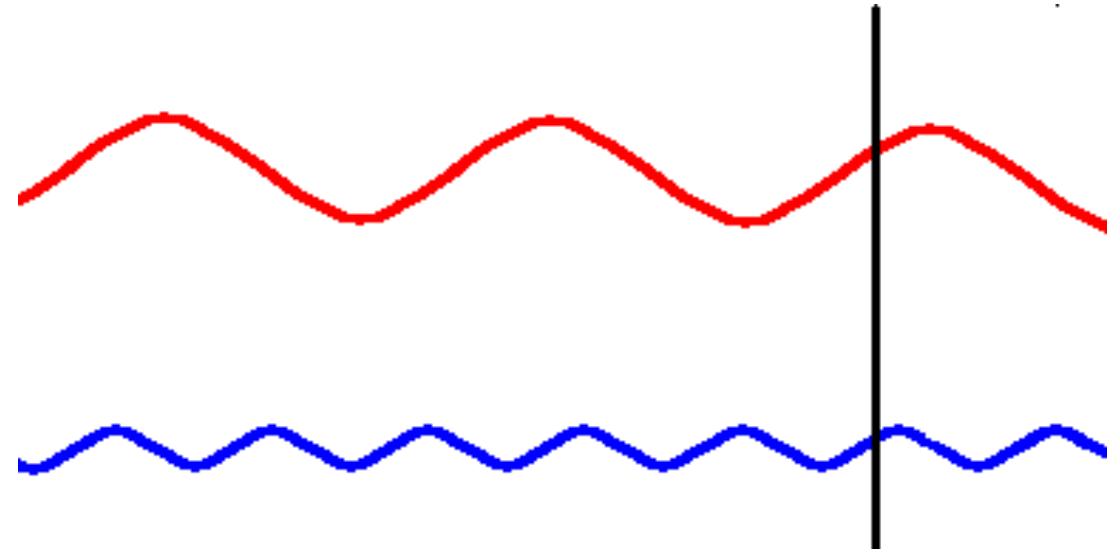
glasses plastic windows

Light is a wave

Wavelength






Frequency



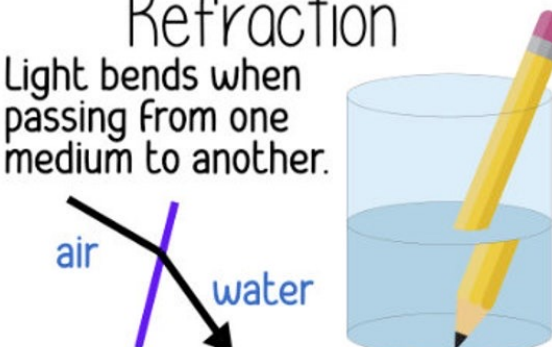
Time (s)

LIGHT ENERGY


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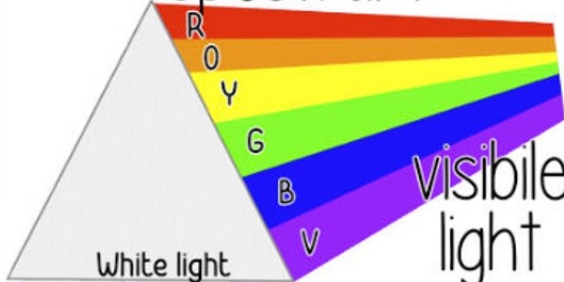


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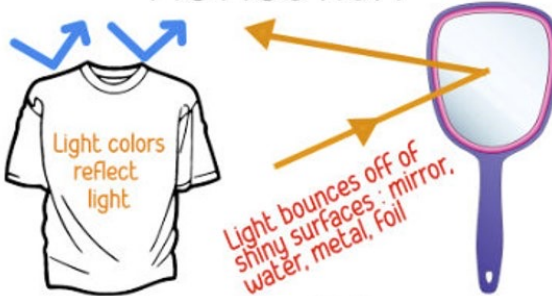


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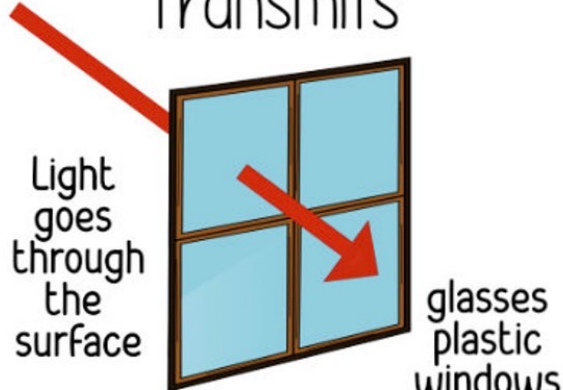
Electromagnetic Spectrum



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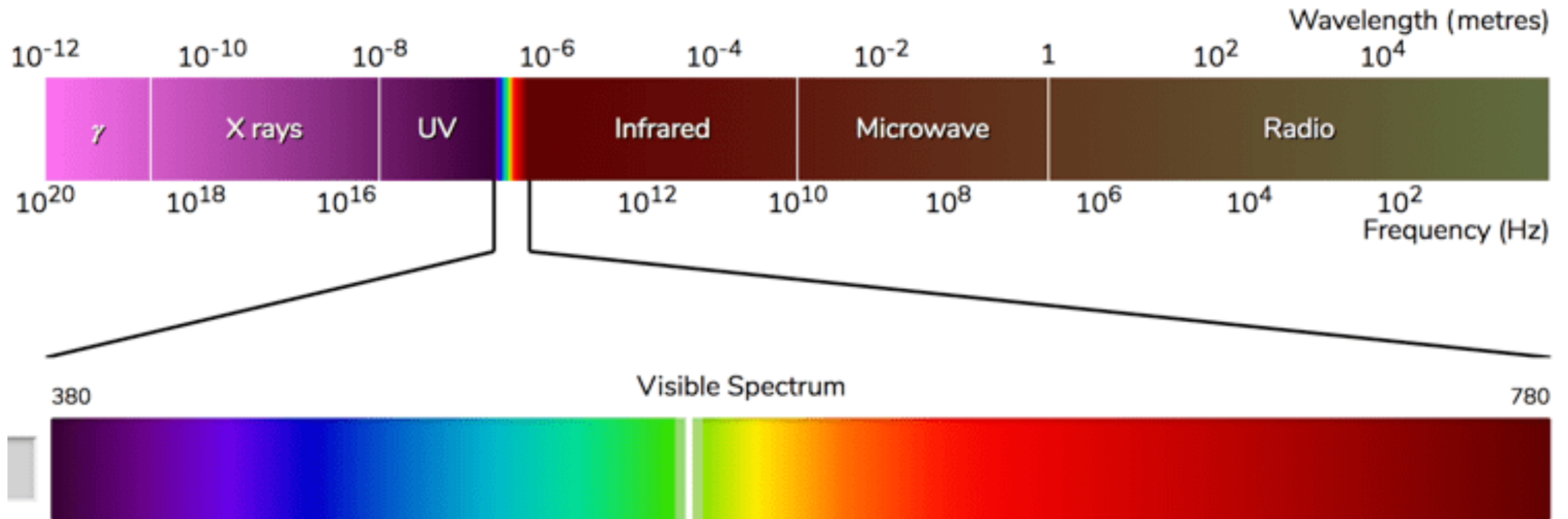


Transmits
 Light goes through the surface



Electromagnetic spectrum

Electromagnetic Spectrum



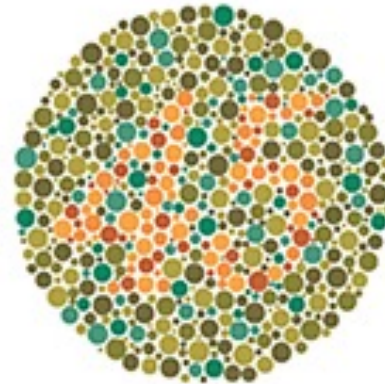
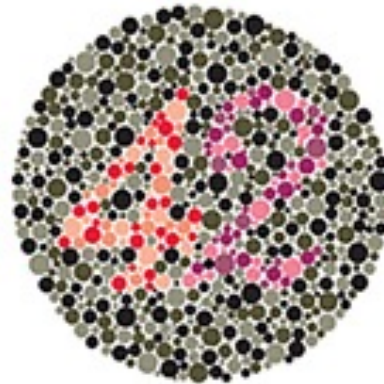
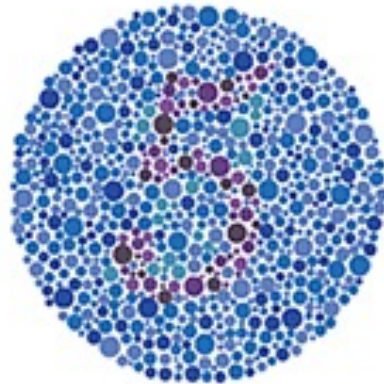
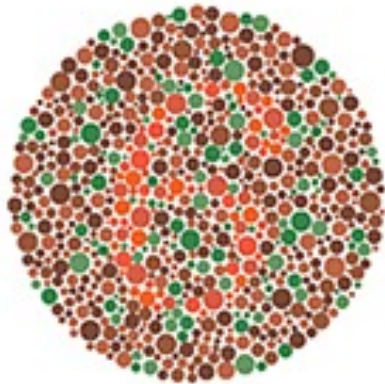
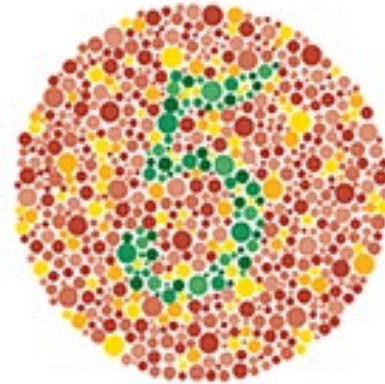
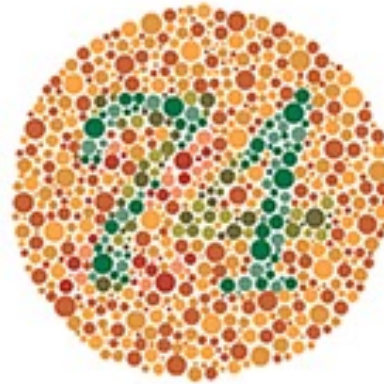
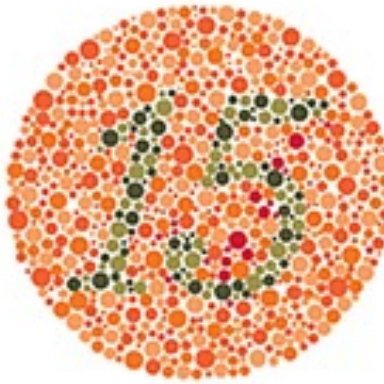
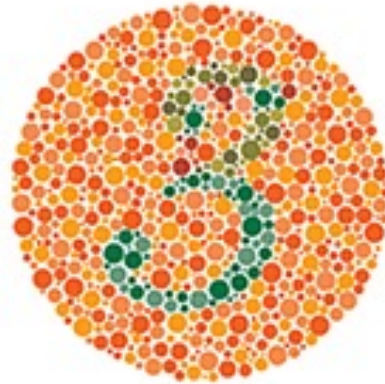
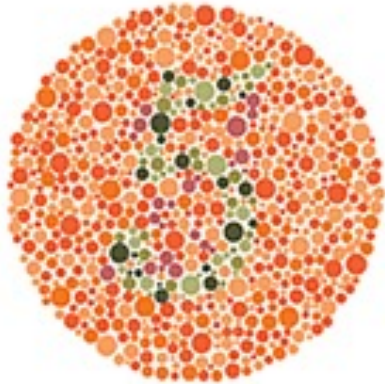
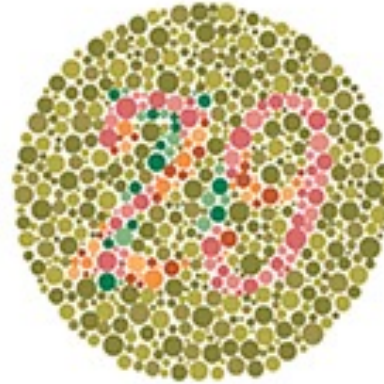
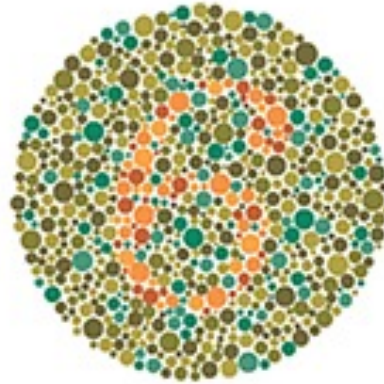
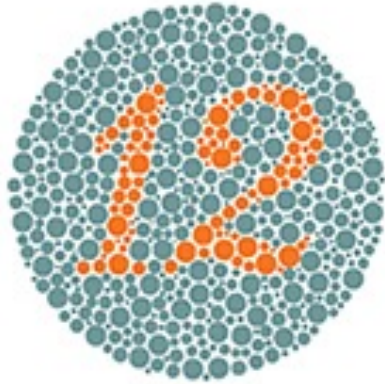


Human vision
(R+G+B)


UV vision



Simulated bee
vision (UV+G+B)

Simulated bird vision
(UV+R+G+B)




LIGHT ENERGY

Artificial Light  Natural Light 

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Refraction
Light bends when passing from one medium to another.

air water




Absorbs
Light goes into & stops.

dark colors



Light travels in a straight line

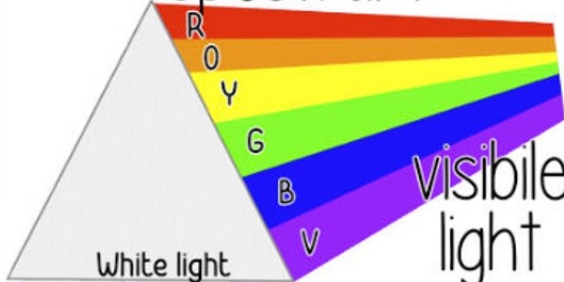


Until it strikes an object or travels from one medium to another.

Electromagnetic Spectrum

White light

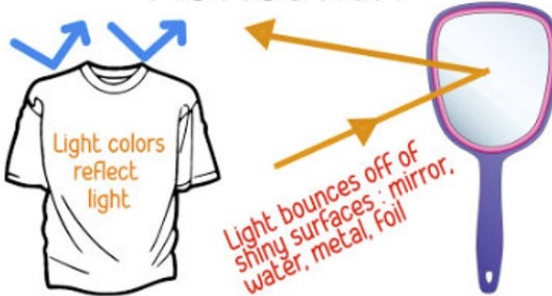
Visible light



Reflection
Light bounces off the surface and changes direction.

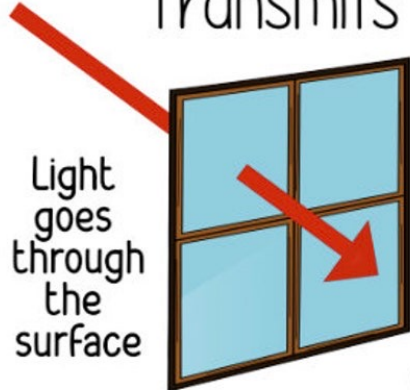
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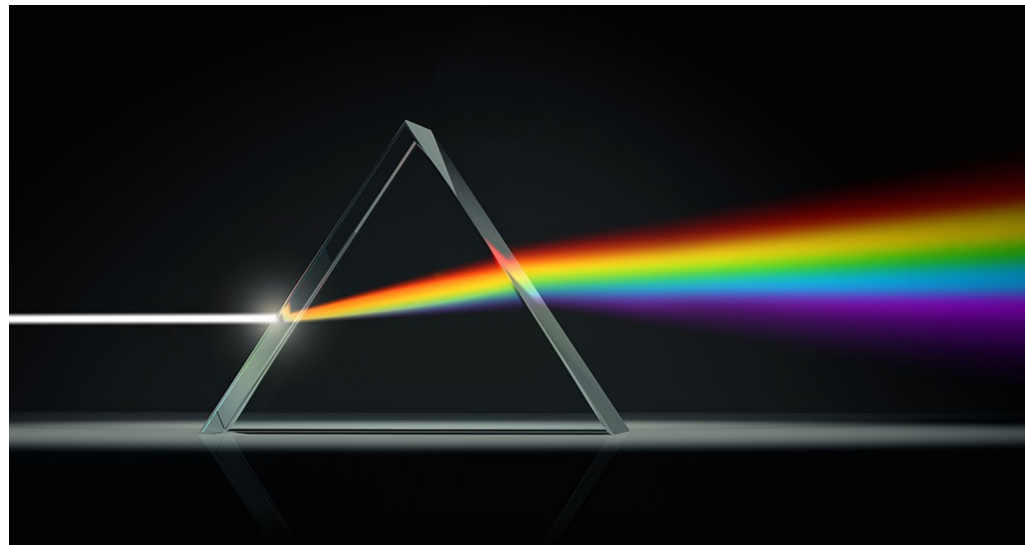
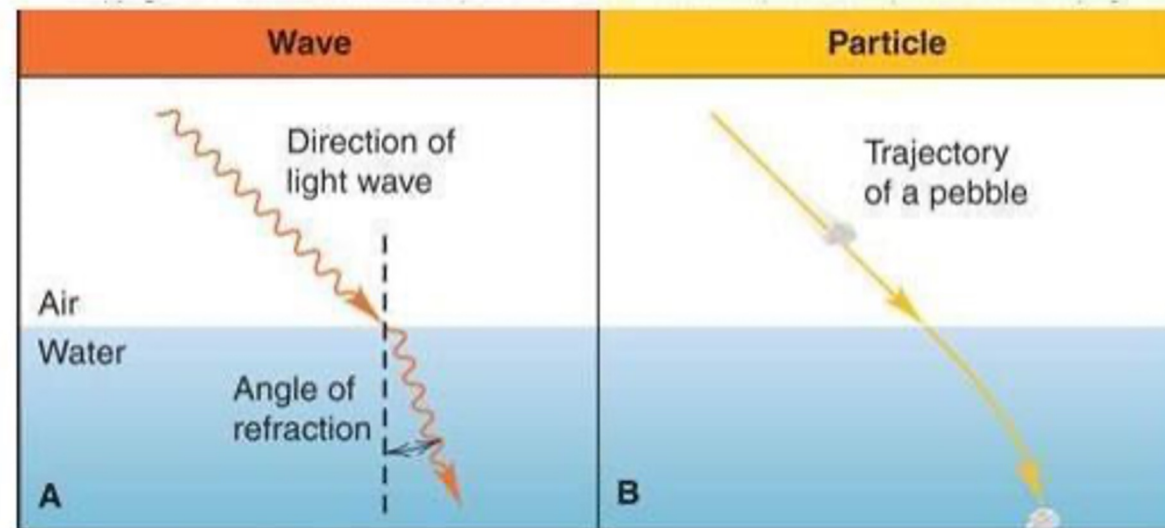


Transmits
Light goes through the surface

glasses plastic windows



Refraction

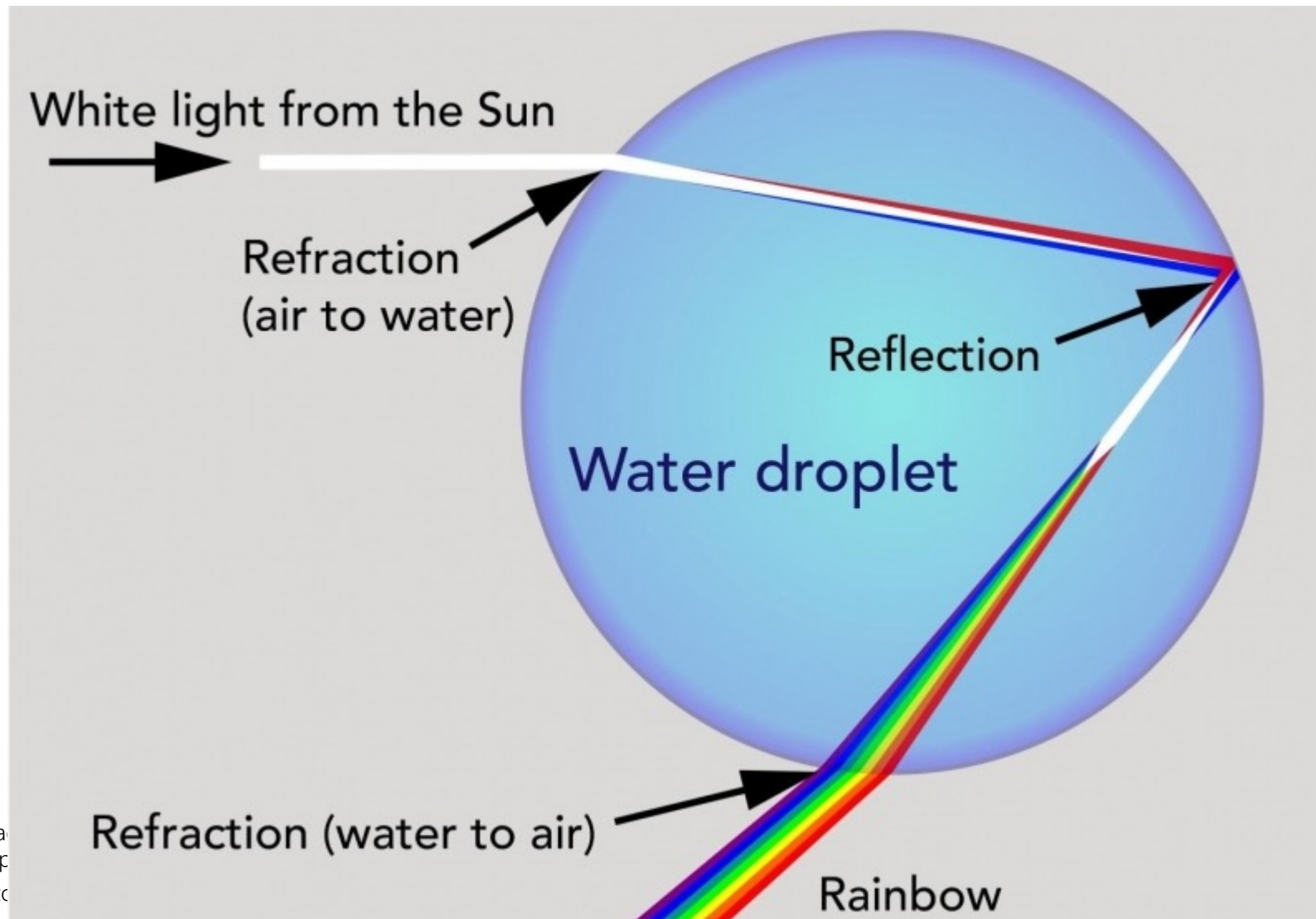


courtesy [imagine.gsfc.nasa.gov/
Images/people/Huygens.gif](http://imagine.gsfc.nasa.gov/Images/people/Huygens.gif)

A. Dagli Orti/©De Agostini Editore/age fotostock

courtesy
[http://microgravity.msfc.nasa.gov/education/
on/WhatIsMicrogravity/WhatMicro.htm](http://microgravity.msfc.nasa.gov/education/WhatIsMicrogravity/WhatMicro.htm)

Rainbows!



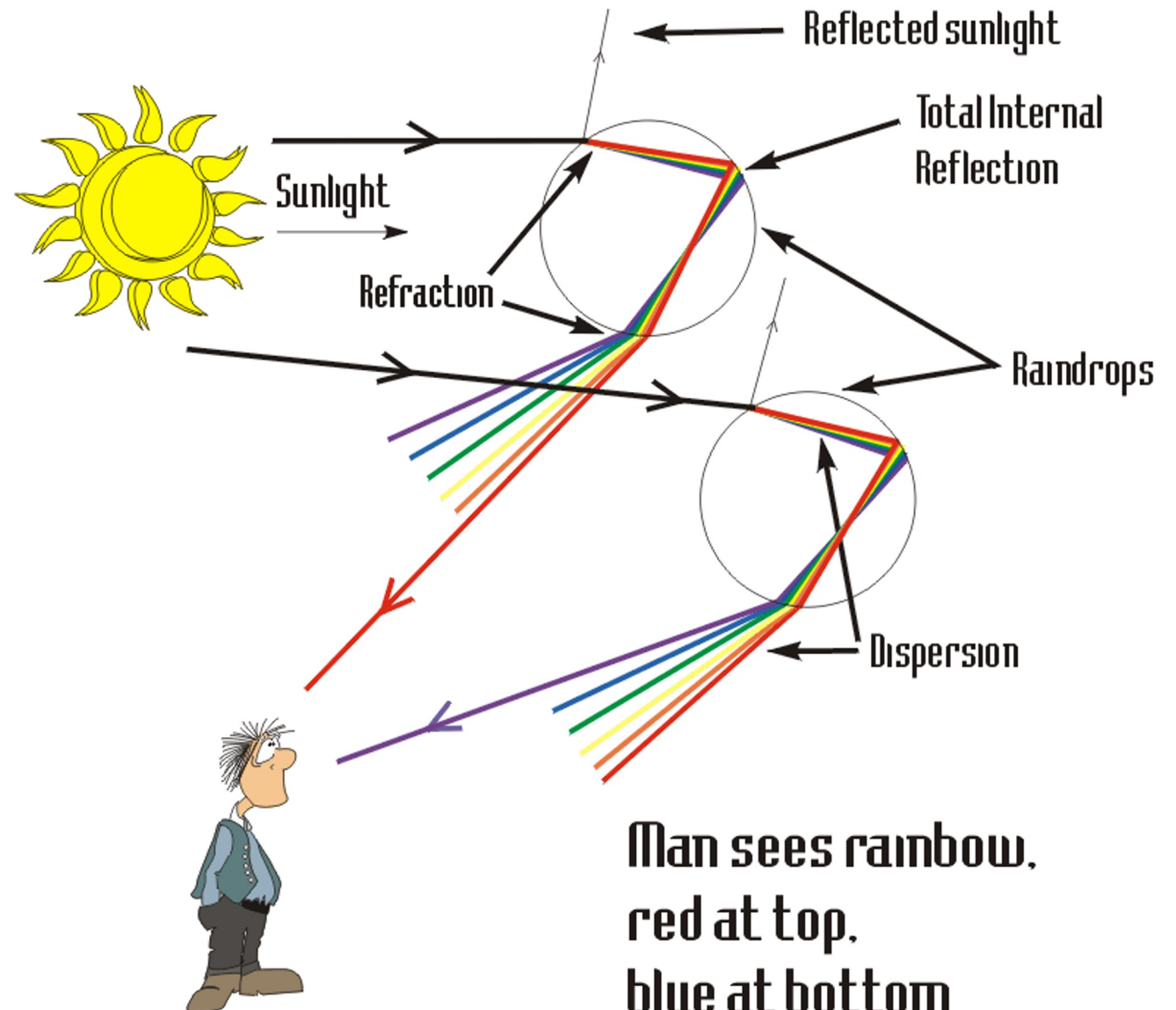
courtesy ima
Images/peop

A. Dagli Orti/©De Agostini Editc


sy
microgravity.msfc.nasa.gov/educati
natisMicrogravity/WhatMicro.htm



Rainbows

1. Light strikes a raindrop
2. Some light is reflected
3. The rest is refracted
 - a. Spectrum
4. Light is reflected at the rear of the drop
5. Light is refracted again
6. Colors are dispersed

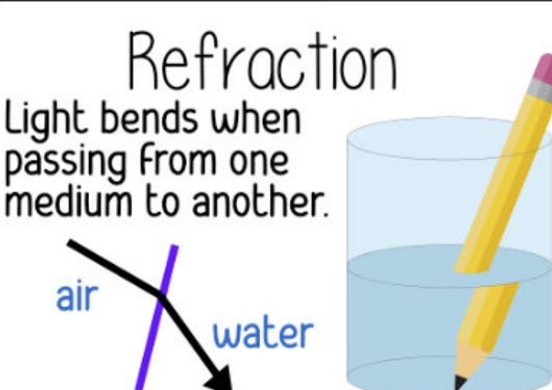


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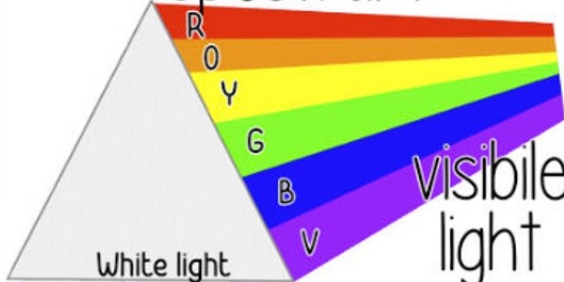


Light travels in a straight line

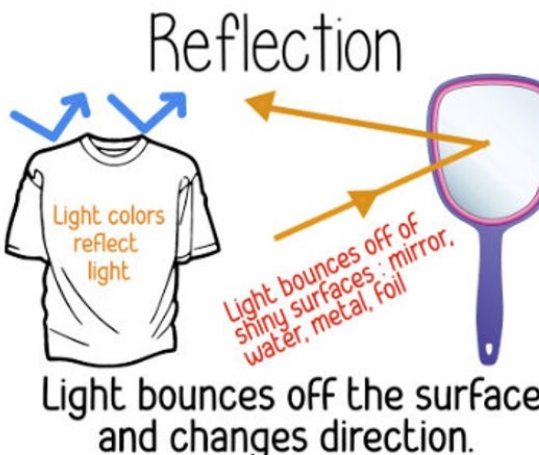


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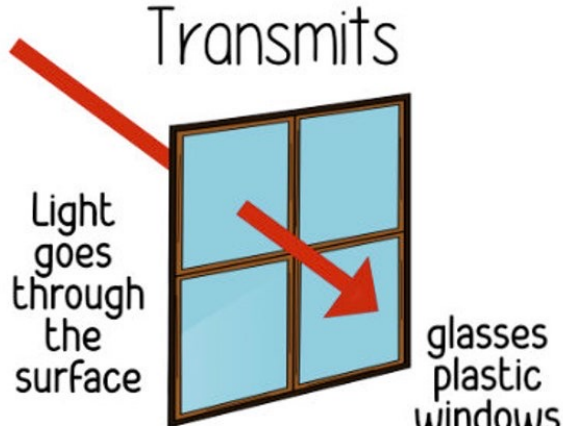
Electromagnetic Spectrum



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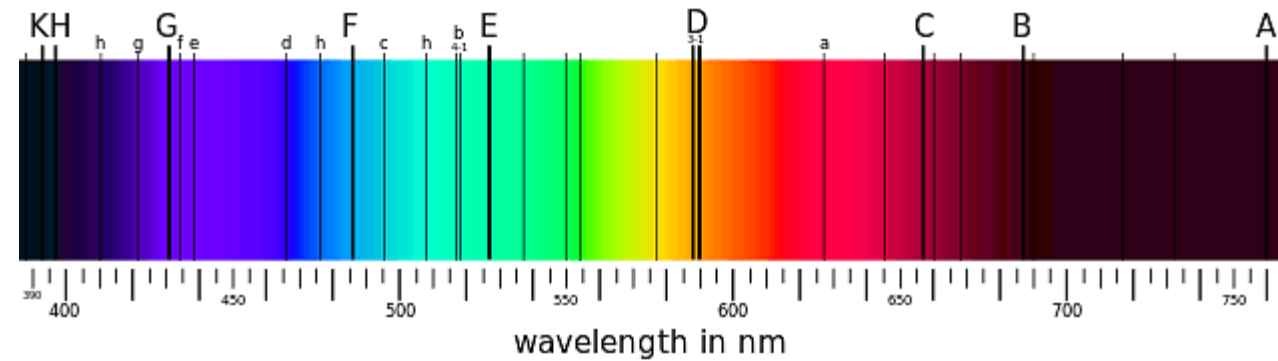
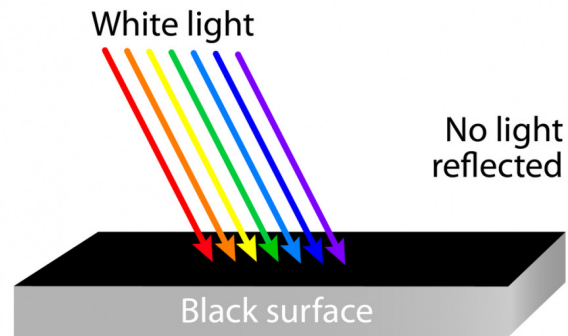


Transmits
Light goes through the surface

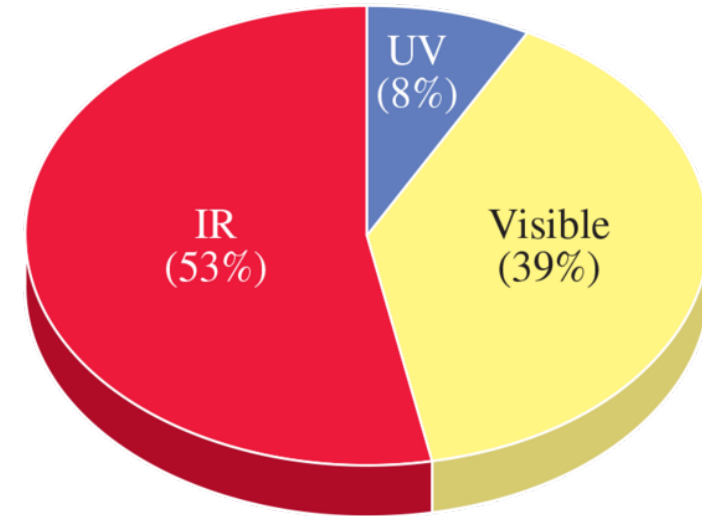
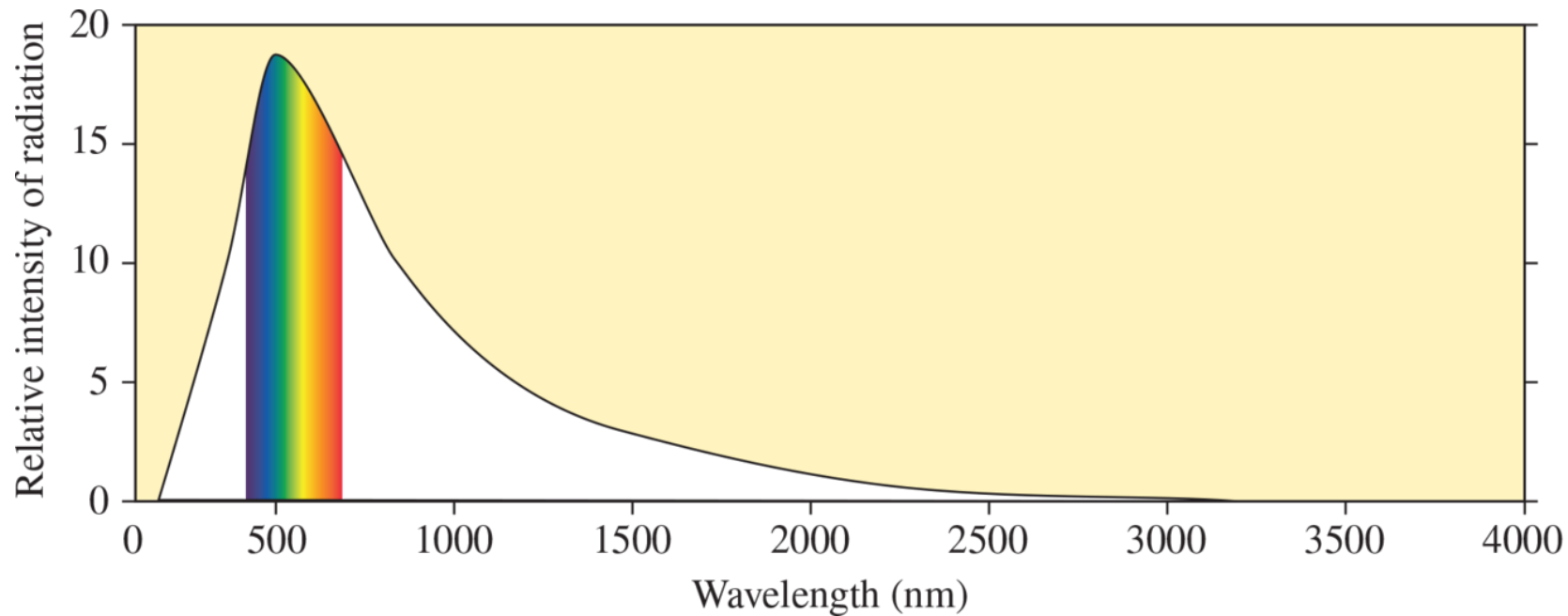


Absorption

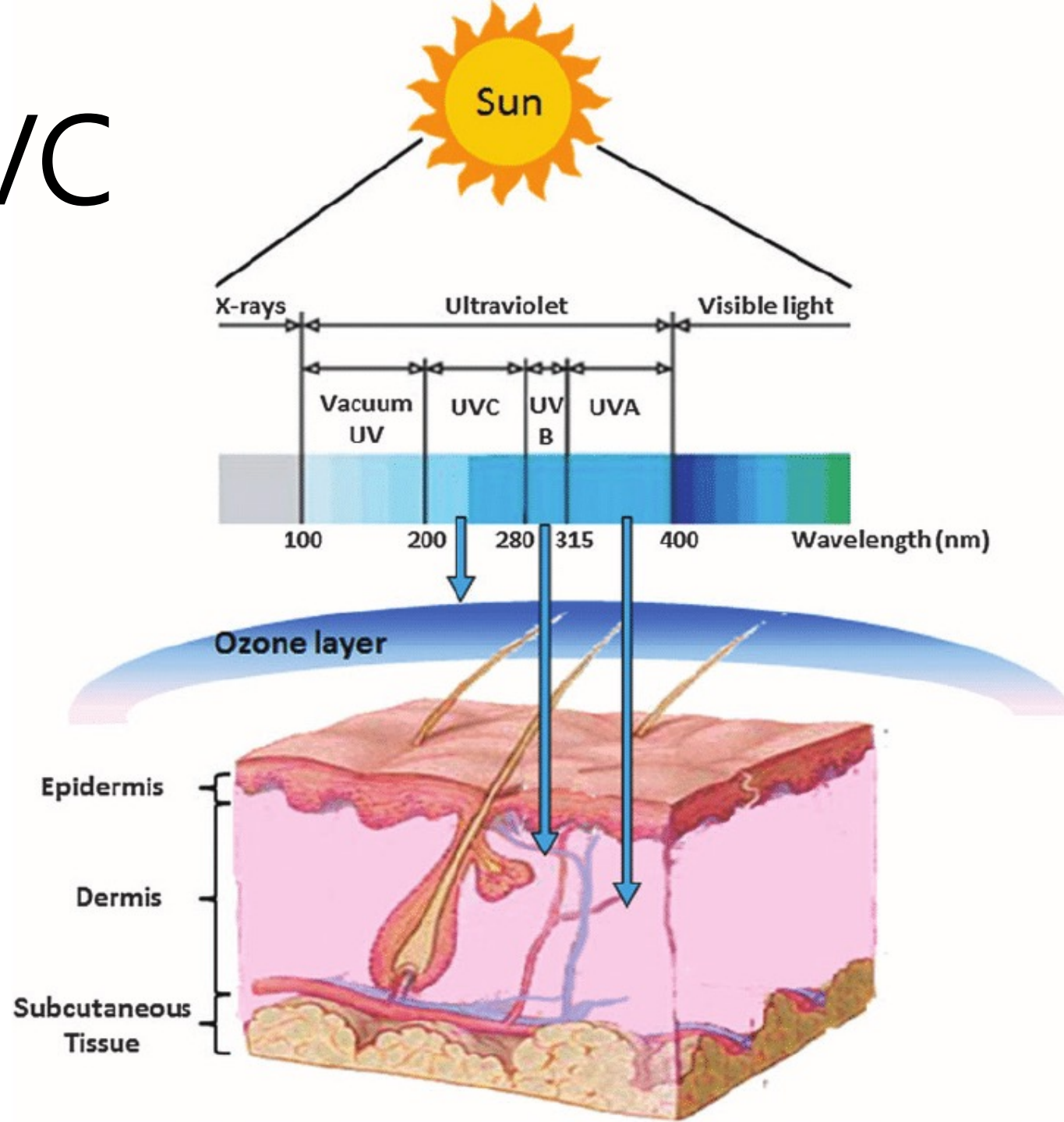
- Regular



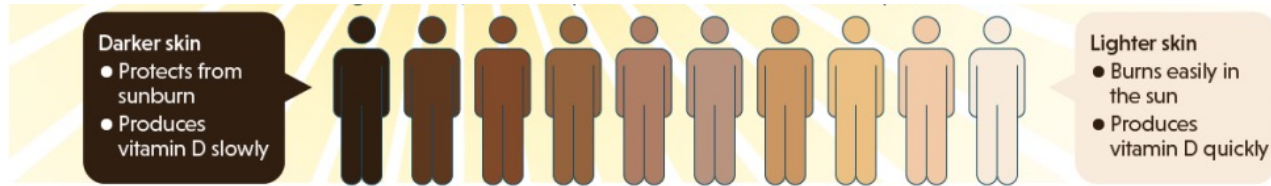
Light from the sun



UVA, UVB, UVC



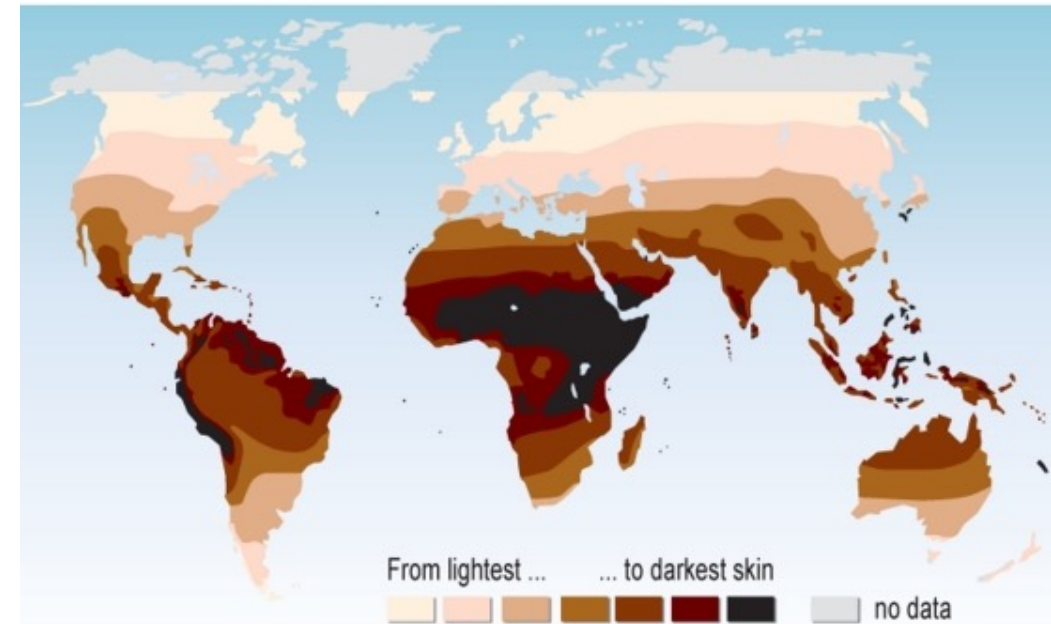
Why is there a spectrum of skin colors?



Sunscreen and sunglasses are awesome

Don't go tanning

Vitamin D supplements

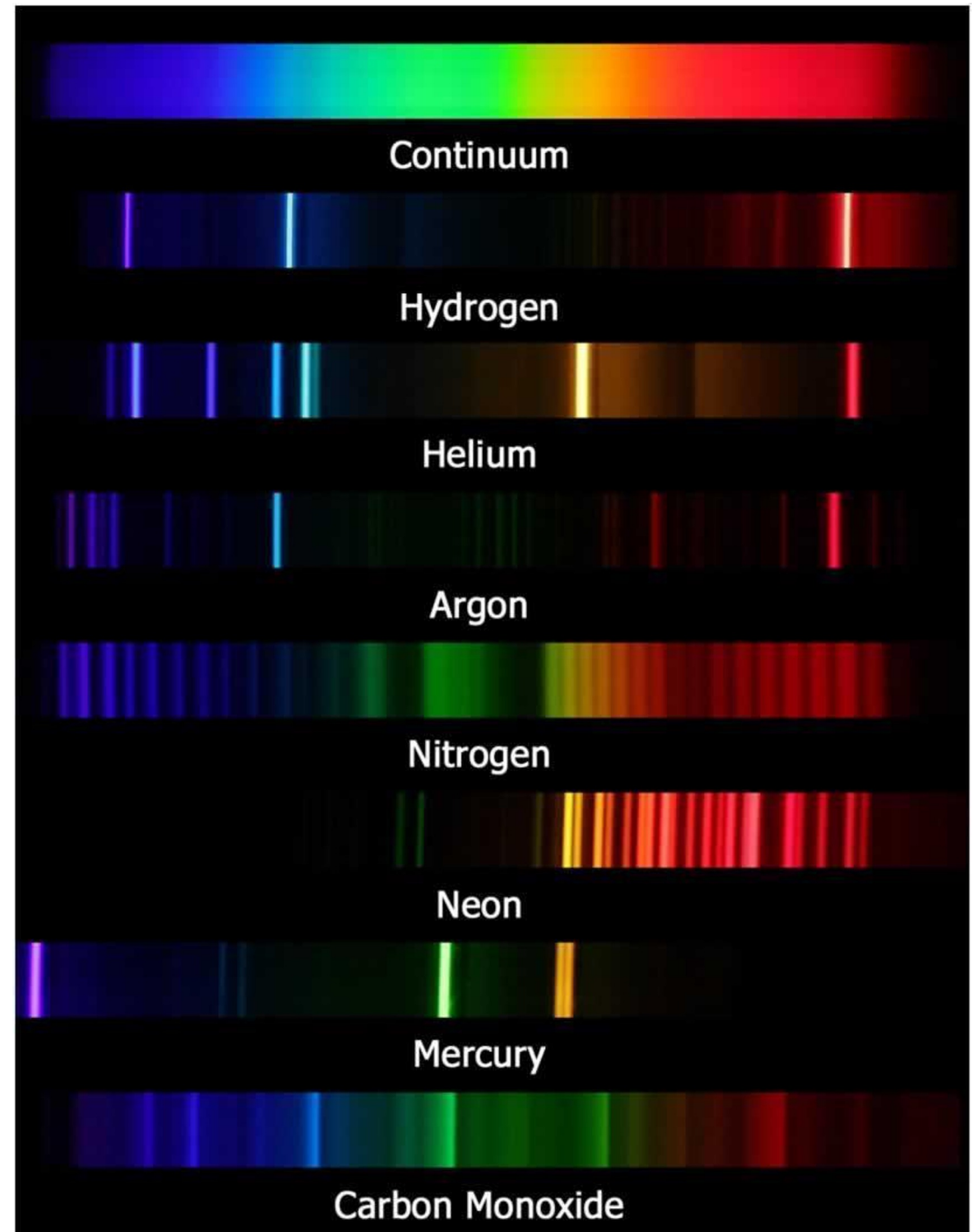


Source: Chaplin G.®, *Geographic Distribution of Environmental Factors Influencing Human Skin Coloration*, *American Journal of Physical Anthropology* 125:292–302, 2004; map updated in 2007.

Line spectrum

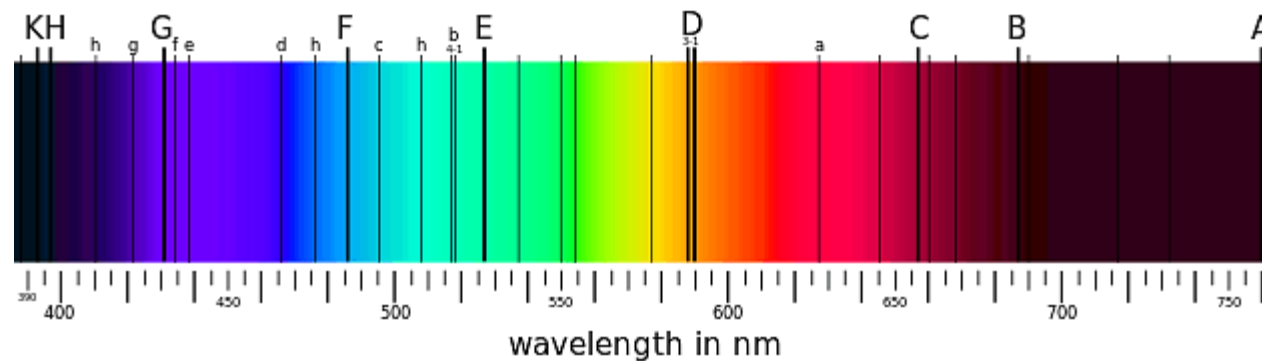
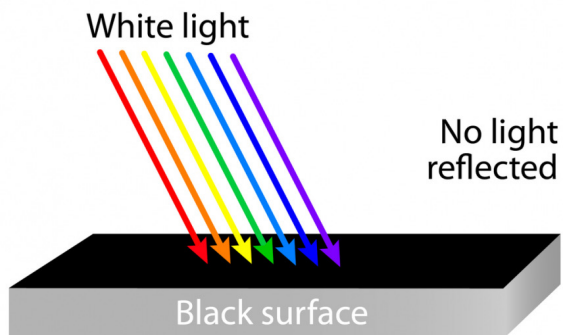
Used to determine the components of stars.

How they discovered Helium!

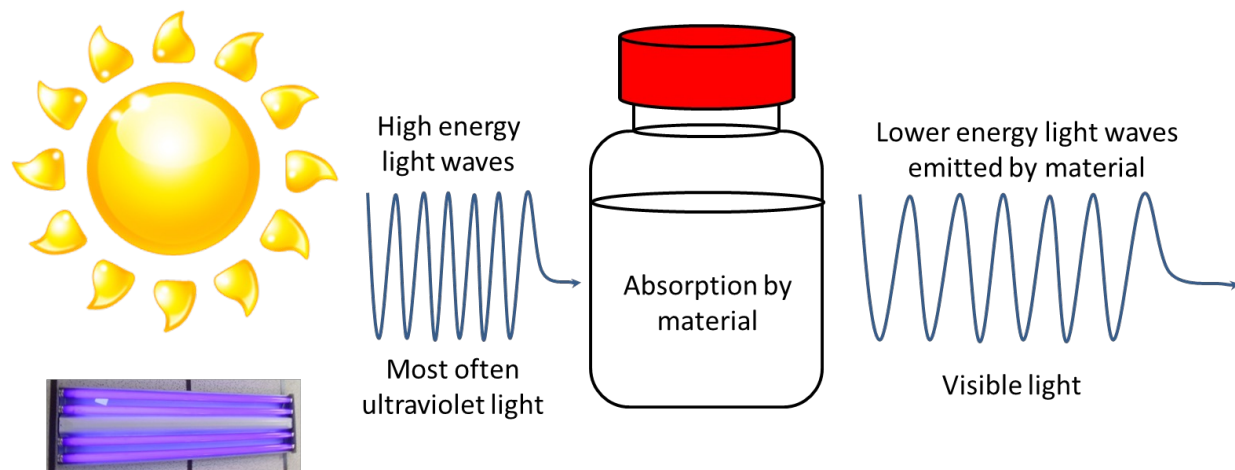


Absorption

- Regular



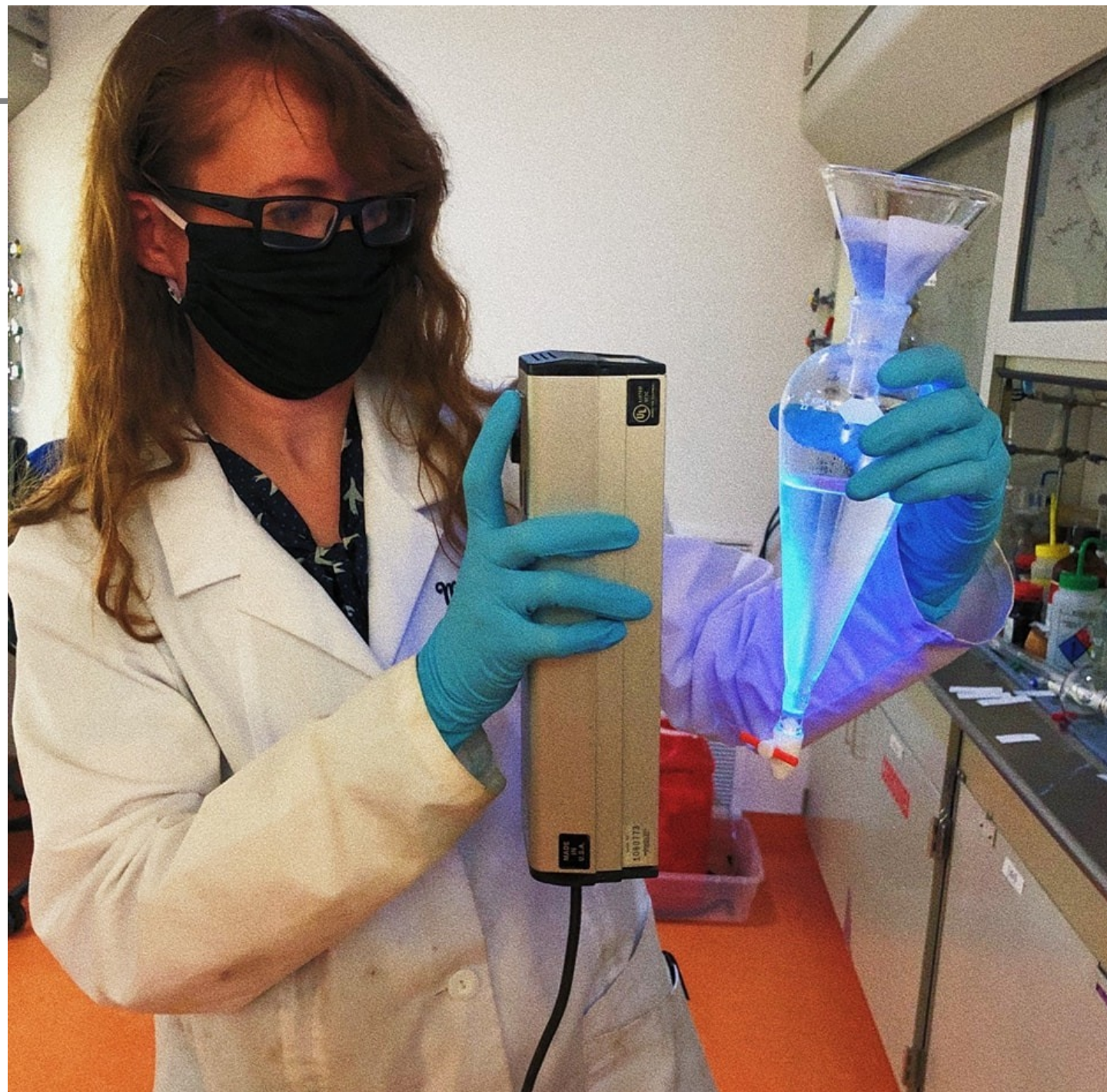
- Fluorescence!




- Phosphorescence!



My lab

- We use fluorescent tools all the time!
- Come on a virtual tour with us next month!

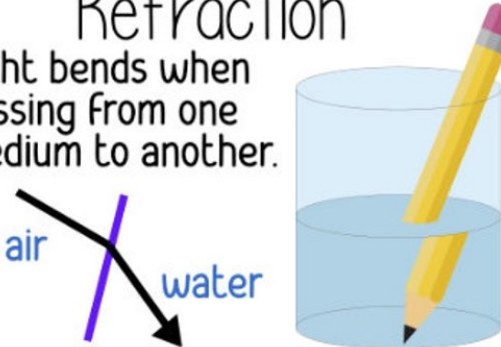


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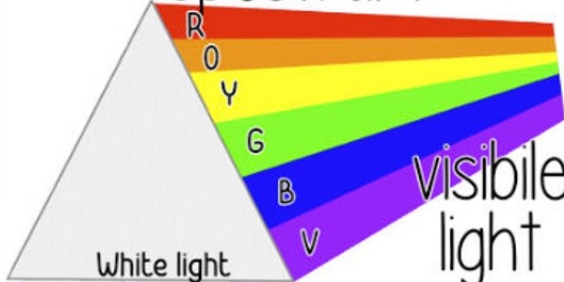
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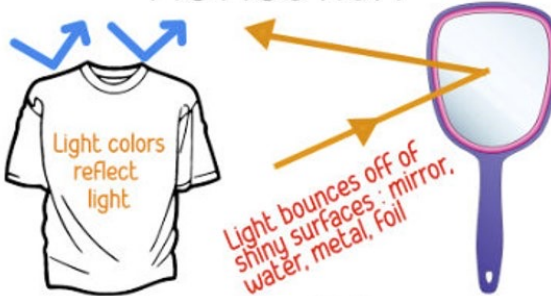
Electromagnetic Spectrum



White light

visible light

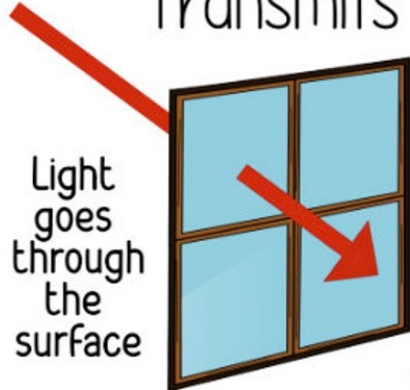
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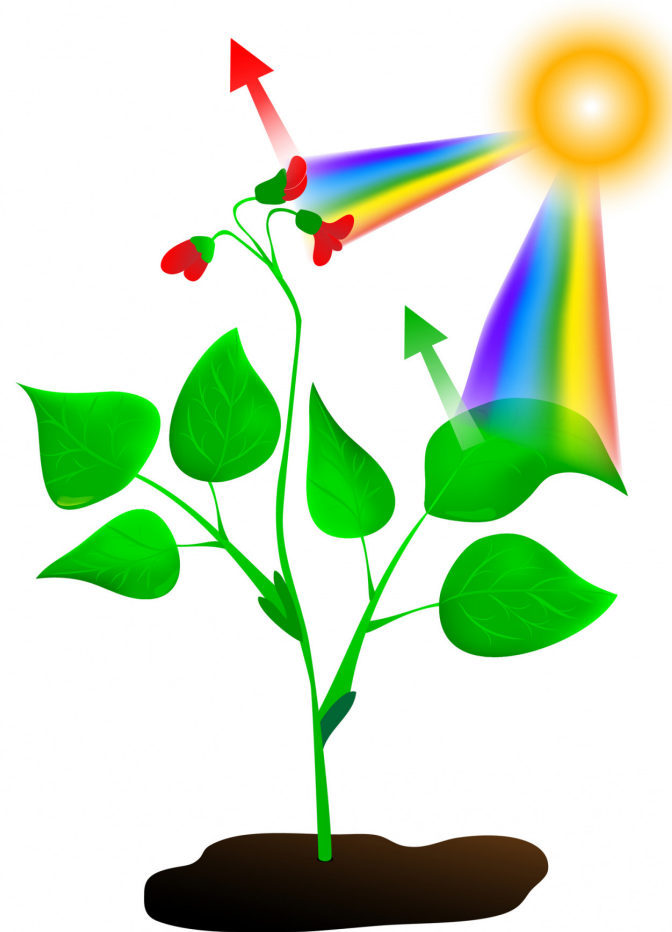
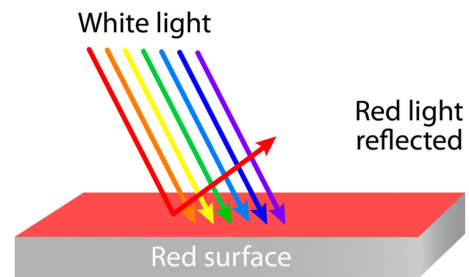
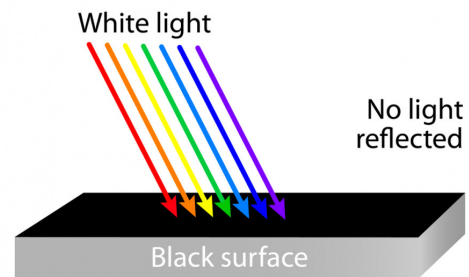
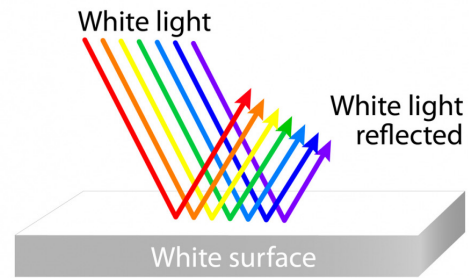
Light bounces off of shiny surfaces: mirror, water, metal, foil

Transmits
Light goes through the surface



glasses plastic windows

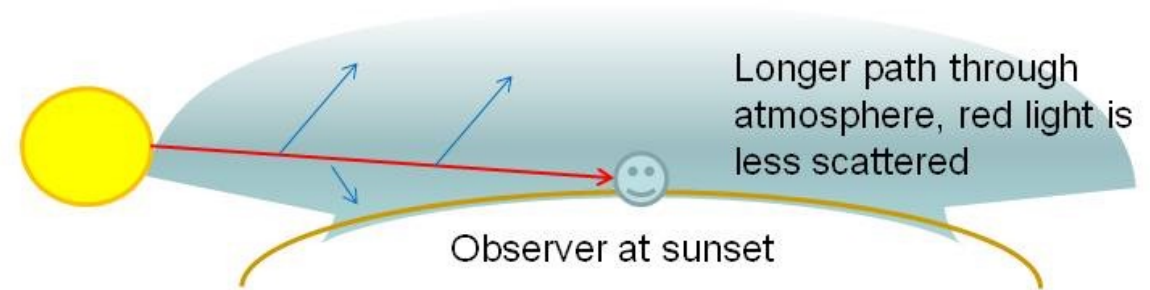
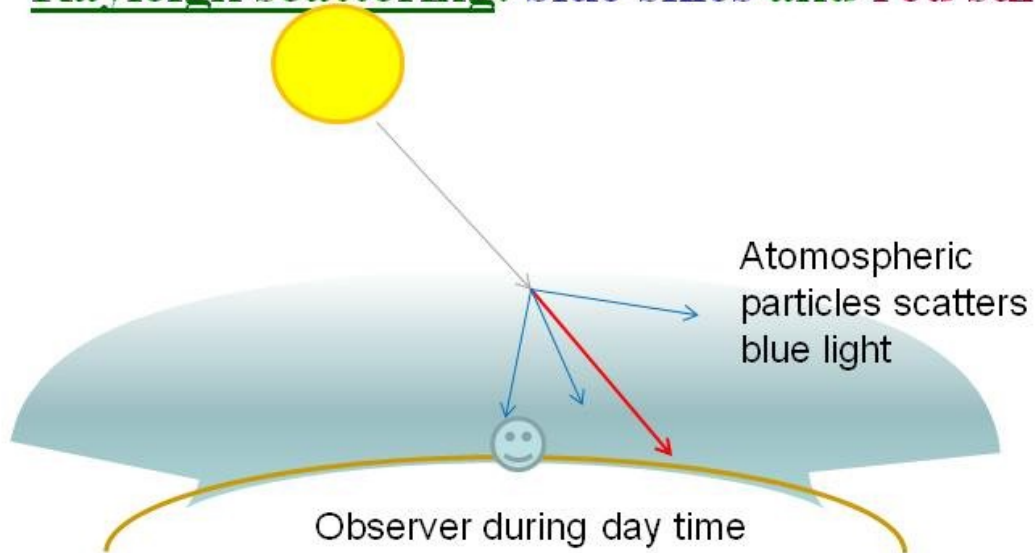
Reflection



Why is the sky blue?

It's not it's purple.
Light scatter!



Rayleigh scattering: blue skies and red sunsets





Chemiluminescence

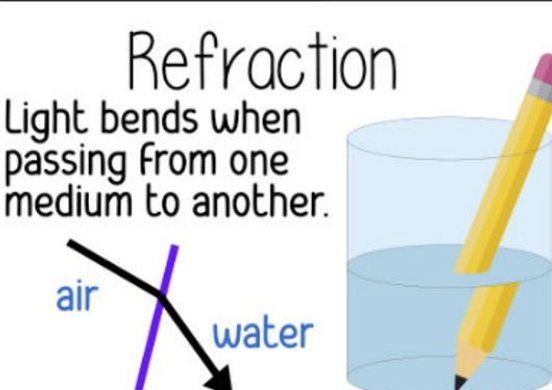
- Glow sticks!

LIGHT ENERGY

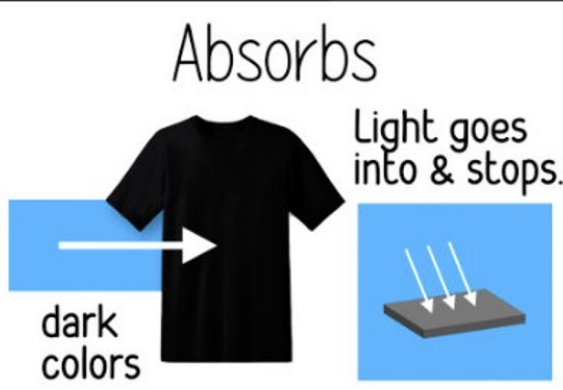
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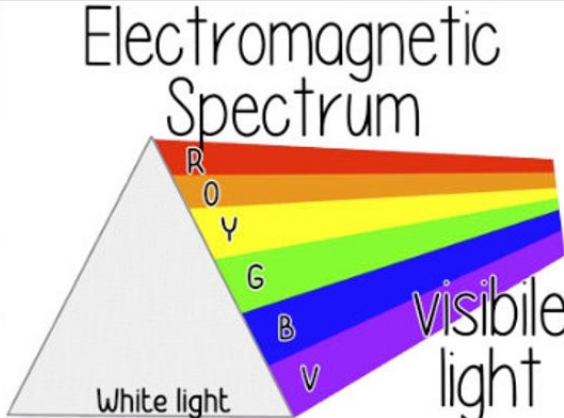


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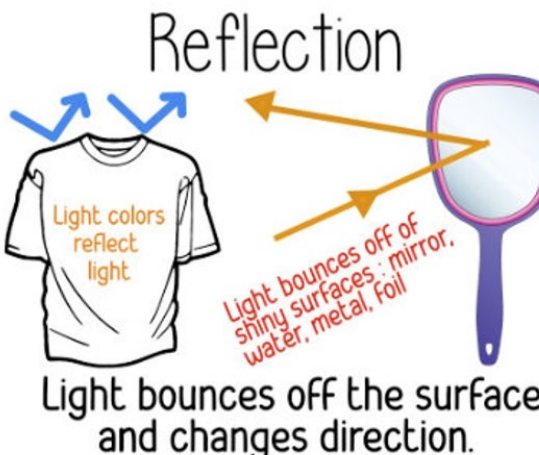


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