

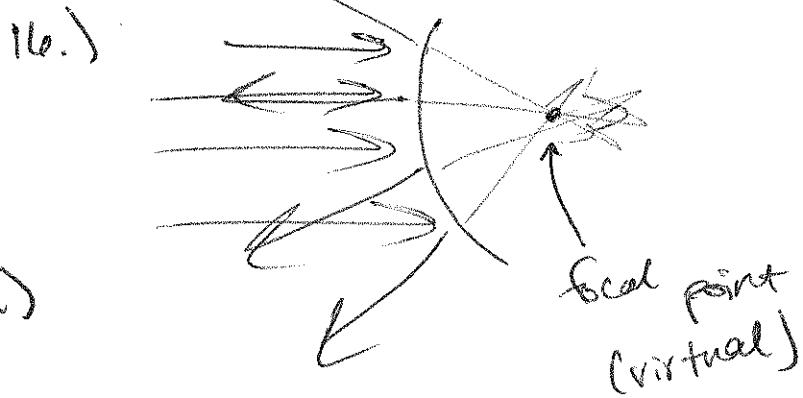
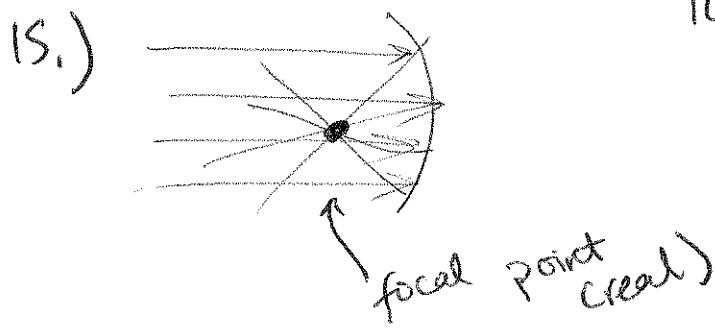
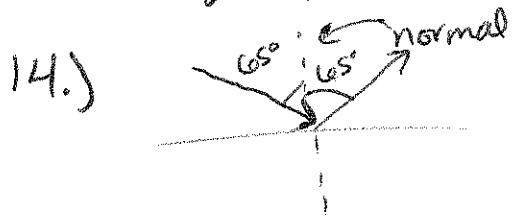
1. Yes. Light travels through a vacuum
2. There is an electric wave and a magnetic wave that propagate perpendicular to each other.
3. 6.67×10^{11} microwave
4. Red 640 nm.
5. Same speed. Different frequency, different wavelength
6. Speed of sound is MUCH SLOWER than light.
7. Polarizing filters remove 50% of the light intensity and causes light to propagate along a single wave.
8. a. Frequency of the sound wave hits at a higher rate so sounds higher.
b. Red shift is a star moving away from us. Blue shift is an object moving towards us.

Color

- 9.) Red, Blue, Green
- 10.) Color by addition - light wavelengths are added so more colors can be reflected \rightarrow more light
- Color by subtraction - pigments/paints absorb wavelengths so colors are subtracted \rightarrow less light
- 11.) Objects are different colors depending on whether they absorb or reflect certain wavelengths of energy. We see wavelengths that are reflected.

12.)	green	green	cyan
	green	yellow	yellow
	green	green	blue

- 13.) angle of incidence = angle of reflection



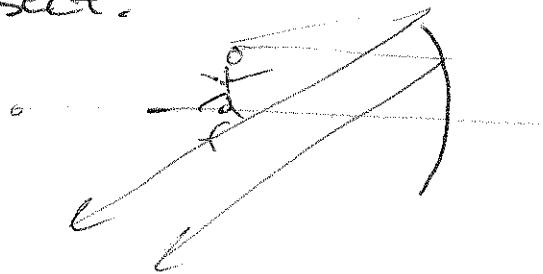
17.) light rays
really meet!

light rays
don't actually
meet!

18.) Real - light rays intersect each other and an image can be projected on a piece of paper/screen.
Virtual - light rays diverge from each other, so they do not actually intersect, but our brain assumes that they intersect

19.) Convex - mirrors to see around corners
Side mirrors on cars (widen the range you see)
Concave - make up mirrors/magnification mirrors

20.) If an object is at the focal point (mirror OR lens), an image will not form because light rays are reflected/refracted parallel to each other and will never intersect.



21.) See worksheet!

$$22.) d_i = 3.33\text{cm}, m = -1.67, n_i = -4.167\text{cm}$$

23.) slows down, bends toward normal

24.) speeds up, bends away from normal

25.) Total Internal Reflection - when light travels from a more dense medium to a less dense medium past the critical angle, so the light does not leave the medium, but instead reflects.

$$2(4.) \Theta = 35^\circ$$

- 27.) convex \rightarrow converges (brings together) light ()
Concave \rightarrow diverges (spreads apart) light //

28.) only convex!

- 29.) near sighted \rightarrow light focuses in front of retina,
fixed by diverging lens
farsighted \rightarrow light focuses behind retina \rightarrow fixed
by converging lens