Wednesday, April 10, 2019

Pick up: Warm ups ISN pg 150

Today you will:

Complete warm ups for Day 1 and 2

Learn about telescopes ISN pg 152

https://www.youtube.com/watch?v=-gHGkBKwdSc

HOMEWORK:

Complete anything not completed

Telescopes

- In 1609, an Italian scientist, Galileo, built a device that used two lenses to make distant objects appear closer and turned it toward the sky.
- **telescope** an instrument that collects electromagnetic radiation from the sky and concentrates it for better observation
- Telescopes that collect only visible light are called *optical telescopes.*
- The two types of optical telescopes are refracting telescopes and reflecting telescopes.

Telescopes, *continued*

Refracting Telescopes

- **refracting telescope** a telescope that uses a set of lenses to gather and focus light from distant objects
- The bending of light is called *refraction*.
- Refracting telescopes have an objective lens that bends light that passes through the lens and focuses the light to be magnified by an eyepiece.
- One problem with refracting telescopes is that the lens focuses different colors of light at different distances causing the image to distort.
- Another problem is that it is difficult to make very large lenses of the required strength and clarity.

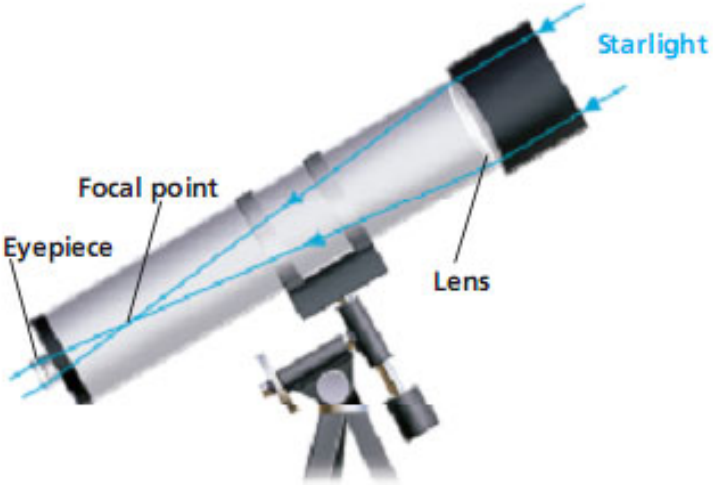
Telescopes, *continued*

Reflecting Telescopes

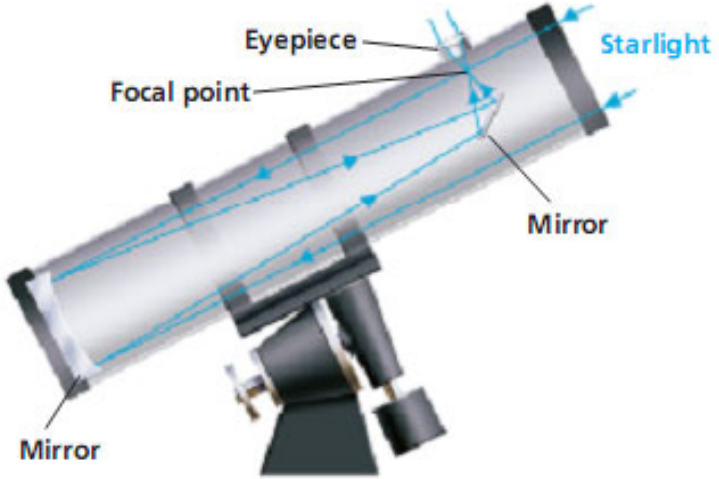
- **reflecting telescopes** a telescope that uses a curved mirror to gather and focus light from distant objects
- In the mid-1600s Isaac Newton solved the problem of color separation that resulted from the use of lenses.
- When light enters a reflecting telescope, the light is reflected by a large curved mirror to a second mirror. The second mirror reflects the light to the eyepiece, where the image is magnified and focused.
- Unlike refracting telescopes, mirrors in reflecting telescopes can be made very large without affecting the quality of the image.

Telescopes, *continued*

The diagram below shows refracting and reflecting telescopes.



Refracting telescopes use lenses to gather and focus light from distant objects.



Reflecting telescopes use mirrors to gather and focus light from distant objects.

Telescopes, *continued*

Telescopes for Invisible Electromagnetic Radiation

- Scientists have developed telescopes that detect invisible radiation, such as a radio telescope for radio waves.
- One problem with using telescopes to detect invisible electromagnetic radiation is that Earth's atmosphere acts as a shield against many forms of electromagnetic radiation.
- Ground-based telescopes work best at high elevations, where the air is thin and dry.

Space-Based Astronomy, *continued*

Space Telescopes

- The *Hubble Space Telescope* collects electromagnetic radiation from objects in space.
- The *Chandra X-ray Observatory* makes remarkably clear images using X rays from objects in space, such as remnants of exploded stars.
- The *Swift* spacecraft detects gamma rays and X rays from explosions and collisions of objects such as black holes.
- The *James Webb Space Telescope* is scheduled to be launched in 2013 to detect near- and mid-range infrared radiation from objects in space.

- https://www.youtube.com/watch?v=mYhy7eaazIk