

Chapter 11 Lesson 3

Lenses!!!

Welcome To 7th grade Life Science!

Mrs. Winters

Materials Needed

Today

Please take these materials out of your backpack.

- Pencil
- Lesson 2 Review
- Science news article!!

Hot Sync

Monday 3/31/14

Draw and explain what refraction is!

Then write in your planner the week's schedule

Update assignment log

www.online-stopwatch.com





00:00:00

Clear

← Back

11.3 Using Lenses

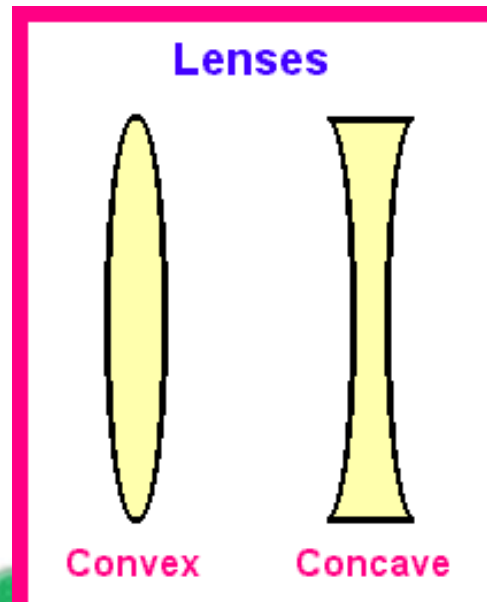
LESSON Vocabulary

-  lens
-  convex lens
-  focal point
-  focal length



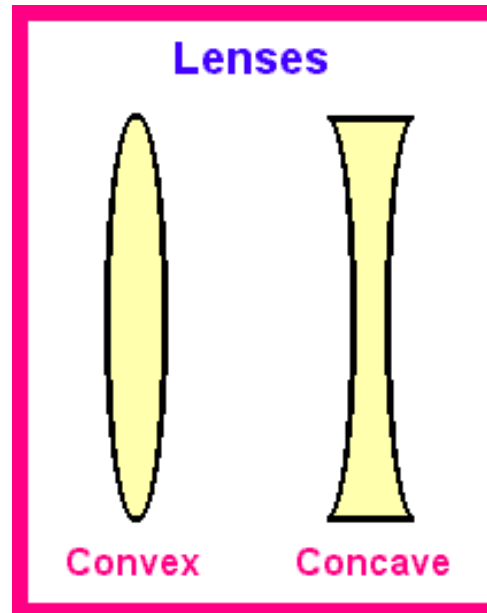
What is a convex lens?

- A **lens** is a transparent object with at least one curved side that causes light waves to bend.
- A **convex lens** is a lens that bulges outward.



What is a convex lens? (cont.)

- A concave lens is thinner in the middle than at the edges.



Light's Path Through a Convex Lens

- A light ray bends when it slows down moving from air into the lens.
- The light ray bends again when it speeds up moving from the lens back into the air.



Lenses Lab

- Hold the lense on the outside, don't touch the middle with your dirty fingers!
- Be very careful with the lenses. Transport with MUCH caution!!!!
- No running or fooling around or automatic alternate assignment (NO WARNINGS THIS TIME!!!!)





Welcome To 7th grade Life Science!

Mrs. Winters Hot Sync

Materials Needed Today

Please take these materials out of your backpack.

- Pencil
- Lenses and Light lab
- Notes 11.3 Using Lenses

Answer the following in complete sentences.

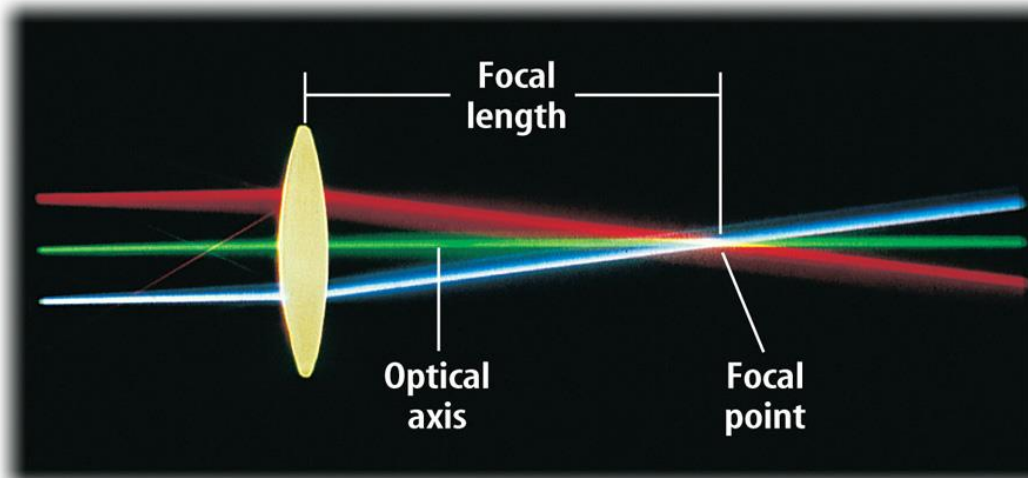
Tuesday 4/1/14

Which lens bent light out and which lens bent light in?

Draw what happens to the rays as they pass through each lens.

Focal Point and Focal Length

- The **focal point** is the point where all of the beams of light converge.
- In a convex lens, all light rays traveling parallel to the optical axis are bent so that they pass through the focal point.



Focal Point and Focal Length (cont.)

- The **focal length** is the distance from the center of the lens to the focal points.

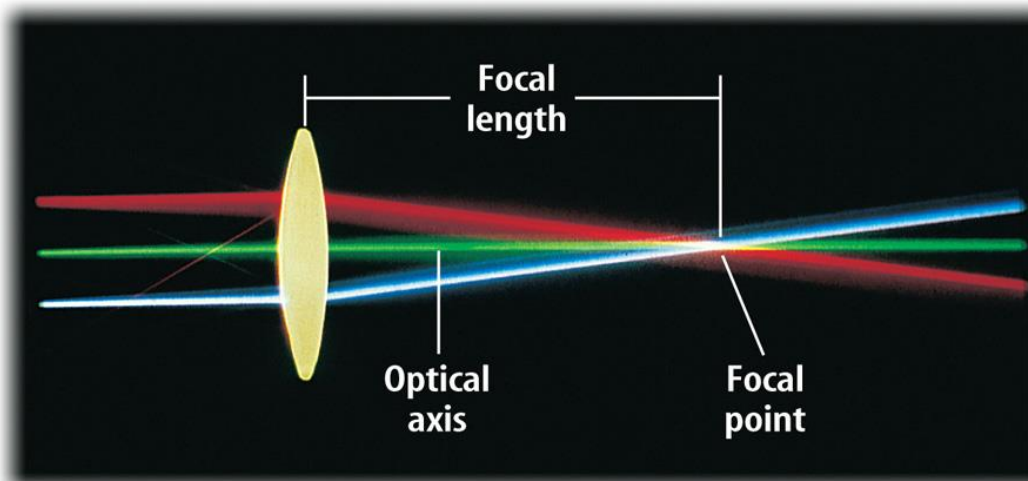
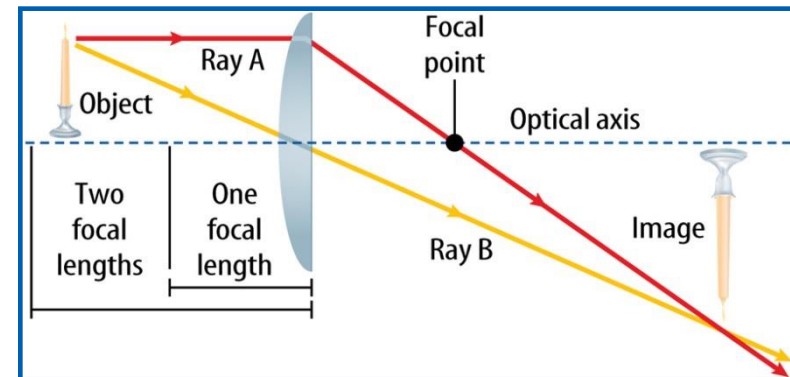
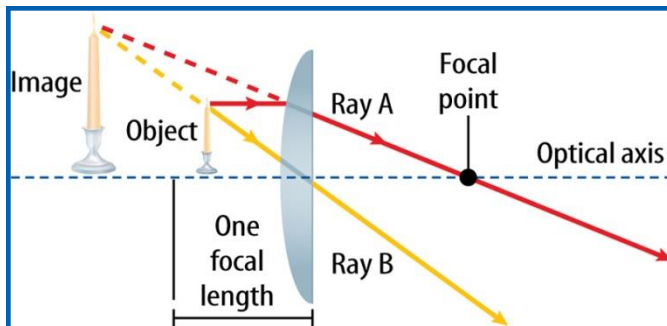
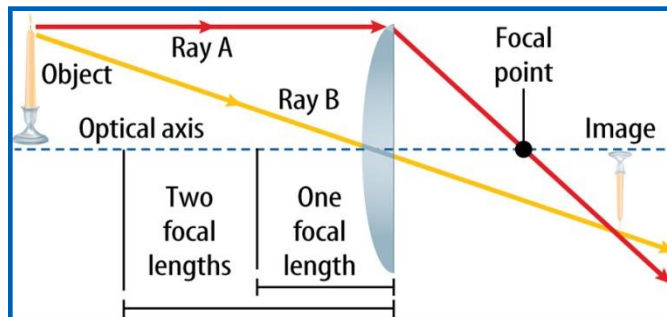


Image Formation by a Convex Lens

- The image formed by a convex lens depends on the position of an object relative to the focal point.



Optical Instruments

- An optical instrument uses lenses to focus light and create useful images.
- Different optical instruments do this by combining lenses in various ways.
- Types of optical instruments
 - Cameras
 - Telescopes
 - Microscopes



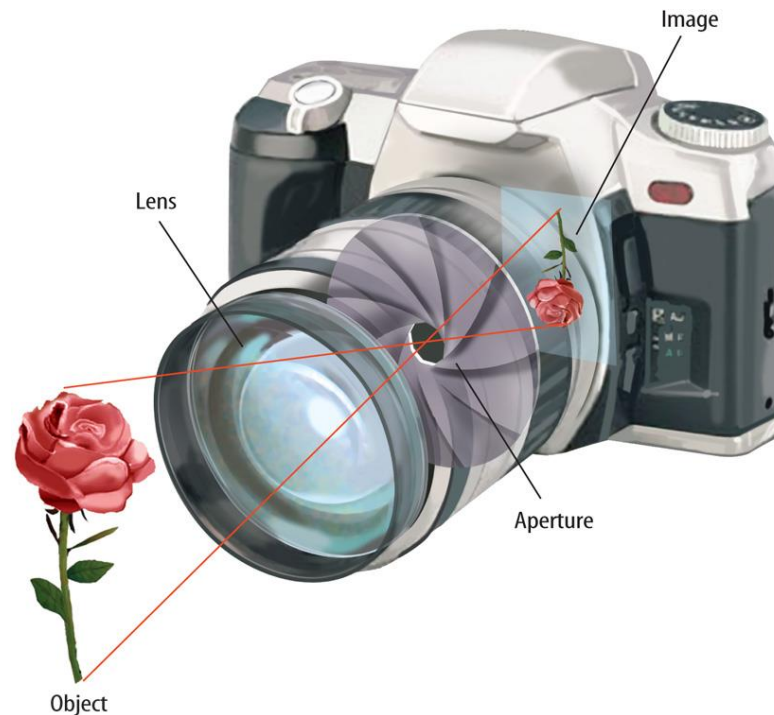
Cameras

- A camera is focused by moving various lenses back and forth until a sharp image is formed.
- The image is smaller than the object and is upside down.
- To take a picture, the shutter opens so that light enters the camera, and film or an electronic sensor is exposed.



Cameras (cont.)

- To control the amount of light that reaches the film or light sensor, cameras have a diaphragm or an aperture.



How Digital Cameras are made

<http://www.youtube.com/watch?v=Lkv0Sc2MxP8>



Resources



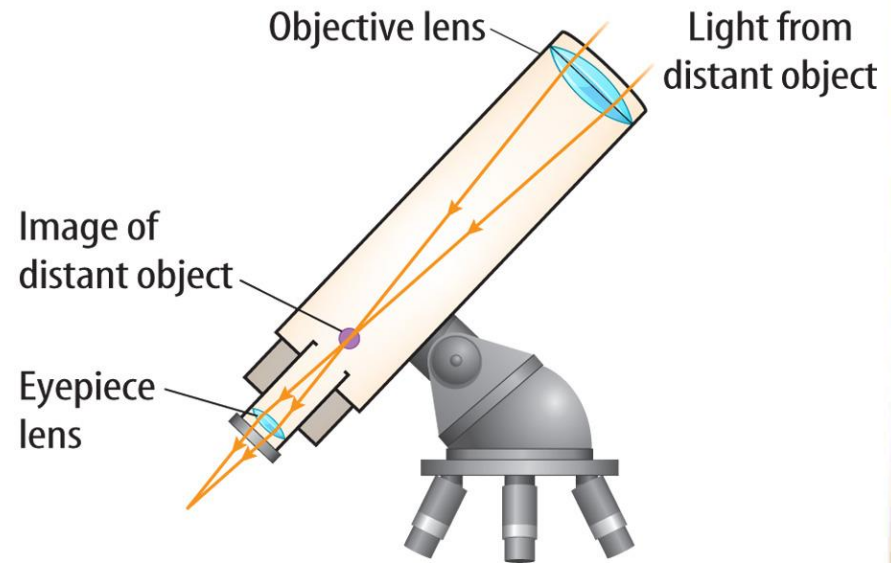
Telescopes

- As an object gets farther away, less of the light from the object enters the openings in your eyes.
- A telescope is an optical instrument that makes far-away objects seem closer.
- There are two basic types of telescopes—refracting and reflecting.



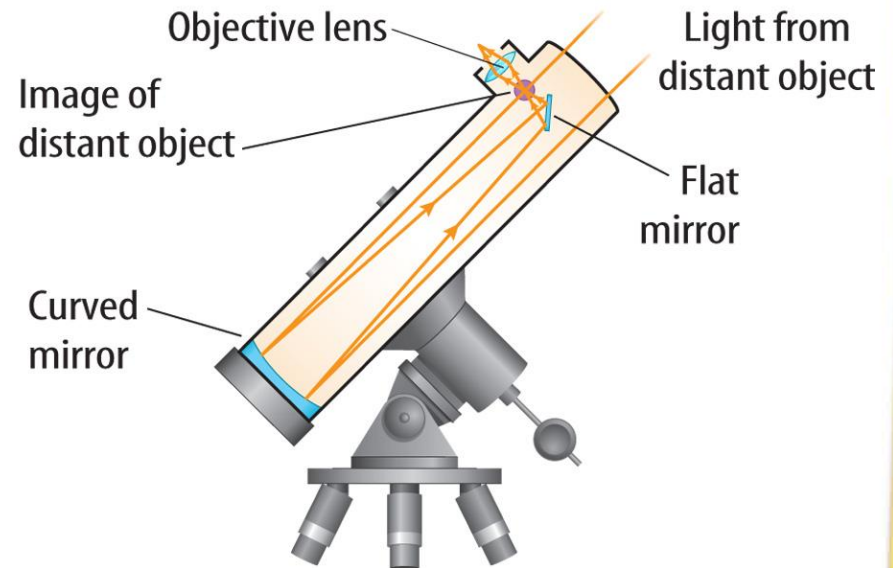
Refracting Telescopes

- The objective lens in a refracting telescope is much larger than the opening in a human eye.
- Much more light from a distant object enters the objective lens than would enter an eye.



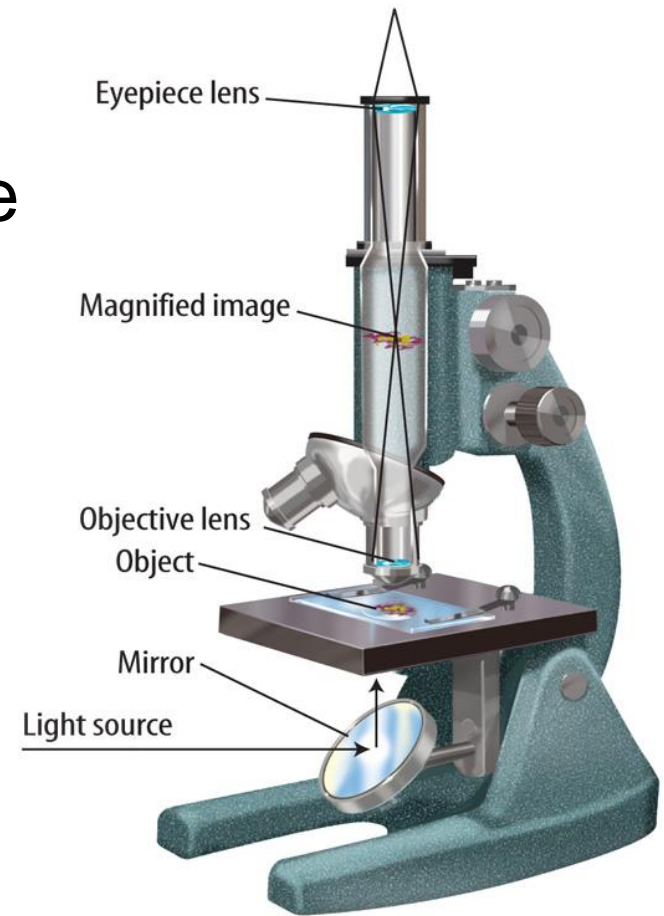
Reflecting Telescopes

- An image of a distant object is formed inside the telescope tube when light rays are reflected from the curved surface of a mirror.
- The largest telescopes are reflecting telescopes.



Microscopes

- The eyepiece lens of a microscope is positioned so it is closer to the image than one focal length.
- This makes the image enlarged by the objective lens even larger.

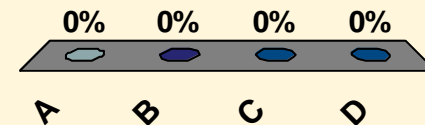


LESSON 3 Review



Where do all the beams of light passing through a convex lens converge?

- A** focal point
- B** optical axis
- C** two focal lengths from the lens
- D** in the center of the lens



Resources

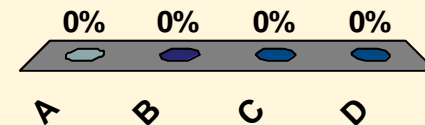


LESSON 3 Review



What happens to light when it moves from air into a convex lens?

- A it is reflected
- B it is scattered
- C** it slows down
- D it speeds up



Resources

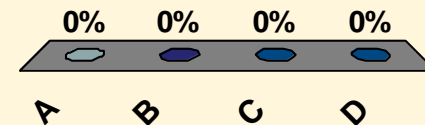


LESSON 3 Review



Which uses a curved mirror to form an image that is magnified by an eyepiece lens?

- A refracting telescope
- B reflecting telescope
- C camera
- D microscope



Resources

