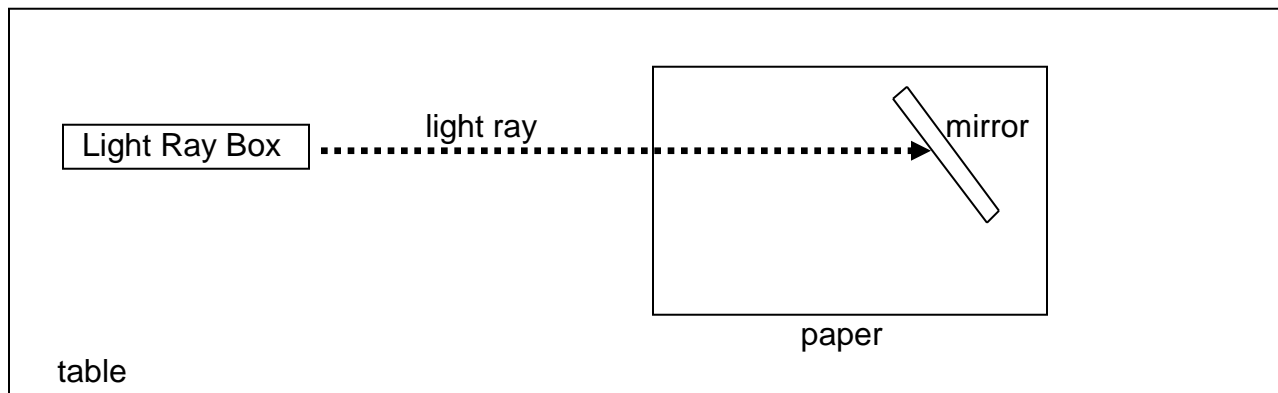


Light Ray Box Lab: Mirrors and Lenses

A) Flat Mirror – Part A

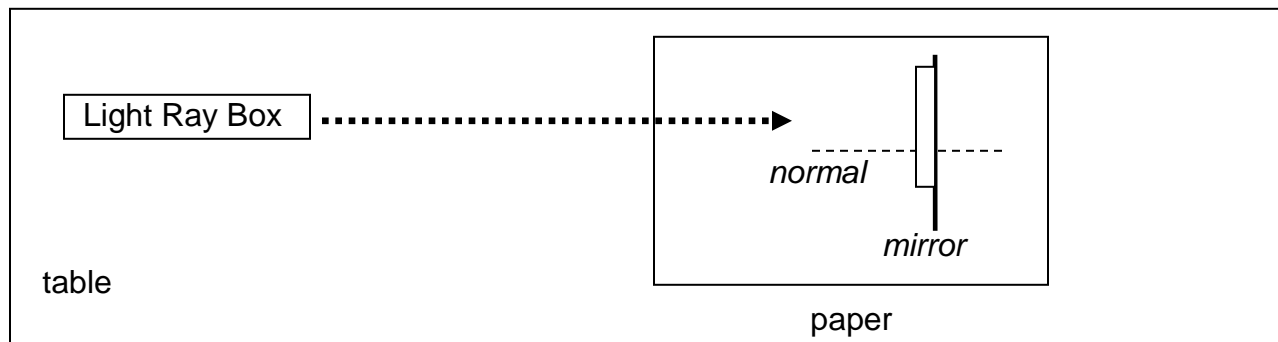
1. Set up the light ray box so it is projecting a single ray of light.
2. On a blank paper, put your name, class, date and the title for this part of the lab.
3. Set the light ray box, paper and mirror up as shown in the diagram below.



4. Using a ruler, trace the mirror, the incident ray and the reflected ray onto the blank paper. Be sure to place arrow heads on the middle of the incident ray and the middle of the reflected ray to show the direction each is travelling.
5. Use the protractor to draw a dashed line to represent the normal at 90° to the surface of the mirror (where the incident ray meets the mirror).
6. Label the angle of incidence and the angle of reflection.
7. Label the mirror, the incident ray, the reflected ray, and the normal.
8. Use the protractor to measure the angle of incidence and the angle of reflection, and record both angles on your diagram. Be sure to use the correct scale on the protractor to measure the angle.
9. Below your light ray diagram, write the Law of Reflection for light hitting the mirror at an angle.

B) Flat Mirror – Part B

1. On the back of your blank paper put the title for this part of the lab.
2. Use a ruler to draw a line going across most of the page about the middle of the page, to represent the mirror, and label it (see diagram below).
3. Use the protractor to draw a dashed line at 90° to the mirror (in about the middle of the mirror) to represent the normal, and label it.
4. Set up the light ray box, the paper and the mirror as shown in the diagram below, so the light ray is travelling parallel to the normal just beside it.



5. Use a ruler to trace the incident ray and the reflected ray onto the paper. Be sure to place arrow heads on the middle of the incident ray and the middle of the reflected ray to show the direction each is travelling.
6. Label the incident ray and the reflected ray.
7. Below your light ray diagram, write the Law of Reflection for light hitting the mirror straight on.

C) Convex Mirror

1. Set up the light ray box so it is projecting 5 or 6 lines.
2. On a blank paper, put your name, class, date and title for this part of the lab.
3. Set up the convex mirror (bulges out) so it is about the middle of the blank paper.
4. Trace the shape of the convex mirror onto the paper and label it.
5. Set up the light ray box so the light rays are hitting the convex mirror straight on.
6. Use a ruler to draw each of the incident rays and label them.
7. Use a ruler to draw each of the reflected rays and label them.
8. Below your diagram, write the Law of Reflection for Convex Mirrors using the term converge or diverge to describe what happens to the light rays.

D) Concave Mirror

1. On the back of the blank paper, put the title for this part of the lab.
2. Set up the concave mirror (caves in) so it is about the middle of the blank paper.
3. Trace the shape of the concave mirror onto the paper and label it.
4. Set up the light ray box so the light rays are hitting the concave mirror straight on.
5. Use a ruler to draw each of the incident rays and label them.
6. Use a ruler to draw each of the reflected rays and label them.
7. Label the point where the reflected rays meet the "focal point."
8. Below your diagram, write the Law of Reflection for Concave Mirrors using the term converge or diverge to describe what happens to the light rays.

E) Concave Lens

1. Set up the light ray box so it is projecting 5 or 6 lines.
2. On a blank paper, put your name, class, date and title for this part of the lab.
3. Set up the concave lens (caves in) so it is about the middle of the blank paper.
4. Trace the shape of the concave lens onto the paper and label it.
5. Set up the light ray box so the light rays are hitting the concave lens straight on.
6. Use a ruler to draw each of the incident rays and label them.
7. Use a ruler to draw each of the reflected rays and label them.
8. Below your diagram, write the Law of Refraction for Concave Lenses using the term converge or diverge to describe what happens to the light rays.

F) Convex Lens

1. On the back of the blank paper, put the title for this part of the lab.
2. Set up the convex lens (bulges out) so it is about the middle of the blank paper.
3. Trace the shape of the convex lens onto the paper and label it.
4. Set up the light ray box so the light rays are hitting the convex lens straight on.
5. Use a ruler to draw each of the incident rays and label them.
6. Use a ruler to draw each of the reflected rays and label them.
7. Label the point where the reflected rays meet on your diagram the "focal point."
8. Below your diagram, write the Law of Refraction for Convex Lenses using the term converge or diverge to describe what happens to the light rays.

Name _____ Class _____ Date _____

A) Flat Mirror – Part A

B) Flat Mirror – Part B

C) Convex Mirror

D) Concave Mirror

E) Concave Lens

F) Convex Lens