Energy Explorations Outline

Station 9

**Light Reflection Station**

**Materials:**

Hand held mirrors Laser Maze Game (2)

Mirrors on blocks Paper and pencils

1. **Introductions**
2. **Review of Important Ideas**

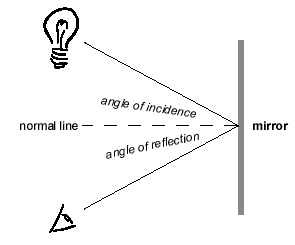
* Most objects do not emit light. It must reflect light in order to be seen.
* Light is reflected when it bounces off a smooth hard surface. It can be compared to a ball bouncing off a wall.
* When light hits an object, it can be reflected, refracted or absorbed.
* Light travels in straight lines.
* When a light hits a reflective surface, there are two light rays: incoming and outgoing. They bounce off in a predicted manner.
* Mirrors reverse images.

1. **Activities and demos**
2. Mirror Activities-What are several surfaces that light is reflecting off in this room? *Anything-if you can see it, light is reflecting.* How does a mirror work? *It is a thin piece of aluminum or silver on the back of a piece of high quality glass. It reflects most of the light that hits it.*
3. When light hits a mirror, there are two light rays: incoming and outgoing. Light reflects in a predictable manner.

* Working with a partner and one mirror, have the partner holding the mirror look at themself in the mirror.
* With your partner next to you, move the angle of the mirror so you can see your partner and you partner can see you.
* How did you know what angle you needed to hold the mirror? *Remember that the incoming light is reflected as the same angle as outgoing light. These light rays are at the same angle compared to the normal (90⁰ to the mirror).*

1. Measuring Angles. How does the angle of incidence (incoming) compare to the angle of reflection?

* Using the Light Angles Diagram, place the mirror in the correct spot.
* Place the laser on the Light Angles Diagram on the incoming ray line.
* Place the wooden block on the reflected ray line.
* Where is the reflected ray? *If the incoming ray is lined up correctly on the line, the reflected ray you see will be on the reflected ray line. You may need to slightly adjust the position of the laser to make sure the incoming ray is exactly on the line.*
* *Leaders Note: If it is difficult to see the reflected ray, try putting a piece of paper over the mirror to shade the demo from overhead light.*



1. Mirrors reflect a reverse image.

* Have students print their initials on a piece of scrap paper. Then have the students look at their name in a mirror. What do you see? *It is a reverse image.*  Have students try writing their initials a second time, so that it looks correct in the mirror.

1. Laser Maze Game-Divide your students into two groups. Each group will have one game. Ideally, you do not want more than 3 students per game.
   * Goal-Using what you have learned about light reflection, you will manipulate the laser and mirrors to light up game pieces (the red side of the purple game piece is a correct response.)
   * Using the Laser Maze puzzle activities, have the students put each piece in the correct place. Each puzzle has one piece that the students must decide the location and direction of the piece. Have the students set up the puzzle, then test to see if they are correct with the laser. Complete as many puzzles as time allows.

**Laser Maze Game Safety – Lasers must stay on the tray the entire time. Do NOT use the mirrors to reflect the laser light beyond the tray.**

1. Closing

* Place block mirrors in box.
* Fill in booklet or worksheet
* Farewells and reminders.
* Straighten up and re-set station.

Question in student booklet:

Light travels in \_\_\_\_\_**straight** \_\_\_\_\_\_\_ lines.

Images in mirrors appear \_\_\_\_**reversed**\_\_\_\_\_\_.