Extension 4.1CDE

Heat, Sound, Light

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_

**Part 1 – How light Travels**: Light is a form of energy. As light moves through an area, there are very specific rules that determine its path. **First**, light always travels in a straight line. **Second**, light always travels through the shortest path possible. These rules were developed by Pierre Fermat in 1605, and are called Fermat’s Theorem. In the picture below, circle the path of light (A, B or C) that best follows Fermat’s Theorem. Then, explain what is wrong with the other two paths.

A

![C:\Users\Joy White\AppData\Local\Microsoft\Windows\INetCache\IE\YZWWILPF\Light_bulb_(yellow)_icon.svg[1].png]()

![C:\Users\Joy White\AppData\Local\Microsoft\Windows\INetCache\IE\4WLF9350\angry-cartoon-eyes-md[1].png]()

B

C

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

![C:\Users\Joy White\AppData\Local\Microsoft\Windows\INetCache\IE\NTU54U7O\dibujo-32-remix[1].png]()**Part 2 – Around the Corner**: Light will continue in a straight line until it is reflected, diffracted, or absorbed. In this activity, you will use tunnels and mirrors to reflect light through an obstacle course that will also allow you to see an object (picture of Ray the Rabbit) around the corner. Use the diagram below to set up the obstacle course.

Ray the Rabbit

![C:\Users\Joy White\AppData\Local\Microsoft\Windows\INetCache\IE\4WLF9350\angry-cartoon-eyes-md[1].png]()

Tunnel

Look through the tunnel on this end to see Ray the Rabbit

Mirror

1. What did you have to do to see Ray the Rabbit?
2. Would you be able to see Ray the Rabbit without the mirror? Explain Why.

**Part 3 – Down Periscope**: Use 2 tunnels and 2 mirrors to create a zig zag obstacle course. Draw the obstacle course below.

Use 3 tunnels and 2 mirrors to create a zig zag obstacle course. Draw the obstacle course below.

Use 3 tunnel and 3 mirrors to create a zig zag obstacle course. Draw the obstacle below.

1. Describe how you had to position the mirrors.
2. What would happen if the tunnels were removed and only the mirrors were used in the activity?
3. Is the path of light reversible (can you change position of the eye and object)
4. Imagine you were Ray the Rabbit, what would you see at the other end?
5. How does this activity show how light waves travel?