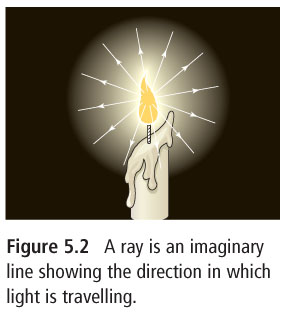
**NOTES 5.1: Ray Model of Light**

**What is light made of?**

* As reviewed earlier the \_\_\_\_\_\_\_\_\_\_ model of light is used to explain some of the behavior of light
  + For example, refraction of light as it enters a new medium
* However, this model is limited. There are cases where this model does not fully explain the behavior of light
  + For example, light bends as it moves near a black hole indicating that it has mass

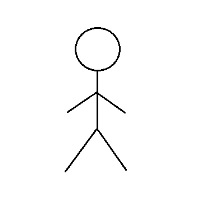
**Models used to explain the behavior of light**

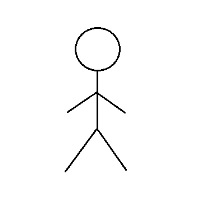
* Sir Isaac Newton believed that light is a stream of fast moving tiny particles
* This model is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Parts of this model are still used today
* Einstein also believed that light is composed of small units of mass and energy called \_\_\_\_\_\_\_\_\_
* For the study of optics it is helpful to use a simplified model called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The ray model of light represents light as a \_\_\_\_\_\_\_\_\_\_\_\_\_ that shows the \_\_\_\_\_\_\_\_ that light is travelling
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are used to analyze the behavior of light (ex reflection and refraction)
* The ray model of light represents light as a straight line that shows the direction the light wave is travelling



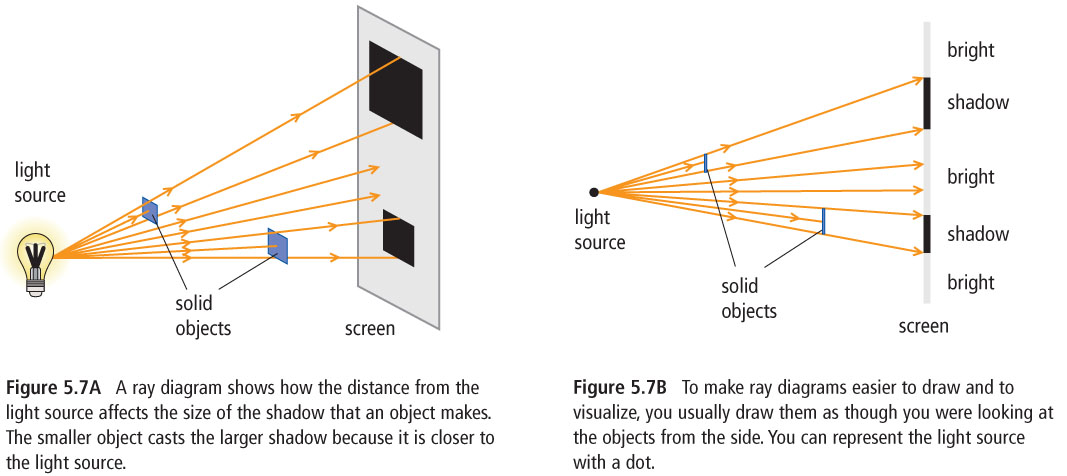
**Shadows**

* You can use the ray model to predict where \_\_\_\_\_\_\_\_\_ will form and how \_\_\_\_\_\_\_\_\_ they will be

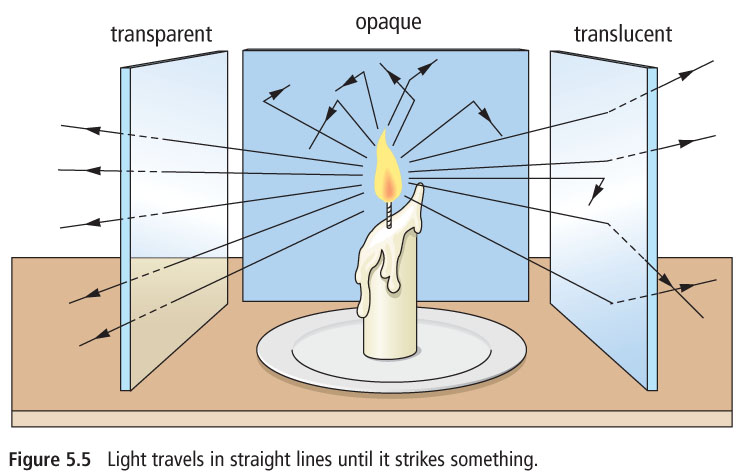




* During sunset and sunrise, your shadow becomes \_\_\_\_\_\_\_\_ than you are tall
* Closer to noon, your shadow becomes \_\_\_\_\_\_\_\_\_ than you are tall
* Ray diagrams can be used to show how the size of shadows is related to the distance of the objects from the source



**Light and Matter**

* The type of matter in an object determines the amount of light it absorbs, reflects and transmits
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material allows light to pass through it. Only a small amount of light is absorbed and reflected
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ material such as frosted glass, allows most light rays to get through but scatters them in all directions
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ materials prevent any light from passing through