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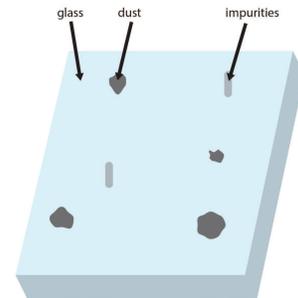
Date: _____

Reading: How is a one-way mirror made?

To understand how a one-way mirror is made, first we need to understand how a regular mirror is made.

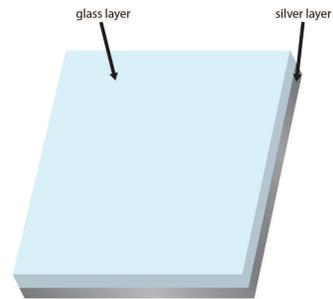
How is a regular mirror made?

Making a regular mirror starts with a piece of glass or plastic. A piece of glass is transparent because it transmits most of the light that shines on it. It cannot transmit all the light because there are impurities in the glass as well as dust and other things on its surface. Light reflects off the dust and impurities to our eyes, which is how we see the glass.



Glass with dust and impurities

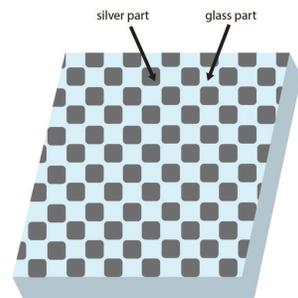
To make a mirror, a thick layer of smooth metal, such as silver, is added to the back of the glass. This process is called “silvering.” Behind the silver layer is a layer of paint to protect the back of the mirror. With the silver layer and paint layer, the mirror is opaque, meaning that no light can transmit through it. All the light reflects off it.



Mirror with thick silver layer

How is a one-way mirror made?

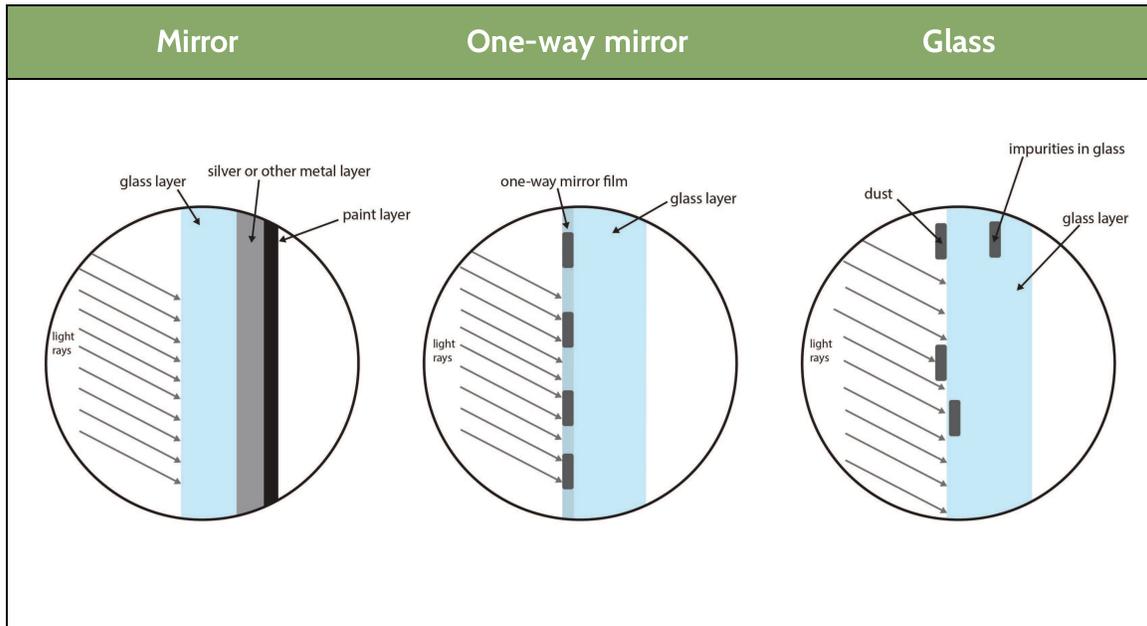
A one-way mirror is made by combining a thin layer of one-way mirror film and a piece of glass or plastic. The one-way mirror film has special structures that we can only see when we zoom into a scale we cannot see with our naked eyes. The film is made of a very thin layer of silver, aluminum, tin, or nickel that is mixed into a clear piece of plastic. This creates a “half-silvered” plastic film. The half-silvered film is added to the front side of a piece of glass. Because the silver layer is so thin,



One-way mirror with thin silver layer

this leaves some parts of the glass fully transparent, while other parts are covered by silver. The result is a material that has some transparent surface and some reflective surface.

If 10 light rays shined on a mirror, a one-way mirror, and a pane of glass, what would happen to the 10 light rays? Draw your ideas on the diagrams below.



What new ideas do you have to answer the question, "How do similar amounts of light transmit through and reflect off the one-way mirror?"