Module B. Colour from the Cosmos

Lesson 12: Colour, Light and Optics 1

Transparency

**Transparency** describes how light transmits through a medium. There are roughly five main groups,transparent, semi-transparent, translucent, semi-translucent, and opaque. Transparent minerals are those where objects can be viewed through the medium (e.g., glass, diamond, beryl).

Transparent specimen of pink zoisite. Photo courtesy of the Smithsonian Institute's [National Museum of Natural History](http://www.mnh.si.edu/).

Semi-transparent minerals are those where objects can be viewed through the medium, but object are heavily blurred (e.g., chalcedony, moonstone).

These sunstones from Oregon, USA show varying degrees of transparency. The faceted gem in the center of the image weighs ~5 carats and is transparent. The sunstone carving on the right weighs ~175 carats and is semi-transparent. It transmits light readily but the background is not transferred crisply.

Translucent minerals are those where objects cannot be viewed through the medium, although light will pass through the medium with lesser intensity (e.g., jade, opal, agate).

This piece of carved jade shows superb translucency, bordering on semi-transparent. Photo courtesy of the Smithsonian Institute's [National Museum of Natural History](http://www.mnh.si.edu/).

Semi-translucent minerals are those where objects cannot be viewed through the medium and light will only pass through the medium if it is thin (e.g., jade, turquoise).

Turquoise is a common semi-translucent to opaque gemstone. Photo courtesy of the Smithsonian Institute's [National Museum of Natural History](http://www.mnh.si.edu/).

Opaque minerals are those where objects cannot be viewed through the medium, and no light will pass through (e.g., pyrite, malachite, galena).

Lazurite is a common idiochromatic opaque gemstone. Photo courtesy of the [Gemological Institute of America](http://www.gia.edu/).