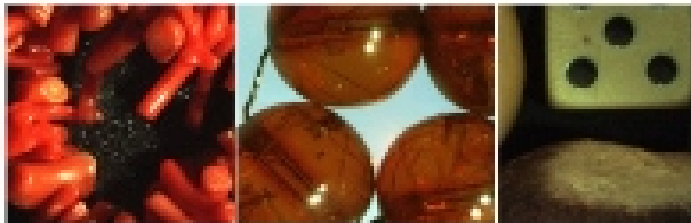


What is a Gem?

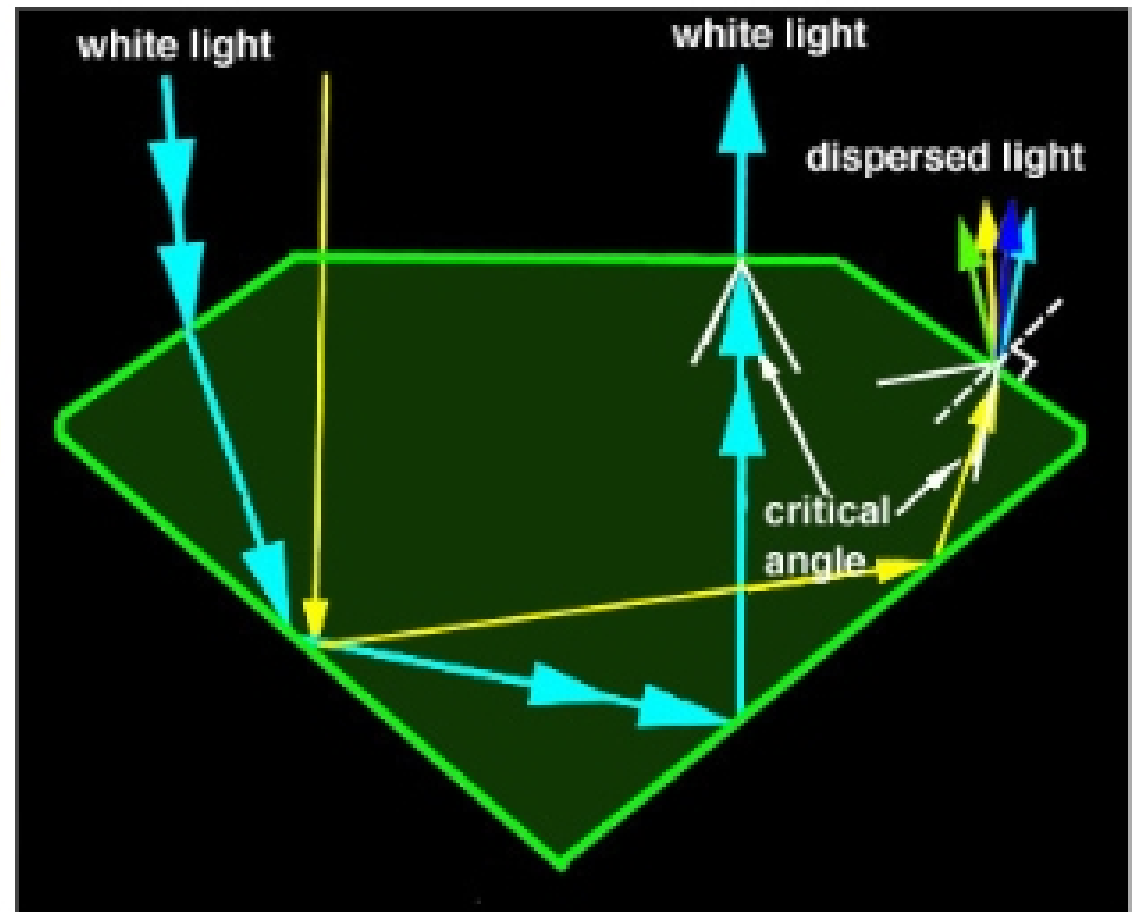
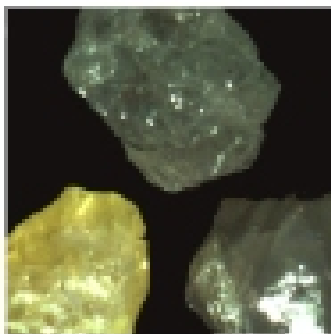
Introductory ideas:

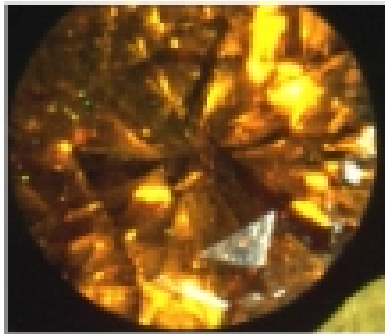
- o Gems have been part of human history for over 20,000 years.
- o very early gems were generally of organic materials.



Examples include (left-right) coral, amber, and vegetable ivory (tagua nuts).

- o most gems used today are inorganic minerals.
- o early crystal gems were probably derived from alluvial sources.
- o as found, gems are rather ordinary-looking, unlike cut gemstones:





- o there are many different kinds of gems, and most come in many colors
- o gems can be synthesized
- o gems can be enhanced (and most commonly are)
- o simulants are different from synthetics
- o names: trade or commercial names obscure the true identity of a gemstone or simulant material

In this course we will consider what gems are, the factors that affect their value, where gems form, how gems are identified, why gems are colored, and other important gemology concepts such as simulants, synthetics, gemstone enhancement, and related issues.

A gem is a **naturally occurring** material **desirable** for its **beauty**, **valuable** in its **rarity**, and sufficiently **durable** to give lasting pleasure.

- It should be **naturally occurring**, but it need not be crystalline.
- **Beauty** is determined by brilliance, iridescence, color, sparkle, and play of color.
- A gem should be **durable** against heat and common

household chemicals. It should not be easily scratched or broken. Brittleness is a measure of the gem's tendency to crack or cleave.

- How rare is rare?
 - Typically, a diamond deposit yields about 5g gem/1000kg of mined material. That's 5g per million grams!

Beauty:

Beauty of a gemstone is determined by brilliance, luster, fire and color (later lecture). The first three quantities depend on the cut of the stone. Before we can understand why cut gems sparkle, we need to learn some basic terms to describe cut stones.

Cut stone vocabulary:

- Polished planar surfaces are referred to as facets.
- The midline of a faceted gem is called the girdle and may or may not be faceted.
- The area above the girdle is called the crown; the facets on the crown are the table, the star facets, the kite (or bezel) facets and the upper girdle facets.
- The area below the girdle is called the pavillion; these facets are known as the lower girdle facets, the pavilion facets and the culet.

