**Lesson 24**

* Summarize the significance of gold through history

- symbol of sun

Ancient

- Egypt beat gold into leaves, brilliant like the sun

Greece - Used financially

- massive gold from persian conquest

- practice alchemy, mined from to places like asia minor and egypt

Rome - hydraulics and roasting to mine gold

Middle ages (400 - 1400) - metallic currency standard

- Charlemagne, King of the Franks took over and got lots of gold to take over western Europe

Early modern(1400 - 1800) - Brazil became biggest contributor in 1720

- Spanish search for gold, helped discover western hemi

- 1799 US discover first gold (North carolina)

Modern -

US - gold rushes in US, north carolina,

South Africa - accidental when digging for house foundation, now 40% of all gold in world

Prized metals, used in medicine, technology, jewelry

* Describe the diagnostic properties of gold

- mineral

- nobel metal

-metal at room temp

-alloyed

-197 mass (amu), 1.3ppb of crust

-19.3 density, 1064 melting point, 2808 boiling

- very malleable

- high conductivity

-dentritic or crystalline

* Describe the basic structure and habit of crystalline gold

- isometric

- cube closed packed

- golden yellow, scratcheable

- hardness of 2.5

- similar atomic radius as Ag, and somewhat Cu and Pt

- form with Se, Te, Hg, Sb

* Describe the causes of different colours in gold alloys

- metallic, sea of electrons

- Crystal field theory (of the band theory), form overlapping bands

- absorb higher energy waves, thus have reddish yellow hue

- can mix with silver (become more white) and copper (become more red)

* Describe the numerous modern and historical uses of gold

- currency, technology such as medical circuit of implants, delivery of drugs,

- jewelry

- dentistry - no corrosion, highly malleable

**Lesson 25**

* Describe the general global geography of gold's supply and demand

- Canada was the world's 8th largest producer of gold with about 4% of the total global production

- China, South Africa, Australia, Russia and the United States are the top five producers and together control about 45% of the global output of new gold.

- 175,000 tonnes since ancient to 2012

* Describe the common geological settings in which lode gold occurs in Canada (i.e., mesothermal/orogenic, intrusion-related and epithermal)

- lode gold deposits are the most important domestic source - over 80% of Canada

- 3 groups of lode: mesothermal (aka orogenic), intrusion-related (e.g., porphyry), and epithermal

-  between 5 and 10 km are variably called orogenic, mesothermal, shear zone-related, or greenstone-related quartz-carbonate vein depositsasian

- 83% of lode

- active faulting due to corrosion

- metamorphic rock

- intrusion - ancient rocks like canadian shield,

- sulfur rich quartz dykes

- epithermal - less than 1.5km , hydrothermal fluids, often from quartz veins, mixed with meteoric waters (surface waters that percolate down through the rocks)

- volcanoes and continental arcs

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* Be aware of the three (3) main geological time periods that gave rise to gold deposits in Canada

- Most orogenic lode gold deposits in the world from 2800 to 2550 million years ago (Ma), 2100 to 1800 Ma, and 600 to 50 Ma

- The most productive lode gold districts in Canada are of the orogenic lode gold type

- The largest intrusion-related deposits are those of the Hemlo district in western Ontario, around 2700 Ma.

* Discuss the general economic significance of lode gold deposits in Canada

- attract many of the exploration dollars spent in Canada

- help discover over mineral types

- recovery rates of Au from lode gold deposits is very high, averaging ~95%

- major employer in the Canadian mining industry

**Lesson 26**

* Describe the local distribution of gold in BC and the Canadian Shield

- Klondike - 12.5 million ounces

- The most significant Canadian placer gold rushes of the 19th century included the Queen Charlotte Islands (1852), along the Fraser River (1858), in the Cariboo District (1860)

* Describe the differences between lode and placer gold

- weathering of gold by water lets it sit away due to its heavy nature

- lode is hard rock, placer is with pan