

## LEARNING OBJECTIVES

### Module A. Diamonds and Due Diligence

#### Lesson 2 - Famous Gemstones and Jewellery

### Learning Objectives

**By the end of this Lesson, learners will be able to:**

- List examples of valuable historic gemstones and their quality, size, colour, any special features, and geographic origin.
- Describe the historic significance and current value of famous gemstones.
- Summarize the history of the Koh-I-Noor diamond and Mogul Emerald.
- Identify common geographic origins for historic and magnificent diamonds, emeralds, and rubies.

## INTRODUCTION AND OBJECTIVES

### Module A. Diamonds and Due Diligence

#### Lesson 2 - Famous Gemstones and Jewellery

### Introduction

In this lesson we will get acquainted with some of the most famous gemstones and pieces of jewellery, most of which have a significant story to tell. Through two online readings and the supporting content found online in our first lesson we will start to obtain a good understanding of the words and terms we use in the gem, precious metal, and jewellery world. If you have further questions about the terms, please post your thoughts on the Discussion Board. In addition, we will learn how to access online journal articles through the UBC library - a great digital resource for accessing a broad range of academic literature.

A key journal that we will be accessing throughout the course is titled "Gems & Gemology", and is produced by the Gemological Institute of America (commonly known as the GIA). We'll learn more about the GIA and Canadian Gemological Association (CGA) in the next activity, along with other historically significant people and groups.

An insightful quote by Sydney Ball in 1935 in his article "Historical Notes on Gem Mining" is still valid today, 80 years later:

*Exceptionally fine gems are so rare that they have no fixed price, and each transaction becomes a matter of negotiation between buyer and seller. As with a fine painting or other work of art, set rules do not hold. Such are red, green, or blue diamonds, white diamonds of unusual size and brilliancy, rubies of over four carats, emeralds of fine deep color and relatively free of flaws, particularly if of good size, and unusually fine sapphires.* - *Economic Geology*, August, 1935, Vol. 30, No. 5, pp. 630–642.

### Required readings and topics for this lesson

Topic	Pages
Historic Study of the Koh-I-Noor Diamond	Abstract, Introduction, Box A, and Summary

**Optional readings for this lesson**

Topic	Pages
English Royal Collection of Crown Jewels	<a href="http://www.royalcollection.org.uk/eGallery/">http://www.royalcollection.org.uk/eGallery/</a> <a href="http://www.englishmonarchs.co.uk/crown_jewels.htm">http://www.englishmonarchs.co.uk/crown_jewels.htm</a>
Garrard & Co – Crown Jewellers from 1843 to 2007	<a href="http://www.garrard.com/heritage/">http://www.garrard.com/heritage/</a>
Hope Diamond	<a href="http://www.si.edu/Encyclopedia_SI/nmnh/hope.htm">http://www.si.edu/Encyclopedia_SI/nmnh/hope.htm</a>
Wittelsbach Diamond	<a href="http://en.wikipedia.org/wiki/Wittelsbach-Graff_Diamond">http://en.wikipedia.org/wiki/Wittelsbach-Graff_Diamond</a>

Now on with the gems!

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**DIAMOND ENCRUSTATIONS****Module A. Diamonds and Due Diligence****Lesson 2 - Famous Gemstones and Jewellery****Diamond Encrustations**

Perhaps some of the most well-known and iconic diamonds familiar to the Western world are those of the British Crown Jewels, which, not surprisingly, have been incrementally accumulated over many centuries.



### Required Reading

The Koh-I-Noor diamond (which translates to "Mountain of Light") is the centerpiece of the collection and sits within the Queen Mother's Crown. The current weight of the stone is 105.6 carats, significantly less than the original ~186 carats. The original stone was not cut in a fashion that brought maximum colour and fire to the stone and Queen Victoria had it recut so as to be more of a magnificent gem. In the 38-day recutting process nearly 90 carats were lost in exchange for a more brilliant stone. For a more complete history of this diamond we'll read **part** of an article by Sucher and Carriere in a *Gems & Gemology* article from the Summer 2008 Volume. Read **ONLY** the *Abstract, Introduction, Box A, and Summary*.

Sucher, S.D. and Carriere, D.P. (2008): The Use of Laser and X-Ray Scanning to Create a Model of the Historic Koh-I-Noor Diamond. *Gems & Gemology*, Vol. 44, No. 2, pp. 124 - 141.

[Click here to download and read the Sucher and Carrier \(2008\) article.](#)

The Crown Jewels are also home to faceted pieces of the largest diamond rough ever found - The Cullinan Diamond. The original weight of the Cullinan rough was 3106 carats and yielded nine significant stones, 96 smaller stones and some extra 'bits and pieces'. The nine significant stones were given the names Cullinan I through IX and reside with the British Royal Family and Crown Jewels. The Cullinan I (530.2 carats), also known as the Star of Africa, is mounted in the Royal Scepter and the Cullinan II (317.40 carats) is mounted in the Imperial State Crown. The "smaller" Cullinan III and IV, 94 and 64 carats respectively, are set together in a single brooch. We'll read about the Cullinan Diamonds in a later section.

Another famous diamond is the Hope Diamond. This stone is most remarkable because of its deep blue colouration and lack of internal flaws – something that rarely comes together in such a great size! It weighs 45.52 carats, shows VS1 clarity, and its cut is described as a Cushion Antique Brilliant. It was most likely mined in India from the Golconda region and was first sold to King Louis XIV in 1668 by Jean-Baptiste Tavernier. It has changed hands a number of times but currently sits in the [Smithsonian Institution's National Gem Collection](#). Because of its remarkable nature and long history, there are more than 5 books devoted to it and many articles on the topic. Our textbook also includes details of this infamous 9 gram stone. An equally legendary diamond is the 41-carat "Dresden Green", which is naturally green in colour and sits in the "Green Vaults" of Dresden, Germany. Green is the rarest hue that diamond naturally exhibits and is the result of natural radiation. This stone originates from India and thought to have been mined in the early 18th century.



The infamous blue 45.52 carat Hope Diamond set in its brooch under normal light (left) and fluorescing red under short wave ultraviolet light (right). Note how the red fluorescence is being refracted through some of the other diamonds, which are also fluorescing a subtle green, though one of the white diamonds is fluorescing a light blue (at left of the Hope). Smithsonian Institute. Click on either image for higher resolution.

Diamonds like the Hope, Koh-I-Noor and Cullinans are hard to value – how exactly do you put a price on the Queen Mother's centerpiece stone? And what scenario would unfold that prompts the British Crown to sell such iconic pieces? To approximate the value of these stones we could look at some of the most expensive stones ever sold, but even then, it is not a true comparison. The historic blue [Wittlesbach Diamond](#) has a history stretching back to the 17<sup>th</sup> century and has been passed through many royal families. It weighed 35.56 carats (it was later recut to 31.06 carats) and is the current record holder for one of the most expensive diamonds ever sold at auction (held in December of 2008). Christie's was the proud auctioneer of this gem, and the reported total price for this stone came to \$24.3 million USD, which translates to ~\$680,000 per carat. More recently, a flawless 101.73 carat D-colour (ie, colorless) diamond (dubbed the Winston Legacy) was auctioned at Christies in May 2013, setting a record for the largest diamond auctioned - it fetched \$26.7 million USD (~\$250,000 per carat). It was quickly surpassed by a 118.28 carat D-colour flawless diamond auctioned in Hong Kong by Sotheby's in October 2013 for \$30.6 million USD (~\$260,000 per carat). High prices per carat for unset stones include the 0.95 carat Hancock Red Diamond that sold for ~\$925,000 USD per carat and another recent (2013) exceptional auction result for a 1.92 carat Fancy Red that sold for \$3.2 million USD. An unnamed [24.78 carat "fancy intense" pink diamond](#) that sold for \$46 million USD in Nov 2010 (that's ~\$1.8M per carat!) was later named the "Graff Pink". In April 2013, another fancy intense pink diamond, [the 34.65 Princie Diamond](#), was auctioned for \$39.3 million USD (~\$1.1M per carat) and quickly became the #2 diamond ever sold by price. If we use \$1,000,000 USD per carat as a gauge for other infamous stones, then the Cullinan I has an estimated minimum value of \$530 million USD...



The Wittlesbach Diamond (31.06 carats, left) and The Winston Legacy Diamond (101.73 carats, right).© Christie's Ltd. Click on right image for higher resolution.



The Hancock Red (0.98 carats, left) and the Graff Pink Diamond (~24.7 carats, right). © Tino Hammid ([The Handbook of Gemmology](#)) and Sotheby's 2010

## TOP TEN DIAMONDS BY SIZE

### Module A. Diamonds and Due Diligence

#### Lesson 2 - Famous Gemstones and Jewellery

### Top Ten Diamonds By Size

Diamonds more than 10 carats are exquisite, those over 50 carats are usually named and in the possession of museums, royalty or very very wealthy people, and those larger than 100 carats are usually not sold and find their way into recorded history. Smaller diamonds of intense colour or with intriguing stories can be placed alongside other 'epic diamonds'.

The following is a list of the 10 largest [polished](#) diamonds:

Diamond Name	Carats, Rough	Carats, Cut	Origin
Golden Jubilee	755.5	545.67	Premier Mine, S. Africa
Cullinan I	3106	530.2	Premier Mine, S. Africa
Incomparable	890	407.48	Congo
Cullinan II	3106	317.40	Premier Mine, S. Africa
Spirit of Grisogono	587	312.24	Congo (?)
Centenary	599	273.85	Premier Mine, S. Africa
Jubilee	650.8	245.35	Jagersfontein Mine, S. Africa

7 <sup>th</sup> DeBeers Diamond	428.50	234.65	DeBeers Mine, S. Africa
The Red Cross	375	205.1	DeBeers Mine, S. Africa
Millennium Star	777	203.4	Congo

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## EMERALDS OF ENVY

### Module A. Diamonds and Due Diligence

#### Lesson 2 - Famous Gemstones and Jewellery

### Emeralds of Envy

Perhaps the first known use of emeralds as decorative stones was by the Pharaohs of Egypt. Items dating back more than 1500 B.C. have been found, and the emeralds are usually fashioned into beads that are then mounted in rings and pendants. Amulets carved from emeralds have also been unearthed. The stones from the Egyptian deposits were certainly emeralds, however, they did not have the quality that is seen from the deposits mined today and are commonly called "Old World" emeralds. Emeralds of similar quality to those of Egypt were mined in India's Rajasthan State and are often classified as Mogul Emeralds because their extraction was commissioned during the reign of the Mughal Empire. Some of the better quality and larger stones were carved with inscriptions and of those, the largest are often named.

The most impressive of emeralds today originate almost exclusively from the mines of Colombia and in antiquity are often called New World emeralds. Emeralds sourced from Colombia are consistently more vivid, cleaner, and often larger than emeralds from anywhere else in the world. Many beads, pieces of jewellery and ceremonial items containing emerald have been found throughout the Andes and belonged to the Incans, but all presumably originating from Colombia. The Aztecs also valued emeralds and obtained their stones from Colombia as well.

When the Spanish came to South America in the 16<sup>th</sup> century and returned to Europe with a wealth of exquisite emeralds it did not take long for these stones to spread into other regions, such as India. For instance, a spectacular large and clean emerald from Colombia was shipped to India and subsequently carved into what was to become the famous Mogul Emerald. This 217 carat rectangular shaped emerald (measuring 5.2 by 4.0 cm) is inscribed with Islamic text thought to be carved at the end of the 17<sup>th</sup> century. On the backside of the tablet is carved a beautiful display of poppy flowers. In 2001 The Mogul Emerald was auctioned through Christie's of London for \$2.2 million USD.



The Mogul Emerald - Front (left) and back (right). Image from [Christie's Fine Art Auctions](#).

Yet another famous cut Colombian emerald is the Hooker Emerald (see our textbook by Bonewitz et al. page 110) which weighs 75 carats and is set in a Tiffany-designed platinum brooch. It is currently on display in the Smithsonian Institute's Museum of Natural History, donated by Janet Hooker in 1977. Prior to her ownership the stone belonged to Sultan Abdul Hamid II and subsequently Salomon Habib – a famous French jewellery dealer.



The Hooker Emerald, originating from Colombia. The brooch is part of the Gem and Mineral Collection of the Smithsonian [National Museum of Natural History](#).

One of the largest uncut fine Colombian emeralds existing today is the Patricia Emerald, weighing in at an impressive 632 carats, or 126 grams. The 6.35 cm long and 2.54 cm wide stone (or rock?) has been housed in the American Museum of Natural History's collection of precious minerals and gems since 1921.



The Patricia Emerald. Photo from the [American Museum of Natural History](#).

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## REGAL RUBIES

### Module A. Diamonds and Due Diligence

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### Regal Rubies

Like emeralds from Colombia, rubies of the finest quality generally originate from the Mogok Stone Tract of Burma, or what is known today mostly as Myanmar. Colour of the finest stones is often referred to as Pigeon's Blood Red - a red to purple-red colour with medium-dark tone that is enhanced by a red fluorescence. These stones are rarely larger than 5 carats, and the following quote by Jean-Baptiste Tavernier in 1676 still holds true today:

*"When a ruby exceeds five carats, and is perfect, it is sold for whatever price is asked for it." -Travels in India, Vol II (1676) pp.78-79*

Indeed, the famous "Mogok Ruby", also known as the Alan Caplan Ruby, weighs 15.97 carats and is perhaps one of the finest cut rubies. In April of 2005 Sotheby's auctioned the stone for \$3,630,000 - resulting in a per carat value of \$227,301! It was sold to the Sultan of Brunei who apparently used it as an engagement ring - lucky bride. In 2006, Christie's auctioned a similarly magnificent Burmese ruby ("The Graff Ruby") weighing 8.62 carats and fetching \$US 3,621,000 - resulting in a per carat value of over \$420,00 per carat. In December 2011, Christie's sold a similar stone weighing 8.24 carats (the Richard Burton Ruby) from the Elizabeth Taylor Collection and fetched \$4.2 million USD (~\$513,000 per carat). Another Burmese ruby, this time 6.04 carats and set with six ~1 ct diamonds, was sold by [Christie's in May 2012](#) for \$3.3 million USD, around ~\$551,000 per carat. The 32.08 carat Hope Ruby of Burmese origin, also sold by Christie's in May 2012, sold for \$6.7 million USD.



The Richard Burton Ruby (left) was given to Elizabeth Taylor in 1968 and auctioned in 2011 after her death, with proceeds going to the The Elizabeth Taylor AIDS Foundation. It weighs 8.24 carats. The Graff Ruby (right), weighing 8.62 carats, was auctioned in 2006 and originated from Burma as well. The colour of red in these stones is described as "Pigeon's Blood Red". Photos from the Smithsonian [National Museum of Natural History](#) and Christie's Auction House.



The Hope Ruby (left) weighs 32.08 carats and is of Burmese origin. The ruby ring on the right was the piece described above, weighing 6.04 carats and shows excellent transparency for such a large Burmese ruby. The colour of red in these stones is also described as "Pigeon's Blood Red". Photos from Christie's Auction House.



This unnamed ruby (left) shows top quality colour and originates from Africa. The Harry Winston, Inc. designed bracelet (right) features 60 carats of the finest Burmese rubies set alongside many marquise shaped diamonds. Photos from the [Gemological Institute of America](#) and the Smithsonian [National Museum of Natural History](#).

Star rubies also make the history books. Among the more infamous ones, the Burmese DeLong Star Ruby weighs 100.32 carats and is on display at the American Museum of Natural History. Stolen in 1964, it was returned for a reported \$25,000 USD ransom... far below the actual value of the stone but a nice purse for the thief, Jack Murphy. The other famous star ruby is the Rosser Reeves Ruby – it sits in the Smithsonian National Museum of Natural History and weights 138.7 carats.



Rosser Reeves Star Ruby. Photo from the Smithsonian [National Museum of Natural History](#).

But perhaps the most famous ruby is the Black Prince's Ruby that is set in the Imperial State Crown just above the Cullinan II diamond (and in close proximity to the almost-as-famous Stuart and St. Edward's Sapphires). Ironically, the Black Prince's Ruby is not a ruby at all, but instead a red spinel. Its documented history starts in 1366 AD in Spain following which is a lengthy story filled with trials and tribulations. The story is well documented on [Richard Hughes' website](#). So although it is not a ruby at all its significant history makes that particular spinel essentially priceless.

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## CHECK YOUR UNDERSTANDING

### Module A. Rocks, Minerals and Gems

#### Lesson 2 - Famous Gemstones and Jewellery

This is our second Check Your Understanding (CYU) page. These CYU pages repeat the original Learning Objectives from the start of each Lesson and also have a couple of questions to get you reflecting on the Lesson. Some will be "Open ended" and some will be "Forms". In some cases the CYU questions may simply be an altered restatement of a learning objective simply offering a different wording - consider using the CYU questions as starting points on the Discussion Board!

#### Learning Objectives

- List examples of valuable historic gemstones and their quality, size, colour, any special features, and geographic origin.
- Describe the historic significance and current value of famous gemstones.
- Summarize the history of the Koh-I-Noor diamond and Mogul Emerald.
- Identify common geographic origins for historic and magnificent diamonds, emeralds, and rubies.

#### Check Your Understanding

- What are the top cut ten diamonds by size? Where do most of these famous diamonds originate?
- Other than its impressive size, what makes the Mogul Emerald Unique? Why do you think it is called the "Mogul Emerald?"
- From where do most of the listed famous emeralds originate? Rubies?

## Lesson 2 ("L2") Check Your Understanding (CYU) Form

Do you understand the difference between "rough" and "cut" gemstones?

- Yes
- No

What makes some gemstones "priceless"?

- Historical and cultural significance
- Made of technically worthless material
- No one can afford to buy them
- There is no standard grading for large diamonds

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