



Gem & Jewelry Careers



Presenter Notes



Introduction: Provide a brief introduction. Perhaps explain what got you interested in the industry, or what you find intriguing about gems and jewelry, or what subjects in school helped you to become who you are today. This is an opportunity to connect with the audience and to help them feel comfortable.

What do you want to do when you get older? ***Allow time for answers.***

What subjects in school do you think would be helpful for that job? ***Allow time for answers.***

What are some things you can do now to learn more about that career path? ***Allow time for answers.***

****Click to go to next slide***



The gem and jewelry industry is fascinating!

But have you ever wondered about where jewelry comes from? Or what it takes to make amazing pieces of jewelry?

Today we'll look at the process, often called the "Mine to Market" process.

We'll also learn about the various jobs that are involved in this process, and we'll talk about the skills required for each job.

Finally we'll learn a little about the Gemological Institute of America (GIA), and we'll show you where to go to learn much, much more about gems and jewelry!

PRESENTER NOTE: Tell students to ask questions as you go along. Feel free to add personal stories that may relate to each career as you discuss the information.

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Jewelry has been around since ancient times. There is evidence of early man wearing sea-snail beads and engraved rocks.

This may not be what you think of as jewelry today, but the idea of adorning is not new.

So how is jewelry made? Who is involved in making jewelry?

Let's start with the Mine to Market process...

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1-GEM DISCOVERY: Gems are discovered all around the world, even in exotic locations like Tanzania, Vietnam, Brazil, and Australia.

****Click to show next picture***

IMAGE 2-ROUGH SALES: Uncut gems known as ROUGH are bought by brokers, dealers, and cutters, who then sell to wholesalers in gem centers around the world. ****Click to show next picture***

IMAGE 3-IDENTIFICATION: Laboratories identify and grade gems. Laboratories examine diamonds, colored stones, and pearls. ****Click to show next picture***

IMAGE 4-CUSTOM DESIGNING: Jewelry designers combine design methods ranging from traditional hand sketching to sophisticated computer programs. ****Click to show next picture***

IMAGE 5-JEWELRY MANUFACTURING: Jewelry designers and bench jewelers set gems and create pieces that will be treasured for generations. ****Click to show next picture***

IMAGE 6-GEM AND JEWELRY SALES: Sometimes rare and valuable pieces are sold through auction houses. Other gems and jewelry are sold at retail stores and online stores around the world.

Now that we know a little about the process involved, let's take a closer look at some of the careers in the gem and jewelry business.

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A gemologist is someone who studies gemstones.

A **field gemologist** is someone who not only studies gemstones, but also travels around the world to visit mines and new sources of gem material.

Field gemologists collect samples for further study in a laboratory environment.

A successful **field gemologist** must have a solid understanding of gemology, mathematics, chemistry, and current pricing and consumer trends within the gem and jewelry market.

In addition to the knowledge required, a **field gemologist** should have the following skills:

- Good hand-to-eye coordination
- Ability to use optical instruments such as a loupe and a microscope
- Photography and videography skills—documenting discoveries is VERY important!
- Hiking, camping, and basic safety, survival, and first aid

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1-Field gemologists need to take preparation seriously if they are going to be ready to hike in jungle conditions. These field gemologists are climbing a trail covered with wet, slippery vegetation in Vietnam. ****Click to show next picture***

IMAGE 2-Ruby (left), blue spinel (center), and pink spinel (right). These rough gemstones were recovered during a field expedition in Vietnam. ****Click to show next picture***

IMAGE 3-This image was taken at a morning gem market in Vietnam. Field gemologists often speak with sellers to create new relationships and locate new sources of gemstones.

****Click to go to next slide***



Gem Miner

Gem miners extract gemstones from river streams or rock.

They usually use baskets or pans in rivers and streams, while picks, shovels, or heavy equipment are used in rock mining.

Gem miners work to remove gemstones from river streams or rock.

Diamond mining is typically done using heavy machinery, hydraulic shovels, and trucks to recover diamonds from the ground.

Colored gemstone mining is much different, usually involving **gem miners** who use tools such as picks and shovels to break up the rock.

Once the rock has been collected, they carefully sort through the material looking for gemstones.

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1-These artisanal miners in Cambodia are mining for ruby and sapphire. ****Click to show next picture***

IMAGE 2-Here the miners search and sort through the material. ****Click to show next picture***

IMAGE 3-Here is the result of the day's mining. Obviously, some locations produce more gem-quality stones than others. But it is important to understand how difficult it can be to find gemstones.

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Let's put this into perspective. This is a picture of the Diavik diamond mine in Northern Canada.

The hole in the earth is manmade, meaning ALL of that earth has been removed by heavy equipment such as earthmovers, scrapers, and dump trucks.

Once all the earth has been dug up, it has to be searched and sorted.

As you can see, when mining diamonds, a lot of earth has to be moved and sorted.

Typically, in order to recover 1 carat of diamond, you would have to process about 250 TONS of earth.

That's the same weight as 16 trucks! Or 50 elephants! Or approximately two hundred THOUSAND puppies!!

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Once the gemstones have been pulled from the ground, they are processed and sorted by color, size, and quality.

A **buyer** is a person who can buy rough gemstones and sell them to a gem cutter, jewelry designer, or collector.

The **buyer** must know current market values and what gemstones are popular at the time.

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1-These buyers are examining rough emerald at an open market. ****Click to show next picture***

IMAGE 2-This buyer is examining rough emerald in the office of a Colombian gem dealer.

****Click to go to next slide***



Before the rough gemstones can be mounted into jewelry, they need to be cut and polished.

The person who cuts, shapes, and polishes natural and synthetic gemstones is known as a **gem cutter**.

A **gem cutter** must have great knowledge of gemology, jewelry design, and the very specialized process of cutting and polishing gemstones.

The **gem cutter** begins by closely examining the stone, evaluating the quality and the best cut to use.

Next, the **gem cutter** carefully plans the final shape of the stone that is needed. This can be tricky depending on whether the stone will be used in a necklace, a ring, a bracelet, or something else entirely.

Once the planning is complete, the **gem cutter** works with various tools to cut, shape, and polish the gemstone.

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

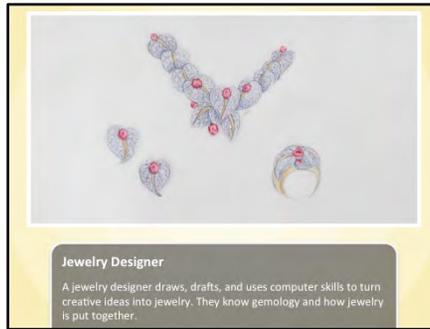
IMAGE 1-Once the planning is complete, the stone may be cut using a saw. Here the cutter is making the initial cut. ****Click to show next picture***

IMAGE 2-Next, the stone is attached to a brass or steel rod using wax. This is called a dop. The dop allows the cutter to handle the stone while cutting facets. ****Click to show next picture***

IMAGE 3-The cutter then creates the facets (smooth edges of the finished stone), and then it will be polished to a mirror-like finish.

If you like to be creative, enjoy working with tools, and have great pride in your craftsmanship, perhaps the role of **gem cutter** is something you would enjoy.

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Much like amazing works of art and beautiful music, jewelry begins with an idea, an INSPIRATION.

These ideas and inspirations are brought to life by very talented people who can capture and translate these concepts into design sketches.

These people are called **jewelry designers**.

The process begins with meeting the client and listening to their ideas.

Then the designer creates a sketch incorporating the client's ideas.

Some designers work with metals, gemstones, and other materials to create magnificent pieces of jewelry for customers, while others provide jewelry manufacturers with the design for final production.

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1- Designers often use common tools that you are probably familiar with: colored pencils, rulers, paints, and markers. ****Click to show next picture***

IMAGE 2-The final sketch is reviewed by the customer before manufacturing begins.

****Click to go to next slide***



Jewelry Manufacturer

Do you like gemology, art, and working with tools?

Jewelry manufacturers make or repair jewelry by using skills such as sawing, soldering, and laser welding.

By a show of hands, how many of you like to draw or paint? ****Allow time for students to respond***

What about working with tools? ****Allow time for students to respond***

Well, if you like both of these types of activities, a career in jewelry manufacturing may be very interesting to you!

Creating jewelry from raw materials is an art that requires very specific skills and knowledge.

Jewelry manufacturers must understand the fundamentals of jewelry engineering as well as the techniques required to create and repair jewelry.

Jewelry manufacturers can make or repair jewelry, and they work with a wide variety of special tools that help them to saw, solder, engrave, polish, and much more!

Many successful jewelry designers and manufacturers start as bench jewelers and learn their skills through educational programs and over time on the job.

PRESENTER NOTE: This slide contains multiple images. See information for each image below:

IMAGE 1-A file is used to finish this ring setting prior to setting the gemstones. ****Click to show next picture***

IMAGE 2-This jewelry manufacturer is using a torch to prepare this ring for stones.

****Click to go to next slide***



Computer-aided design (CAD) and computer-aided manufacturing (CAM) is another method used to custom design jewelry.

Custom designs often start as a sketch and are then created using computer software.

The computer file is then used to create a prototype of the final design.

If everything works, the final piece of jewelry is created using the prototype as a guide.

PRESENTER NOTE: This slide contains multiple images. See notes for each image below:

IMAGE 1-Sketches visually communicate the design. ****Click to show next picture***

IMAGE 2-The CAD model is created to exact specifications and prepared for use by the 3D printer. ****Click to show next picture***

IMAGE 3-The 3D printer creates resin models of the design. ****Click to show next picture***

IMAGE 4-The designer then compares the initial design sketch to the printed resin model. ****Click to show next picture***

IMAGE 5-If everything is within specifications, the metal casting can be made. ****Click to show next picture***

IMAGE 6-Gemstones are added and secured, and the final piece of jewelry is ready for the customer. ****Click to show next picture***

****Click to go to next slide***



If you like science, and discovering the differences that make something unique, then a career as a laboratory gemologist may interest you.

Laboratory gemologists use loupes, microscopes, and other sophisticated lab equipment to observe gemstones.

Laboratory gemologists can be very helpful in determining the source, characteristics, and even the quality of various gemstones.

Sometimes laboratory gemologists identify new species of gemstones.

PRESENTER NOTE: This slide contains multiple images. See notes for each image below:

IMAGE 1-This research technician is using a very specialized microscope connected to a laser imaging machine. ****Click to show next picture***

IMAGE 2-Here we see a technician using an X-ray machine to examine pearls.

****Click to go to next slide***



Purchasing jewelry can be a very personal experience.

Often people make the decision to buy jewelry to mark a significant life event.

Can YOU think of any time when people typically buy jewelry? ***Allow time for answers**

(Sample answers include engagement, marriage, major holidays such as Christmas, Valentine's Day, Mother's Day, etc.)

A retailer is someone who works with customers to identify an appropriate piece of jewelry.

A retailer must be honest and friendly and be a good listener.

An effective retailer must also have passion and confidence about what they're selling and be ready to answer questions from the customer.

PRESENTER NOTE: This slide contains multiple images. See notes for each image below:

IMAGE 1-Retailers must be able to listen closely to the customer in order to understand what type of jewelry to present. They must also have a firm understanding of what they are selling and how to handle hesitation from the customer. ***Click to show next picture**

IMAGE 2-Successful retailers strive to create relationships through honesty and product knowledge, which will hopefully lead to return customers.

***Click to go to next slide**



By a show of hands, how many of you like to take pictures? ****Allow time for students to answer***

What do you like most about taking pictures? ****Allow time for students to answer***

Photographers must know about various photography tools such as cameras, lenses, lighting, and staging, but photographing gemstones and jewelry is a very specialized skill.

Gemstone photographers must also have knowledge of how different gemstones react to light and what color is best to present.

To be successful, you'll also need to understand photo-editing software. This software makes it possible to correct color to match the actual gemstone, and to adjust the background or modify shadows.

Patience is also a key in capturing the brilliance and beauty of gems and minerals.

Remember, practice makes perfect. The more pictures you take, the better you'll get at it!

PRESENTER NOTE: This slide contains 3 images. See below for information about each image:

IMAGE 1-Proper lighting for photographing jewelry can be quite difficult. This image shows a very specialized setup in a controlled environment. Without proper lighting, the correct color may not be captured, or reflections may appear misleading. ****Click to show next image***

IMAGE 2-Photographers have to be creative when shooting gems and jewelry. This photographer is using special tools to help him accurately capture the jewelry in this display case. ****Click to show next image***

IMAGE 3-Documentation is a key part of field gemology and requires skillful coordination of photography AND videography.

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Who likes to learn new things? **Allow time for students to respond**

What is something NEW you learned recently? **Allow time for answers**

And **WHO** taught you this new information? **Allow time for answers**

Chances are you do a LOT of learning at school, from your teachers.

Did you know that most of YOUR TEACHERS like to learn new things too?

A good teacher loves to learn! That's why they spend most of their day helping others enjoy the learning process.

A **gemology teacher** can show students how to identify and evaluate a wide variety of gemstones.

A **jewelry manufacturing arts teacher** can show students how to design, create, and repair jewelry of all types.

PRESENTER NOTE: This slide contains 4 images. See below for information about each image:

IMAGE 1-At GIA, teachers help students understand the identifying characteristics and qualities of diamonds and colored gemstones. **Click to show next image**

IMAGE 2-Students also learn how to identify various gemstone treatments and practical skills that they can use in their careers. **Click to show next image**

IMAGE 3-Jewelry manufacturing arts teachers show students the proper techniques for working with tools and materials while creating jewelry. **Click to show next image**

IMAGE 4-They also teach students how to create designs using computer software, and how to transform those computer designs into jewelry prototypes using 3D printers.

***Click to go to next slide**



Let's see how much you learned today!

First we'll break into some small groups.

Then I'll present a few brief facts about each career.

Work with your teammates to figure out which career is being discussed.

Don't shout out the answer—make sure you raise your hands!

If you'd like, you can use your workbooks to help out.

PRESENTER NOTE: The following slides contain a clue about the career. When you click on the center of the slide, a 10-second counter will begin. It's a good idea to let the students look at the first clue for a few seconds.

After the 10-second counter is up, a portion of an image will be presented (as a bonus hint).

If a group guesses CORRECTLY, click on the LOWER RIGHT portion of the slide. This will advance to the answer slide.

****Click to go to next slide—REMEMBER that the next slide will show the FIRST CLUE! Don't go forward until all groups are ready to start!***

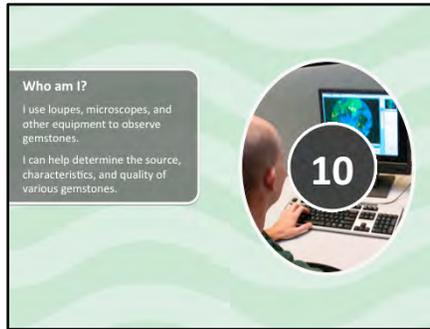


Okay! Here's your FIRST clue!

Remember to raise your hands, and don't shout out the answer!

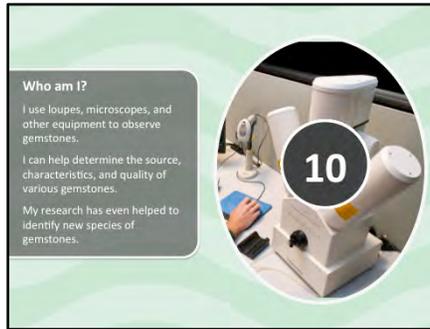
PRESENTER NOTE: If a group guesses CORRECTLY , click on the **LOWER RIGHT** portion of the slide. This will advance to the answer slide.

****Click to go to next slide***



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****Click to go to next slide***



PRESENTER NOTE: If a group guesses CORRECTLY, click on the **LOWER RIGHT** portion of the slide. This will advance to the answer slide.

****Click to go to next slide***

Who am I?

I use loupes, microscopes, and other equipment to observe gemstones.

I can help determine the source, characteristics, and quality of various gemstones.

My research has even helped to identify new species of gemstones.



**Laboratory
Gemologist**

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PRESENTER NOTE: This slide has an animated counter and an image that will display after the countdown (10 seconds).

****Click to start counter***

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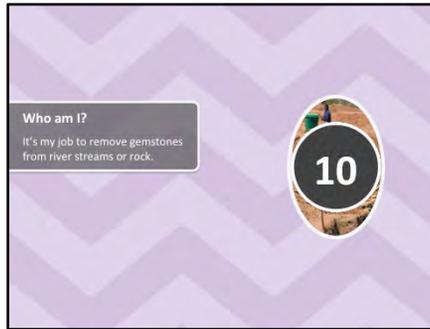
Who am I?
I seek out new sources of gemstones.
I collect samples of gemstones for further laboratory research.
I have great knowledge of not only gemology, but also safety, survival, and first aid.

Field Gemologist



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****Click to go to next slide***



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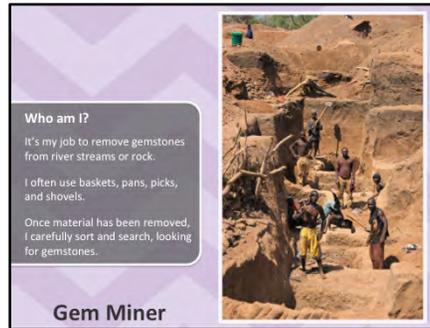


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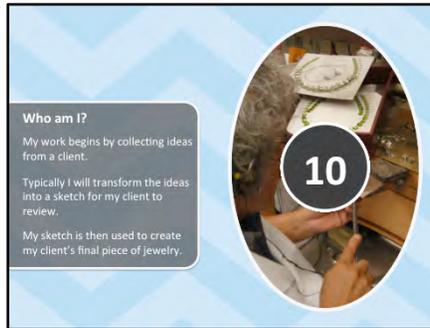


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****Click to go to next slide***



Who am I?
My work begins by collecting ideas from a client.
Typically I will transform the ideas into a sketch for my client to review.
My sketch is then used to create my client's final piece of jewelry.

Jewelry Designer

PRESENTER NOTE: REMEMBER that the next slide will show the FIRST CLUE! Don't go forward until all groups are ready to start!

****Click to go to next slide***



GIA is both a school and a laboratory.

People come from all over the world to study at GIA.

Established in 1931, GIA is the world's foremost authority on diamonds, colored stones, and pearls.

A public benefit, nonprofit institute, GIA is the leading source of knowledge, standards, and education in gems and jewelry.

PRESENTER NOTE: This slide contains 3 images. See below for information about each image:

IMAGE 1-Jewelry manufacturing arts courses teach how to make and repair jewelry, using both traditional and computer software design.

IMAGE 2-GIA also teaches the science of gemology and gem identification, including how and where minerals grow, and how to identify a stone's internal features that we call inclusions.

IMAGE 3-The GIA laboratory has a research department where they have the difficult task of identifying all different types of gem material and some materials that are not even gems, such as glass or plastic.

This is Dr. James Shigley. He is one of GIA's top researchers.

****Click to go to next slide***



Students, parents, and teachers have easy access to interactive gemology and geology education through GIA's GemKids website.

The website features a Gem Explorer which highlights popular gems and provides fun facts about color, history and lore, name origin, and much more!

There is also a Gem Glossary which offers descriptions and definitions for a wide range of gemological and geological terms, including pronunciations!

When you have a chance, enter gemkids.GIA.edu in your web browser and check it out!