

*Sapphires and Rubies*

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*[Animated ROM logo appears with sound sting]*

*[Katherine Dunnell sitting in her office, with a microscope and several small boxes of gems beside her]*

My name is Katherine Dunnell and I am the gemologist at the Royal Ontario Museum, and we're talking about corundum today. A lot of people don't realize that corundum, or sapphires, start off as these very sort of, pinacoidal minerals.

*[Katherine picks up a grey-coloured shard-like gemstone]* This one tends not to be gem quality because it's pretty cloudy. But um, this is how they start off as. *[Close-up of stone]* And, sapphires are very, very hard. They're a hardness of nine, and they usually actually form in metamorphic environments, and environments that don't usually have a lot of... have a lot of free silica, but they don't have a lot of um, of quartz.

*[Katherine holds up a small box of multi-coloured gems, dragging her fingers through the stones]* Um, a lot of times they'll weather out of the rock, and you'll find them in these lenses in rivers. *[Close-up of multi-coloured gems, with Katherine pointing to stones]* These are from Burma, and these are sort of what they call the "gem gravel". Now, all of these are sapphires, and they'll, they'll pan them like they do for gold. And from there, they'll cut little stones out of them. Sometimes they'll heat them a bit to heat-treat them, and bring up the colour, but the majority of the time, they are usually found in these, these lenses of gravel.

*[Wide shot of Katherine holding a colourless gem under a light]* Now, sapphire, we know... the real name is actually corundum and there just different varieties that we sort of designate. Um, corundum is made up of two elements, aluminium and oxygen. So, in its pure state, it's actually colourless. We know that... people are familiar with blue sapphire, and ruby, and yellow sapphire, but I don't think they really realize that sort of the purest form of sapphire is actually colourless, *[close-up of colourless sapphire]* and what imparts colour into the other sapphires are metal ions that get stuck into the ah, atomic structure of the sapphire. So, sapphire actually, in its impure form, comes in every colour in the rainbow. *[Close-up of Katherine holding a row of sapphires showing the full range of colours]* So, you have all of the colours represented in sapphire, and each of them, um, is from a different metal ion and is substituting in during formation. *[Wide shot of Katherine pointing to the chart]* Um, they are all named according to colour, except for the red. The red, we know as ruby. Um, so we have blue sapphire, yellow sapphire, and they all come in various sizes. *[Katherine holds up a large yellow sapphire; close-up of sapphire]* This one is a perfect yellow sapphire. It's a fairly old piece in the collection. The yellow, we have orange. *[Close-up of orange sapphire]* Which is a different metal ion.

*[Katherine holds up a small box]* The most expensive sapphire is actually a ruby. Ruby from Burma especially, has a very big significance. Um, lots of the deposits of ruby around the world have a lot of iron in them. And for whatever reason, the ones

from Burma don't. *[Close-up of box containing one red ruby and one blue sapphire]* Um, the Burmese rubies have a bit of, just a tiny bit of inclusions, and a lot of times inclusions aren't a bad thing for a gemstone. When there are inclusions in gemstones, it disperses the light. *[Katherine holds ruby in her hand and under the light]* These particular ones have this really great phenomena. Because they really lack a lot of iron, when you stick them under a light, they fluoresce, or, phosphoresce, under natural light. So what happens is, the light actually activates something within the stone, and ... and emits this sort of glow. And so, a really really good ruby, or what they call a "pigeon blood" colour, *[Wide shot of Katherine and ruby]* so it's a very red red stoplight red colour, has this body colour behind it that fluoresces or phosphoresces this red intensity. This is probably the premium colour for a ruby, and it's usually from Burma, given the lack of iron. Ruby is *the* most expensive gemstone on the market. Um, you know, you do have weird anomalies like coloured diamonds, like oranges and odd reds, but generally, um, ruby is the most expensive, and continues to go higher and higher. I think the last, um, auction at Christie's had rubies going at \$250,000 US a karat. *[Close-up of ruby on Katherine's hand]* Um, so, they're very revered, and you can understand why a lot of them ended up in the Crown Jewels and other places, because of their, um, awesome colour.

*[Video ends with animated ROM logo and sound sting]*