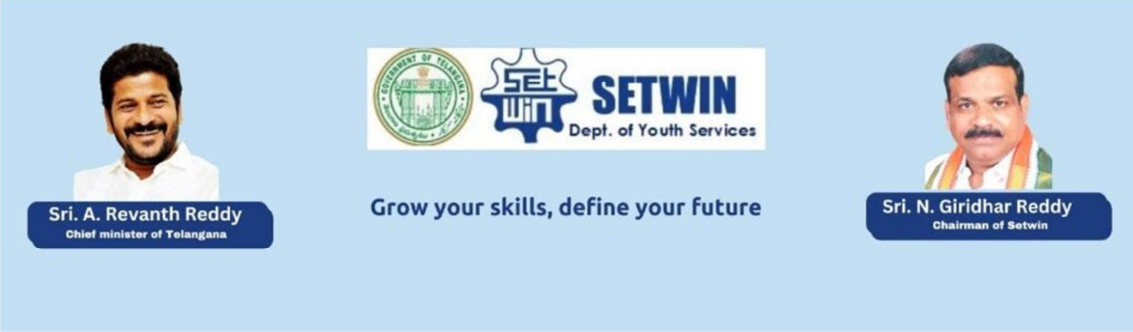

SOCIETY FOR EMPLOYMENT PROMOTION AND TRAINING IN TWIN CITIES

GOVERNMENT OF TELANGANA

GEMS CRAFT & GEMOLOGY COURSE

PROJECT WORK

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15 SEMI PRECIOUS GEMSTONES

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1.JASPER

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = SiO_2 (With varying impurities)

Crystal System = Hexagonal

Crystal Class = Quartz (Chalcedony)

Identification

Colour = Most commonly red

But sometimes Yellow, Brown,

Green, or rarely Blue.

Cleavage = Indiscernible

Hardness = 8.5 Mohs

Luster = Vitreous

Transparency = Opaque

Specific Gravity = 2.5 to 2.9

Refractive Index = 1.54 to 2.65

Jasper is an opaque, solid or patterned variety of cryptocrystalline quartz. All types of jasper take an excellent polish, are trouble free to care for, and hardy enough for all jewellery uses. These stones are usually cabbed, sometimes carved, but seldom faceted. Jasper is common and widely distributed, occurring chiefly as veinlets, concretions, and replacements in sedimentary and metamorphic rocks, as in the Urals, North Africa, Sicily, Germany, and elsewhere. Some varieties are colour-banded, and beautiful examples of pauperized fossil wood are found in Arizona, U.S. Jasper is also common as detrital pebbles. Find out more information at:- https://www.gemstones.com/gemopedia/jasper

2.TIGER'S EYE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = SiO_2 (With varying impurities)

Crystal System = Hexagonal

Crystal Class = Quartz (Chalcedony)

Identification

Colour = Golden to Red Brown.

Cleavage = Indiscernible

Hardness = 6.5 to 7.0 Mohs

Luster = Silky

Transparency = Opaque

Specific Gravity = 2.64 to 2.71

Refractive Index = 1.54 to 2.65

TIGER'S EYE Tiger eye is a type of natural stone that is characterized by its golden-brown color with a shimmering, chatoyant effect. What is Tiger Eye made of? It is a form of quartz mineral that is composed of silica. The golden-brown color of the stone is caused by the presence of iron oxide. Tiger iron is mined primarily in South Africa and Western Australia. Tiger's eye is composed chiefly of silicon dioxide (SiO_2) and is coloured mainly by iron oxide. Common sources of tiger's eye include Australia, Burma, India, Namibia, South Africa, the United States, Brazil, Canada, China, Korea and Spain. Find out more information at:- https://geologyscience.com/minerals/silicates-minerals/tigers-eye/

3.STARSTONE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = SiO_2 (With varying impurities)

Crystal System = Hexagonal

Crystal Class = Quartz (Chalcedony)

Identification

Colour = all colour except red

Cleavage = Indiscernible

Hardness = 9 Mohs

Luster = Vitreous (glassy) to adamantine (diamond-like)

Transparency = Transparent to opaque

Specific Gravity = 2.5 to 2.9

Refractive Index = 1.757-1.779

STARSTONE Star stones, or asteriated gemstones, are known for their unique optical phenomenon where a star-like pattern, called asterism, appears on their surface when viewed under light, caused by microscopic, needle-like inclusions. Among star stones, star sapphire is the archetype, often called the “asteria” in the past.One of the oldest known star sapphires is the Star of India, a 563.35-carat Sri Lankan stone dated by American Museum of Natural History to be around 2 billion years old. It’s also one of the world’s largest gem-quality blue star sapphires.Find more details at:- https://www.gemrockauctions.com/learn/a-z-of-gemstones/star-sapphire?srsltid=AfmBOorX1EOCYbUyZcBdEyzrL12ZueIlJvktMjLKOU_G-C2lswbASA9v

4.AQUAMARINE

CLASSIFICATION:-

General

Category = Mineral –Silicate Beryl Family

Chemical Formula = $Be_3Al_2Si_6O_{18}$, also containing Fe^{2+}

Crystal System = Hexagonal

Crystal Class = Quartz (Chalcedony)

Identification

Colour = Pale blue to light green

Cleavage = None

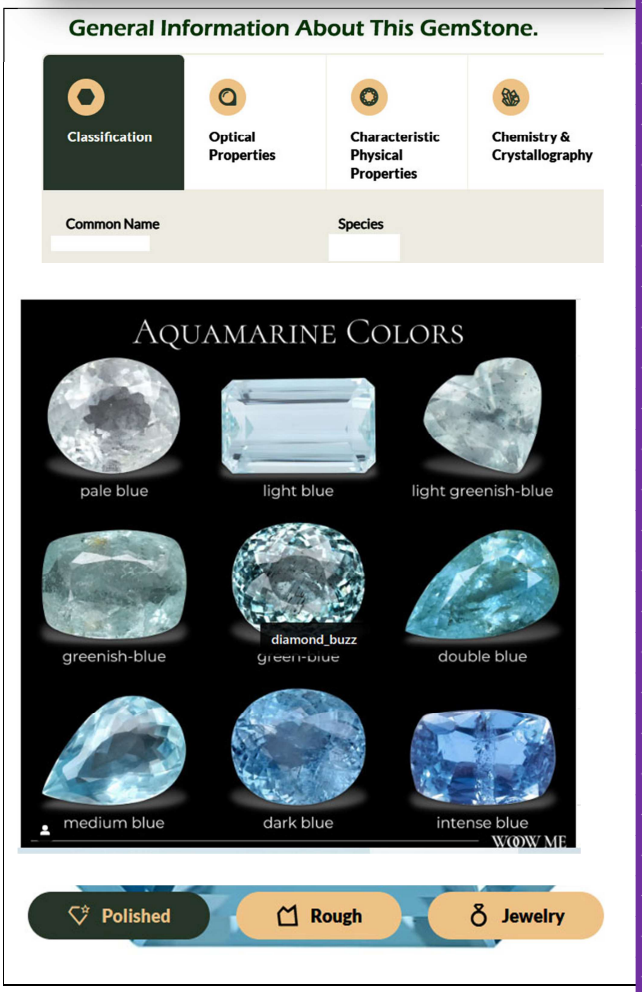
Hardness = 7.5–8 Mohs

Luster = Vitreous (glass-like).

Transparency =Transparent to Translucent

Specific Gravity = Around 2.72.

Refractive Index = 1.577 to 1.583.



AQUAMARINE

Its color is usually a light pastel greenish blue. Heat treatment usually gives it a more bluish appearance. Aquamarine crystals are known to be large in size and relatively clean and well-formed, making them particularly valuable to collectors of mineral specimens.
https://www.gemstones.com/gemopedia/aquamarine

Aquamarine is the blue to green-blue gemstone variety of beryl. It is the birthstone for March. The name aquamarine comes from two Latin words *aqua marinus* meaning "water of the sea". The color comes from trace amounts of iron in the stone. Aquamarine is typically greenish blue in nature, so it is heat treated to remove the yellow component, and to produce a true-blue color. Brazil is the largest producer of aquamarine, but fine quality stones can be found around the world.

5.LAPIS LAZULI

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = $Na_7Ca(Al_6Si_6O_{24})(SO_4)(S_3) \cdot H_2O$

Crystal System = Hexagonal

Identification

Colour = Deep blue color, often described as "royal" or "cobalt" blue. Blue, Azure blue, Violet blue, Greenish blue

Cleavage = Indiscernible

Hardness = 5 to 5.5 on the Mohs scale

Luster = Vitreous

Transparency = Opaque

Specific Gravity = 2.7 to 2.9 g/cm³

Refractive Index = 1.50 – 1.522 Isotropic

LAPIS LAZULI Variously described as indigo, royal, midnight, or marine blue, lapis lazuli's signature hue is slightly greenish blue to violetish blue, medium to dark in tone, and highly saturated. In its most-prized form, lapis lazuli has no visible calcite, although it might have gold-colored pyrite flecks. Lapis Lazuli is mined for years and years from a source still in use today in the mountain that is remote of Kokcha, Afghanistan. Although there are some other sources of Lapis worldwide, Afghanistan still produces the quality material that is finest. Find out more information at:- https://nationalgemlab.in/lapis-lazuli/

6.AMETHYST

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = SiO_2 (With varying impurities)

Crystal System = Hexagonal

Crystal Class = Quartz

Identification

Colour = Purple

Cleavage = Indiscernible

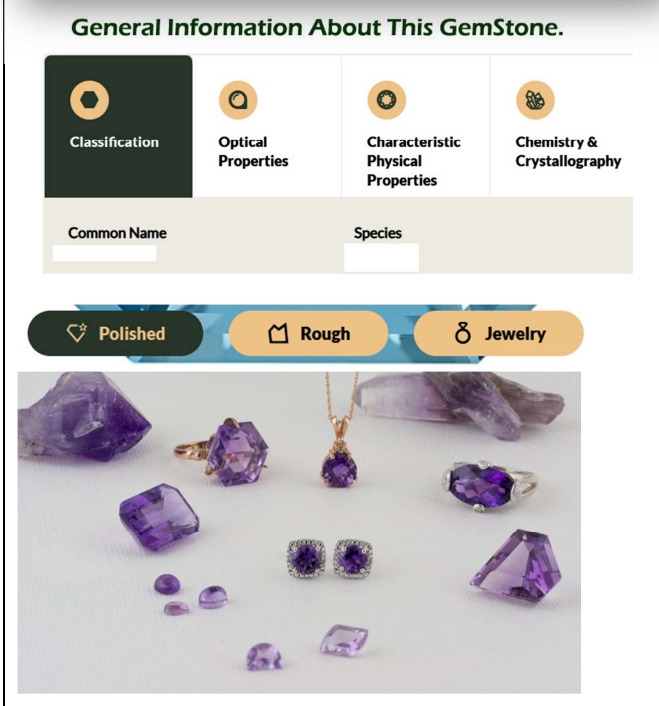
Hardness = 7 Mohs

Luster = Vitreous

Transparency = transparent, translucent and opaque

Specific Gravity = 2.66

Refractive Index = between 1.544 and 1.553.



AMETHYST Amethyst is a violet to purple variety of the quartz mineral species, prized for its color and often used in jewelry, with its hue resulting from iron and other trace elements within the crystal structure. Amethyst is the purple variety of the quartz mineral species. It's the gem that's most commonly associated with the color purple, even though there are other purple gems such as sapphire and tanzanite. Its purple color can be cool and bluish, or a reddish purple that's sometimes referred to as “raspberry.” Find out more information at:- https://snr.unl.edu/data/geologysoils/birthstones/amethyst.aspx#:~:text=Amethyst%20usually%20is%20a%20transparent,transparent%2C%20translucent%20and%20opaque%20varieties.

7.TURQUOISE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = $CuAl_6(PO_4)_4(OH)_8 \cdot 4H_2O$

Crystal System = Triclinic or orthorhombic

Crystal Class = Quartz (Chalcedony)

Identification

Colour = Blue, green, or blue-green

Cleavage = Indiscernible

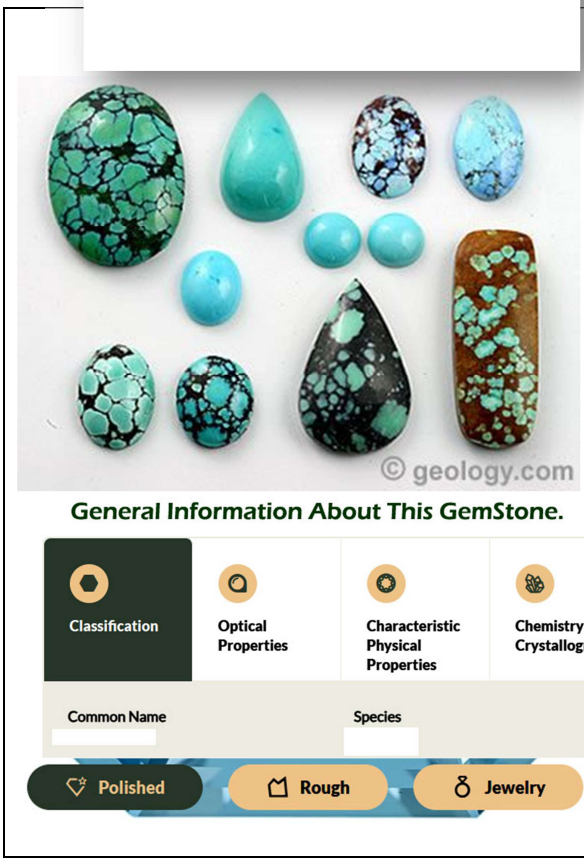
Hardness = 5 to 6 Mohs

Luster = Waxy to subvitreous

Transparency = Translucent to opaque

Specific Gravity = 2.60-2.90

Refractive Index = nα = 1.610–1.650, nβ = 1.615–1.655, nγ = 1.650–1.690



TURQUOISE Turquoise is a blue-to-green, opaque mineral, a hydrous phosphate of copper and aluminum, prized for its color and used as a gemstone and ornamental material. It's formed by the percolation of groundwater through aluminous rock in the presence of copper. This stone comes from as far as the winter corners of Nova Scotia to the parched dunes of Namibia, and it brings with it a low humming vibration. Turquoise of a greener hue is also found in the mountainous lands of Tibet. It's been discovered in the wide and open Mojave desert in California, and in other areas of the USA where Apache mines invited the watery stone to flow out of the earth and into people's hands. To find out more information please visit :- https://tinyrituals.co/blogs/tiny-rituals/turquoise-howlite-meaning-healing-properties-and-everyday-uses?srsltid=AfmBOooD_o5NyOcWdnOLSNUg9jRaTm_9Y_3MfaQ9xUUmJQo1nVTfOsPw#ruffruff-table-of-contents-item-2

8.SERPETINE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = Silicate

(Mg,Fe,Ni,Al,Zn,Mn)2-3(Si,Al,Fe)2O5(OH)4

Crystal System = Most serpentine minerals are monoclinic.

Identification

Colour = Usually various shades of green, but can be yellow, black, white, and other colors.

Cleavage = Indiscernible

Hardness = 8.5 Mohs

Luster = Greasy or waxy

Transparency = Translucent to opaque, rarely transparent

Specific Gravity = 2.5 to 2.6

Refractive Index = within the range of 1.538 to 1.571.

SERPETINE Serpentine refers to a group of hydrous magnesium-rich silicate minerals, often appearing greenish, brownish, or yellowish, and found in igneous or metamorphic rocks, sometimes used as a source of magnesium or asbestos. Serpentine rock is apple-green to black and is often mottled with light and dark colored areas. Its surfaces often have a shiny or wax-like appearance and a slightly soapy feel. Serpentine rock is usually fine-grained and compact but may be granular, platy, or fibrous in appearance. To Find out more information at:- https://geologyscience.com/minerals/serpentine-subgroup/

9. ROSE QUARTS

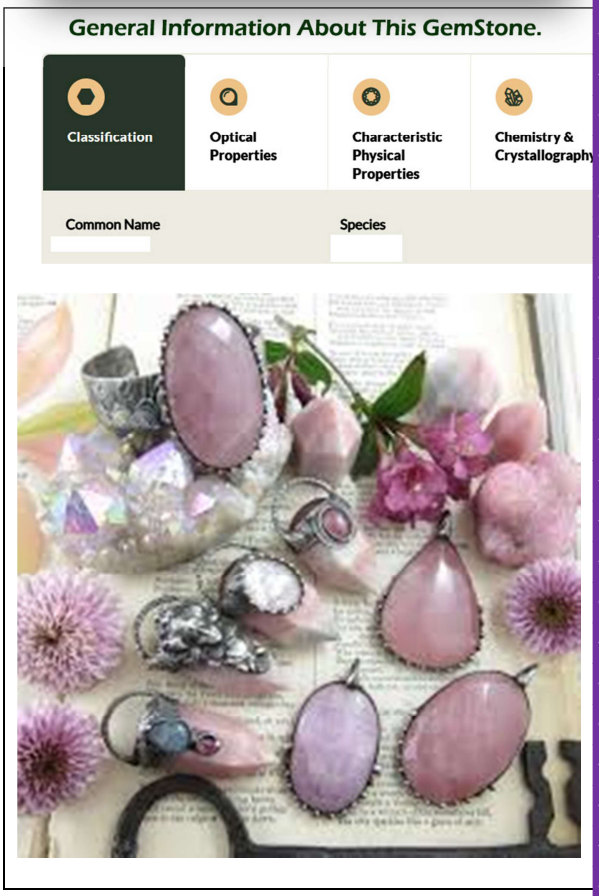
CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = SiO2 (silicon dioxide).

Crystal System = Trigonal (hexagonal-rhombohedral).



Identification

Colour = Pale pink to rose-red.

Cleavage = None.

Hardness = 7 on the Mohs scale.

Luster = Vitreous

Transparency = Opaque to translucent, rarely transparent.

Specific Gravity = Around 2.65 g/cm^3.

Refractive Index = 1.544 to 1.553.

ROSE QUARTS Rose quartz is one of the many quartz varieties used as a gem material. It gets its name from its delicate pink color, which ranges from very light (almost white) to medium-dark. The most appealing color typically occurs in larger sizes, and small rose quartz specimens with good color tend to be rare. Rose quartz, a variety of quartz (SiO2), is known for its pale pink to rose-red color, which is attributed to microscopic inclusions of aligned silicate mineral fibers or trace amounts of titanium, iron, or manganese. It typically forms in massive form, lacks regular crystal faces, and has a Mohs hardness of 7. To find out more details please visit:- https://www.gia.edu/rose-quartz-history-lore

10.GARNET

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = A3B2(SiO4)3 – where A can be Fe2+, Mg, MN or Ca; and B is Al, Cr, or Fe3+

Crystal System = Cubic.

Identification

Colour = Variable, with dark red to reddish brown being the most common, but varieties may be red-violet, brown, black emerald green, or even white.

Cleavage = None

Hardness = 6.5 to 7.5.Mohs

Luster = Vitreous (glass-like)

Transparency = Transparent to translucent.

Specific Gravity = Ranges from about 3.58 (pyrope) to 4.32 (almandine).

Refractive Index = 1.72 to 1.888

GARNET Garnet is a group of silicate minerals with a similar crystal structure and chemical composition, often found in metamorphic and igneous rocks, and known for their diverse colors and use as gemstones and abrasives. To find out more information visit :- https://www.gemstones.com/gemopedia/garnet

11.LABRADORITE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = (Ca,Na)(Al,Si)4O8

Crystal System = triclinic

Identification

Colour = Multicolour, orange, blue, green, red and yellow light.

Cleavage = Indiscernible

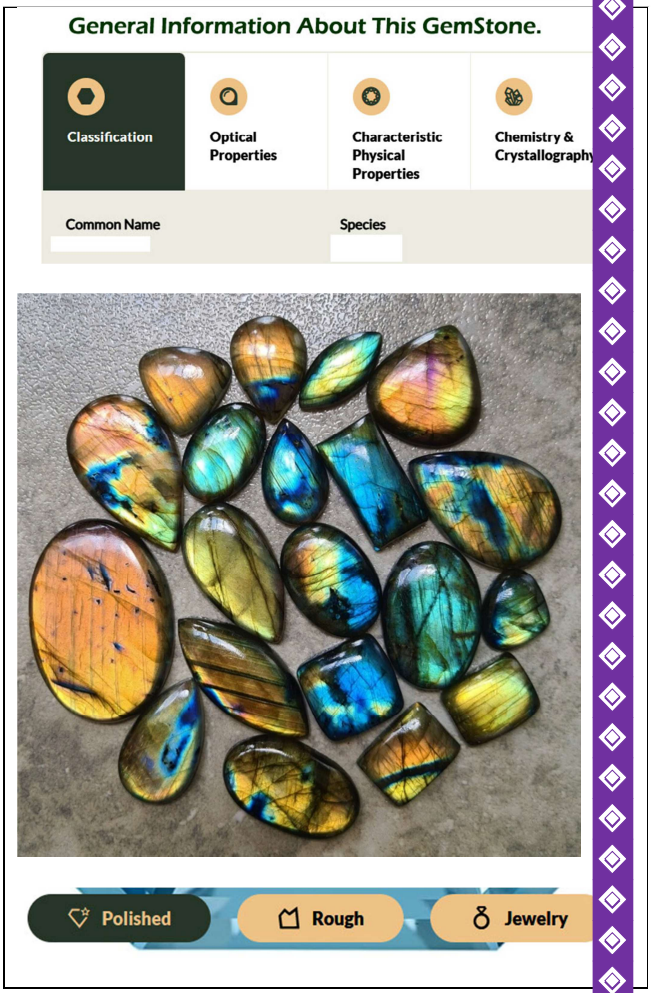
Hardness = 6.0-6.5 Mohs

Luster = vitreous

Transparency = Semi-transparent - Translucent

Specific Gravity = 2.71-2.74 g/ml

Refractive Index = 1.559-1.568



LABRADORITE. Labradorite is a feldspar mineral known for its iridescent play of colors, often blue, green, and gold, called "labradorescence" or "schiller". It's a plagioclase feldspar, found in igneous rocks like gabbro, basalt, and anorthosite, and is valued as both a gemstone and ornamental material. To find out more information please visit:- https://cameo.mfa.org/wiki/Labradorite

12.MALACHITE

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = $Cu_2CO_3(OH)_2$

Crystal System = Monoclinic

Identification

Colour = Bright green. generally opaque and comes in a vivid bluish green to green color

Cleavage = fair cleavage

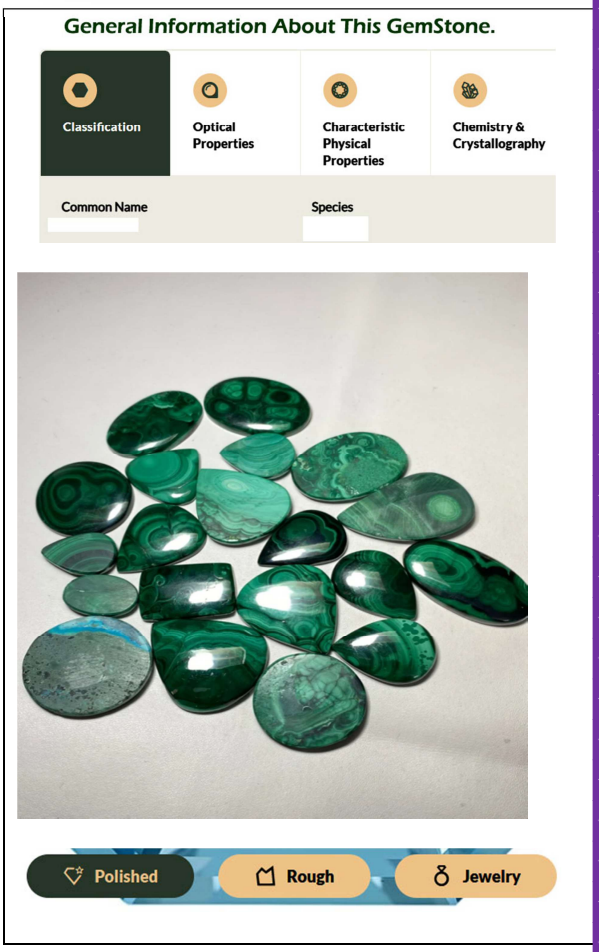
Hardness = 3.5-4 on the Mohs scale.

Luster = Adamantine to vitreous in crystals; silky, velvety, or dull in other varieties.

Transparency = Translucent to opaque.

Specific Gravity = 3.6 to 4.0.

Refractive Index = 1.65 – 1.91



MALACHITE Malachite is a vibrant green, basic copper carbonate hydroxide mineral ($Cu_2CO_3(OH)_2$) known for its distinctive banded patterns and use in jewellery, ornamental objects, and as a copper ore. Malachite's striking appearance and durability have made it a popular choice for decorative objects, such as vases, bowls, and table tops. To find more information please visit:- https://www.gemstones.com/gemopedia/malachite

13.OPAL

CLASSIFICATION:-

General

Category = Mineral

Chemical Formula = $SiO_2 \cdot nH_2O$

(hydrated silica).

Crystal System = Amorphous

Identification

Colour = Can be found in a wide range of colors, including white, black, grey, yellow, orange, and red.

Cleavage = None.

Hardness = 5.5 to 6.5 on the Mohs scale

Luster = Resinous to vitreous.

Transparency = Opaque

Specific Gravity = 1.98 to 2.20

Refractive Index = 1.44 to 1.46.

OPAL Opal is known for its unique display of flashing rainbow colors called play-of-color. There are two broad classes of opal: precious and common. Precious opal displays play-of-color, common opal does not. Play-of-color occurs in precious opal because it's made up of sub-microscopic spheres stacked in a grid-like pattern—like layers of Ping-Pong balls in a box. As the lightwaves travel between the spheres, the waves diffract, or bend. As they bend, they break up into the colors of the rainbow, called spectral colors. Play-of-color is the result.For more information and details please visit:- https://www.gia.edu/opal-description

14.MOONSTONE

CLASSIFICATION:-

General

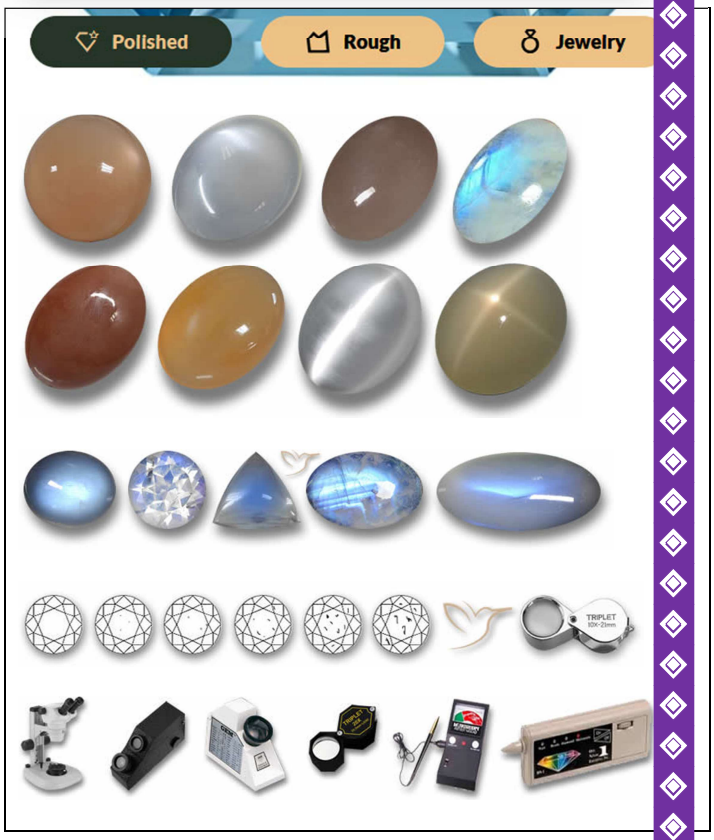
Category = Mineral Feldspar (specifically, a variety of orthoclase).

Chemical Formula = sodium potassium aluminium silicate ((Na,K)AlSi 3 O 8)

Crystal System = Monoclinic

Feldspar

Identification



- Colour = Moonstones can range in color from colorless to white, gray, green, peach, and brown.

Cleavage = perfect

Hardness = 6 on the Mohs scale.

Luster = Opalescent

Transparency = Opaque

Specific Gravity = Around 2.56.

Refractive Index = 1.518 to 1.526.

MOONSTONE Moonstone is a gemstone known for its opalescent, shimmering effect called adularescence, which gives it a milky, bluish interior light. It's a variety of the feldspar-group mineral orthoclase, composed of alternating layers of orthoclase and albite with the characteristic pearly, opalescent sheen (adularescence) resulting from the scattering of light between these layers. For more information and details please visit:- https://www.gia.edu/moonstone-description

15. AVANTURINE

CLASSIFICATION:-

General

Category = Mineral - Quartz - Oxides

Chemical Formula = SiO2 (silicon dioxide).

Crystal System = Trigonal

Identification

Colour = Green, but it can also be orange, brown, yellow, blue, or grey.

Cleavage = exhibits no or indiscernible

Hardness = 6.5 to 7 on the Mohs scale

Luster = can range from glassy, like glass, to greasy, with a more oily sheen.

Transparency = It is slightly translucent to opaque.

Specific Gravity = 2.64 to 2.69

Refractive Index = 1.53 - 1.54.

AVANTURINE Aventurine is a variety of quartz, a silicate mineral, known for its translucent nature and shimmering, glistening effect called "aventurescence" due to the presence of platy mineral inclusions. Aventurine is a distinctive type of quartz gemstone that is distinguished by its shimmering or glittery effect, known as **aventurescence**. This captivating effect is caused by tiny, reflective mineral inclusions that scatter light in various directions. While the most common and well-known color of aventurine is green, it also appears in a spectrum of colors, including blue, red, orange, yellow, and brown, depending on the specific mineral inclusions. To know more about Avanturine please visit:- https://geologyscience.com/minerals/silicates-minerals/aventurine/

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