Use Madonna and Child with St. James Major and St. Jerome to explore how artists used creative problem solving to find natural resources to make paint pigments.

**A CLOSER LOOK AND SUGGESTED DISCUSSION QUESTIONS**

This painting was created around 1512, almost 500 years ago. During this time, oil paints were not as readily available as they are today. Artists had to create their own paints out of pigments. Pigments were used for more than 30,000 years to make paint. Pigments can come from both natural (tree bark, stones, plant gum, and sometimes toxic chemicals like arsenic and mercury) and synthetic sources.

Oil paint is made by mixing a pigment of a certain color with oil, typically linseed oil. The color blue was difficult to obtain because there are very few naturally occurring blue materials. The only way artists during this time could create the blues see in this painting was from a semi-precious stone called lapis lazuli, found in the region that is now Afghanistan. Afghanistan is almost 4,000 miles from Italy, which made lapis lazuli very expensive.

Give students time to look at the painting. Ask:

- What do you see here?
- Who do you think the people in the painting are? What makes you say that?
- If you could enter this painting, what might you hear? See? Smell? Feel?
- Knowing how expensive and rare lapis lazuli was, ask students to consider what the color blue might represent in the image. Why might the artist have gone through such trouble to obtain the stone?

This image is inspired by the Bible. The person in the middle is Mary, the mother of Christ—the baby sitting in her lap. In the sixteenth century, artists were frequently commissioned to create religious paintings. Ultramarine was symbolic as a “heavenly” and important color.

- How were artists creative problem solvers when it came to finding materials to create pigments for oil paint?
ADDITIONAL RESOURCES
• Show a clip from The Science Channel's show How It's Made to explain how paint is made today.
• To learn more about this painting, visit high.org.

FURTHER EXPLORATION: ELEMENTARY SCHOOL
What is a gem? Gems can be cut and polished to be used for jewelry and ornamentation.
• Ask students to describe a lapis lazuli gemstone. What color is the gem? How might it feel?
• How would it be different once an artist crushed it into a powder? How would the powder feel or look different from the gem?

FURTHER EXPLORATION: MIDDLE SCHOOL
• What is the difference between a rock and a mineral?
• What is an organic material, and what kinds of organic materials have been used to make paint?

FURTHER EXPLORATION: HIGH SCHOOL
Gems are composed of minerals. A mineral is a naturally occurring inorganic solid. Minerals are made up of a particular mix of chemical elements. Lapis lazuli is a compound of sodium, calcium, aluminum, silicon, oxygen, and sulfur.
Investigate other natural and synthetic materials that have been used to make paint. Ask of each:
• Does it have a specific chemical makeup? If so, what is it?
• Do artists still use it today? Why or why not?

RELEVANT GEORGIA PERFORMANCE STANDARDS

ELEMENTARY SCHOOL VISUAL ARTS
Meaning and Creative Thinking:
• Formulates Personal Responses
Contextual Understanding:
• Views and discusses selected artworks
Assessment and Reflection:
• Discusses his or her own artwork and the artwork of others
• Utilizes a variety of approaches to understand and critique works of art

MIDDLE SCHOOL VISUAL ARTS
Meaning and Creative Thinking:
• Interprets how artists communicate meaning in their work
• Engages in dialogue about his or her artwork and the artwork of others
• Participates in aesthetic dialogue about his or her artwork and artwork of others (8th grade only)
Connections:
• Develops fluency in visual communication

HIGH SCHOOL VISUAL ARTS
VAHSVAMC.3—Cultivates critical thinking and logical argumentation in aesthetics
VAHSVAAR.2—Critiques artwork of others individually and in group settings
VAHSVAAR.3—Develops multiple strategies for responding to and reflecting on artworks

KINDERGARTEN SCIENCE
SKE1.—Students will describe the physical attributes of rocks and soils.

3RD GRADE SCIENCE
S3E1.—Students will investigate the physical attributes of rocks and soils.

6TH GRADE SCIENCE
S6E5:—Students will investigate the scientific process of how the Earth’s surface is formed.
b.—Investigate the contribution of minerals to rock composition.

HIGH SCHOOL SCIENCE
Chemistry–SC1—Students will analyze the nature of matter and its classifications.
Geology–SG5.—Students will apply geologic knowledge to the use of resources in the Earth and the control of human impacts on Earth’s systems.
Ecology–SES4.—Students will understand how rock relationships and fossils are used to reconstruct the Earth’s past.