MOLTENMETALS™ Metallic Acrylic

Glitter paint

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Glittery Galaxies
A STEAM Project

ART TECHNIQUE
Painting

AGE GROUP
Appropriate for students 6-11 years old

CONCEPT
After learning about the James Webb Space Telescope, stars and galaxies, students will create a painting of an imagined galaxy using the Elements of Art.

SESSIONS
2 x 60 minute sessions

MATERIALS
• 11" x 14" canvas or paper

• Chroma Molten Metals 6 x 8 US fl oz Set containing the following colors: Dorado Gold, Xanadu Gold, Copper, Rojo Gold, Aged Bronze, Pugare Silver

• Chroma Molten Metals 4 x 8 US fl oz Bright Set containing the following colors: Ruby Red, Plum Purple, Regale Blue, Emerald Green

• Chroma Glitter Paint 12 x 12 US fl oz Set containing the following colors: White, Yellow, Orange, Magenta, Red, Violet, Blue, Turquoise, Green, Black, Silver, Gold

• Chromacryl Students' Acrylic or Chromacryl Acrylic Essentials Pint, Black

• 1 round paint brush per student

• 1 sponge per student

• Crumpled plastic to apply paint (optional)

• Toothbrush to "flick" paint (optional)

• paper to cover desks/tables

• 1 x roll of masking tape to secure the newspaper to the desktop per class

• 1 to 2 sheets of scrap paper per student to mix their colors (easily disposable at the end of the session)

• 1 bucket to wash brushes in, per table

Other Chroma paints, such as Chromatemp Artists' Metallic and Pearlescent Tempera, can be substituted in this lesson.

Did you know that there is a telescope in space that has golden mirrors, is over 3 stories tall and the size of a tennis court? That's the James Webb Space Telescope (JWST), launched on December 25, 2021. It reached its final orbit January 24, 2022, about 1 million miles away from Earth, and in July 2022, it began to send pictures back of our universe in great detail. Scientists around the world are studying these images of galaxies, planets and stars just like artists, to learn more about the way these objects in space were formed and how they behave, while citizens of Planet Earth are fascinated with these beautiful, clear images of our universe.

Using inspiration from the images from the JWST and incorporating the Elements of Art, students will create a painting of an imagined galaxy based on the 3 shapes of galaxies and use colors to indicate the hottest and coldest stars with diffracted light.

NATIONAL CORE ART STANDARDS

Creating Anchor Standard 2: Organize and develop artistic ideas and work.

Responding Anchor Standard 9: Apply criteria to evaluate artistic work.

NEXT GENERATION SCIENCE STANDARDS

4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features

SCAN FOR MORE LESSONS
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OBJECTIVE
Students will use the Elements of Art - line, color, shape, texture, form, space, and value - to demonstrate their knowledge of celestial objects, particularly galaxies and stars, by creating an original painting of an imaginary galaxy.

VISUAL REFERENCES & RESOURCES
https://spaceplace.nasa.gov/james-webb-space-telescope/en/ is a great resource. Show the students images that the JWST has captured at **https://www.jwst.nasa.gov/**

FIRST SESSION
Review facts about the James Webb Space Telescope using the resources and references listed above. Show the students images that the JWST (and the Hubble Space Telescope) have captured. In small groups, have the students create a Wonder, Know, Learn chart based on this review.

In the discussion, note the following:

- What is a galaxy? A galaxy is an enormous collection of stars, gas and dust.
- Galaxies are different shapes.
  - ~ Spiral – bright in the center, with arms that radiate outward. The Milky Way (our galaxy) is a spiral galaxy.
  - ~ Elliptical - oval or spherical, bright in the center and gradually fading out.
  - ~ Irregular – a galaxy that is NOT a spiral or elliptical galaxy, with no visible pattern.
- Stars' colors indicate temperature: red, orange, yellow, green, white and blue with red being the coolest and blue being the hottest.
  - ~ Why is blue the hottest? Think of a flame – the blue in the center of a flame is the hottest part.
- Stars' colors indicate its relative age. Blue stars are generally newer, while red stars are generally older.
- The luminosity (brightness or value) of a star indicates distance. The brighter the star, the closer it is.

Further the discussion asking what they would hope to find in space.

What do they think they will see?

How will it look?

How will they "know" what to look for?

The JWST "sees" color differently from the way we see color. The JWST captures images with infrared light, but humans see color using visible light – the colors in the rainbow – red, orange, yellow, green, blue, indigo, and violet. The JWST uses filters to process the infrared light to create its spectacular images that captivated the world, and will do so for the next 20 years, before the telescope runs out of power.

By studying the images the same way that artists observe - noting Elements of Art such as shape, color, value, and texture - and recognizing the patterns that are present, scientists can interpret these celestial bodies. As John Mather, JWST senior project scientist at NASA Goddard said, "We know the Webb images will rewrite our textbooks, and we hope for a new discovery, something so important that our view of the universe will be overturned once again."

SECOND SESSION
Paint your surface black using Chromacryl Students' Acrylic or Chromacryl Acrylic Essentials. Let dry.

Refer to the different types of galaxies and decide which one you

Galaxy group "Stephan's Quintet"
Images taken June-July, 2022; released July 12, 2022
James Webb Space Telescope/NASA/Space Telescope Science Institute

Materials for project - canvas painted black; Chroma Molten Metals; Chroma Glitter Paint: sponge, brushes and/or crumpled plastic

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would like to paint: elliptical, spiral or irregular. Using a sponge, crumpled plastic or a stiff brush, dab on a dark value color of Chroma Molten Metals Metallic Acrylics such as Aged Bronze or Rose Gold. Some areas should be darker, and more heavily applied, and some fade out to black. Let dry.

Next, sponge on a second color of light value, such as Dorado Gold or Pugare Silver. Again, let it be dark in some areas and fade out. Let dry.

Then, make stars of different sizes and colors: red (Ruby Red), orange (Copper), yellow (Dorado Gold), green (Emerald Green), white (Pugare Silver) and blue (Regale Blue). Use a small round paintbrush. Older students can use a toothbrush and their thumb to ”flick” the paint onto your paper. You may need to thin the paint with some water if you want to splatter with a toothbrush.

For some stars, highlight them with rays or spikes, called diffraction spikes. The JWST stars have an 8 pointed pattern. This is due to the mirror used in the telescope as well as the three struts that support the mirror. The JWST mirror is so big that it is made of 18 hexagonal mirrors, so it would fit inside the rocket. When light interacts with the mirrors and the struts, it bends around the sharp edges, causing diffraction spikes.

Lastly, add some more sparkle to the dark parts of your galaxy by painting Chroma Glitter Paint as a top layer. Choose colors such as Black, Gold, Blue, Green and Silver to make some parts sparkle. Glitter Paint is translucent, so it will add depth and enrich colors while adding an allover holographic shimmer to the painting.

REFLECT AND RESPOND

Display the students’ paintings. Have the students respond to the work by asking them to critique their work on an exit ticket.

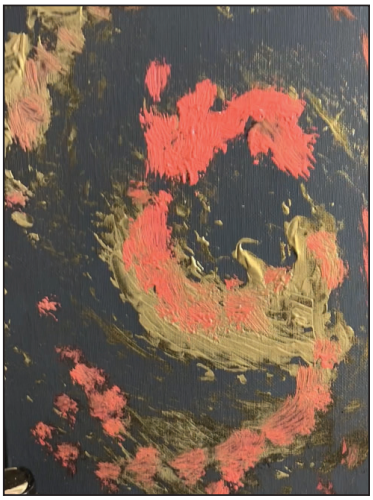
Did I use shapes to indicate the type of galaxy? What type of galaxy is it?

Did I use color to indicate different types of stars?

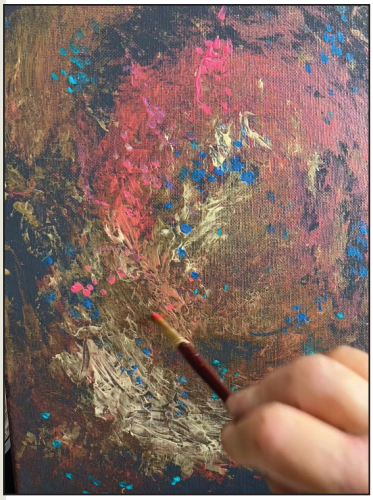
Did I adjust value, so some stars are brighter and some less bright?

Incorporate literacy into this project by writing a paragraph about the galaxy. Students can name their galaxy and describe what it would be like to visit it.

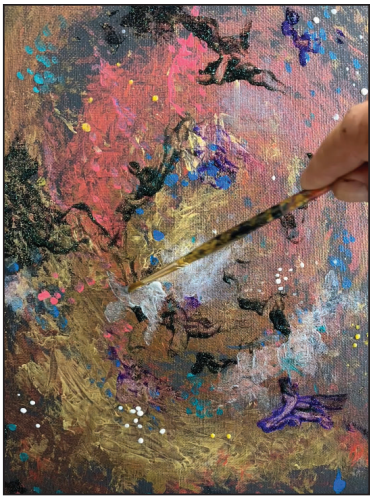
Applying 1st layer of Molten Metals



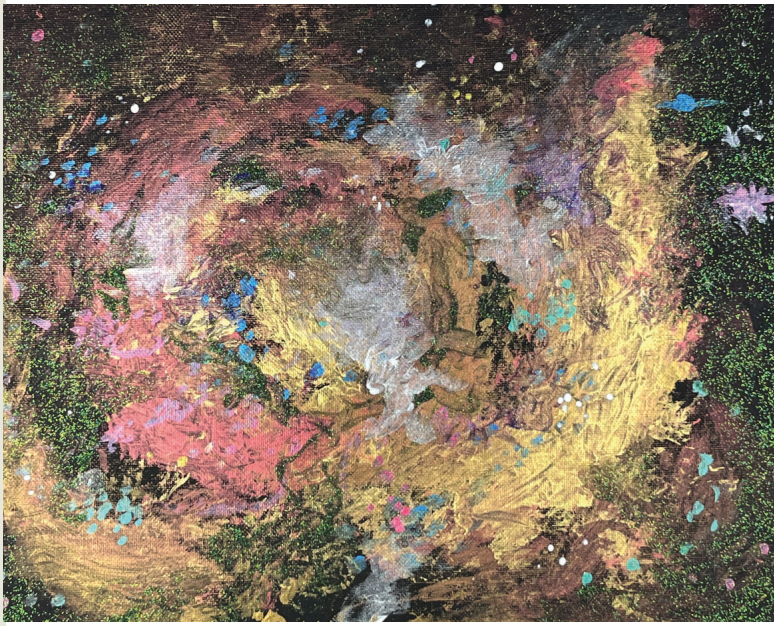
Applying 2nd layer of Molten Metals



Adding stars with Molten Metals



Adding Black Glitter Paint



Final Painting - Goldrun Spiral Galaxy “

CHROMA PAINTS AT A GLANCE

The below chart can help you determine which paints will suit the classroom purposes best. While most of Chroma's Educational lines could be used at any grade level for a variety of projects, particular Chroma brands will meet students' growing skills and provide richer, more sophisticated painting experiences.

Product	Color Range	Acrylic	Tempera	Heavy Body Consistency	Medium Body Consistency	Lightfast	Washable	Indoor/Outdoor	Best for Elementary	Best for Middle School	Best for High School	Canvas	Paper	Canvas Board	Wood	Murals/Sets	General Crafts	Paper Mâché	Printmaking
A2 Lightfast Heavy Body Acrylic	40	x		x		x					x	x	x	x	x				
Chromacryl Students' Acrylics	37	x			x					x	x	x	x	x	x		x	x	x
Chromacryl Acrylic Essentials	20	x			x				x	x		x	x	x	x		x	x	x
Molten Metals Metallic Acrylics	10	x			x				x	x	x	x	x	x	x		x	x	
Chroma Mural Paint	37	x			x	x		x			x					x			x
Chroma Mural Paint Markers	25	x			x	x		x			x					x			x
Chroma Drawing Ink	12	x				x				x	x	x	x	x	x			x	x
Chroma 2 Intense & Opaque Heavy Bodied Washable Tempera	14		x	x			x		x	x	x		x				x	x	x
Chromatemp Artists' Tempera	32		x	x					x	x			x				x	x	
Chroma Glitter Paint	12		x		x		x		x				x				x	x	
Chromacryl Fluid Acrylic	16	x								x	x	x	x	x	x		x	x	

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