

Notes/Reflections:

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Relationships • Diversity • Self-portraits •
Form • Structure • Proportion • Measurement



Discover How the Art of Portraiture Is
Really All About Math!

Invite a few art historians into your classroom! Derive inspiration from classical portrait paintings, Diego Velazquez's *La Infanta Margarita* or Raphael's *Portrait of Baldassare Castiglione*, as you explore the idea of self-portraiture with your students. A closer look at these works will reveal mathematical relationships and proper proportions that will inform your students as they render themselves.

Essential Question: How have artists consistently used mathematics since the Renaissance?

Process

- Begin this lesson by introducing notable Renaissance masters, Raphael and Velazquez, emphasizing their use of measurement and proportion in painting portraits.
- Have students lightly draw a large oval or egg shape onto their paper that measures 8" in height.
- Demonstrate that the eyes are located about halfway down the face (4" down from the top).
- Next, have the students begin drawing the eyes with just a circle, placed in the center of an almond or football shape. Identify the iris, pupil, and sclera at this time. Students must also sketch in the eyebrows at this time.
- Have the students measure halfway between the eye line and the base of the chin (6" from the top) to generate the distance for the bottom of the nose, and tell the students that the center of the nose is a "U" shape surrounded by two nostrils on either side. You can describe this shape as an isosceles triangle. Identify the cast shadow that falls on the face beneath the protruding nose shape.
- Use a ruler once again to demonstrate the mouth is located about 3/4 of an inch below the nose and ears are located between the top of the eyebrows and bottom of the nose.
- Have the students lightly sketch in the hair, neck, and shoulders last before designing the negative space. For this, they may create large symbols indicative of their interests or emotional state.
- Now that the students have drawn their portraits based on mathematical proportions, have them refer back to the proportions that were identified in the master prints.
- Next, demonstrate how to layer colors on the face using oil/chalk pastels or students may use strictly charcoal for their image. Help students generate interesting symbols to create a strong sense of balance in the negative space.
- Students will complete this endeavor by writing an essay on the back of the portraits describing their personalities and hobbies.
- Celebrate your self-portraits by conducting peer evaluations and presentations utilizing critical analysis techniques.

Assessment

- Students solutions must exhibit correct mathematical proportions according to the aforementioned masterworks.
- Student solutions must be free of stray marks and exhibit layering of colors to generate blended hues.
- Student reflective essays must include descriptive language and contain a minimum of five paragraphs.

Materials

- pencils and erasers
- crayons
- 9x12 sheets of drawing paper
- oil or chalk pastels

Vocabulary

Self-Portrait

A portrait of oneself done by oneself

Shape

The outline of a specific form or figure

Color

The quality an object or substance with respect to light reflected by the object

Size

The spatial dimensions, proportions, magnitude, or bulk of anything

Proportion

The size of one object compared to another

Iris

The contractile, circular diaphragm forming the colored portion of the eye and containing a circular opening, the pupil, in its center

Pupil

The expanding and contracting opening in the iris of the eye, through which light passes to the retina

Sclera

A dense, white, fibrous membrane that, with the cornea, forms the external covering of the eyeball

Cast shadow

A shadow that falls from an object onto a second surface

Isosceles triangle

A triangle having two equal sides

Classroom Tips

Utilize a white board to demonstrate your own self-portrait to students. Distribute materials (paper, crayons, and pencils, etc) to students before lesson begins.

Common Core Georgia Performance Standards

ENGLISH LANGUAGE ARTS

GRADES 9-10

ELACC9-10W2: Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

ELACC9-10W4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

ELACC9-10SL1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

GRADES 11-12

ELACC11-12W2: Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

ELACC11-12W4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

ELACC11-12SL1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

MATHEMATICS

GRADES 9-12

MCC9-12.G.MG.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

MCC9-12.G.MG.3: Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios)

Georgia Performance Standards

ENGLISH LANGUAGE ARTS

GRADE 9

ELA9W1: The student produces writing that establishes and appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure.

ELA9C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar both in written and spoken formats.

ELA9LSV1: The student participates in student-to-teacher, student-to-student and group verbal interactions.

GRADE 10

ELA10W1: The student produces writing that establishes and appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure.

ELA10C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar both in written and spoken formats.

ELA10LS V1: The student participates in student-to-teacher, student-to-student and group verbal interactions.

GRADE 11

ELA11W1: The student produces writing that establishes and appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure.

ELA11C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar both in written and spoken formats.

ELA11LSV1: The student participates in student to-teacher, student-to-student and group verbal interactions.

GRADE 12

ELA12W1: The student produces writing that establishes and appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure.

ELA12C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar both in written and spoken formats.

ELA12LSV1: The student participates in student-to-teacher, student-to-student and group verbal interactions.

MATHEMATICS

GRADES 9-12

MM1G1: Students will investigate properties of geometric figures in the coordinate plane.

MM1P4: Students will make connections among mathematical ideas and to other disciplines.

MM1P5: Students will represent mathematics in multiple ways.

VISUAL ARTS

GRADES 9-12

VAHSVAPR.1: Uses formal qualities of art (elements and principles) to create unified composition and communicate meaning

VAHSVAC.1: Applies information from other disciplines to enhance the understanding and production of artworks

National Standards

VISUAL ARTS

Standard 1: Understanding and applying media, techniques, and processes

Standard 5: Reflecting upon and assessing the characteristics and merits of their work and the work of others

Standard 6: Making connections between visual arts and other disciplines