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Primary Type: Lesson Plan

# Guiding Grids: Math inspired self-portraits

In this lesson students will create a proportional self portrait from a photo using a gridded drawing method and understand how a grid system can help accurately enlarge an image in a work of art.

Students will use mathmateical concepts of  scale, proportion and ratio, to complete their artwork.

**Subject(s):** Visual Art, Mathematics
**Grade Level(s):** 6, 7, 8
**Intended Audience:** Educators

**Instructional Time:** 3 Hour(s)

**Keywords:** grid, proportion, portrait, self-portrait, gridded, drawing, ratio, dilation, golden ratio, scale

**Resource Collection:** Arts for a Complete Education (ACE)

## ATTACHMENTS

griddeddrawingquiz.docx
GriddedMathWorksheetandVocab.docx

## LESSON CONTENT

**Lesson Plan Template:** General Lesson Plan
**Learning Objectives: What should students know and be able to do as a result of this lesson?**
Art students will understand how Chuck Close, and other artists, use math in creating their art.

Art students will review scale and proportion as a principle of design and use that prior knowledge to create a proportional self portrait from a photo using a gridded drawing method and understand how a grid system can help accurately enlarge an image in a work of art.

Art students will also be able to understand how scale, proportion and ratio all math concepts, relate to art.

Students will also be asked to solve mathematical equations based on their work of art for example, finding the area of their work, finding the perimeter of their picture.

**Prior Knowledge: What prior knowledge should students have for this lesson?**
The lesson will rely heavily on solving a problem using scale and proportion and reproducing a drawing at a larger scale. Students should have prior knowledge of math vocabulary such as dilation, scale, and ratio.

RATIO: The relationship between two or more similar things in size, number, or degree. Ratio is essential to scale and proportion, and to the particular type of proportion known as the Golden Mean.

SCALE: a term meaning "size" in relationship to some system of measurement. While we can speak generally of things that are "large or small in scale," in art and design when discussing scale we are referring to the size of object in relationship to a clear set of measurements.

PROPORTION: A principle of design, proportion refers to the comparative, proper, or harmonious relationship of one part to another or to the whole.

GOLDEN RATIO: the ratio of the longer side to the shorter is the golden ratio—believing this proportion to be the most aesthetically pleasing (also called the golden mean or golden section)

GRID: A grid is a system of fixed horizontal and vertical divisions. Anything, no matter how complicated or irregularly shaped, can be conceived of in terms of X (horizontal) and Y (vertical) axes.

DILATION: a transformation (notation ) that produces an image that is the same shape as the original, but is a different size. A dilation stretches or shrinks the original figure. The description of a dilation includes the scale factor (or ratio) and the center of the dilation.

SELF-PORTRAIT: A portrait an artist makes using himself or herself as its subject.

**Guiding Questions: What are the guiding questions for this lesson?**
How can I use mathematical concepts of ratio, scale and proportion to accurately enlarge an image?

I can create an accurate enlarged self portrait using math concepts.

## Teaching Phase: How will the teacher present the concept or skill to students?
Close's work is larger than life. Why does he play with scale? How would his portrait work be different if they were very small?



Frank, 1969 (acrylic on canvas) 108"x84"

Activating activity: Students will first observe the stART activity, Chuck Close's painting Frank and with their shoulder partner, they will discuss why Close plays with scale in his work and how would his portrait work be different if they were very small. After brief discussion with their shoulder partner we will call on groups to share their thoughts. (5 min)

Students will review the principle of design, proportion. The review will continue with teacher directed review of the design principle. After the review of the principle of design(s) proportion/scale. Students will be asked how they can use this prior knowledge and how they can use the mathematical concepts of dilation to enlarge their photo.

## Guided Practice: What activities or exercises will the students complete with teacher guidance?
We will then briefly review the rubric so students know what is required of the project.  Students will complete the math worksheet (attached) to determine the proportions of their own reference photo.

Students will prepare their grid paper based upon the proportions selected.  Recommend the ratio of 1:2 for 100% enlargement.

## Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?
Students will then use their reference photograph and their larger gridded paper to begin to enlarge their portrait one grid square at a time. This will process with take the rest of the class and then additional class periods to complete. As students work, teacher will circulate to check for understanding and skill/craftsmanship.

Students will review their rubric and self-evaluate where they are on day one (this will also be done on day 3 and final project to see growth) Students will put their work away in their boxes for dismissal.

## Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?
Have students complete a self-assessment bases upon the rubric.

Have students write an artist statement.

## Summative Assessment
Student Self-Evaluation: based on defined rubric

Teacher Evaluation: Project based assessment on students' ability to skillfully complete their enlarged self-portrait using the grid. Post project: students will be give a quiz based on vocabulary concepts and critical thinking/reflection on works of the artists Chuck Close and Clas Oldenburg

## Formative Assessment
Students will take a short quiz at the end of class to check for understanding

Sketchbook Assignment:
As a formative assessment, give a sketchbook assignment for homework,

For the sketchbook assignment we will look to the work of artist Clas Oldenburg. Oldenburg created sculptures of everyday objects but exaggerated the scale of the object so it stood out. You will draw an object of your own choosing and place that object in a setting so that you play with scale.

Remember the Elements of Art! How will you use line, shape, color, value, space, and texture to make your drawing come alive?

How will you make your background relate to the object you are exaggerating?

How will your object demonstrate the exaggerated scale?

How will your work show creativity and use of imagination?

Have you put the time/effort into your sketch?

Rubric for sketchbook assignment: Total 12 points. Each criteria is worth 3 points: ( 0 points for no attempt made at criteria; 1 point for needs improvement; 2 points for good; 3 point for excellent)

3 points: USE OF ELEMENTS/PRINCIPLES: The sketchbook makes good use of elements of art and principles of design

3 points: SCALE: The work shows use of the exaggerated scale.

3 points: CREATIVITY: The work is imaginative and creative

3 points: TIME/EFFORT: Appears to be very challenging and a considerable amount of time has been spent on the drawing.

### Feedback to Students
Feedback to students will be continual throughout the lesson, at integral points in the lesson, teacher should stop, discuss and give feedback.

## ACCOMMODATIONS & RECOMMENDATIONS

### Accommodations:
Varying levels of picture complexity: teacher will use photoshop cutout filter ahead of time and rasterize each students self photograph modifying the complexity for students that are beginning artists and raising the complexity for more advanced students.

When circulating, teacher will make on-demand modifications as required for students individual needs.

Chunking information into digestible bites. Also chunking the drawing into digestible/easy to draw parts to make it easier for students to see/draw.

Guided practice/Monitoring: Teacher will give demonstration of lesson and monitor students for learned skills.

Peer Mentoring: Students are grouped in "art houses" so more advanced students can mentor more novice students.

Multiple Intelligences: Visual, Auditory, Logical, Spatial, Musical, Intra-personal

ESOL Strategies:

Problem Solving

Provide Visuals for Class Rules

Questionnaires/ Interviews

Simplified Direction

Compare/Contrast

Cooperative Learning

Labeling: Classroom, Equipment, etc

Modify Assignments

Multiple Methods of Evaluation

Peer Tutoring

Use of Student's Cultural Background & Experiences

Use of Overheads & Pictorial Presentation

"WH" Questions to assist


### Special Materials Needed:
HB pencils (2H or 4H if possible)

transparency grid (pre-made)

heavy weight paper (with grid already created from prior lesson)

kneaded erasers

rulers

chipboard

masking tape

students photographs

## Related Standards

| Name | Description |
|---|---|
| VA.68.C.2.4: | Use constructive criticism as a purposeful tool for artistic growth. |
| VA.68.H.3.1: | Discuss how knowledge and skills learned through the art-making and analysis processes are used to solve problems in non-art contexts. |
| VA.68.O.1.1: | Make connections between the structural elements of art and the organizational principles of design to understand how artwork is unified. |
| VA.68.O.1.3: | Combine creative and technical knowledge to produce visually strong works of art. |
| VA.68.S.3.1: | Use two-dimensional or three-dimensional art materials and tools to understand the potential and limitations of each. |
| MAFS.7.G.1.1: | Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. |
| MAFS.7.RP.1.2: | Recognize and represent proportional relationships between quantities.<br>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.<br>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.<br>c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.<br>d. Explain what a point $(x, y)$ on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.<br><br>**Remarks/Examples:**<br>**Examples of Opportunities for In-Depth Focus**<br><br>Students in grade 7 grow in their ability to recognize, represent, and analyze proportional relationships in various ways, including by using tables, graphs, and equations. |