

The Elements of Design ~ An Overview

The elements of design are the components which make up any visual design or work or art. They can be isolated and defined, but all works of visual art will contain most, if not all, the elements.

Point: A point is essentially a dot. By definition, it has no height or width, but in art a point is a small, dot-like pencil mark or short brush stroke.

Line: A line can be made by a series of points, a pencil or brush stroke, or can be implied by the edge of an object.

Shape and Form: Shapes are defined by lines or edges. They can be geometric or organic, predictably regular or free-form. Form is an illusion of three-dimensionality given to a flat shape.

Texture: Texture can be tactile or visual. Tactile texture is something you can feel; visual texture relies on the eyes to help the viewer imagine how something might feel. Texture is closely related to Pattern.

Pattern: Patterns rely on repetition or organization of shapes, colors, or other qualities. The illusion of movement in a composition depends on placement of subject matter. Pattern is closely related to Texture and is not always included in a list of the elements of design.

Color and Value: Color, also known as hue, is one of the most powerful elements. It can evoke emotion and mood, enhance texture, and help create the illusion of distance. Value is the relative lightness or darkness of a color.

Space: In two-dimensional compositions, the objects we identify can be thought of as positive space, while the background or the area left over designates negative space. Space also refers to a perspective, which gives a feeling of distance and/or depth.

Math and Point Activities

Mosaic Shapes

Art Technique: mosaic Math Concepts: geometric shapes; symmetry

Materials: white construction paper, 6x6; colored construction paper scraps; glue stick



Procedure: Glue small bits of colored paper onto white paper to create geometric shapes. Fill in all the background space with black or white bits of paper.

Three-Dimensional Pointillist Shape Drawing

Art Technique: pointillism Math Concepts: two-dimensional shapes and three-dimensional forms

Materials: white drawing paper; shapes to trace (optional); colored pencils Procedure: Draw or trace geometric shapes and shade them with points, varying the distance between the dots to create the illusion of volume.

Pointillist Gradations

Art Technique: pointillism Math Concepts: size gradation; symmetry

Materials: white construction paper, 6x6; assorted fine tipped markers

Procedure: Choose a basic shape and create it with very small points in the center of a paper. Make a surrounding layer of slightly larger points in a different color. Repeat several times with new surrounding layers of larger and larger points, using a new color each time.



Additional Connections:

Geometry: points on lines and line intersections Coordinates: intersecting points on grids

Math and Line Activities

One-Minute Faces

Art Technique: blind contour drawing Math Concepts: time; estimation; spatial sense

Materials: white copy paper; medium-tip markers; colored construction paper

Procedure: Students sit facing each other to use each

other as models. Each student draws a face without looking at the paper and without lifting the marker from the paper. Teacher keeps time for one minute. Do three faces, using different models and different colored markers for each. Observe each drawing to determine what time or size adjustments might be needed. Mount one favorite face on the same color construction paper. Demonstrate first if necessary.

Line Landscapes

Art Technique: contour drawing Math Concepts: line segments and lines; curved and parallel lines; fraction estimation

Materials: white construction paper; pencils; finetipped and medium-tipped permanent black markers; magazine pictures of landscapes

Procedure: Have students look at a variety of photographs of landscapes. Use pencil to draw landscape contours, including details like trees, lakes, mountains, clouds, rocks, etc. The finished contour drawing should have many closed shapes and some lines should go off the paper. Trace over all the contours with a black marker, then fill about half the closed shapes with parallel and other lines. Mount on black construction paper.

Geometric Solid Drawings

Art Technique: contour drawing Math Concepts: line segments and lines; curved and parallel lines

Materials: white construction paper; pencils; boxes and playground balls **Procedure:** Set up a "still life" of boxes and playground balls. Draw the arrangement using only lines for shading.

Additional Connections:

Geometry: Line Segments and Edges Statistics and Probability: Line Graphs Floor Plans and Maps





Math and Shape Activities

Geometric Shape Collages

Art Technique: collage Math Concepts: geometric shapes

Materials: geometric shapes for tracing (optional); colored construction paper in a variety of sizes; white or black construction paper, 9X12; scissors; glue stick



To give this idea a problem-solving twist, try the following:

For Primary Students

Use ...

one circle two lines an odd number of triangles an even number of rectangles less than fifteen total pieces no more than four colors

Overlap at least two shapes.

For Upper-Grade Students

Use ...

one circle two lines or line segments three different kinds of triangles four quadrilaterals no more than five colors

Show movement with your design. Cover approximately half the paper.

Geometric People

Art Technique: collage Math Concepts: geometric shapes; proportion

Materials: black construction paper, 9X12; assorted brightcolored construction paper sheets, 6X9; scissors, glue **Procedure**: Cut geometric shapes (circles, squares, triangles, rectangles, etc.) to make a human figure that shows movement.

Additional Connections:

Pattern Blocks and Tangram Activities Human Body Proportions







Math and Pattern / Texture Activities

Three-Inch Squares



Art Technique: freehand drawing Math Concepts: patterning; squares

Materials: white construction paper squares, 3x3; markers; black construction paper for background **Procedure:** On three small white squares, create three totally different design/shapes and choose one. Replicate the shape sixteen times, then fill each shape with a different pattern. Glue the finished squares into a grid on black construction paper. Squares can be rotated for interest.

Patterned Line Rubbings

Art Technique: collage; rubbings Math Concepts: line; patterning



Materials: white and black construction paper; crayons; glue & scissors Procedure: Cut line segments from black construction paper. Glue lines onto white construction paper square to make a design. Use the design to make repeated rubbings on a long sheet of white construction paper.

Radial Squares

Art Technique: collage Math Concepts: patterning; ;measurement; radial symmetry

Materials: construction paper, two contrasting colors; scissors; black construction paper for mounting **Procedure:** Trace or draw one small square on one color construction paper. On the second color, make a square one-



half inch larger. Make a third square on the first color one-half inch larger than the second. Continue making larger and larger squares using alternate colors until you have about ten squares. Glue the squares from smallest to largest on top of each other, slightly rotating each square. Option: Use the series of squares to make designs other than symmetrical designs.

Additional Connections:

Pattern Blocks Tangram Activities Patterns in Multiplication Tessellations Fractals Quilts and Quilt Blocks

Math and Color / Value Activities

Easy Color Wheels

Art Technique: line drawing; color vocabulary Math Concepts: symmetry; measurement; circle/triangle proportions

Materials: white copy or construction paper; crayons; pencils; rulers (optional) **Procedure**: Very lightly draw an equilateral triangle in the center of the paper, then overlay an inverted equilateral triangle over it, to make a six-pointed star shape. Add

color swatches to the vertices of the triangles, primary colors on one triangle, secondary colors on the other triangle. Add the tertiary colors in the spaces between. the triangles. Erase the pencil lines and write the vocabulary underneath the wheel for future reference:

primary colors: yellow, blue, red secondary colors: green, violet, orange tertiary colors: blue-green, yellow-orange, red-violet, etc. complimentary colors: colors across from each other - ex. yellow and purple; blue and orange analogous colors: colors next to each other - i.e., red, red-violet and violet neutral colors: brown, black, grey



Fraction Color Mixing: Value Scale

Art Technique: painting Math Concepts: fractions; proportion

Materials: white and black paint; brushes; lightcolored construction paper, 6x12; paint containers; small measuring items, i.e., teaspoons, eyedroppers, etc.



Procedure: Paint a black strip on one end of the construction paper strip, and a white strip on the other end. Use fraction proportions to mix colors and paint strips the resulting colors in the appropriate place on the value scale. Allow students to choose their own measuring instruments.

Optional Procedure: Choose one color to explore. Mix the color with proportions of black or white to make a variety of lighter and darker values. Paint shapes, lines, objects, or designs using as many different values as possible.

Math and Space Activities

Symmetrical Positive/Negative Designs

Art Technique: collage Math Concepts: symmetry

Materials: two contrasting colors of construction paper, 9x12; scissors; glue **Procedure**: Each student will need two sheets of each color, one of each for cutting and one of each for mounting. Hold one of each color together. Cut out different shapes so that you have a two sets of identical shapes in contrasting colors. Glue the white shapes onto the black paper and the black shapes onto the white paper, being careful to glue matching shapes in the same exact place on each paper. For variation, use any combination of dark and light colors.





Vanishing Point Perspective

Art Technique: contour drawing Math Concepts: measurement

Materials: white construction or

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drawing paper, 6x18; rulers; writing pencils; colored pencils **Procedure**: Establish a vanishing point. Using a ruler, draw four very light lines from the center point to make a large 'X' with each line going to one corner of the paper. Using the resulting lines as a height template, draw a series of "stick figures" from one edge of the paper to the other. The head and feet of each figure should touch the lines;

the figures will be large at each edge of the paper and become smaller and smaller as they approach the center, giving the illusion of distance. As an option, draw a city or country scene using the perspective lines as a guide for the height of trees, buildings, people, or other objects. Try using a vanishing point on one side of the paper to create a scene that shows distance toward one side of the paper.

Additional Connections:

Human Body Proportions

Find the ratio of a person's head to his or her height, arm and leg length, and torso length. Practice drawing the human form using average body proportions.



Geometric People Recording Sheet

How many rectangles?	How many circles?
Draw them:	Draw them:
How many squares?	How many triangles?
Draw them:	Draw them:
What other shapes did you use? Draw and label them:	How much is your figure worth, Add it up! Squares = 5 points each Rectangles = 1 point each Circles = 10 points each Triangles = 2 points each





Geometric Collage Recording



Explain how you know you covered half the background.

Challenge

Calculate the areas of all the shapes. Use measurements to the nearest one-fourth inch.

How many lines did you use in your design? Write the number word:

Count by 1's, 2's, 5's and 10's:

If lines are 1 point each,
my design is worthIf lines are 2 points each,
my design is worthIf lines are 5 points each,
my design is worthIf lines are 10 points each,
my design is worth

Write about your design:

Ten Lessons the Arts Teach

By Elliot Eisner

The arts teach children to make good judgments about qualitative relationships. Unlike much of the curriculum in which correct answers and rules prevail, in the arts, it is judgment rather than rules that prevail.

The arts teach children that problems can have more than one solution and that questions can have more than one answer.

The arts celebrate multiple perspectives. One of their large lessons is that there are many ways to see and interpret the world.

The arts teach children that in complex forms of problem solving purposes are seldom fixed, but change with circumstance and opportunity. Learning in the arts requires the ability and a willingness to surrender to the unanticipated possibilities of the work as it unfolds.

The arts make vivid the fact that neither words in their literal form nor number exhaust what we can know. The limits of our language do not define the limits of our cognition.

The arts teach students that small differences can have large effects. The arts traffic in subtleties.

The arts teach students to think through and within a material. All art forms employ some means through which images become real.

The arts help children learn to say what cannot be said. When children are invited to disclose what a work of art helps them feel, they must reach into their poetic capacities to find the words that will do the job.

The arts enable us to have experience we can have from no other source and through such experience to discover the range and variety of what we are capable of feeling.

The arts' position in the school curriculum symbolizes to the young what adults believe is important.

SOURCE: Eisner, E. (2002). *The Arts and the Creation of Mind,* In Chapter 4, What the Arts Teach and How It Shows. (pp. 70-92). Yale University Press. Available from NAEA Publications.

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Highlights of Art Education Research

A summary of findings from seven separate academic studies revealed that the arts:

- reach students in ways that they are not otherwise being reached;
- connect students to themselves and each other;
- transform the environment for learning;
- provide learning opportunities for the adults in the lives of young people;
- provide new challenges for those students already considered successful;
- connect learning experiences to the world of real work;
- enable young people to have direct involvement with the arts and artists;
- require significant staff development; and
- support extended engagement in the artistic process.

source: Champions of Change, 1999 pp. 9-11

Did You Know?

Young people who participate in the arts for at least three hours on three days each week through at least one full year are:

- 4 times more likely to be recognized for academic achievement
- 3 times more likely to be elected to class office within their schools
- 4 times more likely to participate in a math and science fair
- 3 times more likely to win an award for school attendance
- 4 times more likely to win an award for writing an essay or poem

source: *Living the Arts through Language + Learning: A Report on Community-based Youth Organizations,* Shirley Brice Heath, Stanford University and Carnegie Foundation For the Advancement of Teaching, Americans for the Arts *Monograph*, November 1998

Americans for the Arts: http://www.americansforthearts.org/public_awareness/facts/

The Arts and Math Achievement

Elementary students who attended schools in which the arts were integrated with classroom curriculum outperformed their peers in math who did not have an arts-integrated curriculum. In 1998, more than 60 percent of the students attending schools integrated with the Chicago Arts Partnership in Education (CAPE) performed at or above grade level on the math portion of the Iowa Test of Basic Skills while the remainder of Chicago Public School students averaged just over 40 percent. Those same numbers in 1992, before the CAPE program began were 40 percent in the pre-CAPE schools and 28 percent district-wide. source: *Champions of Change*, 1999 p. 54-55, Figure 4 Imagination Project at University of California

Graduate School of Education & Information Studies

study: Chicago Arts Partnerships in Education Summary Evaluation

Visual Art and Reasoning

Being taught to "read" art through a "visual thinking curriculum" helped 9- and 10-yearold students develop their reasoning based on visual evidence. This increased ability translated into better "reading" of evidence in science.

source: *Critical Links: Learning in the Arts and Student Academic and Social Developments,* 2002, p.142

study: Investigating the Educational Impact and Potential of the Museum of Modern Art's Visual Thiking curriculum: Final Report

Visual Art and Understanding History

Assessments of 6th graders' history understanding using drawing as well a writing helped students veal more of what they knew than using just writing. This held true for both English language proficient and English limited students.

Source: Critical Links: Learning in the Arts and Student Academic and Social Development, p. 141 Study: The Arts, Language and Knowing: An Experimental Study of the Potential of the Visual Arts for Assessing Academic Learning by Language Minority Students

Visual Art and Reading Comprehension

7th grade boys who were "reluctant readers" but were interested in visual art were given several visual art exercises that resulted in them taking a more active role in reading and interpreting the text rather than just passively reading it. The students were asked to, "create cutouts or find objects that would represent characters and ideas in the story they were reading, and then use these to dramatize the story...draw a picture of strong visual impressions formed while reading a story...illustrate books...(and) depict visually the key details of nonfiction texts."

source: *Critical Links: Learning in the Arts and Student Academic and Social Development,* 2002, p.144

study: Reading is Seeing: using Visual Response to Improve the Literary Reading of Reluctant Readers

Selected Resources for Art/Math Integration

<u>Books</u>

Creating Art With Kids. Renee Goularte, 2006.

A collection of easy, open-ended art explorations based in the elements of design. Available directly from the author: http://www.share2learn.com/CreatingArt-info.html

Drawing With Children. Mona Brooks. Jeremy P. Tarcher, Inc.; 1986. Drawing ideas and guidelines for teachers and students.

Lively Learning: Using the Arts to Teach the K-8 Curriculum. Linda Crawford.

Northeast Foundation for Children; 2004. Guidelines and ideas for using the arts across the curriculum.

On the Internet

Share2Learn ~ Student art work ~ Linking Math With Art

http://share2learn.com/artmathsamples.html Student art work samples spanning several elementary grades.

Art Education Internet Resources

http://falcon.jmu.edu/~ramseyil/arteducation.htm A great place to start if you're looking for museums, lessons, standards, research, and more.

Draw a Math Story ~ Read-Write-Think lesson by Renée Goularte

http://www.readwritethink.org/lessons/lesson_view.asp?id=144 Complete lesson plan for drawing math stories.

Math Cats

Crafts: http://www.mathcats.com/crafts.html Math Art Gallery: http://www.mathcats.com/gallery.html

mathartfun.com

http://www.mathartfun.com/shopsite_sc/store/html/index.html Resources for integrating math and art

Fractals: A Fractals Unit for Elementary and Middle School Students

http://math.rice.edu/~lanius/frac/ All about fractals, including examples and lessons which are available in print versions for classroom use. Step by step illustrated directions for making Sierpinski Triangles, Koch Snowflakes, Anti-Snowflakes, and more.

Mathematics Lessons that are fun! fun! fun!

http://math.rice.edu/~lanius/Lessons/index.html Several math lessons and activities with art connections.



To order

Creating Art With Kids

Print this order form page. Include full payment by Cashier's Check, Personal Check or Money Order, made out to *Renee Goularte*. Send to:

> Renée Goularte 14204 Decatur Drive Magalia, CA 95954

For more information or to view sample book pages: http://www.share2learn.com/artbook.info.html

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