Communication & Expressive Arts

National Association of Extension 4-H Agents

Geometry in Art and Design: An exploration of geometrical shapes.

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Introduce and explore the relationship between geometric shapes, architecture, art, textiles and entertainment. Assist youth in making connections and applying the knowledge in the creation of aesthetically pleasing products – crafts, fine art, furniture, home decor, architecture, textiles, clothing, kaleidoscopes, music, games and more.

Geometry is a very basic and functional science, yet when unique combinations of lines, angles, planes, triangles, circles, squares and spheres are combined, our human eye begins to see height, width, depth, proportion, and patterns which are both aesthetically pleasing and structurally functional.

A functional science of math becomes art when pencil is applied to paper, clay is shaped, wood, fabric, glass, are cut and yarns are woven into a pattern.

Architecture—Ancient Pyramids and other marvels of engineering.
Games/Toy—Tangram an ancient Chinese puzzle . Science of a Kaleidoscope.
Art—Creating design and symmetry though the cultural exploration and creation of a Mandala.
T**extiles**—The practical, historical and art of designing quilt block s. Weaving geometrical designs in fabric, baskets and beads.

Materials Needed:

Geometric Shapes—Circle, triangle, square, rectangle, pentagon, hexagon, heptagon, octagon, etc.

Examples of **everyday items** with geometrical shapes incorporated into the design.

Assorted Geometry Tools used in crafts, art, woodworking, sewing, etc.—protractor, ruler, triangle, square, compass, etc.

Geometry in Art and Design: An exploration of geometrical shapes *Power Point* presentation.

Art Supplies: paper, drawing pencils, colored pencils, markers, scissors, glue, etc.

Time Required:

Prep Time: 1 - 2 hours

Lesson Time: 1 to 4 hours in two or more sessions.

Clean Up Time: 30 minutes

Special Considerations/Presenter Notes

Thoroughly review the article published by the Los Angeles County Museum of Art, Geometry and Art: Symmetry, Balance, Scale.

Excerpt: "*WHAT DO MATH AND THE VISUAL ARTS HAVE IN COMMON? WHAT CONCEPTS DO they share? Why should we as learners have an understanding of these concepts? These are some of the guiding ideas that will be explored in this resource.*

We know that line, shape, form, pattern, symmetry, scale, and proportion are the

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AUDIENCE:

4-12th grades (ages 9 -19)

Materials can be adapted for a variety of ages and skill levels or taught as non-related sessions.

Learner Objectives:

- Exploration process, make connections to 4-H project areas.
- Shapes—Identify and name geometric shapes
- Explore Geometries applications to functional and aesthetic design.

Background:

4-H Science and Communications and Expressive Arts have a natural connection. The mediums used for creativity are all founded in the physical, social and formal sciences.

References:

All addresses retrieved 09/20/2017 from internet.

Geometry and Art: Symmetry, Balance, Scale. http://www.lacma.org/eduprograms/EvesforEds/GeoEssay.pdf

10 Geometric Art Explorations https://www.weareteachers.com/10-geometric-art-explorations/

Sacred Art of Geometry

https://www.sacredartofgeometry.com/

The Elements of Euclid – book Euclid: The Art of Geometry https://www.youtube.com/watch?

Resource books and sites:

Ghyka, Mtila. The Geometry of Art and Life. ISBN 13: 9780486235424

Newman, J. and Edward, K. Mathematics and the Imagination. ISBN 13: 9780486417035

Rouse Ball, W.W. and Coxeter, H.S.M. Mathematical Recreation and Essays. ISBN 13: 9780486253572

LACMA Teacher Resources: http://www.lacma.org/students-teachers/teacher-resources#curricula

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building blocks of both art and math. Geometry offers the most obvious connection between the two disciplines. Both art and math involve drawing and the use of shapes and forms, as well as an understanding of spatial concepts, two and three dimensions, measurement, estimation, and pattern. Many of these concepts are evident in an artwork's composition, how the artist uses the elements of art and applies the principles of design. Problem-solving skills such as visualization and spatial reasoning are also important for artists and professionals in math, science, and technology. By taking an interdisciplinary approach to art and geometry, students can identify and apply authentic connections between the two subjects and understand concepts that transcend the individual disciplines."

Experiential Learning

Do - experiencing the activity

Over time, provide a variety of opportunities to explore and apply Geometry to various project areas. Adapt the accompanying PPT to meet your needs.

Activity 1 **Provide Geometric Shapes**—Learn names of shapes and what makes each unique. Apply this to finding the shapes incorporated into **everyday items** both functionally and aesthetically. Apply to the exploration of 4-H projects which involve geometry.

Activity 2 **Assorted Geometry Tools** used in crafts, art, woodworking, sewing, etc.—protractor, ruler, triangle, square, compass, etc. Look for similarities and differences .

Activity 3 **Art/Games/Crafts/Project Work—**Introduce activities from 10 Geometric Art Explorations or other resources. Make Tangram , Kaleidoscope, Mandala, Polygon animals, etc..

Reflect and Apply Questions:

1. Name/show examples of geometry in occurring in nature or created by man.
2. What geometric shape(s) are seen in the example. Is the design aesthetic or functional?
3. Why would Geometry tools be adapted for various uses or mediums? Could some be used for multiple purposes?
4. How many 4-H project areas have some form of Geometry applied in functionally or aesthetically?
5. How can you apply the science of geometry to home, school, or other projects?

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