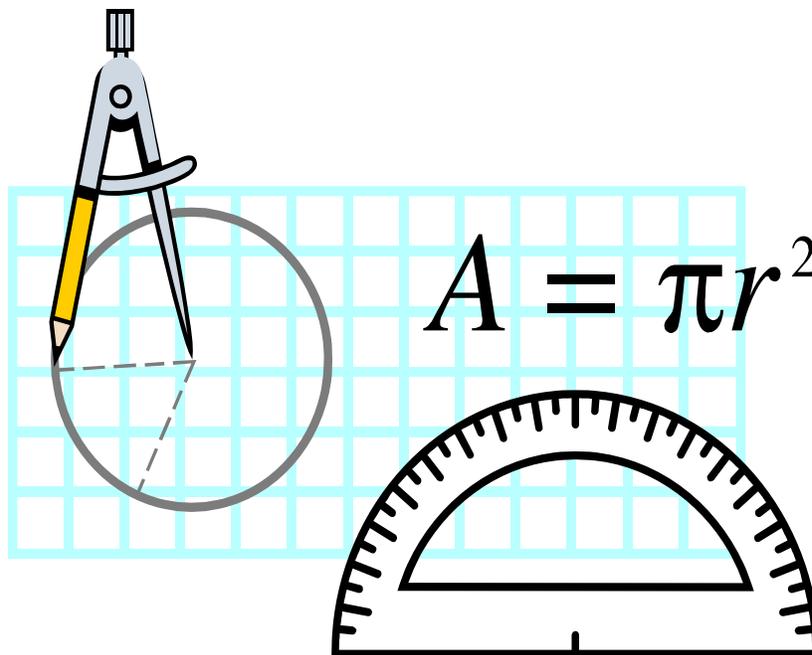


G E O M E T R Y

AND

A R T



Idaho State Department of Education
Idaho State Board of Education
The Monsanto Fund
August 2008

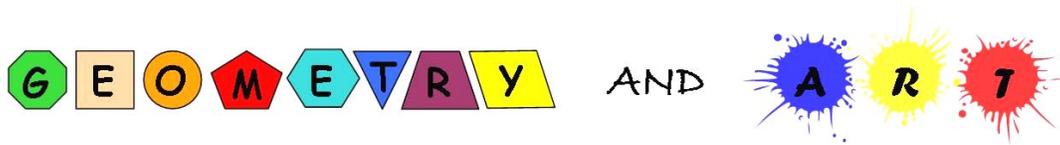


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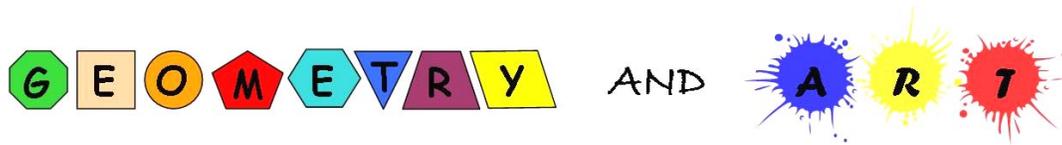
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References/Resources

NCTM 9-12 Standards

Idaho Geometry Standards

Sources Consulted



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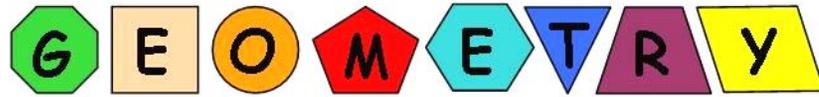
Cathy Moore, Cascade High School

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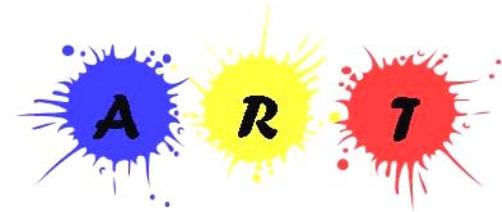
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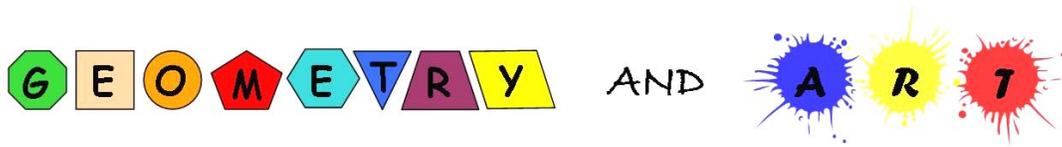


AND



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Introduction

Mission Statement

This resource is a mathematically rich collection of hands-on geometry projects designed to enhance student understanding of the integrated nature of mathematics and art.

Audience

It is understandable that there might be anxiety on the part of the mathematics teacher involving the use of an art component in mathematics projects. These projects are designed to alleviate that anxiety and will require no special artistic skill on the part of the math teacher.

Background

The State Department of Education wrote a grant to the Monsanto Fund requesting funding for a project integrating mathematics and the humanities. The grant was awarded in May of 2007, and a decision was made to focus specifically on the integration of geometry and art.

Dr. Peggy Wenner, Art and Humanities Coordinator from the Idaho State Department of Education, headed a task force consisting of geometry and art teachers from across the State of Idaho. During the 2007-2008 school year the projects were field tested and edited in May 2008.

Resources

These black-line masters may be reproduced for classroom use. The projects may be used in any order with any text.

MATH TOPICS COVERED IN EACH PROJECT

Amalgamation	<ul style="list-style-type: none"> ➤ Transformations <ul style="list-style-type: none"> • Rotations • Translations • Reflections • Dilation
Clay Cylinders	<ul style="list-style-type: none"> ➤ Surface Area/Volume <ul style="list-style-type: none"> • Net Construction • Measurement and Calculation ➤ Ratio <ul style="list-style-type: none"> • Percent Change
Cubism	<ul style="list-style-type: none"> ➤ Polygons <ul style="list-style-type: none"> • Classification • Construction ➤ Platonic and Archimedean Solids <ul style="list-style-type: none"> • Classification • Construction • Analysis
Golden Ratio	<ul style="list-style-type: none"> ➤ Ratio/Proportion <ul style="list-style-type: none"> • Introduction to Phi • Golden Ratio • Golden Triangle ➤ Compass Constructions <ul style="list-style-type: none"> • Bisecting Segments • Archimedes Spiral • Pentagon ➤ Measurement ➤ Fibonacci Numbers
Mandalas	<ul style="list-style-type: none"> ➤ Circles <ul style="list-style-type: none"> • Compass Constructions • Concentric Circles • Circumference • Arcs
Optical Illusions	<ul style="list-style-type: none"> ➤ Symmetry ➤ Patterns/Fibonacci Sequence ➤ Golden Ratio ➤ Measurement

MATH TOPICS COVERED IN EACH PROJECT

Origami	<ul style="list-style-type: none">➤ Polygon/Polyhedra<ul style="list-style-type: none">• Construction• Identification➤ Linear Geometry<ul style="list-style-type: none">• Parallel/Perpendicular lines
Perspective Drawings	<ul style="list-style-type: none">➤ Points, Lines, Planes and Angles➤ Perspective (One and Two Point)➤ Vanishing Points
Snowflake Geometry	<ul style="list-style-type: none">➤ Review of Geometric Principles<ul style="list-style-type: none">• Polygons• Lines/Segments/Midsegments• Angles• Area• Planes• Bisect
Geometric Treats	<ul style="list-style-type: none">➤ 3-Dimensional Shapes<ul style="list-style-type: none">• Identification/Classification• Terminology➤ Frustrum