ART AND GEOMETRY IN ANCIENT AMERICA

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INTRODUCTION

Students tend to think of geometry solely as a formal system of logic involving shapes, lines, planes, etc. They rarely consider where and how the discipline originated, why it was created, or how it extends to other areas of human interest. Yet these rudimentary issues take on vital importance as they elucidate elements of world cultures in which geometry plays an important role. Their philosophical frameworks, arts, and rhythms of daily life are commonly represented and understood through geometric forms like circles and triangles and are presented in patterns whose asymmetry and/or symmetry reveal significant attitudes. The word “geometry,” originating from Greek roots, means “earth measure,” and verbally links our physical world (earth) to an intellectual concept (measure). For example, Karl Von den Steinem [cited by Frans Boas in Primitive Art. New York: Dover, 1955], found patterns in one particular Brazilian Indian group that appeared to be purely geometrically represented fish, bats, bees, and other animals, even though they do not bear any apparent relation to the animals represented. Wilbert also said that geometric designs “carried as intelligible a symbolic message for the native observer as any of the representational decorations.” A spiral on a Mesoamerican art object, for example, could be a snake representing water or a symbol of a long ritual journey. Thinking about geometric properties that are present in a given work of art can help lead us to an increased understanding of the piece itself as well as of the culture which produced it.

This lesson is designed so that students are encouraged to think of the kinds of geometric properties that might be used in analyzing a work of art. The students will try to analyze some slides of ancient American works using these properties. This exercise is followed by a trip to the Art Institute where they will see some of the actual objects previewed in slides. The emphasis should be on how geometric properties contribute to the meaning of a work of art.

I. OBJECTIVES

To explore the relationship between geometry and art in the context of ancient American art. Students will determine what kinds of geometric properties are contained in works of art. They must recognize them in specific works and understand how these properties contribute to the meaning and artistic merit of these works.

II. MATERIALS

Slide projector with the following slides:
View of Chan Chán, Capital of the Chimu Empire, Peru, North Coast
Ceremonial Knife or Tumi (Slide 19)
Peru, North Coast, Lambayerque Valley
Chimu Culture
View of the Inca city Machu Picchu, Peru
Pendant (Slide 18)
Coastal Peru or Highland Bolivia, Tiwanaku
Frog Pendant (See drawing in Chapter 2)
Panama, Venado Beach Culture
View of the Maya city of Tikal, Temple of the Inscriptions, Guatemala
III. CONTENT AND ACTIVITIES

- In the first part of the lesson the students will be asked to think about which kinds of geometric properties can be recognized in a work of art. The teacher should write down all student ideas. This list might include, but not necessarily be restricted to, the following: shape, proportion, scale, perspective, color, value, horizontal, vertical, diagonal, geometric shapes, abstraction, rhythm, congruence, transformations, mappings, rotations, reflections, symmetry, asymmetry. The students should discuss these concepts and think about how they might relate to various works of art.
- The second part of the lesson is to show slides of specific works and discuss them in the context of the list of properties that the students developed in the first part of the lesson. Students might think of additional characteristics when they are looking at actual works.

IV. FOLLOW UP

Students will visit the Art Institute, bringing with them the list of geometric properties that they compiled. They will look at the ancient American works and try to analyze them according to these properties. Students will work with one or two partners. They will pick three objects of different types, which may or may not be from the same culture, and sketch a picture of the object; they will then attempt to analyze it in terms of its geometric properties, relating the properties to the meaning and function of the object. In addition, for any of the geometric concepts on their list that were not used in any of their analyses, they will try to find a work of art that embodies these concepts.

V. EVALUATION

Evaluation will be based on the work that students do at the Art Institute. This assignment will be graded on a pass/fail basis (students fail only if they do not do the work). It is important that the teacher look at each student's work, write comments, and return it to the student, as this confirms the value of the project.

VI. NOTES

This lesson could be done for varying age levels, adjusting the level of sophistication of the properties accordingly. It was originally planned for a geometry class and an art class which included students from grades 10-12.