



## PART ONE: BUILDINGS, NEIGHBORHOODS & TOWNS

### LESSON TWO: DESIGN IN ARCHITECTURE

By Charles M. Yarborough

#### Grade Levels

4 – 12 Teachers should adjust/select activities appropriate for the age and ability of their students.

#### Objectives

- Using historic buildings in your community, students will sharpen their powers of observation and develop research skills.
- Students will learn to become aware of their local environment and learn about local history and architecture.
- Students will learn the role geometric shapes play in buildings.
- Students will learn the concepts of scale and ratio in buildings.
- Students will learn about architectural styles commonly found among Mississippi's historic buildings.
- Students will learn to distinguish between the work of architects and vernacular architecture.

#### Mississippi Curriculum Connections

- Mississippi Studies (4<sup>th</sup> grade) Framework – Competencies 1,3, & 5
- Mississippi Studies (9<sup>th</sup> grade) Framework – Competencies 1, 2, 3, 4, & 5

#### Materials Provided Online

[www.mississippiheritage.com](http://www.mississippiheritage.com)

- Geometric Shapes in Architecture
- Architecture Style Guide
- Scale and Ratio in Architecture
- Professional and Vernacular Architecture
- Scavenger Hunt

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#### For the Teacher

In constructing our built environments, humans have used and continue to use fundamental geometric shapes set in relation to one another to achieve the principles for architecture set forth by the Roman architect Vitruvius: durability, utility and beauty.

In this lesson, students will be exposed to the basic geometric shapes employed to design our buildings and learn to consider the principles that guide how these shapes are used together and independently.

#### Opening the Lesson

Using a photograph of the Mississippi State Capitol included in the *Geometric Shapes in Architecture* materials provided on [www.mississippiheritage.com](http://www.mississippiheritage.com), project the image on the board and have students trace the geometric shapes they find in the picture on the board or on paper at their desks. Turn off the projector to illustrate the component parts of the building design. Remind students that architecture is the art and science of designing buildings.

Discuss with students that basic geometric shapes make up the fundamental pieces of architectural design.

#### Developing the Lesson

##### Geometric Shapes in Architecture

Divide students in to small working groups. Using the *Geometric Shapes in Architecture materials* provided on [www.mississippiheritage.com](http://www.mississippiheritage.com), distribute photographs of historic buildings to each group. Teachers can also provide images of buildings from magazines or other sources. Students are to identify as many examples of two- and three-dimensional shapes as they can find in the images. Refer to the *Architecture Style Guide* provided on [www.mississippiheritage.com](http://www.mississippiheritage.com) to define architectural details.

Students should record examples of each shape by drawing them on a piece of paper and labeling the example and geometric shape. For instance, for a rectangle, students might draw a window or window pane, labeling it as a rectangle. Or, for a cylinder, students might draw a tower or column, labeling them as cylinders. These shapes will include triangles, circles, semi-circles, squares, rectangles, and their three-dimensional counterparts: pyramids, cones, spheres, domes, cubes, cylinders, and rectangular solids.

For homework, have students draw an abstract rendering of their home or a building in their neighborhood utilizing the geometric shapes they've covered in class.

Teachers can also assign students vocabulary terms from an on-line glossary. The Heritage Education Network (THEN) provides a good architectural glossary, <http://histpres.mtsu.edu/then/architecture/page3.html>. The glossary provided by the Louisiana Division of Historic Preservation, <http://www.laheritage.org/glossary> is also very helpful.

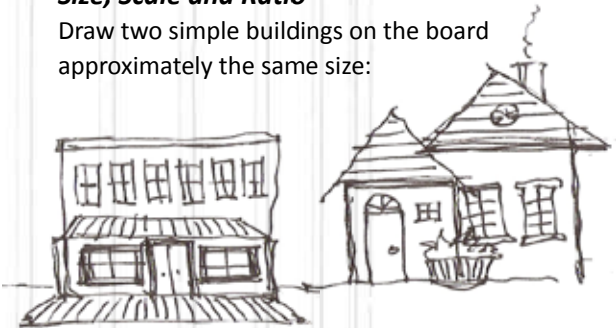
### **Other possible exercises:**

Have students photograph the architectural details that exemplify the geometric shapes covered in class. Then have students utilize the digital images to “construct” a picture of a building by cutting-and-pasting/photo-editing the images into a whole.

Download free versions of Google Sketch-Up 3D modeling software, <http://sketchup.google.com>. Utilizing as many computers as are accessible (and adapting the class/student time as appropriate) have students “build” three-dimensional buildings with the Google Sketch-Up software. Google Sketch-Up has great tutorial help and will make for an exciting means of engaging students in this exercise and understanding how geometric shapes form the basis of our built environment.

### **Size, Scale and Ratio**

Draw two simple buildings on the board approximately the same size:



Ask students “How big are these buildings?” There will probably be some disagreement as well as confused guessing. Then draw a large shoe and leg next to one and a small stick figure/person next to the other. “Now, how big are these buildings?”



Using the *Scale and Ratio in Architecture* materials provided on [www.mississippiheritage.com](http://www.mississippiheritage.com), have stu-

dents draw a person who would fit with each building example.

Explain the differences between size and scale, and explain that ratio is a numerical representation of scale.

Have students learn the following definitions:

- **Size** – how big something is; the dimensions of something.
- **Scale** – the comparative size of a thing in relation to another like thing or its “normal” or “expected” size.
- **Ratio** – the relation in degree or number between two similar things; the relation between two quantities expressed as the quotient of one divided by the other.

### **Architectural Styles**

Architectural styles are determined by the continuous use of certain shapes and patterns in construction and decoration. Some styles are referred to as “revival” styles because they employ the re-use of certain shapes and patterns after a period of nonuse.

Using the *Architecture Style Guide* available on [www.mississippiheritage.com](http://www.mississippiheritage.com), introduce students to the various nineteenth- and early twentieth-century architectural styles commonly found across Mississippi.

Once the styles have been introduced, ask students to identify the architectural style and identifying details of additional buildings from examples found online or in magazines.

For homework, have students identify local buildings of the styles covered in class and sketch or photograph the buildings. For each example, have students identify a) the style, b) the approximate date of construction and c) the details that lead them to believe the building is of the style they cited.

Have students speculate as to why the builders chose the architectural style for each building.

### **Professional and Vernacular Architecture**

Tell students there are many things that must be taken into consideration when designing and constructing a building. Then have students suggest what some of the various considerations might be. Make a class list, which should include things such



as: the building's use; materials available; site details; building regulations and codes. Explain that there are essentially two traditions that address the various considerations that must be considered while designing and constructing a new building: Professional Architecture (Architects) and Vernacular Architecture. A brief explanation of the distinctions between the two terms follows:

An architect is a professionally-trained and licensed person who is involved in the planning, designing and oversight of a building's construction. Architects are required to obtain specialized education and documented work experience to obtain a license to practice architecture, similar to the requirements for other professionals.

Vernacular architecture utilizes methods of construction which use locally available resources to address local needs. Vernacular architecture tends to evolve over time to reflect the environmental, cultural and historical context in which it exists.

In contrast to planned architecture, the building knowledge in vernacular architecture is often transported by local traditions and based on knowledge achieved by trial and error which is handed-down through the generations. This of course does not exclude architects from using vernacular architecture in their designs or being firmly based in their regional vernacular architecture.

Using the *Professional and Vernacular Architecture* materials provided on [www.mississippiheritage.com](http://www.mississippiheritage.com), introduce students to illustrations that distinguish vernacular architecture from the works of professionally-trained architects.

For each photograph, ask "What does this building tell us about the people who built it?" The answers will vary-allow plenty of creative speculation to emphasize the cultural/historic lessons that can be learned from buildings.

For homework have students locate and sketch/ photograph a building they suspect is an example of vernacular architecture. Have them answer the following questions: Why do they believe it to be vernacular? What can the building tell us about the people who built it?

### **Other possible exercises:**

Have students search for "vernacular architecture" in the "Built in America" collection of the Library of Congress on-line American Memory website, [http://memory.loc.gov/ammem/collections/habs\\_haer/index.html](http://memory.loc.gov/ammem/collections/habs_haer/index.html). Photographs of many National Historic Landmarks and National Register of Historic Places properties may be accessed and downloaded/printed through the "Built In America" collection. Twenty-six Mississippi counties have buildings represented in this collection.

### **Assessing Student Learning**

Teachers may develop assessment opportunities in addition to the following:

- Students should learn the following glossary terms: vernacular; architect; size; scale; ratio; terms associated with various architectural styles and additional terms determined by the teacher.
- Students should complete illustration assignments for geometric shapes in the built environment.
- Students should be able to explain their choice of a vernacular building example and what the building can tell us about the people who built it.
- Students should participate in various classroom discussions.

### **Extending the Lesson**

The possibilities for extending the lesson are limited only by the desire, time and creativity of the teacher and students. Some possible extensions include:

- Using the *Architecture Scavenger Hunt* materials provided on [www.mississippiheritage.com](http://www.mississippiheritage.com), have students complete (or compete in) a "scavenger hunt" that could include architectural details, geometric shapes and architectural styles.
- Take students on a field trip to discover the geometric shapes and architectural styles evident in the local community. Have students sketch/ photograph the buildings and identify styles and/or details.
- Have students create photographic collages of historic buildings in their area or across the state that illustrate the architectural details and architectural styles. This may be done for public presentation at a local library or historical society or developed as a website.



### **Curriculum Developed by**

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As a native Mississippian, Charles M. Yarborough has long been an advocate for educating young people about the history and architecture of our state. A teacher at the Mississippi School for Mathematics and Science since 1995, Charles regularly involves his students in preservation activities, including the performance project *Tales from the Crypt*, which was awarded the 2005 Governor's Award for Excellence in the Arts, and an architecture scavenger hunt of historic Columbus. Charles was named History Teacher of the Year for Mississippi in 2007.

