

# **Exploring the Changing Face of Houston Reflected in Structure, Technology, Design, and Physical Context**

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## **INTRODUCTION**

### **My Housing Evolution**

I came to Houston in 1960 and lived in a brick apartment building (complex) for several years before moving into a house. The house was constructed with lumber and had a living room, two bedrooms, one bath, a kitchen and an attached garage. Over the past 35 years as my family has grown, my house has undergone two expansions. The first time, we added a bedroom and a dining room, and we converted the garage into a den. The second time, we added a carport and a sunroom. We also covered the wood frame with aluminum siding. We built a utility house in the back yard with aluminum siding and roof to match the house.

As a child, I lived in rural East Texas, where my family worked as sharecroppers and lived on the property of the farmers where we worked. Therefore, we moved a lot. I have lived in a converted railroad car, a log cabin that I helped build, and several shotgun houses.

East Texas was, and still is, known as the Piney Woods. Several sawmills manufactured lumber from the tall timber (pulpwood) that grew abundantly in the forest. Local companies transported it by large trucks and also cut the timber. The trucks could be seen traveling back and forth every day. The lumber was loaded into boxcars and taken to various locations. Timber is still being cut in the Piney Woods, but there are no more saw mills operating in my hometown. The timber is shipped out of the area for processing.

My housing experiences are an example of how advanced technology and economics can change living arrangements. My students will not have this kind of history to draw from. With this unit, I plan to share with them my experiences and introduce them to the field of architecture. Since architecture is such a broad field, I will focus on Houston, which will include the neighborhood around the school and the Heights.

The following information is taken from the School Improvement Plan, 2002. Bellfort Academy is located in Southeast Houston. The established community of Glenbrook Valley consists mostly of retired citizens. Approximately 26% of the students live in homes located in the community: the other 74% live in the various apartment complexes surrounding the school. Enrolled are 298 fourth and fifth graders. Forty nine percent (49%) are male and 51% are female. The ethnic population consists of 62%

Hispanics, 36% African Americans, less than 1.0% whites and 1.0% Asian American. Student attendance is 97%, and the mobility rate is 26%. Sixty eight percent (68%) of the students are identified as being “at-risk.” Fifty percent (50%) of the students are Limited English Proficient (LEP), 10% receive special education, and 98% receive free/reduced lunch. Bellfort Academy is the sister school to Lewis Elementary. Students at Lewis Elementary are enrolled in pre-kindergarten through third grade. Both schools have the same lead principal, but each school has its own assistant principal.

### **What I Want to Teach**

I teach Special Education Resource, reading, language, and math at Bellfort Academy. Although the students are enrolled in the fourth and fifth grades, their instructional levels are usually at the second or third grade levels. A fifth grader could be at the fourth grade instructional level. Therefore, for one content area, there might be several students at different instructional levels. Students with disabilities, as mandated by IDEA, are taught according to Individual Education Plans (IEPS) that are developed by an Admission, Review and Dismissal (ARD) committee. A student with a disability can be at the second grade instructional level in reading and the third grade instructional level in math.

According to the SIP, only one fourth of the children who attend Bellfort live in houses. In my current class of nine students, only one of them lives in a house. Another one visits her grandmother’s house. They have no concept of the Heights or any other historic areas. Some of them come from other countries, such as Mexico, El Salvador, Puerto Rico, or Chile.

I want to tell the students the story of American architectural styles. Architectural styles are a method of classifying buildings into historical or cultural periods. A style is associated with the work of an individual architect, e.g., the style of Frank Lloyd Wright or the style of A. J. Downing. I want to teach them the vocabulary of house styles, but I want to focus on cottages and bungalows (Encyclopedia of Architecture 35).

I want them to know about two pioneers in the field of American Architecture: A.J. Downing and Frank Lloyd Wright. I want to teach them about how pattern books and catalogs, especially the Sears Catalog, were used to plan and construct houses, and about the different construction materials that were used to build houses.

### **Architects**

Downing’s houses were distinguished by steep roof slopes, balconies, porches, window gables, and deep shadows made by projecting roofs (Walker 126).

A cottage is a dwelling of small size, intended for the occupation of a family that wholly manages household care itself or, at the most, with the assistance of one or two servants. Downing’s cottages emphasized simplicity. Some of their characteristic

features were gables; a simple porch or veranda; simple bay windows; verge-board; the principal entrance or front door opening onto a porch, lobby, or entry of some kind; steep roof; and proper ventilation. Downing also wrote that the first floor should never be less than one foot above the level of the surrounding surface of the ground, to secure dryness. He felt that the kitchen should always be on the first floor so that the mistress of the house could supervise. In addition, he felt that in all cottages constructed of brick or stone, the inside walls should be “furred off,” (meaning a space of two or more inches is left between solid wall and plaster) to prevent dampness. In all cottages in the colder portions of the country that were built of wood, there should either be a double weather-boarding, as is common in New England, or the space between the weather-boarding and the inside should be “filled in” with cheap brick, as is common in the Middle States (Downing 42-45).

Frank Lloyd Wright’s creations were based on a life philosophy that was undeniably rooted in his childhood. Further shaped by his life experiences, his designs developed distinct attributes which, when repeated, pushed some of his buildings into sub-styles. Wright called the totality of his work organic architecture. This concept provides the breath and flexibility required to define Wright’s style as he and his followers have practiced it for the past century (Lind 35).

## **Housing Styles**

Some of the houses listed in *Historic and Architectural Resources of Houston Heights* are cottages. The houses at 1536 Heights Blvd. and 119 East 20<sup>th</sup> are bungalows, while the houses at 1651 Columbia St. and 1640 Harvard are cottages. The house at 1651 Columbia is described as a one-story frame cottage with a combination roof with projecting gable on front bay; a shingled gable end; and the porch and other details hidden by a high wooden fence. The house is of a type common in the early development of the Heights, both in form and detail. The house of bungalow style located at 1536 Heights Blvd. is described as a brick two-story house with a hip roof and small front dormer (with three windows); an attached porch wrapping to both sides, supported by battered half-columns on brick piers; turned balusters between piers; statues of griffins which flank the front steps at the foot; a front door with beveled glass and sidelights; windows with nine-over one upstairs; and fifteen over-one downstairs. The author of *Historic and Architectural Resources Of Houston Heights* states that it is one of relatively few brick houses in the Heights.

The Bungalow Style was an outgrowth of many influences—the Craftsman Style; Japanese architecture derived from new tea houses built in this country and from photographs and travel in Japan; the low abode dwellings of the Spanish Colonial Style of the Southwest; the open informal planning of the Eastern Shingle Style; shack like rural cottages; the Swiss chalet; and barn and log cabin construction (Walker, 186). Bungalow style homes can also be found in the Heights.

Patricia Brown Glenn, in *Under Every Roof: A Kids Style and Field Guide To The Architecture of American Houses*, lists the following features of a bungalow:

Window Types	Porches Types	Door and Window Trim
Sash (1)	Stoop	Plain
Sash (2)	Open Porch	Lintel
Sash with Sidelights	Closed Porch	Flat Arch
Double Hung	Portico	Round Arch
Casement	Veranda	Shelf
Transom	Columns	Pediment
Palladian	Arcade	Broken Pediment
Bay		Hood
Sliding		Quoins
Broken		Pilasters
Awning		Sidelights
Glass Block		

I want to teach the students how economics, technology, and lifestyles affected how houses looked. Early settlers to Houston made decisions about housing depending on the materials that were available. In addition, different techniques were employed for construction in those days. They often used pattern books instead of hiring architects to design houses. After pattern books came catalogs.

### Pattern Books

Sears, Roebuck and Company provided mail order houses for thousands of families. By 1926, Sears had sold 34,000 houses, and by 1934, the figure was 100,000. In 1991, according to the *Sears, Roebuck Catalog of Houses, 1926*, some of those houses were still standing. Students probably know about the present day Sears but will be surprised, as I was, to learn that Sears used to provide houses via the rail lines. I will collect Sears Catalogs from the Sunday paper and get an unabridged reprint of *Sears, Roebuck Catalog of Houses, 1926* so that the students can see how technology has changed the way buildings are constructed. As early as 1909, Sears was offering plans and materials for complete homes. From 1916 to 1934, Sears offered completely prefabricated houses to customers throughout the country, and later (from 1929 to 1934), the company offered actual house construction through contracting with local carpenters. The houses covered the broad spectrum from the truly minimal to the substantial. The price ranges were from \$4909, at the top of the line to \$629, at the bottom (Sears, Publisher's Note).

I think it will be important for the students to learn about the materials that were used in the construction of houses. There were many, of course, but I will only focus on two: wood/lumber and brick. Advances in transportation made brick more affordable, but

advances in technology also made lumber cheaper, more available, and more widely used.

## **BUILDING MATERIALS**

### **Wood/Lumber**

In North America, the early pioneers built log cabins by laying logs one on top of another and filling the gaps with clay to keep out the wind and rain. This method of building used large amounts of timber. Most houses that are built of other materials still have wood in them. They often have lumber framing, and flooring, doors, and windows frames that are made of wood (Dyson 22-23).

According to Katherine Salant, (Houston Chronicle 2003) timber frames, a building tradition more than 2000 years old, is a framing system in which complex wood joinery and wooden pegs hold everything together. This system was found in Europe and Asia and was also common in North America from the time of the first European settlement until about 1850. The distinguishing characteristic of the old American timber-framed houses, compared to those of other regions, is the exterior—the timber frames are covered up. In the south, settlers encased the timber frame in brick. Salant says that until about 1850, most houses in the U.S. were built using some variation of the New England or Southern style of timber framing. But as sawmills began to produce smaller sawn timbers and machine-made nails became widely available, a house could be built much faster for less money. Timber framing was all but forgotten when the wood studded construction which is still used by most homebuilders today emerged. Salant indicates that the timber-frame construction did continue on a smaller scale. In the 1970s, several individuals around the country began working with the few craftsmen who learned the trade from their forefathers, and the timber-frame revival slowly spread across the country.

### **Bricks**

Rickard defines bricks as small building blocks of clay and mud. He says that they are dried in the sun or baked in a kiln to make them hard and strong. Builders use bricks to make walls. Their size varies from one country to another, but most modern bricks are small enough to hold in one hand. They are usually twice as long as they are wide (Rickard 4).

Bricks have been a part of man's history for thousands of years, since prehistoric man began experimenting with dried mud and trying to solve the problems inherent in the material, according to Plumbridge. Sun-dried bricks, or adobe, date back to around 5000 BC. They were used in simple and primitive dwellings, despite their irregular shape and inherent unreliability. Plumbridge indicates that eventually the need for more reliable

building materials led to the invention of the fired brick. He says that the Mesopotamians and the Indus Valley culture were jointly responsible for the fired brick (Plumbridge 10).

While the log cabin is often thought of as a typical domestic house for the early colonists to North America, it was in fact a relatively late arrival. The Swedish immigrants introduced it at the end of the 17<sup>th</sup> century. In the early 17<sup>th</sup> century Dutch and British colonists, who were brick makers and bricklayers, sailed to America, bringing with them bricks as well as readymade designs for homes and fortifications (Plumbridge 38).

The use of brick has a long and involved history. Bricks come in a variety of colors and consistencies, making beautiful patterns in homes and other buildings possible.

With the emergence of the industrial age, which brought transportation, electricity and technology, brick became the material of choice in construction. Brick was longer lasting and made for a prettier house. Throughout its long history, brick has proved remarkably resilient to competition from other materials. It has met its greatest challenge in a century, which has seen architecture become increasingly indebted to engineering for its success. Bricks were the prime materials used in an innovative style of domestic architecture to emerge from the States. Frank Lloyd Wright, in a series of villas that he built from 1890s onwards in the cities along the Great Lakes and the leafy suburbs of Chicago and Buffalo, developed that style. (Plumridge 56-57)

### **Careers in Construction**

During the month that the unit will be taught, I want to introduce the students to careers in the construction industry. An article in the Houston Chronicle on Sunday, March 2, 2003 states:

Several years ago, Houston's labor market hit rock bottom in its supply of skilled construction trades people. Wages were increased to attract enough plumbers, electricians and carpenters. Unions and associations reached well into the community, including local high schools, to attract new talent to fill the exploding need for the skilled crafts.

The article went on to quote a local executive, saying:

I don't see where we're going to find enough kids here in Houston to fill these jobs, but I also don't think many of them realize that, as skilled framer or trim carpenter or plumber, they could be driving their own BMW to work. We've tried outreach in the past with little success, and we're still carrying the message that construction is an honorable profession that offers honorable work with good pay and good upward mobility for people who want to get into it at an early age.

Students with disabilities, like all students, are encouraged to learn about different occupations. The field of construction offers opportunities for men and women. Some of the available trades include: bricklayer, cement mason, carpenter, cabin maker or millwright, construction inspector, electrician, floor layer, glazier, and other related trades. Another important field in architecture is landscaping. Most homeowners want their homes to stand out. They want their surroundings to reflect themselves. Some neighborhoods have garden shows where homeowners open their yards for tours. It is not too early for students to be exposed to the work world. I will present information to them concerning the educational requirements for entering the fields mentioned above.

I want to teach terms associated with architecture such as: gable roof, hip roof, shingles, and other identified terms. I want the students to be able to recognize different plan shapes (square, rectangle, L-shaped, U-shaped, T-shaped, circular, octagon, pavilion, atrium, irregular), roof types, roof materials, and housing materials.

## **WHY THIS SUBJECT IS IMPORTANT**

### **Considering the Development of Houston Heights**

Most students do not see houses in a functional sense. They only think of them as the places where they sleep and eat, which is true, but houses are so much more. They contribute to the structure of society. I am not just focusing on houses, but on living quarters of any kind—apartments for the elderly, shelters for the homeless, barracks for the military. Living arrangements in adequate quantities provide stability to neighborhoods, communities, cities, and the country. After this unit, I hope that students will see houses in a different light.

This unit is important because it will teach students the history of how Houston developed. It will explore the cultural aspect of how people lived in earlier times. They need to know why the Heights area is considered historic:

One of the first planned suburbs in the state, Houston Heights has retained its architectural and civic identity to an unusual degree. This has been accomplished in spite of its location in one of the fastest growing cities in the United States. The Heights presents a Whitman's Sampler of turn-of-the-century architectural styles. Several notable late-Victorian mansions and substantial early 20<sup>th</sup> century public, ecclesiastical and commercial buildings serve as the anchors of the neighborhood. Nevertheless, the real strength of the Heights rests in its wide array of essentially vernacular, middle class, and domestic architecture of the period 1893-1932. (Texas Historic Sites Atlas 1)

It is important not only to provide insight to historical areas but also to understand the impact that this development had on the city of Houston.

## **HOW THE MATERIAL WILL BE PRESENTED**

### **Thematic Units**

The unit will be presented over a four-week period. I will use the Project CLEAR curriculum objectives to plan my lessons. The HISD curriculum provides teachers with the information needed to develop teaching plans that will actively engage students in the learning process (HISD, 2002).

I plan to set up three learning centers: reading, language and math. Teaching students with disabilities to read requires specific techniques. Students' different learning styles will also be taken into consideration when developing strategies for instructions. For students with spatial/visual learning styles, I will provide pictures, images and other visuals such as interactive CD-ROMS to enhance their learning. The student who is a kinesthetic learner will benefit from the math class, where there will be models to build and other hands-on activities. The auditory learner will enjoy listening to the oral reports and taped interviews that are planned for the reading unit. Students who are logical/mathematical learners will be thrilled during the math unit as they look at blueprints of houses and discuss the different housing styles. Linguistic learners will like the coloring book, the drawing book and the writing exercises that will be done. Group activities will enhance interpersonal learners' skills, and the intrapersonal students will work well independently.

The Literacy Center will have books written and illustrated just for children. They will be at the reading level for the age group in the classroom. I have found several that will be suitable. I will also read passages from books to them, and they will make inferences from the oral presentations. They will develop questionnaires to interview their families and maybe their neighbors about past living experiences. The questionnaires will require check-off since students may be limited in their knowledge of writing long explanations. The students will also be asked to compare and contrast lumber and bricks as building materials. They will be shown samples of the materials and will research the history of each one using websites, encyclopedias, family members, newspapers, trade journals, and other appropriate resources.

This unit will be taught during the second semester; so, before the weather gets too extreme, we will take a walking tour of the neighborhood. I will get approval from the principal to contact parents for permission to take the students on a walking tour of the neighborhood. We will look at houses on the streets near the school as well as the apartments in the area. They will use disposable cameras to capture the event and prepare a power point presentation for class. We will discuss the similarities between houses and apartments. For instance, both have kitchens, bathrooms, and bedrooms. We will also explore the differences, like parking lots and parking spaces versus yards and garages. These are modern structures, but they will serve as an introduction for the students to get them interested in learning about early American homes.

The Houston Public Library has an interactive CD-ROM, “Hard Hat,” that the students can use to build their own structure. It provides instructions as students proceed through the activities. It is very colorful and gives verbal instructions during the process.

In the writing center, students will do research on A.J. Downing and Frank Lloyd Wright. They will use the student resource section in the Bellfort School site located on the HISD website. The librarian has included several user-friendly websites for students. The research papers will include the contributions made by each of the architects. One of the websites has an interactive program that shows videos about architecture. There will be architecture drawing and coloring books for hands-on activities. If writing becomes a problem for the students, they can dictate to me and I will compose it for them on the computer. They will work in pairs or groups and prepare oral reports on their research to present it to the class. This will encourage them to become confident when speaking in public.

The math center will have manipulatives available for lots of hands-on activities. There will be blocks so that models of buildings can be erected. Students will be required to identify different shapes and lines. Architecture contains many basic geometric shapes. The students will be given the opportunity to recognize some of them, such as squares, rectangles, polygons, plane geometry figures, and solid geometry shapes.

I will have the “Home” section of a few newspapers available so that the students can find shapes and lines in houses featured in this section of the paper. I will also provide them with appropriate magazines with images of houses and landscapes.

## **HOW THIS UNIT WILL FIT INTO THE CURRICULUM**

### **Project CLEAR**

The 2002 Project CLEAR reading objective, Goal 8, states, “The student uses reading as tool for learning and research.” The reading exercises that the students will do in the reading center will fulfill this objective. They will be learning about Houston’s history and researching architecture.

The 2002 Project CLEAR writing objective, Goal 8, states, “The student uses writing as a tool for learning and research.” Students will use graphs and Venn diagrams in the center to compare and contrast housing styles and materials. Students will be required to go through the writing process to complete the research project.

The 2002 Project CLEAR math objective, Goal 9, geometry and spatial reasoning states, “The student recognizes congruence and symmetry.” At this grade level, math is taught using concrete models and technology. Instruction will include the use of blocks and exposure to actual building materials such as lumber, bricks, cement and shingles.

Will attempt to get someone from the construction industry to visit the class and perhaps bring some blueprints.

Project CLEAR includes modifications for special education students. The 2002 edition allows for the following modifications in math: vocabulary development; reduction of paper and pencil tasks; manipulatives; and peer tutoring.

## **WHAT THE STUDENTS HAVE STUDIED BEFORE THIS UNIT**

### **Reading**

Since this unit will be taught during the second semester and I will be teaching Goal 8, the students will have had instructions in the preceding seven goals. According to Project CLEAR, those objectives call for students to: develop and extend the foundation of reading; read a variety of genres and texts for a variety of purposes; use a variety of strategies to recognize and develop vocabulary; interpret the nuances of text to develop effective communication skills and to appreciate the use of language; select and use a variety of strategies and criteria to comprehend and analyze texts; read critically to evaluate and respond to text; and read culturally diverse texts to develop skills in reflection and communication.

### **Language**

For English language arts or writing, the seven Project CLEAR goals call for a student to: develop the foundations of writing; write for a variety of audiences and purposes; use the conventions of written language to communicate clearly and effectively in writing; apply standard grammar and usage to communicate clearly and effectively in writing; select and use recursive writing process for self-initiated and assigned writing; evaluate his/her own writing and the writing of others; and interact with writers inside and outside the classroom in ways that reflect the practical uses of writing.

### **Math**

The Project CLEAR math curriculum is developed into model lessons for 2002-2003. The model lessons that will be taught before Unit 9, Geometry: Patterns, Plane and Solid Figures, are: whole numbers: addition and subtraction; time and money; place, value and number patterns; whole numbers: comparing, ordering and rounding; multiplication facts; exploring division; and collecting and representing data and probability.

## READING LESSON PLANS

### Lesson Plan 1

#### ***Objectives***

The student inquires and conducts research using a variety of sources relating to houses. (TEKS 110.6.4.13)

#### ***Materials***

The Visual Dictionary of Buildings

*Under Every Roof: A Kids Style and Field Guide to the Architecture of American Homes Our Homes and School*

Newspapers

Real Estates Guides/Apartment Guides

Scissors, art paper, glue

#### ***Procedure***

As a warm-up each student will answer questions about where he/she lives: in a house, in an apartment, or in other living arrangements. I will use one of two social studies Graphic study books to introduce this thematic unit. The first study book is entitled, *Our Homes and Schools*. Unit 2 has a section listed as “Different Homes for Different People.” Page one has a subtopic that asks, “How are these homes alike?” Page two has a subtopic that asks, “How are these homes different?” The seven homes on page one are not identified by style, but they do have similarities. The students will not be able to name them at this time. The homes are being introduced to them as a method of getting them interested in the subject matter. Page two has seven houses that have differences, which are obvious. They range from an adobe hut to a prefabricated house. The students will use these pages to begin their journey into gaining knowledge about housing styles.

Another unit in the study book has a graphic that shows a picture of a home and a map of the interior area of the home. The students will use these pictures to sketch their own homes or apartments. They will do an activity of drawing a map of the inside of their homes.

After this activity, the students will do choral reading with the teacher from the introduction of the book *Under Every Roof: A Kid’s Style and Field Guide to the Architecture of American Houses*. Choral reading is done when students repeat passages after the teacher. This method of reading is used because of the reading problems students with disabilities have. This way the teacher is modeling for the students. The students will be given a list of vocabulary words to define using websites, newspapers, dictionaries, and trade books from the school library and the Houston Public Library. The vocabulary words will include:

- Architect: a person who designs and lays out plans for buildings; a person skilled in architecture.
- Architecture: the art of designing buildings.
- Balloon Frame: house frame built up from small-dimensioned lumber, principally two-by-fours, nailed together.
- Bracket: a curved or angular projection at the top of a post for support of a horizontal section.
- Clapboard: board siding laid horizontally, and overlapping; butted vertically.
- Dormer Window: a window that projects from a roof.
- Façade: the face or front of a building.
- Gable: the end wall of a house having a pitched or gambrel roof.
- Gambrel Roof: a form of ridge roof with two pitches.
- Gingerbread: decorative woodwork applied to a Victorian house.
- Hipped Roof: a roof that slopes back equally from each end of the building so that there are no gables.
- Octagonal House: one having eight sides; specifically a Victorian design.
- Plank House: one built without studs, in place of which wide board planks are used vertically. Plastered within and covered with clapboard or shingles without.
- Polygonal: having many angles.
- Siding: exterior wall covering.

## **Lesson Plan 2**

### ***Materials***

*Our Neighborhood and Groups* Graphic study book

*Under Every Roof: A Kids Style and Field Guide to the Architecture of American Houses*

Notebooks, pencils

Newspaper

Real Estate and Apartment Guides

Scissors, glue

### ***Procedure***

As a warm-up, the students will describe their neighborhoods either orally or by drawing. The second social studies Graphic study book titled *Our Neighborhood and Groups* has a unit showing nine different kinds of homes. These homes are a combination of styles of homes shown in the first study book with additional styles included. The graphics are very crisp and colorful and should create an interest for the students to learn more about houses. The books are designed for students at the elementary level.

For activity one, students will be asked to name places in their neighborhoods similar to those found in the study book. Places such as schools, grocery stores, fast food restaurants, malls, fire stations, etc. are appropriate. They will develop a questionnaire to

interview long-time residents in their neighborhood. They can use a notebook to record the answers or use a tape recorder. Some of the questions they can ask are:

- Where and when were you born?
- How long have you lived in this neighborhood?
- How long have you lived in this house?
- What did it look like when you moved in?
- What changes has your family made to the house? Why?
- What changes have you noticed in this neighborhood?
- How have houses changed in the last twenty-five years?

If the students take notes, they can do an oral report; but if they tape the interview, they can play the tape in class with permission.

For activity two, the students will do choral reading with the teacher from Parts One and Two of *Under Every Roof: A Kids Style and Field Guide to the Architecture of American Houses*. They will look at each page before the reading is done and will respond to questions about what they see and think each picture means: Do they see flat roofs? How many windows are there? Is there a porch? The students will use “Home” sections from newspapers, real estate home guides, and apartment guides to develop field guides to determine housing styles (Figure 1).

## **LANGUAGE LESSON PLANS**

### **Lesson Plan 1**

#### ***Objective***

The student uses writing as a tool for learning and research about building materials. (TEKS 110.6.4.21).

#### ***Materials***

Lumber samples  
Bricks of various sizes, shapes and colors  
Dictionaries  
Pencils/notebook

#### ***Procedure***

As a warm-up, students will be shown bricks and lumber and be allowed time to examine each. The students will use graphic organizers to compare and contrast these two types of materials, which are used in the construction of houses (Attachment A). For lumber/wood, they will compare softwood (spruce and pine) to hardwood (mahogany). They will use web resources to identify the different trees that produce softwood and

hardwood. They will list how each type of wood is used. Other resources will consist of dictionaries, videos, and trade books from various libraries.

For bricks, the students will be shown different sizes, shapes, and colors. They will do research using the resources listed above to learn about the history of bricks. Such information will consist of when and how they were first made, the materials used to make them, what they were used for, how they were transported then and now. They will also research what affects the decision on which material, lumber or brick, when designing houses.

The students will be asked if anyone in their families or anyone they know does construction work. If so, the students will interview them and do an oral reports for the class. I will also contact local construction companies to get representatives to come and speak to the students about what they do, what tools they use, and the market for workers skilled in construction trades.

## **Lesson Plan 2**

### ***Materials***

*The American House: Styles of Architecture* Coloring Book

Coloring pencils

Crayons

Notebooks, pencils

Copies of graphic organizers

Sturdy Art paper

### ***Procedure***

As a warm-up, students will use *The American House* coloring book for 15 minutes to color houses that show the development of American domestic architecture step by step. As Smith notes, the arrangement is primarily chronological: the Indians, the Northern Colonial tradition, the Southern Colonial tradition, and the various styles that found widespread favor after the establishment of the Republic (Smith, Publisher's Note).

Each coloring page describes the style of the house, its features and where it is located. For example, on page 24 the following information is found:

**Octagon House** (Farmington, Me., ca. 1850-60). The Octagon Style was a variation of the Victorian Italiante, promoted by an eccentric phrenologist, Orson Squire Fowler, during the 1850s and 1860s. The rooms on each floor were arranged around a central hall and stairway. The Cupola on the low-pitched roof provided both ventilation and light to the interior hall. This example is built of brick with a poured-concrete foundation. (Smith 24)

Frank Lloyd Wright designed the house on page 36, the Prairie. The description says that Wright advocated an “organic architecture” in which the house should be in complete harmony with its environment. The long lines of the Prairie house are intended to parallel the flatness of the Midwestern landscape. The large central chimney is also a feature of the style, the fireplace being an important element of many Wright interiors (Smith 36).

These two houses, as well as the others found in the coloring book, will support the reading and math units. The Octagon House is a geometric shape; therefore, a math concept is introduced. Since Frank Lloyd Wright is one of the architects I want the students to focus on, they can see the reading connection.

The students will use graphic organizers and list the differences between bungalows and cottages (Attachment B). They will use the information to write a research report. This assignment will cover one week. The students will use the writing process to complete the report. The steps for the writing process are:

#### Prewriting

1. The students think about what they know about house styles.
2. They will make a list of what they have thought about.
3. They will ask the other students what they want to know about the items on their list.

#### Drafting:

1. The students will choose one thing about bungalows and cottages that they want to write about, such as the windows, roofs, porches, etc.
2. They will write their report.
3. They will read their report to the other students and ask them questions about it.

#### Revising:

1. The students will think about what the other students say.
2. They will change their report to make it better.
3. They will rewrite it and add changes as necessary.

#### Proofreading:

1. The students will correct any writing mistakes.
2. They will have other students check their work.
3. They will rewrite or dictate their reports to me.

#### Publishing:

1. Each student will select a title for his or her research report.
2. They can enhance their reports with pictures.
3. I will provide materials for the students to make a book of their reports.

## MATH LESSON PLANS

### Lesson Plan 1

#### *Objectives*

The student recognizes congruence and symmetry (TEKS 111.15.15.B.9).

#### *Materials*

*The Eddie Files* video

Ruler, compass

Triangle

Scissors

Cardboard

Pencils

Lined graph paper

#### *Procedure*

As a warm-up, students will watch a 20-minute video; *The Eddie Files*, which is told from the viewpoint of eleven-year-old student named Eddie, who is in a geometry class studying polygons. A portion of the video shows a tour of a construction site and demonstrates how buildings have geometric shapes. There are windows with triangular and rectangular shapes. There are even windows with circular shapes. The video will be an excellent introduction to the math unit.

As an assignment, students will complete activities in *Frank Lloyd Wright for Kids*. One activity involves learning more about symmetry. It gives illustrations about how symmetry as well as geometric shapes can be found in nature. The instructions are to draw a line from the top of a congruent triangle straight to the bottom, which will divide the triangle into two smaller congruent triangles. Additionally, a line drawn through a circle will divide it into two symmetrical half circles. A line drawn through the center of a square will divide it into two rectangles. The students will draw their own symmetrical designs using the basic shapes of plane geometry. They will use cardboard and cut them out for sturdier designs. They will then lay the cut outs over printed graph paper and trace around them. They will be instructed to draw a heavy black line down the center of the graph paper so that when they finish, the shapes on either side must match.

Frank Lloyd Wright shows how he used the shapes of plane geometry to draw plans for his buildings and how he used the shapes of solid geometry to make his buildings (Thorne-Thomsen 74).

In another activity, the students will be given pictures of houses that have been drawn on graph paper. Some of the houses will show symmetry when the paper is folded in half and others will not. To expand on this lesson, the students will draw their own houses using sketches from the *Draw 50 Buildings and Other Structures* step-by-step drawing

book. The book has several sketches of houses that the students can complete. They start with the minimum sketch and end with the finished house. The students are required to complete the drawings in between.

## **Lesson Plan 2**

### ***Materials***

Dictionary

*Hard Hat* video

Wooden blocks

### ***Procedure***

As a warm-up, students will develop a vocabulary list of formal geometric terms such as:

- Triangle: a geometrical figure having three angles and three sides.
- Rectangle: any four-sided plane figure with four right angles.
- Square: a plane figure having four equal sides and four right angles.
- Right angle: straight line or plane perpendicular to a base.
- Line: a collection of points in a straight path that goes forever in both directions.
- Point: an exact location in space. A point can show a position on a line.
- Line segment: part of a line that has two endpoints.
- Parallel lines: lines on the same flat surface that can never meet or cross.
- Intersecting lines: lines that cross each other at one point.
- Congruent: figures that have the same shape and same size.

Another assignment will have students using the interactive “Hard Hat” CD-ROM to construct buildings. The video has very interesting house patterns including tall columns with fancy arches. The student with visual learning styles will enjoy this. Other groups of students will use concrete materials such as wooden blocks to construct buildings. Each of these activities will meet the needs of students with different learning styles.

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