

# Architectural Drafting and Design

2019-2020

By: Brian Jorgensen

<b>Unit:</b> <i>Residential design styles</i>		<b>Time:</b> <i>August</i>
<b>Standards Taught</b>		
ADD 1.1 Identify architectural products and styles.		
<b>Differentiation/Assessment:</b>	<b>Classroom Management and Environment:</b>	<b>What will the students be doing?</b>
<i>Students who needed the extra help received guided notes, extra individual practice, and shortened tests.</i>	<i>The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place.</i>	<ul style="list-style-type: none"> <li>• Define Architectural Product.</li> <li>• List and show images of common examples or Architectural products in the following areas:             <ul style="list-style-type: none"> <li>- Landscaping</li> <li>- Pool and related structures</li> <li>- Commercial</li> <li>- Residential</li> <li>- Outbuildings</li> <li>- Landscape structures</li> <li>- Bridges and roads</li> <li>- Ornamental or art related</li> <li>- Unique</li> </ul> </li> </ul>

		<ul style="list-style-type: none"><li>• Research 10 of the following styles of residential construction.<ul style="list-style-type: none"><li>- Ranch</li><li>- Craftsman</li><li>- Modern</li><li>- Victorian</li><li>- Tudor</li><li>- Georgian</li><li>- Gothic</li><li>- Dutch Colonial</li><li>- Art Deco</li><li>- Greek Revival</li><li>- Contemporary</li><li>- Neoclassicism</li><li>- Mediterranean Revival</li><li>- Italianate</li><li>- Shingle Style</li><li>- Colonial</li><li>- Prairie School</li><li>- Second Empire</li><li>- Mid Century Modern</li><li>- Federal</li><li>- Pueblo Revival</li><li>- Spanish Colonial</li><li>- American Colonial</li></ul></li> <li>• Prepare a report on those ten styles chosen that identifies the time that they were most popular, major design characteristics, and where this design is most prevalent and a photo of a structure built in this style.</li></ul>
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Prior Knowledge Needed	Vocabulary	Assessments
<p><i>Students working on this unit should have taken, passed, and completed the class in Introduction to Drafting that is offered at the Corsica Stickney High School, or had a similar class in another location, or comparative live experiences.</i></p>	<ul style="list-style-type: none"> <li>• Residential Architectural Styles</li> <li>• Landscaping</li> <li>• Pool and related structures</li> <li>• Commercial</li> <li>• Residential</li> <li>• Outbuildings</li> <li>• Landscape structures</li> <li>• Bridges and roads</li> <li>• Ornamental or art related</li> <li>• Unique structures</li> <li>• Individual styles</li> </ul>	<ul style="list-style-type: none"> <li>• 10 style essays completed by the students.</li> <li>• Definition of Architectural Products.</li> <li>• List of websites that define each of the Residential Architectural Styles identified above.</li> <li>• Quiz over Architectural Styles</li> </ul>
<p><b><u>Relevance:</u></b> Architectural design is a personal, as well as, an era, and locational decision.</p>	<p><b><u>Examples:</u></b></p> <ul style="list-style-type: none"> <li>• Pinterest photos</li> <li>• Project plans from periodicals and websites</li> <li>• Prior projects</li> </ul>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Computer.</li> <li>• Internet</li> <li>• Miscellaneous office supplies.</li> </ul>
<p><b><u>Reflection:</u></b> Most people aren't failure with more than two or three styles of residential construction. As they become more acquainted with them they tend to broaden their horizons.</p>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"> <li>• What is the style of my home?</li> <li>• What is the style of most of the homes in my area?</li> <li>• What are my favorite styles of homes?</li> </ul>	

<b>Unit:</b> <i>Necessary pages for a set of blueprints</i>	<b>Time:</b> <i>August</i>	
<b>Standards Taught</b>		
<p>ADD 1.2 Interpret the fundamentals of framing plans.  ADD 3.1 Create a plot/site plan for a residence.  ADD 3.2 Design footings and foundation for a residence.  ADD 4.1 Develop a floorplan using accepted symbols and techniques.  ADD 4.2 Prepare a working drawing of the residence HVAC lights and electrical needs.  ADD 4.3 Design a residential roof plan.  ADD 4.5 Draw interior and exterior stair details appropriate to those found in a residence.  ADD 4.6 develop door, window, and finishing schedules.</p>		
<b>Differentiation/Assessment:</b>	<b>Classroom Management and Environment:</b>	<b>What will the students be doing?</b>
<p><i>Students who needed the extra help received guided notes, extra individual practice, and shortened tests.</i></p>	<p><i>The classroom is set up in a “regular class room” like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. Students will be allowed to rearrange desks so that they may use more than one at a time so that they have more room to work. Numbers permitting we may move into the shop for the drawing segments so that we may utilize the larger tables.</i></p>	<ul style="list-style-type: none"> <li>• <i>Examine a set of blueprints to see what drawings are included and to determine what details are important for each of those drawings.</i></li> <li>• <i>Start creating a Glossary of construction terms that is to include not only the definition of the term but where that idem the term identifies would be found in an architectural construct.</i></li> <li>• <i>Prepare a rough and dirty sketch of the home that the students’ lives in that demonstrates each of</i></li> </ul>

		<p>the above pages of the blue prints.</p> <ul style="list-style-type: none"> <li>• Read and outline chapters 23 and 24 in the <u>Basic Technical Drawing</u> text book and answer the questions at the end of each chapter.</li> </ul>
<b>Prior Knowledge Needed</b>	<b>Vocabulary</b>	<b>Assessments</b>
<p><i>Other than the ability to read and write there is no prior knowledge needed for this unit of instruction.</i></p>	<p>Students should have a basic understanding of building and construction vocabulary at this time.</p> <p>They will start a glossary of Architectural and Construction terms and will continue adding to it until the end of the semester.</p>	<ul style="list-style-type: none"> <li>• List of components to be included on each page of a set of blueprints.</li> <li>• Review questions from Chapters 23-24 in the <u>Basic Technical Drawing</u> textbook.</li> <li>• Quiz</li> <li>• Glossary will be checked on a weekly basis to determine completeness.</li> <li>• Check sketches and outlines for completeness.</li> <li>• Determine the student’s ability to answer thought provoking questions about work that they have completed.</li> </ul>
<p><b><u>Relevance:</u></b>  Architectural design and drafting is the Career that is the first step of the building career pathway. These drawings pave the way for everything else including.</p> <ul style="list-style-type: none"> <li>• Functionality</li> <li>• Budgeting</li> <li>• Timeframes</li> <li>• Utility</li> <li>• Style</li> <li>• Materials</li> <li>• Durability</li> <li>• Suitability</li> </ul>	<p><b><u>Examples:</u></b></p> <ul style="list-style-type: none"> <li>• Residential Construction Blueprints</li> <li>• A Glossary</li> </ul>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Text book’s <u>Modern Woodworking Introduction to Drafting Basic Technical Drawing.</u></li> <li>• Computer.</li> <li>• Internet</li> <li>• Miscellaneous office supplies.</li> <li>• Drafting tools and supplies</li> </ul>

<ul style="list-style-type: none"> <li>• Lifespan</li> <li>• Adaptability</li> <li>• Ascetics</li> </ul> <p>and pretty much everything else that follows in the construction business. It is hard to underestimate the importance of this career pathway in the building industry.</p>		
<p><b><u>Reflection:</u></b></p> <p>Allow plenty of time for this lesson to make sure that students have a firm understanding what drawings must be included in a set of blueprints as well as what needs to be conveyed in each of those drawings. Keep their initial sketches completed in this unit so that they can use them as a reference point to gage their progress.</p>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"> <li>• What is an Architectural Drawing?</li> <li>• What is each drawing trying to convey?</li> <li>• How can that information be conveyed in the most concise, and efficient manner with the least chance of any misunderstanding?</li> <li>• Do I now possess at least the minimum skills necessary to be able to utilize a set of Architectural Drawings?</li> </ul>	

<b>Unit:</b> <i>Building Materials Available</i>	<b>Time:</b> <i>September</i>	
<b>Standards Taught</b>		
ADD 1.4 Identify residential building materials.		
<b>Differentiation/Assessment:</b>	<b>Classroom Management and Environment:</b>	<b>What will the students be doing?</b>
<p><i>Students who needed the extra help received guided notes, extra individual practice, and shortened tests.</i></p>	<p><i>The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place.</i></p>	<ul style="list-style-type: none"> <li>• Students will do an internet search to find houses built from standard, new, and unusual building materials including but not limited to: <ul style="list-style-type: none"> <li>- Lumber</li> <li>- Metal</li> <li>- Concrete</li> <li>- Plastic</li> <li>- Fiberglass</li> <li>- Earth or mud</li> <li>- Straw</li> <li>- Logs</li> <li>- Brick</li> <li>- Bamboo</li> <li>- Manufactured materials</li> <li>- Glass</li> <li>- Recycled materials</li> <li>- Stone</li> <li>- Shipping crates</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>- Pallets</li> <li>- Mycelium</li> <li>- 3-D printing</li> <li>- Others</li> </ul> <ul style="list-style-type: none"> <li>• Compare five of the materials listed above to determine structural soundness, insulative quality, ease of use, availability, special tools needed and speed of construction.</li> <li>• Identify suppliers that would be practical to utilize for these material if I were to use them in South Dakota.</li> </ul>
<b>Prior Knowledge Needed</b>	<b>Vocabulary</b>	<b>Assessments</b>
<p><i>Students working on this unit should have taken, passed, and completed the class in Introduction to Drafting that is offered at the Corsica Stickney High School, or had a similar class in another location, or comparative live experiences.</i></p>	<ul style="list-style-type: none"> <li>• Building Code</li> <li>• Zoning Board</li> <li>• County Commission</li> <li>• City Council</li> <li>• Ordinance</li> <li>• Variance</li> <li>• Law</li> <li>• Act</li> <li>• Farmers Home Administration</li> <li>• Standards</li> <li>• Frost level</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be given building, zoning, electrical, plumbing and land use problems and required to come up with useable solutions that conform to all applicable codes and laws and ordinances.</li> <li>• List consequences of code violations.</li> <li>• Quiz</li> </ul>
<p><b><u>Relevance:</u></b> Code violations result lead to costly solutions. They may also have devastating results that can result in bankruptcy as well as loss of life.</p>	<p><b><u>Examples:</u></b></p> <ul style="list-style-type: none"> <li>• Local Zoning Ordinances</li> <li>• Unified Building Code</li> <li>• Unified Electrical Code</li> <li>• Unified Plumbing Code</li> </ul>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Computer.</li> <li>• Internet</li> <li>• Douglas county planning and zoning boards</li> <li>• Miscellaneous office supplies.</li> </ul>

<p><b><u>Reflection:</u></b> Most people aren't failure with more than two or three styles of residential construction. As they become more acquainted with them they tend to broaden their horizons.</p>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"><li>• Do I have the resources to determine if something is up to code?</li><li>• How do I determine what codes I am dealing with?</li><li>• What do I have to do to build it to code?</li><li>• How can I bring an existing structure up to code?</li></ul>	

<b>Unit:</b> <i>Building Site Suitability</i>	<b>Time:</b> <i>September</i>	
<b>Standards Taught</b>		
<p>ADD 4.4 Understand the use of elevations in the design of a residence.</p> <p>NOT INCLUDED IN STATE STANDARDS BUT OF VITAL IMPORTANCE!!!</p> <p>ADD ?.? Determine building site’s suitability for intended use.</p> <p>ADD ?.? Examine soil survey maps to determine their usefulness to the building contractor as well to provide information to compete site remediation practices.</p>		
<b>Differentiation/Assessment:</b>	<b>Classroom Management and Environment:</b>	<b>What will the students be doing?</b>
<p><i>Students who needed the extra help received guided notes, extra individual practice, and shortened tests.</i></p>	<p><i>The classroom is set up in a “regular class room” like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place.</i></p>	<ul style="list-style-type: none"> <li>• Students will examine three or four vacant lots in the community to determine their suitability as a building site.</li> <li>• Soil survey maps will be examined to determine drainage, compaction and expansion, and suitability for septic systems.</li> <li>• Determine the effect soil type has on the building process, especially foundations and drainage.</li> <li>• Identify the most desirable building site of those that were researched</li> </ul>

Prior Knowledge Needed	Vocabulary	Assessments
<p><i>Students working on this unit should have taken, passed, and completed the class in Introduction to Drafting that is offered at the Corsica Stickney High School, or had a similar class in another location, or comparative live experiences.</i></p>	<ul style="list-style-type: none"> <li>• Soil Survey maps</li> <li>• Soil type</li> <li>• Soil use survey</li> </ul>	<ul style="list-style-type: none"> <li>• Land Use Report</li> <li>• Map and table</li> <li>• List of concerns for each potential building site</li> <li>• Quiz</li> </ul>
<p><b><u>Relevance:</u></b></p> <p>The Leaning Tower of Pisa is a very good example of what can happen when a location is not evaluated for suitability before a structure is built. This is a problem that continually occurs since people have started building. It is easily solved in today's day and age by examining a soil survey. These surveys were started in the 1950's in south Dakota and were completed in the 1970's.</p>	<p><b><u>Examples:</u></b></p> <ul style="list-style-type: none"> <li>• Douglas County Soil Survey</li> <li>• Erosion and drainage models and experiments</li> <li>• Buildings in the area that show structural problems</li> </ul>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Computer.</li> <li>• Internet</li> <li>• Douglas county planning and zoning boards</li> <li>• Miscellaneous office supplies.</li> <li>• Transportation</li> <li>• Permission from land owners</li> <li>• Soil survey maps and tables</li> <li>• Listing and descriptions of soil types on building sites</li> </ul>
<p><b><u>Reflection:</u></b></p> <p>The importance of site selection cannot be stressed enough and even though this is not one of the standards identified for this subject area it should be. Not all lots are suitable for all purposes.</p>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"> <li>• Will this location work for what I have in mind?</li> <li>• Are there any problems that need to be addressed on this site that will extend the life or usefulness of the structure I want to build?</li> <li>• Is there a better location on this property for the structure?</li> <li>• Can my concerns be rectified and if so at what cost?</li> </ul>	

<b>Unit:</b> <i>Drawing a set of "Blue Prints"</i>		<b>Time:</b> <i>October - December</i>
<b>Standards Taught</b>		
<p>ADD 1.1 Identify architectural products and styles.  ADD 1.2 Interpret the fundamentals of framing plans.  ADD 2.1 Examine drawing identification and management techniques used in architectural drafting.  ADD 2.2 Illustrate proper dimensioning and notation practices used in architectural drafting.  ADD 3.1 Create a plot/site plan for a residence.  ADD 3.2 Design footings and foundations for a residence.  ADD 4.1 Develop a floor plan using accepted symbols and techniques.  ADD 4.2 Prepare a working drawing of the residence HVAC, lighting and electrical needs.  ADD 4.3 Design a residential roof plan.  ADD 4.4 Understand the use of elevations in the design of a residence.  ADD 4.5 Draw interior and exterior stair details appropriate to those found in a residence.  ADD 4.6 Develop door, window, and finishing schedules.  ADD 4.7 Understand basic estimating practices used in the construction industry.  ADD 4.8 Generate final presentation drawings and three dimensional computer model.</p>		
<b>Differentiation/Assessment:</b>	<b>Classroom Management and Environment:</b>	<b>What will the students be doing?</b>
<i>Students who needed the extra help received guided notes, extra individual practice, and shortened tests.</i>	<i>The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. Students are encouraged to group desks together to allow for more useable space during drawing. If conditions permit we will utilize the larger work tables located in the shop.</i>	<ul style="list-style-type: none"> <li>• Students will tour the town of Corsica to identify different residential construction styles present in the community</li> <li>• Students will complete each of the following drawings: <ul style="list-style-type: none"> <li>- Plot Plan</li> <li>- Front Elevation</li> <li>- Rear elevation</li> <li>- Side Elevation</li> <li>- Floor Plan</li> <li>- Wall Section</li> <li>- Foundation Plan</li> <li>- Roofing Plan</li> </ul> Complete (complete with truss plan and roofing section) </li> </ul>

		<ul style="list-style-type: none"> <li>- Finishing schedules for Doors, Windows, Bathroom Fixtures, and Cabinetry</li> <li>- HVAC, Electrical and Plumbing Plan</li> </ul> <ul style="list-style-type: none"> <li>• Students will demonstrate an understanding of the components involved as well as the code requirements of each phase of the design process.</li> <li>• As new terminology is interjected into the class discussion students will continue to be responsible for updating their glossary's.</li> <li>• A cost estimate will be completed for each phase of the design process.</li> <li>• Take detailed notes on Lecture Monday's that will be used in completing individual drawings.</li> </ul>
<b>Prior Knowledge Needed</b>	<b>Vocabulary</b>	<b>Assessments</b>
<p><i>Students working on this unit should have taken, passed, and completed the class in Introduction to Drafting that is offered at the Corsica Stickney High School, or had a similar class in another location, or comparative live experiences.</i></p>	<p>The vocabulary that the students need to master will be determined by the students. Definitions of construction terminology will be given during Lecture Monday's. Students will be required to record those definitions and mark the locations of these items on their drawings. This insures they will</p>	<ul style="list-style-type: none"> <li>• Completed set of detailed Blue Prints.</li> <li>• Bi-Weekly Quiz's</li> <li>• Glossary and location guide.</li> <li>• Participation in class discussions.</li> <li>• Time Management in directed studies drawing sessions.</li> </ul>

	<p>have an good understanding of locations and functions of these components.</p>	<ul style="list-style-type: none"> <li>• List the addresses of at least five different examples of residential construction styles that the student has located in this geographic area.</li> <li>• Exterior drawing using sketch up</li> </ul>
<p><b><u>Relevance:</u></b></p> <p>Plans and blueprints are the backbone of the construction industry they are used by the everyone involved, from the sales staff, through the builders as well at the people that are purchasing the final structure. These plans insure that the end user will take possession of a high quality structure that conforms to all of the code, ordnances, and laws of the location that it is completed in. There are also several legal considerations that need to be addressed by these plans that will limit liability for everyone involved with the construction process.</p>	<p><b><u>Examples:</u></b></p> <ul style="list-style-type: none"> <li>• Completed plans from previous classes.</li> <li>• Unified Building Code</li> <li>• Unified Electrical Code</li> <li>• Unified Plumbing Code</li> <li>• Floorplans from other sources</li> </ul>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Computer.</li> <li>• Internet</li> <li>• Douglas county planning and zoning ordinances</li> <li>• Drafting supplies and tools</li> <li>• Miscellaneous office supplies.</li> <li>• #2 and #4 lead pencils</li> <li>• Pencil sharpeners and sandpaper</li> <li>• Transportation</li> <li>• Sketch Up</li> <li>• Supplier websites</li> </ul>
<p><b><u>Reflection:</u></b></p> <p>This unit of instruction is long and very detailed. It is important for the teacher to keep the students moving along. To do this I will be doing progress checks this next year to more closely monitor what they are doing and to address problems and concerns in a more timely manner.</p>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"> <li>• Just what needs to be included in each drawing?</li> <li>• Have I thought of everything?</li> <li>• Have I checked the relevant codes and ordnances?</li> <li>• Am I on pace to complete all of these drawings?</li> <li>• Am I keeping my glossary up to date?</li> <li>• Is there a way to achieve the same results in a less expensive manner?</li> </ul>	

