Residential Construction
2019-2020
By: Brian Jorgensen

Unit: *Career opportunities in Residential Construction.*	**Time:** *January*

Standards Taught

RC 17.1 Research career opportunities in the Architecture and Construction fields.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.*	• Research 3 different career opportunities in the building construction industry to answer the following questions? - Educational requirements or opportunities - Job skills required - Work performed - Entry and median salaries - Safety concerns and issues - Advancement potential

		- Employment outlook - Worker satisfaction • Interview someone employed in this field to see if they would recommend this career to someone looking to enter in to it and to see if they had to start all over again would they stay in the same type of career.
Prior Knowledge Needed	**Vocabulary**	**Assessments**
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.	• Students should have a completed glossary from their Architectural Drafting	• Worker Interview • Career research papers
Relevance: Knowing what is expected of a person entering into this career path is the first step in determining if this is a fit for you.	***Examples:*** • Grain bin builder • Carpenter • Dry Waller • Painter • Finnish Carpenter • Plumber • Electrician • Contractor	**Materials Needed:** • Computer. • Internet • Miscellaneous office supplies • Someone in the building construction field to interview

Reflection:	**Essential Questions:**
I moved this from the end of the year to the first of the year so that I can illustrate to the students that there are more than one career that they can be looking at in this field.	• What do these people do? • Can I make a living doing this? • What does job security look like in this career field?

Unit: *Construction safety*	**Time:** *January*

Standards Taught

RC 1.1 Demonstrate proper industry safety standards.
RC 5.1 Demonstrate safe and proper use of hand tools.
RC 5.2 Demonstrate safe and proper use of power tools.
RC 5.2 Demonstrate safe and proper use of pneumatic tools.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Students will take safety pre-tests for all of the power tools that they will be using for this class. • Scores of a 90% or better will allow students to skip the chapter for that tool. Any lesser score students will read the safety information for that toll and retake the safety test until the 90% score is achieved. • Students will demonstrate that they are able to use ant maintain tools in a manner consistent to OSHA standards.
Prior Knowledge Needed	**Vocabulary**	**Assessments**

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.	• Students should have a completed glossary from their Architectural Drafting	• Testing • Demonstrations
Relevance: On the job safety is the primary concern in this industry. Work place accidents often result in permanent disability when working with power tools.	***Examples:*** • Table Saw • Band Saw • Miter Box Saw • Belt Sander • Router • Planner • Jointer • Portable saws • Radial Arm Saw • Hammer • Air nailer • Air compressor • Jacks	**Materials Needed:** • Computer. • Internet • Modern Woodworking Textbook • Miscellaneous office supplies • Someone in the building construction field to interview
Reflection: It is almost impossible to overemphasize safety where power tools are concerned. When teaching this unit make sure to talk about consequences inattention when using these tools.	**Essential Questions:** • Am I qualified to use this tool? • Am I aware of my surroundings? • Am I aware of what my coworkers are doing and where they are located? • Will my using this tool affect those around me?	

Unit: *Site preparation and squaring structures*	**Time:** *January*

Standards Taught

RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 3.2 Demonstrate survey techniques and site layout.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Students will conduct a site survey to determine slope, and suitability of soil type for intended purpose. • Students square up a building using both the measurement method and the geometric method. • A topographical survey will be conducted to determine depth of excavation and the amount of fill will be required for a given building.

<table>
<tr><th>Prior Knowledge Needed</th><th>Vocabulary</th><th>Assessments</th></tr>
<tr><td>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.</td><td>Topography
Site map
Squaring a building
Soil survey
Intended use</td><td>Students will demonstrate to the instructor how they determined this answer to the above questions.
Demonstrations</td></tr>
<tr><td><u>Relevance:</u>

Every builder should be able to. square a building. One that starts out unsquared creates problems throughout the entire building process.</td><td><u>Examples:</u>

You Tube video on how to square up a building</td><td><u>Materials Needed:</u>

Computer.
Internet
Modern Woodworking Textbook
Soil survey maps and tables
Stakes
Chalk line
Hammer
Surveying equipment
25” and 100” Tape measures
Blue print</td></tr>
<tr><td><u>Reflection:</u>

This lesson is done almost entirely out of doors so its scheduling has to be somewhat flexible to take advantage of good weather.</td><td colspan="2"><u>Essential Questions:</u>

What math can I use that I learned in math class to master this lesson?
What is that theorem called?
Why do I need to look at the soil to build on top of it?
Why does this building have to be square?</td></tr>
</table>

Unit: *Pouring concrete*	**Time:** *February or May*

Standards Taught

RC 1.1 Demonstrate proper industry safety standards.
RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 4.1 Understand and demonstrate the use of wood building materials.
RC 4.2 Understand and demonstrate the use of fasteners and adhesives.
RC 5.1 Demonstrate safe and proper use of hand tools.
RC 5.2 Demonstrate safe and proper use of power tools.
RC 5.2 Demonstrate safe and proper use of pneumatic tools.
RC 6.1 Understand and Demonstrate the use of concrete and reinforcing materials.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Discuss safety concerns when working with concrete and concrete reinforcement. • Build a form to pour concrete. • Cut and secure rebar to reinforce concrete. • Determine concrete mixes appropriate for different applications. • Discuss components that make up concrete. • Pour and finish a concrete project.

Prior Knowledge Needed	Vocabulary	Assessments
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.	• Slump • Aggregate • Binder • Screed • Float • Trowel	• Class participation • Quiz • Demonstrate required skills
Relevance: Most everyone in this area of the state will pour concrete at some point in their lives, and having a basic understanding of how to do it correctly will make the investment that they make in it last a whole lot longer.	***Examples:*** • Sidewalks • Driveways • Patios • Brick laying	**Materials Needed:** • Lumber for forms • Blue print • Rebar • Concrete • Concrete supplier • Hammer • Fasteners • Level • Trowels • Floats • Finishing tools
Reflection: This lesson is done almost entirely out of doors so its scheduling has to be somewhat flexible to take advantage of good weather. It must be done when rain is not in the forecast for the day of and after the pour.	**Essential Questions:** • What is the load that this concrete must be able to support. • What type of soil will support this pad? • Do I have enough help to finish this concrete before it sets up?	

Unit: *Drywall, drywall finishing and drywall repair*	**Time:** *February*

Standards Taught

RC 1.1 Demonstrate proper industry safety standards.
RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 4.1 Understand and demonstrate the use of wood building materials.
RC 4.2 Understand and demonstrate the use of fasteners and adhesives.
RC 5.1 Demonstrate safe and proper use of hand tools.
RC 5.2 Demonstrate safe and proper use of power tools.
RC 5.2 Demonstrate safe and proper use of pneumatic tools.
RC 6.1 Understand and Demonstrate the use of concrete and reinforcing materials.
RC 7.2 Understand and demonstrate framing of wall and ceiling systems.
RC 12.1 Understand and demonstrate drywall installation.
RC 12.2 Understand and demonstrate drywall finishing.
RC 13.1 Understand and demonstrate interior finishing.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Cut, layout and frame an interior wall model that is 4' wide by 3' tall. • Install drywall on one side of the wall insuring that there are at least 3 seams in the drywall. • Tape, mud and finish the drywall. • Bust a hole in the finished drywall. • Patch the hole that you created. • Create your own texture for the dry wall. • Prime half of the wall that you have created and leave the other half unprimed. • Paint the entire wall.

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<tr><th>Prior Knowledge Needed</th><th>Vocabulary</th><th>Assessments</th></tr>
<tr>
<td>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.</td>
<td>Mud
Tape
Joint
Seam
Hammer track</td>
<td>Class participation
Cleanup
Quality of final product.
Demonstrate required skills</td>
</tr>
<tr>
<td><u>Relevance:</u>

Every home owner has drywall or plaster in their home. Both plaster and drywall are relatively easy to damage if students learn to do their own repairs it will save them money over the long term.</td>
<td><u>Examples:</u>

Textures that can be achieved using common materials</td>
<td><u>Materials Needed:</u>

Lumber for forms
Drywall
Fasteners
Screw driver
Hammer
Plaster
Tape
Drywall knives
Utility knife
<u>Modern Woodworking</u> Text
String</td>
</tr>
<tr>
<td><u>Reflection:</u>

I believe that this is a lesson that will benefit almost anyone. In fact, one of the sophomore students told me that they used it this year to fix a hole that they knocked in their bedroom wall with their door.</td>
<td colspan="2"><u>Essential Questions:</u>

How much drywall do I need?
Do I need to add drywall to the hole or will filling it with plaster suffice?
What does primer do?</td>
</tr>
</table>

Unit: *Electrical wiring*	**Time:** *February or May*

Standards Taught

RC 1.1 Demonstrate proper industry safety standards.
RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 4.1 Understand and demonstrate the use of wood building materials.
RC 4.2 Understand and demonstrate the use of fasteners and adhesives.
RC 5.1 Demonstrate safe and proper use of hand tools.
RC 5.2 Demonstrate safe and proper use of power tools.
RC 16.1 Understand and demonstrate basic residential electric and plumbing applications.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Study the principle of electricity and what makes up an electrical circuit. • Review electrical safety rules. • Check the Electrical Code to determine if work will be up to standards set forth. • Create a simple circuit that contains the following, a plug, an outlet a switch a light and a switched outlet. • Wire a three-way switch.

Prior Knowledge Needed	Vocabulary	Assessments
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.	• Circuit • Amps • Voltage • Electrical Shock • Resistance • Load • Maximum load	• Class participation • Safety Quiz • Demonstrate of mastery of required skills
Relevance: Even though this is a very basic introductory lesson it is relevant tin the fact that it introduces the principles of electricity to the building trades student.	***Examples:*** • Wiring diagrams • Rewiring lamps • Replacing plugins and switches.	**Materials Needed:** • Unified electrical code • Electrical boxes • Electrical outlets • Electrical switches • Light socket • Light bulb • Three-way switches • Electrical wire • Male plug in • Computer • Internet • Screwdriver • Wire stripper • Plyers • Outlet covers • Switch covers • Wire nuts

Reflection:	**Essential Questions:**
This is a basic entry level lesson and should not be considered anything more. Special care should be taken to stress the safety concerns when working with electricity.	• What is load? • Is my wire size and amperage load compatible? • Is the electricity turned off? • What are the safety concerns when working with electricity?

Unit: *Basic plumbing*	**Time:** *March*

Standards Taught

RC 1.1 Demonstrate proper industry safety standards.
RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 4.1 Understand and demonstrate the use of wood building materials.
RC 4.2 Understand and demonstrate the use of fasteners and adhesives.
RC 5.1 Demonstrate safe and proper use of hand tools.
RC 5.2 Demonstrate safe and proper use of power tools.
RC 16.1 Understand and demonstrate basic residential electric and plumbing applications.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Students will be able to replace a heating element in a water heater. • Safety concerns will be reviewed and addressed. • Students will replace a Fawcett, replace a toilet flush valve and flopper, take apart and reassemble a trap and operate plunger and a snake.
Prior Knowledge Needed	**Vocabulary**	**Assessments**

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.	• Water Pressure • Brown water • Black water • Potable water • Valve seat • Goose neck • Trap	• Class participation • Safety Quiz • Demonstrate required skills
Relevance: Basic plumbing repairs are something that with a little knowhow most homeowners can perform for themselves.	***Examples:*** • Fawcett repair or replacement • Replacing a water heater element • Unclogging a drain • Retrieving diamond ring lost down a drain	**Materials Needed:** • Trap • Lavatory Fawcett • Salvaged sink • Plastic or pex pipe • Channel locks • Fawcett wrench • Plyers • Flush valve • Flopper
Reflection: This lesson is done almost entirely out of doors so its scheduling has to be somewhat flexible to take advantage of good weather. It must be done when rain is not in the forecast for the day of and after the pour.	**Essential Questions:** • What does a leaky Fawcett cost me in a year's time? • How do I make sure that this won't leak when I am done? • Do I have the tools that I need to do this job?	

Unit: Budgeting, design, and materials accusation.	**Time:** *March through May*

Standards Taught

RC 2.1 Understand and demonstrate basic math skills.
RC 3.1 Demonstrate how to read blueprints.
RC 3.2 Demonstrate survey techniques and site layout.
RC4.1 Understand and demonstrate use of wood building materials.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*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.* *The shop is set up like a commercial Cabinet shop or a shop of an industrial wood worker. It contains equipment and tools that are consistent with those used by people employed in this industry.*	• Relative chapters will be read in the Modern Woodworking Text. Each chapter will be outlined and discussion questions will be answered. Each student will be required to write five test questions with answers for each chapter. • Student questions will be edited by the teacher and then 10 questions will be chosen to compose a test that will then be given to the students after information has been reviewed by the class. • We will find someone that want a storage shed built and draw up a set

		of blueprints for appropriate for the project. • Using the approved blueprint, a bill of materials will be completed • The students will create a budget for the building from the bill of materials, one of the online lumber yard websites such as Menards will be used to price materials. A 10% charge will be added to budget to account for items that are damaged in construction or items that were incidental due to construction changes. • The storage building will be constructed to customer specifications. • Students will devise a method moving the building out of the shop and onto the parking lot. • Methods of loading the building will be researched by the students. They will choose the most feasible method and the building will be loaded onto whatever truck or trailer will be used to transport the building. • Upon completion of this assignment students will be required to write a reaction paper on the construction project. • A daily construction journal will be kept recording the tools used, work performed, time

		on task, what recommendations can I make to make the work we are doing more efficient and of a better quality, and what new skills that they learned that day as well as skills that they desire to learn in the near future. • Students will take turns being the construction foreman, whose duties include keeping everyone working, assigning students to tasks to be performed, and motivating workers. • Students will also take turns being the shop foreman, whose duties include taking care of tools and equipment, making sure the shop gets cleaned at the end of the class, and making sure everyone is involved in clean up. • Students will take turns being assigned as the Safety Officer whose job is to observe the other students job performance and call out safety violations and take corrective action in accordance to rules set up by the class room teacher. • Each student is to record any miss cuts or other mistakes that they make in the construction process so that the cost of mistakes can be calculated and be used as a learning tool.

Prior Knowledge Needed	Vocabulary	Assessments
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.	• Time on task • Job performance • Self-motivation • Supervisory skills • Project management • Innovation • Problem solving skills	• Daily Work • Journal entries • Clean up • General shop safety practices • Attention to detail • Performance as Shop Foreman • Performance as Construction Foreman • Performance as Safety Officer. • Time Cards • Review Questions • Quizzes
Relevance: Building construction is not just the act of slapping a few boards together and calling it good. There are a whole host of other skills that are necessary for the student to master. They include problem solving, project management, supervision, motivation, planning, and several other soft skills that they will obtain by being required to perform in leadership situations.	***Examples:*** • You Tube construction videos • Photos of buildings under construction • Problems and challenges as they arise on the job • Guest speakers involved in the industry	**Materials Needed:** • Computer. • Internet • Guest speakers • Modern Woodworking Textbook • Someone who wants a storage shed • Lumber • Building construction related hand and portable power tools • Screws nails and other fasteners • Paint • Stationary construction tools • Spiral note book and a pen for journaling. • Time cards • Blue print

Reflection:	**Essential Questions:**
This is a very long and detailed lesson that entails not only class room instruction but a lot of hands on learning. Because of the nature of the tasks being performed and the inherent safety concerns involved with power tool use, working on ladders, the nature of the work being performed and the behavior and exuberance of the young men and women performing the work, I have determined over time, that including them in supervisory positions not only increases desired results, it also allows them to gain some skills mastery that they would not have, if they were not thrust into these positions. It is very important however that the students doing the supervising be closely supervised themselves. Failure to do so can result in them being carried away with their newfound responsibilities.	• Just what skills are needed to be a competent carpenter? • How can waste be limited? • What can I use as a problem solving procedure? • Where are the most likely opportunities to make mistakes and what are the likely consequences of those mistakes? • Is there a better way to get any certain job accomplished? • Do I understand why the building goes together as it does? • How can I work more efficiently? • Upon completion of this class do I think that I now have the skills to build another building on my own?