Running Head: Unit Plan

TBTE407 – Instructional Unit Assignment 1: Design a Condo
Dr. Bishop

Mary Jo Brown

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Changes to Lesson Plan
Page 2 Removed Objective regarding measuring teamwork.
Page 4 Removed from Instructional Plan "…to recognized trends in traditional and classical Architectural design"
Page 11 Teacher's Page is now written more specific to the Webquest Lesson.

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Changes to Lesson Plan
The Interactive White Board (SmartBoard) demonstration was changed to a live demonstration video taped and presented as an iMovie. Interactive White Board technology did not provide exactly what I was looking for in this presentation.

Project Overview

Title

Senior Project: Design a Condo

Target Audience

Twelfth grade high school students

Overall Goal

The overall goal of this unit plan is to analyze and determine the instructional needs of the twelfth grade student and to supply the necessary instruction to assist him/her in the application of construction principles to successfully design and develop a residential floor plan using the AutoCAD program.

Rationale

The senior project is given to twelfth grade students in the drafting and design program in order to satisfy state standard requirements for the Information Technology program. The Condo Design project is intended to give the twelfth grade student the experience to solve construction problems through the application of field-specific tools, materials, processes, and systems. Students develop the ability to select and correctly use the field-specific elements to answer questions, understand explanations, and solve problems encountered in real life situations.

Description of the Project

The senior project is a challenging design and drafting problem providing occasion for creative stimulation, thoughtful reflection, guided practice, and purposeful judgment.
The project was also planned to be relevant to the high school student's interest.

Scope of the Project

The scope of the senior project spans the design phase through the development of the solution. The content of the unit is determined by the requirements of the design process normally followed in a real-life construction project. Essential knowledge that the student needs to understand before starting the project is incorporated into the beginning lessons. The content covered in the beginning lessons includes building codes and drafting symbols. The subsequent lessons cover the explanation and resolution of specific room areas of residential space planning and design.

Materials to Be Included

Non-digital materials and media included in the lessons are handouts, chalkboard, chalk, tracing paper, pencils, erasers, scale rulers, and markers. Students also use trade magazines for reference articles and pictures and textbooks.

Digital media used in the lessons are Blackboard, e-mail and blogs, Internet, Webquests, spreadsheets, word processing, concept maps, AutoCAD, iMovie, PowerPoint, interactive white board, and computer- projection video along with audio.

General Development Guidelines

Teachers will need prep-time before each lesson to ensure all technology is working properly. If there appears to be minor problems with the technology, the technician should be called and the lesson can still be given as planned. If there are major problems with the technology another part of the lesson plan can be substituted such as going to the library.

Needs Assessment

Desired Performance

According to the National Academic Standards for Technology and Science, twelfth grade students should be able to apply the appropriate tools, materials, processes and systems to resolve real world problems and extend human capabilities. The standards specific to Informational Technology Education – Computer Aided Design and Drafting standards, also state that twelfth graders should be able to apply all the necessary resources to design and plan a construction site. Students should be able to recognize the problem and propose, implement, and evaluate the solution. Students should also be able to apply technology to communicate the problem, design, and solution.

By the twelfth grade, students should be able to analyze the physical technology of construction. Students should be able to describe and classify common construction characteristics and composition, compare and contrast construction systems, and demonstrate their knowledge of various construction systems by building or interpreting models. By the twelfth grade students should also be able to demonstrate their knowledge of various construction systems by building or interpreting models. Ultimately, twelfth graders need to acquire the knowledge and skills to reach their full potential to successfully resolve authentic problems that provide benefits to humankind.

Current Performance

Currently, the twelfth grade students in the drafting and design program are at different levels of achievement regarding the use of processes and systems to solve real world problem. Student's ability to master abstract issues such as procedures and methods are sporadic at best.

Students are creative and imaginative during the design process, but they are not experienced enough to develop their own course of action necessary to realistically solve problems by themselves. They will overlook important aspects of a problem because they are unaware of the impact the oversight will have on the outcome. At the same time, student's levels of achievement regarding the use of appropriate tools and materials to solve real world problems in the drafting and design program are developmentally similar. Their ability to keep up with concrete information presented in class is good.

In direct conflict to the standard that students should be able to apply all the necessary resources to design and plan a construction site, twelfth grade students are not capable of realistically designing and planning a construction site. At the very basic level, students are deficient at determining the necessary resources needed to design and plan an authentic construction site. Students have too little contact with real-life construction sites that would provide the necessary exposure to real-time events that occur during a construction project. Students are inadequate at finding appropriate Websites that provide reliable resources regarding the construction industry.

Students are good at recognizing problems and evaluating solutions to real world problems, but they are unconvincing at proposing and implementing authentic solutions. Currently students can work though the design process and offer simple solutions to a simple construction problem, but they cannot adequately offer a strategy to implement the solution.

Currently students have the necessary training using computers and CAD software to communicate ideas by drawing representations of construction conventions such as walls, symbols and layouts. Students can translate these conventions into a design that communicates their solution to construction problems. By the end of the twelfth grade and according to the

national standards, students in the Informational Technology Education: Computer-Aided Drafting and Design program should be able to apply the accumulation of learned construction principles to successfully solve a construction problem. But currently the curriculum does not provide the student with the practical application of those principles or theories.

Goal and Objectives

Goal

Students will be able to apply knowledge of construction principles to successfully design and develop a residential floor plan using the AutoCAD program

Objectives

In order to complete the unit "Design a Condo" the twelfth grade student requires prerequisite knowledge and skills acquired through successful completion of grades 10 and 11 Design and Drafting classes. He and/or she should be familiar with "factual" knowledge such as architectural terminology and reliable informational resources pertaining to the architectural design and drafting field. He/she should also be acquainted with "conceptual" knowledge such as the interrelationships among basic architectural elements with the development of a living space. And also the student should possess "procedural" skill knowledge, such as basic AutoCAD drawing and editing commands, layering conventions, and plotting.

#1 After completing a Webquest searching specific Websites for ideas for the senior project, the twelfth grade design and drafting student will demonstrate he/she knows about trends in architectural residential design by recognizing classic and modern design in architecture. He/she will demonstrate knowledge by identifying pictures and by defining characteristics.

#2 After viewing a white board presentation showing how to relate room layouts to traffic flow in floor plan layouts, the twelfth grade design and drafting student will demonstrate his/her understanding of space relationships by interpreting space layouts implementing bubble diagrams with concept mapping software.

#3 Given the white board presentation, the student will demonstrate her/his ability to analyz*e* how the functional organization of rooms contribute to the quality of the living space by sketching floor plan layouts based on traffic flow explored in his/her bubble diagram.

#4 After completing a peer critique of each others' sketches, the twelfth grade design and drafting student will demonstrate his/her ability to analyze design elements by critically looking at others' sketches and improving their own designs.

#5 After completing a Webquest searching Websites for architectural drawing symbols, the twelfth grade design and drafting student will demonstrate his/her understanding of the basic symbols that represent furniture used in a residential floor plan layouts by using AutoCAD software to draw a symbols library using a prepared handout.

#6 After completing a Webquest searching Websites for documentation of residential building codes, the twelfth grade design and drafting student will demonstrate knowledge by applying building codes to construction principles used in residential design.

#7 After completing research on residential living spaces through Webquests, books, and magazines, the twelfth grade design and drafting student will demonstrate his/her ability to create functional floor plans that offer quality living accommodations by drafting in AutoCAD his/her own interpretation of a residential living space.

Description of Learning Environment

Lower Merion School District (LMSD) is located on the Main Line in Southeast Pennsylvania, about twenty miles outside the city of Philadelphia. The Main Line historically represented the upper-class segment of society living in Philadelphia's suburbs. However, LMSD serves a large portion of middle-class students and their families. Enrollment for the district is 6,770 students attending classes in six elementary, two middle, and two high schools. There are eleven students to every teacher, compared to the state average ratio of 16:1. The average class size is twenty-one students.

LMSD's commitment to excellence in education is evident in the academic accomplishments of its students, such as ranking first in Pennsylvania for SAT and PSAT scores, AP participation rate, total number of International Baccalaureate diplomas granted and National Merit Semifinalists. Ninety-four percent of the high school graduate students attend institutions of higher learning.

In addition to providing a broad range of core courses to all students, LMSD offers an array of support services to special needs and gifted children. Students enjoy supervised extra-curricular and co-curricular programs that compliment a comprehensive program of instruction. Both students and teachers benefit from a continuing investment in technology that aids student learning and integrating technology across the curriculum.

Learner Analysis

General Description

According to the class statistics below, the eighteen students enrolled in the twelfth grade drafting and design program are comprised of ten females and eight males. There are nine Caucasians, five African-American, three Asians and one Middle Eastern. Ten students are from middle-class families, four students are from upper-middle class families, and four students have a lower-middle class socio-economic status.

Students	**Reading**	**Writing**	**Social Skills**	**Emotional Development**	**Attention**	**ELL**	**Special Ed.**	**Ethnicity**	**SES**	**Family**	**Comments**
Mark	Above	Above	Well-developed	Careful, conscientious	OK	No	No	Asian	Middle	Intact	Mark is a very smart student who reads and writes above grade level. He is a quick learner. He is careful and conscientious in his work. Other students like to work in his group. He comes from a middle-class, Asian family.
Katie	At	At	Impatient with others in group work	Wants to please teacher; does required work; raises hand for every question	To please the teacher	No	No	Caucasian	Upper-middle	Intact	Katie reads and writes on grade level. She is motivated by her desire to please the teacher, so she does everything that is required but does not go beyond the requirements. She raises her hand to answer every question the teacher asks. During group work, she is impatient with other group members when she thinks they are not doing what is right or required. She comes from an upper-middle-class Caucasian family.

Students	**Reading**	**Writing**	**Social Skills**	**Emotional Development**	**Attention**	**ELL**	**Special Ed.**	**Ethnicity**	**SES**	**Family**	**Comments**
Olivia	Above	Above	Others like her, but are wary of being in her group	Rebellious; challenges teacher; pushes limits	Focused on her work	No	No	Caucasian	Lower-middle	Intact	Olivia reads and writes above grade level. She is smart and focused on her work. At the same time, she is a rebellious teenager, often challenging the teacher on content, procedures, or assignments. She often pushes the limits, so other students like her but are wary of being in her group. She comes from a lower-middle-class Caucasian family.
Julian	Below	Below	Participates well in small groups where others can help him	Reserved	Needs extra time	No	No, but processes information slowly	African American	Middle	Intact	Julian reads and writes below grade level. He is smart, but processes information slowly and needs extra time to learn and apply new information. He is reserved and quiet during large group work, but participates in small groups where he can ask questions and allow others to help him. He comes from a middle-class African-American family.
Emily	At	At	Keeps group on-task	Organized; thorough	OK	No	No	Caucasian	Middle	Mother and brother	Emily reads and writes on grade level. Her greatest strength is her organizational ability. Although she is of average ability, she completes her work thoroughly and on time. She keeps her group members on task, but is not pushy. She comes from a middle-class Caucasian family, living with her mother and brother.

Students	Reading	Writing	Social Skills	Emotional Development	Attention	ELL	Special Ed.	Ethnicity	SES	Family	Comments
Antonia	Above	Above	Strong	Highly motivated; hard working; goal is to be the first person in her family to go to college	OK	No	No	African American	Lower-middle	Father	Antonia reads and writes well above grade level. Her goal is to be the first person in her family to graduate from college, so she is motivated to be a high achiever. She is not particularly bright, but she works extremely hard. She possesses strong social skills and often asks other students to explain things. She comes from a lower-middle-class African-American family and lives with her father.
Jared	Below	Below	Liked by others, but they get annoyed with his laughing and joking	Laughs and jokes to compensate for lack of processing ability	Often distracts self and others when joking around	No	No, but has difficulty processing linguistic information	Caucasian	Middle	Mother and stepfather	Jared reads and writes well below grade level. He has difficulties processing various kinds of linguistic information. To compensate, he laughs and jokes in class on a fairly constant basis. The other students like him, but get annoyed with his distractions. The teacher is also concerned about the amount of distraction he creates in class. He comes from a middle-class Caucasian home where he lives with his mother and stepfather.
Lilly	At	At	Average; quiet	Average; seldom volunteers	Average; can get overlooked	No	No	Asian	Middle	Intact	Lilly reads and writes at grade level. She is average in every way-in terms of intellect, social skills, appearance, and motivation. Although she is competent, she seldom raises her hand or contributes voluntarily. In addition, she is quiet, so she is easily overlooked by the teacher and her peers. She comes from a middle-class Asian family.

Students	**Reading**	**Writing**	**Social Skills**	**Emotional Development**	**Attention**	**ELL**	**Special Ed.**	**Ethnicity**	**SES**	**Family**	**Comments**
Greg	Below	Below	Popular, but does not work hard in groups	Does not apply himself; football star; thinks he can get through on his athletic ability	Can but does not pay attention	No	No	Caucasian	Upper-middle	Intact	Greg reads and writes below grade level. In addition, he does not apply himself to his schoolwork, paying little attention in class and completing his assignments with minimum effort. He is a star on the football team, so he is popular, but seems to think he can cruise through school and college on his athletic ability. He comes from an upper-middle-class Caucasian family.
Irving	Above	Above	Well-developed; popular	Plays football, but takes academics seriously	OK; applies himself and does homework	No	No	African American	Upper-middle	Intact	Irving reads and writes above grade level. He is also a star on the football team, but takes his academic work as seriously as his sports. He applies himself in class and does well on his homework. He is popular with other students. He comes from an upper-middle-class African-American family.
Tyler	Above	Above	Lacks interpersonal skills; hesitant in groups	Considered by others to be a "nerd"	OK, but tries not to look too smart	No	No	Caucasian	Middle	Intact	Tyler reads and writes well above grade level. He is very smart, but lacks social and interpersonal skills. He is considered by the other students to be the class "nerd," so he is hesitant to participate in class, even though he usually understands the content better than his classmates. He comes from a middle-class Caucasian home.

Students	Reading	Writing	Social Skills	Emotional Development	Attention	ELL	Special Ed.	Ethnicity	SES	Family	Comments
Angie	At grade level, but performs inconsistently	At grade level, but performs inconsistently	Very social	More interested in social life than academics	Does not "have time" for home work; whispers in class	No	No	Caucasian	Lower-middle	Intact	Angie reads and writes at grade level, but does not consistently perform at that level. She is very social and is clearly more interested in her social life than in her academic life. During class she whispers to other students and does not have time for her homework in the evenings. She is very popular with other students, but the teacher often has to remind her to focus on her work. She comes from a lower-class Caucasian family.
Molly	At	At	OK, but lacks confidence and does not take initiative	Lacks confidence; needs encouragement and positive feedback	OK	No	No	Caucasian	Middle	Mother	Molly reads and writes at grade level, but is not a confident learner. She performs well, but does not expect to, so she needs encouragement and positive feedback to even try. The same is true socially-she has social skills and other students like her, but she lacks confidence so she does not take initiative. She lives with her single mother in a middle-class Caucasian household.
Justin	Below	Below	Poor; keeps himself apart from others	Has repeated a grade; unmotivated; brooding	Unfocused; fidgety	No	No	African American	Lower-middle	Mother	Justin reads and writes below grade level and has repeated a grade. He is unmotivated and unfocused and does not sit still. He seems to be brooding and to see no purpose in school. He tends to keep apart from other students. He comes from a lower-class, single-parent African-American home.

Students	Reading	Writing	Social Skills	Emotional Development	Attention	ELL	Special Ed.	Ethnicity	SES	Family	Comments
Lanna	Below; processes written English slowly	Below; spelling and grammar are poor	Quiet; friendly	Works hard; struggles to keep up	OK	No, but ***	No	Middle Eastern	Middle	Large, intact family	Lanna reads and writes below grade level. She is competent, but English is not her first language. She speaks English fluently, but processes written English slowly so her comprehension is poor. Her spelling and written grammar are also poor. She works hard, but struggles to keep up. She is quiet, but friendly. She comes from a large middle-class family of Middle Eastern descent. *** English is not her first language; speaks fluently, but processes written English slowly
Margie	At	At	Highly social, but self-conscious; does not like to make mistakes	Worries about making mistakes in front of others; jokes to cover mistakes	Works fast, but not carefully	No	No	Adopted from Korea by Caucasian family	Upper-middle	Intact	Margie reads and writes at grade level. She works fast, but does not work carefully, so she makes mistakes, which embarrasses her. She is self-conscious in class. At the same time, she is highly social and has a good sense of humor. She seems to laugh off her mistakes, but may be using her humor to cover her self-consciousness. She comes from an upper-middleclass Caucasian family, although she was adopted from Korea.
John	Below	Below	Not strong; is not cool, but wants to be	Does not want to appear smart, so does not work to his potential	Acts as if he doesn't care; does not do homework carefully	No	No	Caucasian	Middle	Intact; lots of parental pressure to excel	John reads and writes a little below grade level. He could perform at a higher level, but does not want to appear too smart. He is not cool, but wants to be. In class, he acts as if he does not care about academics, yet he does his homework thoroughly. His parents are pressuring him to become an engineer, but he will not admit that math is his favorite subject. He tries to be popular, but his social skills are not strong, so his relationships with other students are not strong, either. He comes from a middle-class Caucasian family.

Students	Reading	Writing	Social Skills	Emotional Development	Attention	ELL	Special Ed.	Ethnicity	SES	Family	Comments
Shaneel	At	Below; difficulty with composition	Participates and makes a good partner; others like her	Tries hard	Does not do well on home work	No	No	African American	Middle	Intact	Shaneel reads on grade level, but writes below grade level. She does well verbally, but has difficulty with composition. She participates in class and makes a good partner for verbal exercises, but often does not do well on her homework. Because she makes a good partner and has a pleasant disposition, students in the class like to sit by her, although most of her friends are in other classes. She comes from a middle-class African-American home.

Strengths

In order to provide the best instructional support possible for the varied needs of each student, the strengths of each student must be analyzed individually. But in general, the twelfth grade students possess basic academic learning skills acquired through the satisfactory completion of elementary and middle school. Most of the students have average reading, writing, and listening skills, and five students measure above-average in learning skills. According to the class list, the student's reading ability match their writing ability except for one student who is average in reading but below average in writing, Other strengths include all students speak English fluently, none of the students require special education classes, and there are no serious behavior problems to report.

In support of student's strengths that will enable them to succeed in the informational technology program at the secondary level, all students have had the opportunity since middle school to explore the area of drafting and design. Students have been continually exposed to technical training and possess basic technology skills learned through school.

All students bring with them enabling attitudes and life experiences that support their efforts for success at school. In an elective type course such as Design and Drafting, students bring with them desire to learn about a subject of their choice. Many students have advanced technology skills depending on their personal and social interests.

Weaknesses

In order to provide student with the best possible instructional support to ensure successful completion of the high school program, the weaknesses of each student must also be analyzed individually. Six of the students possess below-average learning skills in reading, writing, and listening. Of the six students with below-average learning skills, four students show obvious

difficulty with attention during class and with focusing on the lesson. The same four students also show unproductive behavior in class as classified under emotional development. As typical in any class of twelfth grade students, social skills vary from excellent to poor. In this class, however, there is only a small segment of students who possess poor social skills. Two students possessing poor social skills also have below average learning skills.

Poor social skills and slow emotional development are not limited to students with below-average learning skills. According to the class list, four students who have average or above-average learning skills also exhibit negative behaviors such as impatience, rebellious, and low self-esteem.

All students bring to school some form of disabling attitudes and life experiences. The negative aspects are not always apparent or obvious. The home-life of students may appear to be "normal," but stability at home should not be taken for granted.

Potential Areas of Difficulty

There are a number of potential content areas that he/she may encounter with difficulty while completing the senior project. Some students may have difficulty with abstract issues that need to be resolved such as space relationships, while other students may have difficulty with concrete issues such as building codes. Although this is an experiment for the students to design for their own "wants and needs", the needs of others including adults, children, elderly, and handicapped people will be introduced. Students at this age may think their way is the best suited for everyone.

Another potential area of difficulty may be in relating the bubble diagram to real spaces. There is no scientific formula for the conversion of the abstract idea to the concrete logistical space. Students will ultimately use his/her judgment in the solution.

Strategies

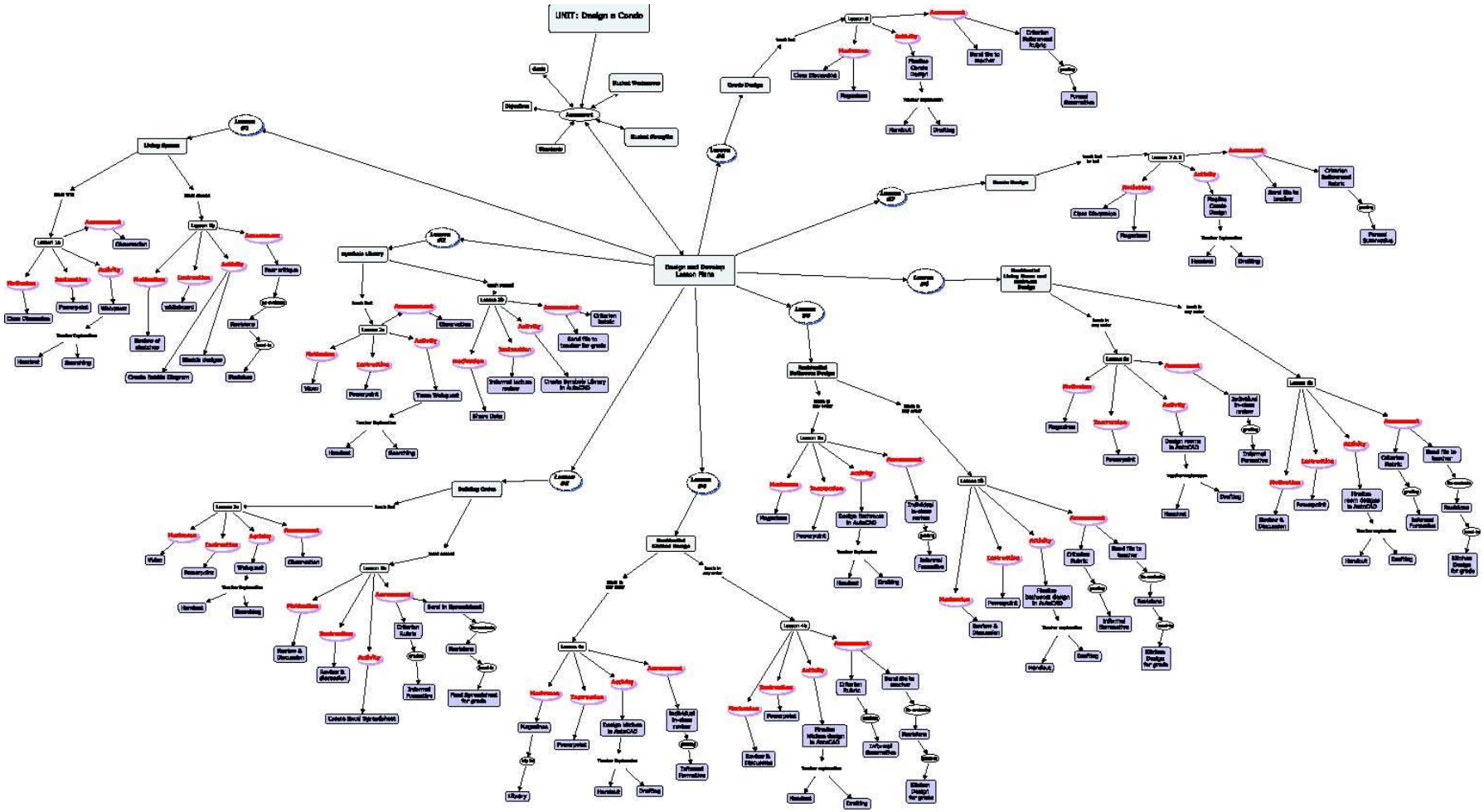
Students bring with them plenty of preexisting issues to the classroom, both positive and negative, such as financial, social, academic, and psychological. In order to take advantage of student's strengths and overcome students weaknesses to resolve areas of potential difficulty with this unit, lessons need to be adjusted according to variations in the backgrounds, cognitive processes, interests, styles, and other needs of learners. Learner-centered instruction should incorporate interesting and meaningful real-life lessons that include characteristics such as social, active, and supportive. Teacher-centered instruction should incorporate direct and guided lessons complete with advanced organizers that include characteristics such as enthusiasm and clarity. The challenge for educators is to make these characteristics regular features of the classroom.

1. In order to capitalize on the students' basic academic skills, lessons should provide instructional scaffolding that will support students as they progress.
2. In order to capitalize on the learners' basic aptitude for learning, lessons should be an effective tool to promote interested and active exploration.
3. In order to capitalize on the learners' desire to learn about construction, teaching should challenge the student's existing knowledge.
4. In order to capitalize on the students' previously learned construction principles, instructional technologies should provide instructional scaffolding that will support students as they progress.
5. In order to capitalize on the basic technology skills learned through school, the lessons should relate new learning experiences to prior knowledge.

6. In order to capitalize on students' advanced skills, students should be encouraged to be share their ideas to with the group. This collaboration improves their thinking skills and helps them to gain new knowledge.
7. In order to accommodate differences in students' backgrounds and abilities, lessons will be adjusted by three aspects: time, materials, and learning activities.
8. In order to overcome students' academic weaknesses, the lessons will include technology that encourages students to organize their knowledge using computer-based tools.
9. In order to overcome potential areas of difficulty with the content of the lessons, he/she will be assigned individual appointments with the teacher to discuss the troubling issues.
10. In order to help students with below average writing skills, handouts will provide the necessary backup for note taking.
11. In order to help students with below average reading skills, lessons will include specific verbal instruction that is concise and relevant.
12. In order to help students with below average listening skills, PowerPoint presentations include illustrations to illuminate ideas and concepts for harder to understand abstract concepts in the lesson.
13. In order to help students overcome low self-esteem, positive feedback and praise will be given to all students and exploration their personal interests will be encouraged.
14. In order to help students with poor social skills, cooperative teams will be formed that bring together student's complementary learning abilities and social skills.

Content Analysis

Unit: Design a Condo (CONCEPT MAP) Image created in CMap saved as a Word Document



Content Analysis
Unit: Design a Condo (TABLE)

	1	2	3	4	5	6
The Knowledge Dimension (what learned?)	**Remember**	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
	(recognize, recall)	(construct meaning)	(use procedure)	(how parts relate)	(check, critique)	(generate, produce)
A. Factual Knowledge Verbal Information, Terminology, Elements	…will demonstrate knowledge by recognizing trends…	…demonstrate understanding of space relationships by interpreting space layouts…	…will demonstrate knowledge by applying building codes…			
Objective:	#1	#2	#6			
Lesson:	(1a)	(1b)	(3b) (3a)			
Motivation:	informal class discussion	interactive white board lesson				
Media:	Webquest	Whiteboard Concept mapping	Powerpoint Webquest Excel			
Activity:	Living Spaces -Webquest and sketch designs on paper	Living Spaces - bubble diagram	Building Codes -students work in teams to make a spreadsheet.			
Assessment:	(IF) give verbal examples and opinions	(IF)	(IF) (FF)			
Scoring:	Observation	Observation	Criterion rubric			

	1	2	3	4	5	6
The Knowledge Dimension (what learned?)	**Remember**	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
	(recognize, recall)	(construct meaning)	(use procedure)	(how parts relate)	(check, critique)	(generate, produce)
B.Conceptual Knowledge Intellectual Skills, Classifications, Principles, Theories			…will demonstrate understanding by making a symbols library…	…to analyze how the organization of rooms contribute to the quality of living…		
Objective:			#5	#3		
Lesson:			(2a) (2b)	(1b)		
Motivation:				verbal discussion		
Media:			Powerpoint Webquest AutoCAD	Whiteboard Concept mapping		
Activity:			Symbols Library	Living Spaces - bubble diagram		
Assessment:			(FF)	(IF)		
Scoring:			Criterion rubric	Criterion rubric		

	1	2	3	4	5	6
The Knowledge Dimension (what learned?)	**Remember**	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
	(recognize, recall)	(construct meaning)	(use procedure)	(how parts relate)	(check, critique)	(generate, produce)
C. Procedural Knowledge subject-specific skills, techniques, methods, and when to use them.			(lessons not supporting specific objectives stated for this project but is prerequisit for Lessons 7 & 8 - Objective #7.)			
Objective:						
Lesson:			(4a&b) (5a&b) (6a&b)			
Media:			AutoCAD			
Activity:			Designing and drafting individual room layouts			
Assessment:			Criterion rubric			
Scoring:			(IF)(IS)			

	1	2	3	4	5	6
The Knowledge Dimension (what learned?)	**Remember**	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
	(recognize, recall)	(construct meaning)	(use procedure)	(how parts relate)	(check, critique)	(generate, produce)
D. Metacognitive Knowledge Strategic knowledge Self-knowledge					…will demonstrate critical evaluating by being able to improve their design…	…will demonstrate ability to create functional floor plans...
Objective:					#2	#7
Lesson:					(1b)	7 & 8
Media:					paper sketches	AutoCAD
Activity:					Living Spaces - hang sketches on wall for critique, peer analysis, and feedback	Finalize cond floor plans
Assessment:					(FF)	(FS)
Scoring:					Criterion rubric	Criterion rubric

Related Standards

Teaching to standards helps to close the achievement gap prevalent in schools where enrollment includes minority and low-income students. The standards, although general in nature, give direction for teachers to follow in planning the goals and objectives of the lesson. The academic standards state what students should know or be able to do. The performance standards not only state what students should know and be able to do but at what level of performance they are expected to demonstrate.

Academic Standards for Science and Technology
3.6. Technology Education 22 Pa. Code, Ch. 4, Appendix B

Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:

3.6.12. Grade 12

- Analyze physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems.
- Apply knowledge of construction technology by designing, planning and applying all the necessary resources to successfully solve a construction problem.

3.6.10. Grade 10

- Apply ergonomic engineering factors when devising a solution to a specific problem.
- Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems.
- Describe and classify common construction by their characteristics and composition.
- Compare and contrast specific construction systems that depend on each other in order to complete a project.
- Evaluate material failure common to specific applications.
- Demonstrate knowledge of various construction systems by building or interpreting models.

Assessment Plan

The assessment plan for this unit will be implemented on a lesson-by-lesson basis. Informal assessment through classroom observations will provide information about the student in order to guide instruction in terms of the learner's strengths and weaknesses. Informal assessments are the most appropriate assessment methods to use during the first six lessons. The early lessons provide a foundation for the students to complete the project. Group activities such as critiques and cooperative team activities such as Webquests provide the opportunity for watchful observation and appraisal. Formal assessment will continue to provide useful information about the student's progress throughout the unit. Formal assessments will be applied to assignments handed-in for grades.

While assessment tools and techniques provide information to help the student before the project is finished, evaluation tools and techniques help decide how the student will be graded. Students will be judged during the last half of the unit using a combination of formative and summative evaluation methods. Using formative evaluation the teacher will monitor student's progress in order to provide students with corrective feedback during the project. This timely communication will benefit student's improvement and development during the activity. As student complete and hand-in designs for the kitchen, bathroom, and living areas, formative evaluation methods will be applied to each assignment. Summative evaluation provides a summary of the student's performance in terms of goals and objectives.

A combination of assessment and evaluation methodologies are used to continually track her/his progress throughout the objectives of the unit. Typically each objective is accomplished over a two-part lesson format. In the first lesson, the objective is informally assessed and in the

second lesson, the objective is formally assessed. Overall, the first part of the unit's objectives is informally assessed and the last part of the unit's objectives if formally evaluated.

Unit Description

This unit will bring together learning that was covered in previous Drafting and Design classes. It is the accumulation of learning culminating in the senior project. Students will design and develop floor plans for a condo that includes a kitchen, bathroom, living room, and a bedroom. The unit "*Design a Condo*" contains seven two-day lessons. Each week's double lesson will focus on specific interior elements associated with residential planning and design. The purpose of the double-lessons is to give students class time for practice after the initial assignment presentation. The floor plan for the condo is a work in progress and can be altered throughout the unit time-line until the final floor plan is handed-in for grading.

Typical classroom media used in this unit include technology hardware such as desktop computers, large LCD monitors, and a large format plotter. Digital media used within the learning environment for communication include network resources such as e-mail and blogs. The course management system is Blackboard. Digital media used in student-centered classes are: Webquests, spreadsheets, concept maps and interactive white board. Students use different software to explore possibilities in design such as the AutoCAD program to communicate their visual designs and MS word to communicate their verbal designs. Media used in teacher-centered classes are: iMovie, PowerPoint, computer-projection video along with audio. Analog (non-digital) media include the chalkboard, tracing paper, pencils, scale rulers, and markers. Students also use trade magazines for reference articles and pictures and appropriate textbooks.

After completing lessons 1 through lessons 8, the twelfth grade student will be able understand space relationships, apply drafting techniques, analyze design elements, and evaluate space requirements to successfully create a residential floor plan.

The first lesson "*Living Spaces*" follows the teacher-centered format complete with advanced organizers, explanation and/or demonstration, guided practice, feedback, and extended practice. This is a two-part lesson. The beginning of class will start off with a motivation segment by engaging students in a class discussion about living spaces and elements they would include in their own living space. In the first part of the lesson (1a), students obtain ideas for design possibilities by discovering trends in architectural design a Webquest. Students receive handout #1 that list reliable Websites to find information for the senior project. After completing the Webquest, students will use tracing paper and pencil to develop sketches. In the second part of the lesson (1b), students participate in an interactive white board presentation on relating traffic flow to floor plan layout design. Students will use concept mapping software to draw bubble diagrams that show relationships among rooms and traffic flow. Students will continue to sketch potential designs for their condo that includes a kitchen, a living room, a master bedroom and a bathroom, a guest bedroom, a laundry room, and a second bathroom Students will hang their best layout on wall for a peer critique. Students can make changes based on peer review feedback. Students can continue this Webquest and continue working on their sketches outside of the classroom before the next class. Students should be ready to hand in their design sketches and concept map before the next lesson for a grade. Students who are not ready to hand in a best design will be asked to hand in all of their sketches and bubble diagrams for the teacher to review and offer individual remedial support.

The second lesson "*Symbols Library*" follows a learner-centered format complete with interesting and meaningful real-life lessons that are social, active, and supportive. In a real-life construction project, drafters will create their own symbols library from company standard libraries or from other reliable sources. Students in this class will also create their own symbols library. This is also a two-part class. In the first part of the lesson (2a), students work in teams to complete a Webquest searching for architectural symbols used in residential floor plans. The students surf the Internet hunting for given objects provided for students in Handout #2- Architectural Drafting Symbols. In part two of the lesson (2b) the students use the symbols found in the team's Webquest to complete a chart (symbols library) in AutoCAD exactly like Handout #2, drawings of the symbols with descriptions. Because of the amount of information the students must include in the chart, the lesson will continue to be a group collaborative project. Students will email and/or dropbox the AutoCAD file of the symbols library for and informal grade based on percentage of completion and accuracy.

The third lesson "*Building Codes*" continues the two-part lesson format in a teacher-centered direct instruction approach. Teacher-centered instruction should incorporate direct and guided lessons complete with advanced organizers that provide a framework for the new learning to be linked to his/her prior knowledge. Students will view a teacher presented PowerPoint introducing the use of building codes and their importance in architectural construction. Using Handout #3 -Reliable Websites, students conduct a Webquest to search the Internet for reliable Websites pertaining to building codes related to residential building construction. Using Handout #4 - Building Codes Spreadsheet, students prepare individual Excel spreadsheets that contain information regarding building codes for minimum space requirements, room sizes, doorways,

passageways, plumbing, electrical, and ADA requirements. Students will email and/or dropbox the Excel spreadsheet file of his/her collected information to the teacher for a formal grade.

In the fourth lesson "*Residential Kitchen Design*," students view a teacher presented PowerPoint presentation. Using their condo design layout sketches, building code spreadsheets, and the kitchen appliance symbols from their symbols library, students will spend time creating kitchen layouts in AutoCAD.

In the fifth lesson "*Residential Bathroom Design*," students view a teacher presented PowerPoint presentation. Using their condo design layout sketches, building code spreadsheets, and the bathroom fixture symbols from their symbols library, students will spend time creating bathroom layouts in AutoCAD.

In the sixth lesson "*Living rooms and Bedrooms*," students view magazines such as Architectural Digest and books that contain information on residential living spaces. Using their condo design layout, building codes spreadsheet, and the living room and bedroom furnishing symbols from their symbols library, students will spend time creating living room and bedroom layouts in AutoCAD.

The purpose of the remaining lessons, are not only to give students time to continue working on their senior project, but to also introduce additional topics students need to know regarding residential design. In the seventh lesson "*Residential Design*", students are introduced to fabrics, finishes, and color. In the eighth lesson, students are introduced to budgets and timelines.

The lessons to be more fully developed in section two of the instructional unit assignment are lesson 1b "*Living Spaces*" and lesson 2a "*Symbols Library,*" because these two lessons are good examples of teacher-centered and student-centered classes with rich media resources included in the instructional design of the lessons.

UNIT MAP

GOAL: Students will be able to apply knowledge of construction principles to successfully design and develop a residential floor plan using the AutoCAD program

Lsn #	Objectives Lesson Description:	1	2	3	4	5	6	7	
1a	Class discussion, followed by a Webquest. Students verbally offer examples. Students sketch designs on paper.	X M IF							
1b	Direct instruction with White Board, followed by a concept map / bubble diagram exercise. Students analyze functional floor plans. Peer critique of sketches, hand-in for grading.		M X IF	M X IF	X FF				
2a	Students view a PowerPoint presentation, followed by a team Webquest. Students start a team chart in AutoCAD.					M X IF			
2b	Students continue the Webquest, followed by completing team charts. Students hand-in CAD file for grading.					M X FF			
3a	Students watch a video, followed by a PowerPoint presentation. Students make a spreadsheet.						M X IF		
3b	Students continue lesson by making a spreadsheet of information found on the Web						X F F		
4	Students view a short PowerPoint, look through magazines, they start designing kitchen floor plans.							M X IF	
4a	Students continue with floor plans. Students have individual in-class progress reviews with feedback.							X I S	
5	Students view a short PowerPoint, look through magazines, they start designing bathroom floor plan.							M X IF	
5a	Students continue with floor plans. Students have individual in-class progress reviews with feedback.							X I S	
6	Students view a short PowerPoint, look through magazines, they continue condo floor plans.							M X	

Lsn #	Objectives Lesson Description:	1	2	3	4	5	6	7	
								IF	
6a	Students continue with condo floor plans. Students have individual in-class progress reviews with feedback.							X I S	
7	Students continue finalizing condo floor plans. Students have individual in-class progress reviews with feedback.							X I S	
8	Students complete condo floor plans. Students hand-in assignment for grading.							X F F	

KEY: Instructional Activities (X) Media (M)
Assessments (FF = Formal Formative, IF = Informal Formative,
FS= Formal Summative, IS = Informal Summative)

Timeline

MONTH: April, May, & June

Week 1				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #1a Computer / CAD Lab		Lesson #1b Whiteboard classroom Computer / CAD Lab	
Week 2				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #2a Computer / CAD Lab		Lesson #2b Computer / CAD Lab	
Week 3				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #3 Computer / CAD Lab		Lesson #3b Computer / CAD Lab	
Week 4				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #4a Library		Lesson #4b Computer / CAD Lab	
Week 5				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #5a Library		Lesson #5b Computer / CAD Lab	
Week 6				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #6a Library		Lesson #6b Computer / CAD Lab	
Week 7				
Monday	**Tuesday**	Wednesday	**Thursday**	Friday
	Lesson #7 Computer / CAD Lab		Lesson #8 Computer / CAD Lab	

General Lesson Plan Format
Nine Event Model
Lesson Plan #1

Lesson Name: Symbols Library ID: Mary Jo Brown

Grade/Subject: 12th Grade / Drafting and Design

Lesson Objectives:
#1 After completing the Webquest searching specific Websites for ideas for the senior project, the twelfth grade design and drafting student demonstrate knowledge about trends in architectural residential design by recognizing classic and modern design in architecture. #5 After completing a Webquest searching Websites for architectural drawing symbols, the twelfth grade design and drafting student will demonstrate his/her understanding of the basic symbols that represent furniture used in a residential floor plan layouts by using AutoCAD software to draw a symbols library using a prepared handout.
State Standards Addressed by Lesson:
Academic Standards for Science and Technology **Technology Education 22 Pa.Code,Ch.4, Appendix B** **3.6.12. Grade 12** ● Apply knowledge of construction technology by designing, planning and applying all the necessary resources to successfully solve a construction problem. This lesson provides instruction to assist him/her in the application of construction principles to successfully begin to develop and design a residential floor plan using the AutoCAD program.
Instructional Strategy:
The instructional strategy for the majority of this lesson follows a student-centered cooperative learning approach. Students learn by having meaningful activities with more experienced individuals, the team, their peers and the teacher. Scaffolded instruction is applied by giving the students lots of group work and practice followed by working alone.
Media Selection:
The media selected for this lesson are a PowerPoint presentation, a Webquest, the AutoCAD program, and handouts created in AutoCAD and MS Word. Beginning by displaying a list of learning objectives, the PowerPoint guides the class through the lesson. I choose a PowerPoint for this lesson because it organizes the learning material and structures

the classroom environment. The PowerPoint also allows me to use colorful graphics to gain all of the student's attention. The Webquest will allow the students time to conduct research and collect ideas regarding the project. The Webquest is designed as a group collaboration in order to take advantage of the strengths and weaknesses that the students bring with them. The students will use the AutoCAD program to draft their symbols. AutoCAD is the industry standard software for drafting. Each student will draft a symbol and add it to the symbols library folder for the group to use in their floorplans.

Instructional Materials (List items here, then append actual artifacts to lesson plan):

PowerPoint – designed in PowerPoint and saved as a PowerPoint file & SWF file for viewing. (Artifact #1 is included as a MS Word document included in the lesson plan.)

Webquest – design in Dreamweaver and saved as files for preview on Internet Explorer. (Artifact #2 is included as a MS Word document included in the lesson plan.)

All documents are saved in my public space H:\\home12.ad.lehign.edu\M-Z\mjbg\public\Unit

Assessments (List items here, then append actual documents to lesson plan):

Pretest

For class discussion - an informal formative by observing student's verbal responses to questions.

For writing answers on the chalkboard – an informal formative by observation.

Posttest

For team Webquest – a formal summative using a criterion rubric. (rubric included with lesson plan.)

For team chart "Symbols Library" in AutoCAD – a formal summative using a criterion rubric. (rubric included with lesson plan.)

Instructional Plan:

Event (E1-E9)	Instructional Activity Group 1	Group 2 Students requiring a little more assistance	Group 3 Students requiring a little less assistance
E1 Gaining Attention	The beginning of class will start off with a motivation segment by engaging students in a class discussion about necessities they would include in each room of their condo	Encourage quiet students to participate.	Remind more aggressive students to give others a try.
E2 Inform Learner of Objectives	A PowerPoint presentation starts by informing the learner of lesson objectives. Make relevant	Write objectives on the board.	
E3 Stimulate Recall of Prerequisite Learning	Students verbally answer questions such as what elements do they think is important to include in a living space.	Ask students about rooms in their own homes.	Ask students how the rooms in their own homes would work better.
E7 Provide Feedback on Performance	Verbally acknowledge students answers.	Invite students who have not verbally participated to help write the "necessities" on the board	Ask students to help with the spelling of the words on the board.
E1 Gaining Attention	Students write the necessities they have decided are important on the chalkboard	Students take turns writing their own "necessity" or ones from the class.	Students help with spelling of the words on the board
E7 Provide Feedback on Performance	Verbally acknowledge students answers by thanking students for their work.	Thank students for their work.	Thank students for their work.
E3 Stimulate Recall of Prerequisite Learning	The PowerPoint continues by recalling the purpose of architectural drafting.		
E3 Stimulate Recall of Prerequisite Learning	The PowerPoint continues by identifying the AutoCAD commands needed to draw the symbols library.		
E6 Elicit Performance (formative)	Students verbally recall drafting procedures by answering questions.		
E7 Provide Feedback on Performance	Verbally acknowledge students answers.		

Event (E1-E9)	Instructional Activity Group 1	Group 2 Students requiring a little more assistance	Group 3 Students requiring a little less assistance
E4 Present Stimulus Material	All students receive the symbols library handouts.		
E5 Provide Learning Guidance	The PowerPoint continues by explaining the importance of the architectural symbols library.		
E4 Present Stimulus Material	All students receive the Team Webquest handouts		
E5 Provide Learning Guidance	The PowerPoint continues by explaining the process of the Team Webquest.		
E1 Gaining Attention	Students are grouped together in teams that will be beneficial to each student's strengths and weaknesses.	Six students to a team during the Internet search.	Three students to a team during the drafting part of the lesson.
E4 Present Stimulus Material	Teams receive handouts that list reliable Websites to find information for the senior project.		
E6 Elicit Performance (formative)	Teams search the Internet for about 20 minutes looking at Websites about architectural drafting symbols. Students circle on the handout any symbols they find.		
E8 Assess Performance (summative)	Teacher walks around the classroom observing student's behavior and progress. Teacher offers help.	Make sure all students stay on task.	
E5 Provide Learning Guidance	Teams must start preparing a symbols library chart that matches the handout. Each student will be assigned a symbol to draft in AutoCAD. At this point in the lesson, smaller teams would be more beneficial to allow each student computer time to draft their own symbol.	Easier to draw symbols will be given to slower students	Harder to draw symbols will be given to faster students.
E7 Provide Feedback on Performance	Teacher continues to walk around the classroom observing student's behavior and progress. Teacher offers help.		Students who are finished their drawing offer help to the other students, but allow the student to complete her/his own symbol.
E6 Elicit Performance (formative)	Each student names his/her symbol according to the handout and saves the work in a team folder on the computer.		

Event (E1-E9)	Instructional Activity Group 1	Group 2 Students requiring a little more assistance	Group 3 Students requiring a little less assistance
E8 Assess Performance (summative)	Teacher checks student's work to make sure each student is progressing. Teacher assigns a team grade for the day's activity.		
E9 Enhance Retention and Transfer	Students can continue researching the Web with optional Websites to explore. This lesson will continue for another class period to give students time to finish the symbols library.		

Documentation for Artifact #1 Webquest

Hello and Welcome to the Webquest
"Design a Condo - Symbols Library"

This is a Webquest designed for the 12th grade Drafting and Design student.

To **navigate** the Website double-click on the menu items to the left.

- The **introduction** section tells you all about the project.
- The **task** section lets you know what is expected of you
- The **process** section show the way to perform the tasks.
- The **evaluation** section provides the rubric for scoring.
- The **conclusion** section tells you what you learned.
- The **teacher page** section presents a teachers view of the project.
- The **credits** section presents a supply of resources used for this project.

Introduction to the Webquest

"*Symbols Library*"

You have just started your first job in your new career as an Architectural Draftsperson. The boss has informed you that you will be part of a design team that is building vacation Condos for a resort area. You think, "Wow, what luck! I designed my dream condo in high school for my senior project!" You find your new work area and meet your new team members. Are you ready for the challenge?

In a real-life construction project, drafters create their own symbols library from company standard libraries or from other reliable sources. You know having a library of reusable drafting symbols handy is an efficient way to begin drafting a floor plan.

The Task

The lesson "*Symbols Library*"

This is a two-part lesson.

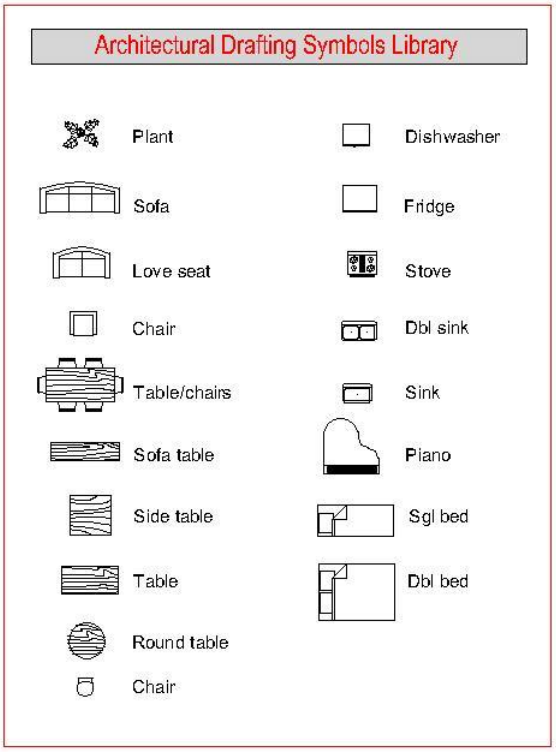
In the first part of the lesson (2a), students work in teams to complete a Webquest searching for architectural symbols used in residential floor plans. The students surf the Internet hunting for given objects provided in the handout *Architectural Drafting Symbols*.

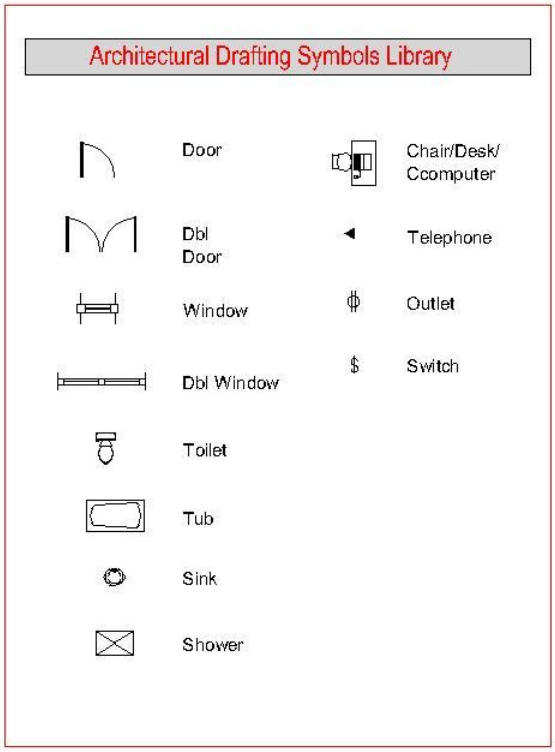
In the second part of the lesson (2b) the students use the symbols found in the team's Webquest to complete a chart (symbols library) in AutoCAD formatted exactly like the handout, drawings of the symbols with descriptions.

Because of the amount of information the students must include in the chart, the lesson will continue to be a group collaborative project. Students will email and/or dropbox the AutoCAD file of the symbols library for and informal grade based on percentage of completion and accuracy.

The Process

All students receive the symbols library handouts.





Students are grouped together into teams that will be beneficial to each student's strengths and weaknesses. Six students to a team will enable the search to be completed faster. Each student takes a turn typing in a url from the handout.

Teams receive handouts that list reliable Websites to find information for the Webquest.

(Some Websites are listed below)

http://www.woodworkersworkshop.com/cadfiles/cabinets.htm

http://www.woodworkersworkshop.com/cadfiles/tables.htm

http://www.woodworkersworkshop.com/cadfiles/chests.htm

http://www.cad-design-and-drafting-services.com/free-autocad-blocks.html

http://www.greathousedesign.net/

http://www.uwec.edu/Academic/Geography/Ivogeler/w367/styles/index.htm

http://lcweb2.loc.gov/ammem/hhhtml/hhhome.html

http://www.sanford-artedventures.com/play/arch1/index.html

http://www.greatbuildings.com/gbc/buildings.html

http://www.bc.edu./bc_org/avp/cas/fnart/fa267/

Teams search the Internet for about 20 minutes looking at Websites about architectural drafting symbols. Students circle on the handout any symbols they find.

Teams start to prepare a symbols library chart that matches the handout. Each student is assigned a symbol to draft in AutoCAD. At this point, smaller groups would be more beneficial to allow each student computer time to draft their own symbol. Student who are finished their drawings first can offer help to the other students, but they must allow the student to complete his/her own symbol. Each student names his/her symbol and saves the work in a team folder on the computer. The teacher checks student's work to make sure each student is progressing.

The teacher assigns a grade for the team for the day's lesson.

Students can continue researching the Web with optional Websites to explore.

This lesson will continue for another class period to give students time to finish putting together the symbols library.

The Rules

#1 Students are to work quietly in their group.

#2 Students are to be respectful of each other's ideas.

#3 Students are to be helpful to each other.

The Evaluation – RUBRICS

(Full rubrics are appended at the end of this document)

The Conclusion

After completing this lesson you should:

1. Be able to recognize the basic symbols that represent furnishings used in residential floor plan layouts.

2. Be able to conduct a Webquest according to defined procedures.

3. Understand the importance of teamwork in terms of a group project.

The Teacher Page

Lesson Title: Webquest for Senior Project

Unit Title: Senior Project - Design a Condo

Target Audience: Twelfth grade high school students

Overall Goal of the Lesson: The overall goal of the Webquest lesson is provide the student with the necessary information to successfully search the Internet for architectural drafting symbols and apply the information to a larger project.

Rationale: The Webquest lesson is part of a Unit Plan for the senior project given to twelfth grade students in the drafting and design program in order to satisfy state standard requirements for the Information Technology program. The senior project "Condo Design" is intended to give the twelfth grade student the experience to solve construction problems through the application of field-specific tools, materials, processes, and systems. Students develop the ability to select and correctly use the field-specific elements to answer questions, understand explanations, and solve problems encountered in real life situations.

Description of the Lesson: The Webquest lesson is a challenging design and drafting problem providing occasion for creative stimulation, thoughtful reflection, guided practice, and purposeful judgment. The project was also planned to be relevant to the high school student's interest.

Scope of the Lesson: The scope of the Webquest lesson includes brainstorming ideas, gathering data, and transforming data into useful artifacts. The content of the lesson is determined by the requirements normally followed in a real-life construction project.

Materials to be included in the Senior Project: Non-digital materials and media included in the lessons are handouts, chalkboard, chalk, tracing paper, pencils, erasers, scale rulers, and markers. Students also use trade magazines for reference articles and pictures and textbooks. Digital media used in the lessons are Blackboard, e-mail and blogs, Internet, Webquests, spreadsheets, word processing, concept maps, AutoCAD, iMovie, Powerpoint, interactive white board, and computer- projection video along with audio.

Documentation for Artifact #2 PowerPoint

*Unit: "*Design a Condo*"*
*Lesson: "*Symbols Library*"*

The PowerPoint provides the direction for the instruction of the lesson. It helps the teacher by guiding the lesson from the beginning to end. The teacher can refer back to slides to help students remember class's agenda.

Slide #1 starts the lesson by explaining the Lesson Objectives

1. To be able to recognize the basic symbols that represent furnishings used in residential floor plan layouts.
2. To be able to conduct a Webquest searching for architectural symbols.
3. To be able to work in teams to collaborate on a project.

Slide #2 starts the discussion. Students verbally respond to questions such as:

What do you think is important to include in your residential design?
What furnishings and/or appliances are necessary to make a space livable?

Slide #3 is to gain attention and continues the discussion by asking students to share their ideas. Students are asked to put ideas on the board

Lets put some ideas on the board.

Slide #4 continues the discussion and gives some answers to verify the student's responses.

Lets put some ideas on the board.

- Bathroom – tub, sink, toilet
- Kitchen- sink, refrigerator, stove
- Living room – sofa, tables, tv
- Bedroom- bed, dresser

Slide #5 continues by recalling the purpose of architectural drafting.

Purpose of architectural drafting:

- To document guidelines for builders.
- To provide a hardcopy of instructions.
- To specify dimensions, materials, and processes.
- To show how parts and objects work together or how they will be put together.

Slide #6 continues by identifying AutoCAD commands needed to draw the symbols library.

Identify AutoCAD commands needed to draw the symbols library:

- Drawing and editing – lines, shapes and text,
- Layering protocol in AutoCAD
- Cartesian Coordinates

Slide #7 starts to introduce the Webquest by discussing the importance of the Team Webquest

In a real-life, construction projects are produced on a very large scale and drafters will work in teams to accomplish some tasks. The team may consist of other drafters, architects, or engineers.

Slide #8 continues to introduce the Webquest by discussing the task.

The task of the teams is to complete a Webquest searching the Internet for architectural symbols the represent furnishings and appliances used in residential floor plans.

Slide #9 continues by discussing the process of the Team Webquest

The process of the Team Webquest includes:

- Students received the "symbols library" handouts.
- Students are placed in groups.
- Teams receive handouts of reliable Websites to search.
- Teams search the Internet for 20 minutes.
- Teams circle the symbols they are able to find.

Slide #10 continues discussing the rules of the Team Webquest

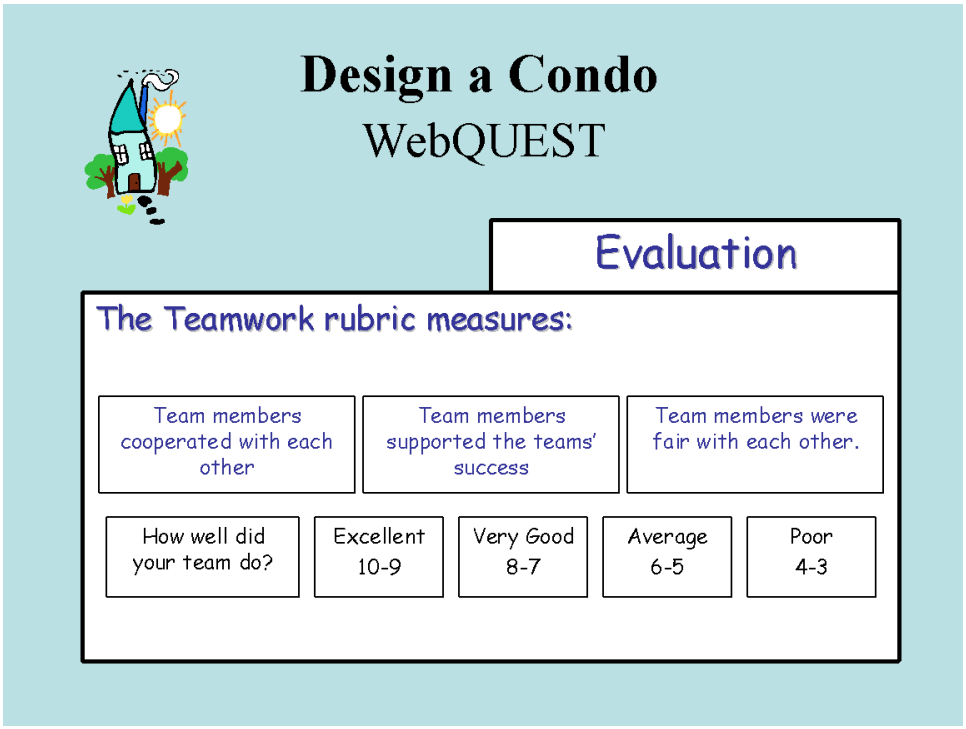
The rules of the Team Webquest are:

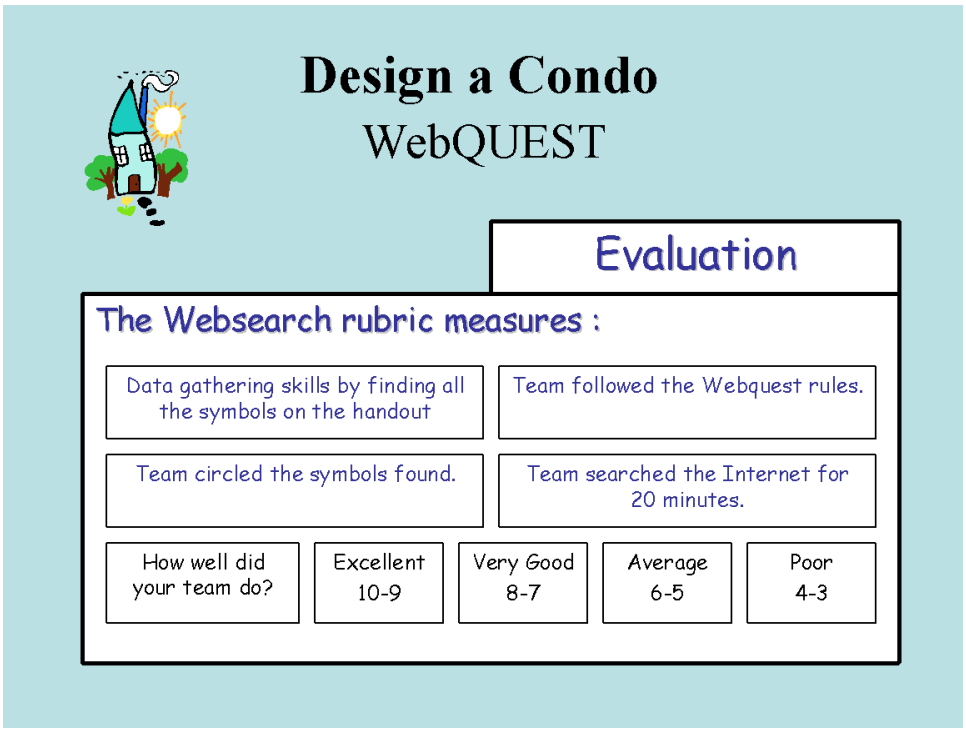
- Students are to work quietly in their group.
- Students are to be respectful of each others ideas.
- Students are to be helpful to each other.

Slide #11 continues by discussing the evaluation methods of the Team Webquest

The evaluation method for the Team Webquest are rubrics that measure the quality of students work in two areas: (Full rubrics are at the end of this document)

- Teamwork (ppt slide below)
- Websearch (ppt slide below)





Slide #12 goes over the lesson learned to enhance retention and transfer of knowledge to long term memory.

1. How to conduct a Webquest
2. Able to recognized the basic symbols that represent furnishings and appliances used in a floor plan.
3. To understand the importance of teamwork and cooperation among team members.

Team work rubric **Team #_____**

Team work	Excellent 10 - 9	Very Good 8 - 7	Average 6 - 5	Poor 4 - 3	Score
Team members cooperated with each other	Team members worked exceptionally well together	Team members worked well together	Team members worked reasonable well together	Team members worked poorly together.	
Team members supported the team's success	Team members were very respectful of one another and provided extra help for each member to succeed.	Team members were respectful of one another and helped each member to succeed.	Team members were respectful of one another, but did not help each member to succeed.	Team members were not respectful of one another and did not help each member to succeed.	
Team members were fair with each other.	Students were exceptional at dividing work appropriately and fairly between group members.	Students divided work appropriately and fairly between group members.	Students tried to divide work appropriately and fairly between group members.	Students did not divide work appropriately and fairly between group members.	
TOTAL SCORE FOR TEAM					

WebQuest rubric **Team #_____**

WebQuest (WQ) search	Excellent 10 - 9	Very Good 8 - 7	Average 6 - 5	Poor 4 - 3	Score
Data Gathering Skills by finding all the symbols on the handout	The team exhibited excellent data gathering skills.	The team gathered most of the data that matched the handout	The team gathered some data that matched the handout	The team did not gather any data that matched the handout	
Team followed WQ Process by circle the symbols found	The team circled all the symbols on the handout	The team circled most of the symbols on the handout	The team circled some of the symbols on the handout	The team did not circle any of the symbols on the handout	
Team followed WQ rules	The team followed all the rules	The team followed most of the rules	The team followed some of the rules	The team did not follow any of the rules	
Team carried out the WQ task by search the web for 20 minutes	The team searched for 20 minutes	The team searched for 15 minutes	The team searched for 10 minutes	The team searched for 5 minutes	
Total Team Score					

General Lesson Plan Format
Nine Event Model
Lesson #2

Lesson Name: Bubble Diagram ID: Mary Jo Brown

Grade/Subject: 12TH Grade / Drafting and Design

Lesson Objectives:
#2 After viewing a white board presentation showing how to relate room layouts to traffic flow in floor plan layouts, the twelfth grade design and drafting student will demonstrate his/her understanding of space relationships by interpreting space layouts implementing bubble diagrams with concept mapping software. #3 Given the white board presentation, the student will demonstrate her/his ability to analyze how the functional organization of rooms contribute to the quality of the living space by sketching floor plan layouts based on traffic flow explored in his/her bubble diagram.
State Standards Addressed by Lesson:
Academic Standards for Science and Technology **Technology Education 22 Pa.Code,Ch.4, Appendix B** **3.6.12. Grade 12** ● Apply knowledge of construction technology by designing, planning and applying all the necessary resources to successfully solve a construction problem. This lesson provides instruction to assist him/her in the application of construction principles to successfully begin to develop and design a residential floor plan using the AutoCAD program.

Instructional Strategy:
The instructional strategy for a major portion of this lesson follows a teacher-centered direct instruction. Modeling is done by the teacher to help students learn the various strategies and skills involved in this process.
Media Selection:
The lesson will include an iMovie demonstration to illustrate the use of the concept mapping software Inspiration. The iMovie is a compilation of three different media: 1) video,

2) PowerPoint, and 3) Camtasia capture of Inspiration software.

Inspiration is the software students will use to "bubble diagram" space layouts. The Inspiration software is a technology tool that can be useful for students to develop, interpret, evaluate, and analyze relational space layouts. The software can make clear the relationships between foot traffic flow of the occupants and functional room layouts. I

Instructional Materials (List items here, then append actual artifacts to lesson plan):

iMovie (Artifact #3 – included in this lesson plan as an MS Word document)

Inspiration software program (Artifact #4 – included in this lesson plan as an MS Word document with screen shots of a sample bubble diagrams)

All documents are saved in my public space H:\\home12.ad.lehign.edu\M-Z\mjbg\public\Unit

Assessments (List items here, then append actual documents to lesson plan):

Pretest

Peer critique of sketches: verbal peer critique of each other's sketches - students analyze functional floor plans – informal formative by observing student's verbal responses to student's sketches.

Compare bubble diagrams to sketches: verbal peer critique of sketches - students analyze functional floor plans – informal formative by observation.

Posttest

Bubble diagram exercise: hand in for grading-formal summative using a criterion rubric.

Students revise sketches on paper: hand in for grading – formal summative using a criterion rubric.

Instructional Plan:

Event (E1-E9)	Group 1	Group 2 Students requiring a little more assistance	Group 3 Students requiring a little less assistance
E1 Gaining Attention	The beginning of the lesson will start off by students hanging their preliminary sketches (from Lesson 2a) on the wall for a group peer critique.		
E2 Inform Learner of Objectives	Teacher verbally informs the students of the objectives of the lesson. The objectives relate how relates?	Ask students to write objectives on the chalkboard.	Ask students to help with spelling and word order.
E3 Stimulate Recall of Prerequisite Learning	This is the second part of the lesson. Teacher reviews first part of lesson.	Emphasize material relevant to the second part of the lesson.	
E4 Present Stimulus Material	The teacher verbally presents room layout design problems, emphasizing the functional purpose of architectural residential design.	Emphasize solving problems in the design phase, and before the construction phase	
E5 Provide Learning Guidance	The teacher poses questions to students asking for suggestions to solve layout design problems.		
E6 Elicit Performance (formative)	Students verbally respond to layout design problems.	Ask students to recall any design problems they may have encountered in their own living spaces.	
E7 Provide Feedback on Performance	The teacher validates student's responses by emphasizing problem and solution.		
E4 Present Stimulus Material	A video demonstration is used to demonstrate the freehand sketching and using Inspiration to draw diagrams.	Make sure all students can see and hear the presentation.	
E5 Provide Learning Guidance	Students use computers at their desks to follow the instructions after the initial demonstration by the teacher.	The teacher reviews the steps as each student moves forward.	

Event (E1-E9)	Group 1	Group 2 Students requiring a little more assistance	Group 3 Students requiring a little less assistance
E6 Elicit Performance (formative)	Students draw a bubble diagram relating functional space relationships to foot-traffic flow.	Teacher goes around room to help.	
E6 Elicit Performance (formative)	Students print out their bubble diagrams and hang them next to their sketches.		Students who are finished can help other students print and hang their sketches.
E7 Provide Feedback on Performance	Students examine and compare their sketches to their bubble diagrams.		
E7 Provide Feedback on Performance	The teacher verbally points out the sketches and bubble diagrams that best address the relationship between foot-traffic flow and room layouts.	The teacher points out whether their bubble diagram or their sketch comes closer to representing the best design.	
E5 Provide Learning Guidance	The teacher explains why he/she thinks the sketches and bubble diagrams provide solutions to the room layout designs. The teacher verbally explains to the class any material the students have not grasped.	The teacher marks up sketches to show better design solutions.	
E8 Assess Performance (summative)	Students revise their sketches on paper applying the new information learned and students hand in a copy of their bubble diagram and revised sketches for grading.		
E9 Enhance Retention and Transfer	Students are encouraged to continue working on their designs at home. Students draw a bubble-diagram of their own home (or take home a pre-printed one) and document their own movements though their house on the bubble diagram.	The teacher can have pre-printed bubble diagrams of various room layouts prepared from class discussion about their own home.	

Documentation for Artifact #3 iMovie

"Bubble Diagram" Lesson

This lesson is presented to the students as an iMovie. The iMovie is a compilation of three different media: 1) video, 2) PowerPoint, and 3) Camtasia capture of Inspiration software.

All are saved in iMovie using the some of the PowerPoint slides as transitions within the iMovie.

The Video
The video is a live demonstration of how to sketch a simple Bubble Diagram. The lesson includes a verbal description of what a bubble diagram is and a visual description of what a bubble diagram looks like. The demonstration includes freehand sketching on a white board with markers. It is approximately two minutes long.

The PowerPoint
The PowerPoint is the instructional part of the lesson that informs the student of the lesson's objectives, provides a review of bubble diagrams, and introduces the software Inspiration.

Slide 1
What is a bubble diagram.

Slide 2
What is the purpose of a bubble diagram

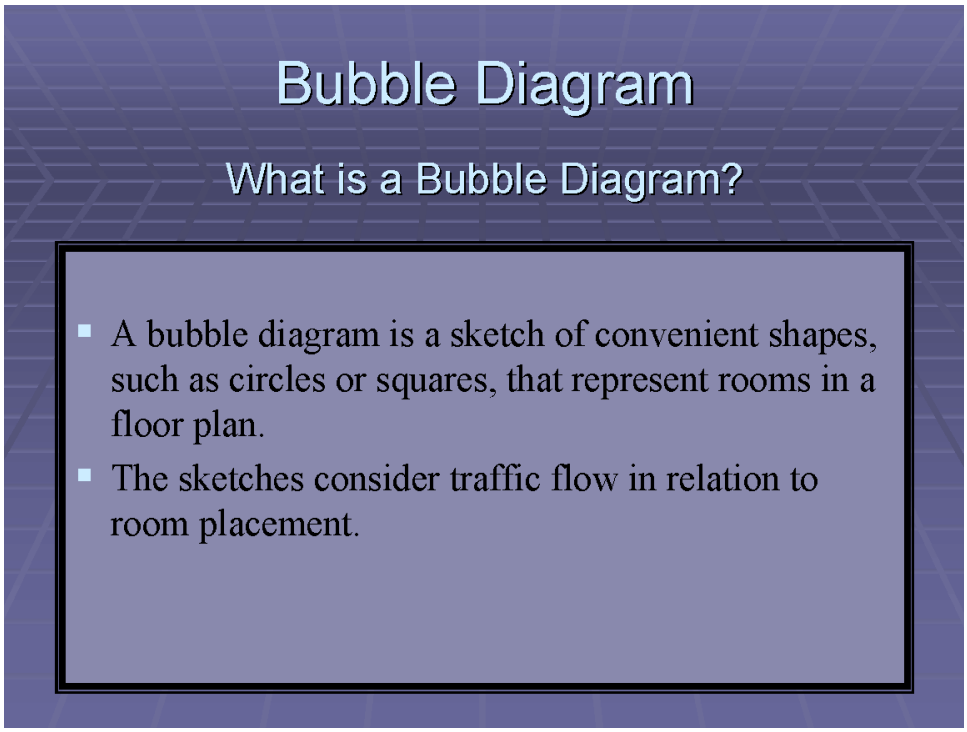
Slide 3
What doesn't a bubble diagram show

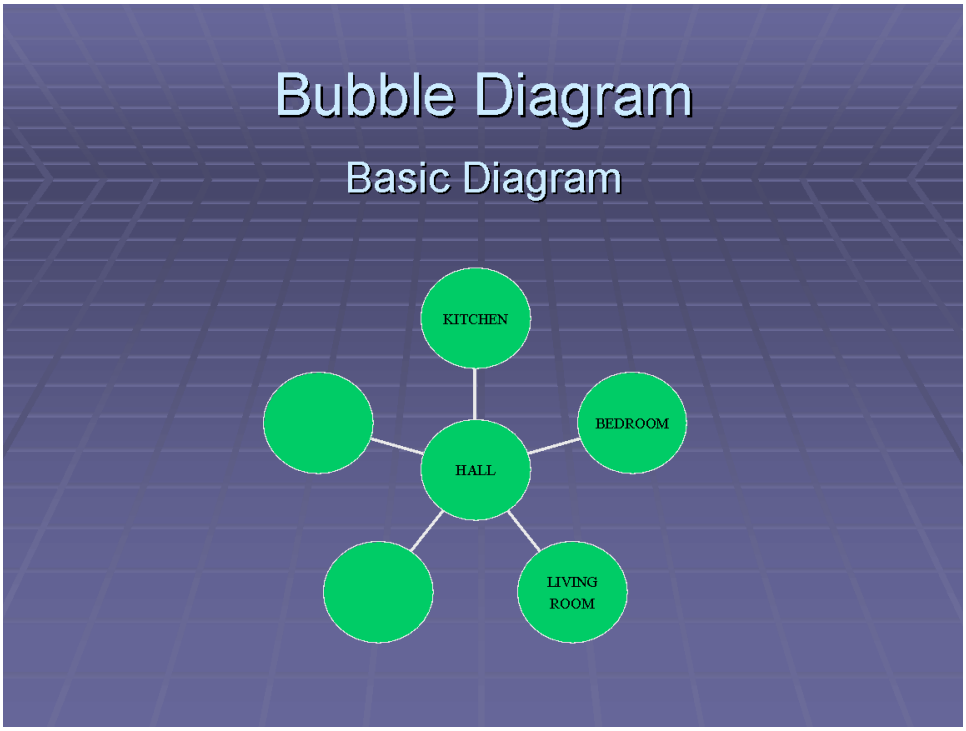
Slide 4
Considerations

Slide 5
Sample of a basic diagram

Slide 6
Sample of an advanced diagram using Inspiration

Samples from the PowerPoint:



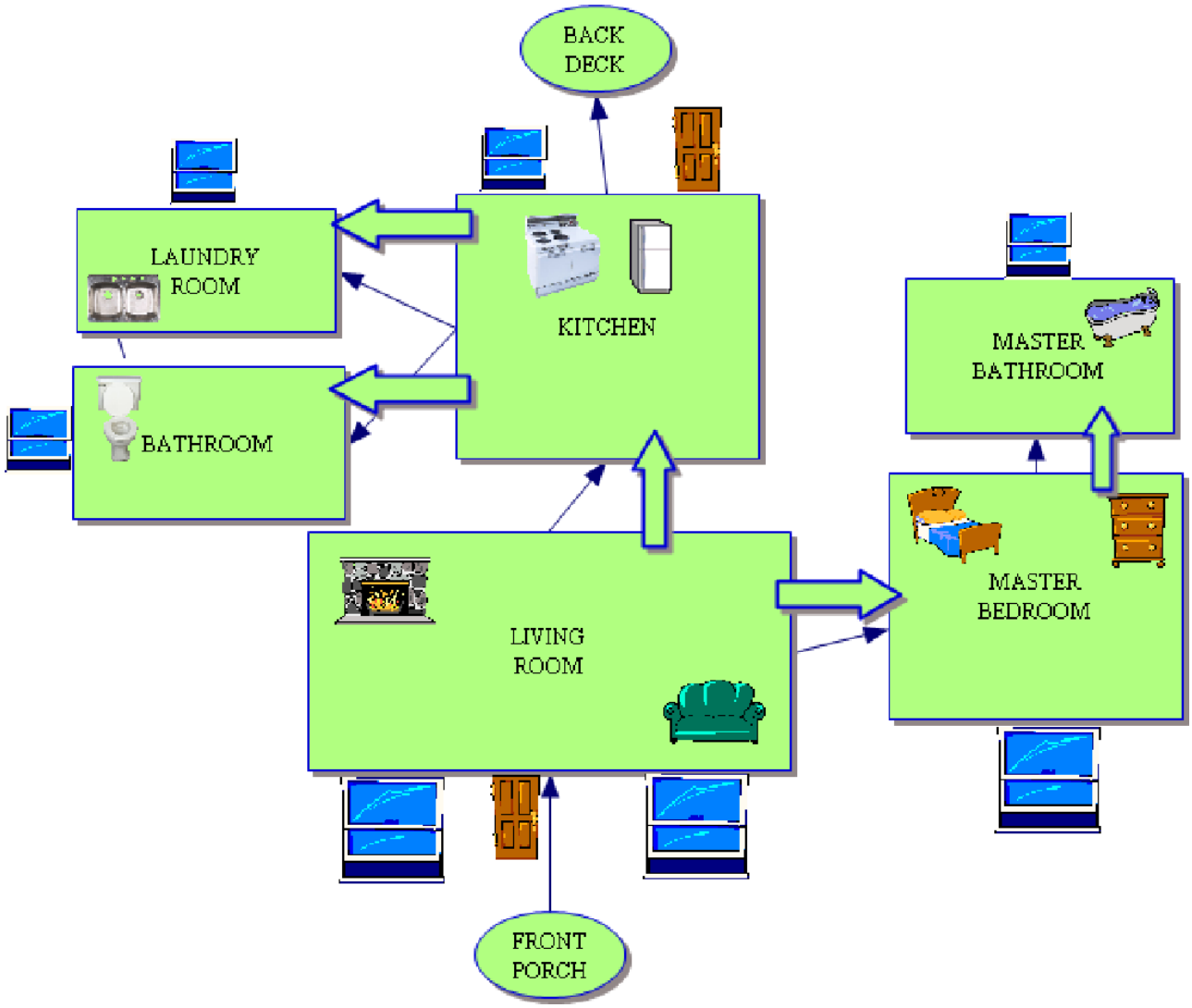


Documentation for Artifact #4 Inspiration software

Inspiration

The students are given a “how to” demonstration on creating a bubble diagram in Inspiration.

Sample from Inspiration Artifact #4:



Sketches	Excellent 10 - 9	Very Good 8 - 7	Average 6 - 5	Poor 4 - 3	Score
Essential rooms included in sketches	Sketches included more than the required essential rooms	Sketches included all essential rooms	Sketches included most of the essential rooms	Sketches missing essential rooms	
Rooms labeled according to use	All rooms were labeled appropriately	Most rooms were labeled appropriately	Some rooms were labeled appropriately	No rooms were labeled	
Drawing skills	Student used exceptional freehand drawing skills	Good drawing. Easy to understand all parts.	Sloppy drawing. But, could read room labels	Sloppy drawing. Could not read room labels	
Room layouts	Student used the Bubble Diagram to accurately draw room layouts in sketches	Student used most of the elements of the Bubble Diagram to accurately draw room layouts in sketches	Student used some elements of the Bubble Diagram to accurately draw room layouts in sketches	Student did not use Bubble Diagram to accurately draw room layouts in sketches	
TOTAL SCORE					

Rubric for sketches of room layout Student:_____

Bubble Diagram (BD)	Excellent 10 - 9	Very Good 8 - 7	Average 6 - 5	Poor 4 - 3	Score
Essential rooms included in BD	BD included more than the required essential rooms	BD included all essential rooms	BD included most of the essential rooms	BD missing essential rooms	
Rooms labeled according to use	All rooms were labeled appropriately	Most rooms were labeled appropriately	Some rooms were labeled	No rooms were labeled	
Rooms appropriately related to foot traffic flow	All rooms did appropriately relate to foot traffic flow	Most rooms did appropriately relate to foot traffic flow	Some rooms did appropriately relate to foot traffic flow	Rooms did not appropriately relate to foot traffic flow	
Bubble Diagram used for sketches	Student used BD to draw room layouts in sketches	Student used most of the BD to draw room layouts in sketches	Student used some of the BD to draw room layouts in sketches	Student did not use BD to draw room layouts in sketches	
TOTAL SCORE					