

Missouri Center for Career Education
Department of Career & Technology Education
Central Missouri State University
Warrensburg, Missouri

Division of Career Education
Department of Elementary & Secondary Education
Jefferson City, Missouri

Exploring Careers in ***Architecture & Construction***

Exploring Career Clusters ***Course A*** ***Architecture & Construction*** ***Science, Technology, Engineering, and Mathematics*** ***Manufacturing***

Architecture & Construction Student Competencies

The following competencies selected for this unit were taken directly from the Career Cluster Resources for Architecture & Construction (www.Careerclusters.org).

Cluster Knowledge and Skills

Perform math operations to complete jobsite/workplace tasks such as estimating and distributing materials and supplies.

Read, understand and respond to English language technical and workplace documents to effectively function in the workplace/jobsite.

Write clear and effective English to prepare workplace/jobsite information.

Use and follow industry specific verbal and visual skills to accomplish workplace/jobsite communications.

Determine alternative solutions for a specific project/problem in order to effectively plan.

Use Internet applications to acquire information.

Identify occupation-specific governmental regulations and national, state and/or local building codes to establish workplace/jobsite regulations and codes.

Identify workplace/jobsite environmental hazards to promote workplace/jobsite safety.

Observe rules and regulations to comply with personal and jobsite safety standards.

Select, inspect and use personal protective equipment (PPE) such as safety glasses and respiratory protection to ensure a safe workplace/jobsite.

Apply industry standards and practices for quality to ensure quality work.

Demonstrate an appreciation for quality workmanship.

Organize work teams to effectively manage assignments.

Use conflict resolution skills to maintain a smooth workflow.

Read and explain the various aspects of service contracts to ensure compliance.

Recognize the relationship between the various parties to a contract in order to interpret responsibilities.

Access appropriate resources to identify the roles, rights and responsibilities of an employee and an employer.

Exhibit behaviors showing you are reliable and dependable.

Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.

Identify opportunities for career advancement to formulate career goals.

Research local and regional labor (workforce) market and job growth information to project potential for advancement.

Align licensing, certification and credentialing requirements to career goals in order to plan for career advancement.

Interpret blueprints and drawings to assist with project planning.

Conceptualize a three-dimensional form from a two-dimensional drawing to visualize proposed work.

Select tools, machinery and equipment to match requirements of the job.

Pathway Knowledge and Skills

Identify client's needs and wants to develop criteria for a set of technical drawings.

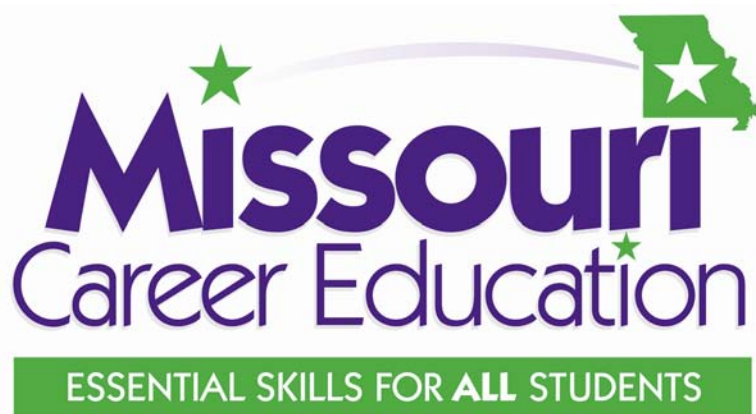
Use two- and three-dimensional drawings to convey graphic information.

Reference drawings and sketches to build models.

Evaluate and select building materials and assemblies to meet project specifications.

Identify building systems needed to complete a construction project.

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Introducing the Architecture & Construction Cluster

Exploring Career Clusters

Course A
Architecture & Construction
Science, Technology, Engineering, and Mathematics
Manufacturing

Introducing the Architecture & Construction Cluster

The cluster of careers found in *Architecture & Construction* encompasses designing, planning, managing, building and maintaining the built environment. This career cluster is divided into three distinct Pathways made up of specialties/occupations: *Design/Pre-Construction*, *Construction*, and *Maintenance/Operations*. Each group represents a particular phase of the design/built world in which we live. Keep in mind that specialties/occupations may cross over to other Pathways due to the multileveled tasks involved. For example, the *architect* will be involved with the design and construction phases of a project and *landscape/groundskeeper* may be involved with initial landscape planning/installation and then maintain the grounds after completion of the project.

Each Pathway has distinct knowledge and skill requirements as well as shared common knowledge and skill requirements. Students who understand these relationships will be prepared and able to make informed career decisions. Students should be given the opportunity to explore and investigate not only the traditional career options of *architect* and *carpenter* but should be encouraged to touch on the many other related occupations found in this Career Cluster (See *Architecture & Construction Cluster Pathways chart in this section*).

Teacher Preparation

The suggested scenario for this unit is the design and construction of a playhouse for children. You should review the whole project and decide on any alterations you want to make to the scenario. You have the option to make part of or the entire project a simulation or a “real life” activity. That is, you may have your students construct a full size playhouse or you may have your students construct models of the playhouse. You may also choose to use a scenario of your own design. If so, you need to include as many occupations as time permits.

Introduce the unit with a short activity which helps students quickly grasp the breadth and depth of this Career Cluster. Be sure to have every student engaged so they can begin the unit of study with the big picture of this career cluster.

Prepare a bulletin board display that illustrates the three Pathways (*Design/Pre-Construction*, *Construction*, *Maintenance/Operation*) found in the *Architecture & Construction Cluster*. Be sure to include photos/illustrations of non-typical careers such as *cost estimators*, *surveyors*, *sheetmetal workers*, and/or *hazardous materials removers*. List under each category some of the key skills and knowledge needed. Remember, the use of bulletin boards, web searches, posters, and engaged projects will assist students in learning about and participating in various career experiences.

Reference: “Architecture & Construction Career Pathways”, “*Career Cluster Resources for Architecture & Construction*, National Association of State Directors of Career Technical Education Consortium” (www.Careerclusters.org)

Pathways:

- Design/Pre-Construction
- Construction
- Maintenance/Operations

Handout: *Architecture & Construction Cluster Pathways chart*

This handout is for teacher reference for the student activity, *Pathway Matching* activity. The chart should not be given to students until after the completion of this activity.

Suggested Activities**Introduction to the Cluster**

Chose one of the following activities or design an appropriate activity that will allow students to comprehend the wide array of occupations involved in their built world.

1. How Many Jobs?

Use a Power Point presentation or photos & drawings to show a new house during the various stages of design and construction and an exhaustive list of jobs and have students or teams of students match the job titles to the photos.

2. What's in a Kitchen?

Using a Power Point presentation or photos of a residential kitchen, have students or teams of students identify as many jobs (careers) involved in designing, constructing, and maintaining the kitchen.

3. Skyscrapers and Stadiums

Using a Power Point presentation or photos of skyscrapers and sports stadiums, have students or teams of students select from a list the jobs that would be involved designing and constructing a skyscraper and/or stadium.

Upon completion of the activity, discuss with students the various occupations needed to complete the design, construction, and maintenance of the structure in question. Be sure to point out occupations that are not obvious.

Pathway Matching

Have students match (even if they have to guess) random list of occupations to the three Career Pathways found in the Architecture & Construction Cluster. Discuss with students what makes up each Pathway (*See Pathway Matching activity*). This activity is designed to help students focus on the vast occupational opportunities available to them in this Career Cluster. It is not important at this point in the course that they are able to recognize most of these occupations. It is important that they begin to see their possibilities. Discuss with students the differences between the three Career Pathways without listing the various occupations. Use the following activity or design an appropriate activity that will allow students to comprehend the wide array of occupations involved in their built world. You should review the list and become familiar with the occupations listed. (www.collegeboard.com/csearch/majors_careers/profiles/ and www.stepfour.com/jobs)

END OF DOCUMENT

Exploring Careers in Architecture & Construction

Student Name: _____ ANSWER KEY _____
(PRINT)

Date Assignment Due: _____ Date Assignment Submitted: _____

_____ Activity Satisfactorily Completed

_____ Activity Not Completed (see notes below)

Pathway Matching

This activity should not be “scored” for right or wrong answers. The intent is to expose students to the very wide array of occupational options they have in this Career Cluster. “Scoring” should be based on the student’s effort in completing the assignment. You, the teacher, should be actively involved with this activity and use it as an appropriate segue into class discussion about occupational opportunities.

The *Architecture & Construction Career Cluster* is divided into three Pathways according to the tasks of designing, planning, managing, building and maintaining our built environment. Our built environment involves much more than we typically think about, such as houses and skyscrapers. Our built environment also includes factories, schools, hospitals, buildings of worship, bridges, water towers, antenna towers, shopping malls, water dams, roads, monuments and more. All of these begin with design and end with the need for maintenance.

The three Pathways for the *Architecture & Construction Career Cluster* are:

1. Design/Pre-Construction
2. Construction
3. Maintenance/Operations

Occupation – Pathway Matching

Given the list below, place the number of the Pathway from the above list next to the occupation it matches. If you think an occupation could match with more than one of the Pathways, you may put more than one number. Be ready to say why you think the occupation matches the Pathway or Pathways you listed.

<u>1</u> Architect	<u>1,2,3</u> Cost Estimator
<u>2,3</u> Iron/Metalworker (structural and reinforcing)	<u>1</u> Architectural and Civil Drafter

<u>2</u> Education and Training Director/Coordinator	<u>1</u> Drafter
<u>2,3</u> Project Manager	<u>2,3</u> Boilermaker
<u>2,3</u> Safety Director	<u>1</u> Regional and Urban Planner/Designer
<u>2,3</u> Electrician	<u>1</u> Materials Engineer
<u>2,3</u> Sheetmetal Worker	<u>2</u> Painter
<u>2,3</u> Security and Fire Alarm System Installer	<u>2,3</u> Concrete Finisher
<u>2,3</u> Glazier	<u>1</u> Mechanical Drafter
<u>2,3</u> Field Supervisor	<u>1</u> Environmental Designer
<u>3</u> Facilities Engineer	<u>2,3</u> Construction Foreman
<u>1</u> Civil Engineer (structural, geotechnical, transportation, etc.)	<u>2,3</u> Heating, Ventilation, Air Conditioning and Refrigeration Mechanic
<u>1</u> Computer Programmer	<u>2,3</u> Terrazzo Worker and Finisher
<u>1</u> Mechanical Engineer (HVAC, plumbing, fire protection, etc.)	<u>3</u> Maintenance Planner/Scheduler
<u>2,3</u> Equipment and Material Manager	<u>1</u> Electrical Engineer (electronics, security, telecommunications)
<u>2,3</u> Elevator Installer	<u>2,3</u> Paperhanger
<u>2,3</u> Construction Inspector	<u>1,2,3</u> Preservationist
<u>2</u> Scheduler	<u>1</u> Environmental Engineer (hydro-engineering, acoustical, etc.)

<u>2,3</u> Landscaper/Groundskeeper	<u>2,3</u> Construction Engineer
<u>1</u> Landscape Architect	<u>1</u> Surveyor
<u>3</u> Hazardous Materials Remover	<u>1</u> Fire Prevention and Protection Engineer
<u>2,3</u> Sales and Marketing Manager	<u>2,3</u> Millwright
<u>2,3</u> Tile and Marble Setter	<u>1</u> Electrical and Electronic Engineering Technician
<u>3</u> Maintenance Estimator	<u>1</u> Environmental Engineering Technician
<u>2,3</u> Construction Superintendent	<u>3</u> Remodeler
<u>1</u> Interior Designer	<u>2,3</u> Construction Manager
<u>1</u> Landscape Designer	<u>1</u> Building Code Official
<u>2,3</u> Project Manager	<u>3</u> Security Controls Manager
<u>1</u> Modeler (traditional and computer)	<u>1</u> Renderer (traditional and computer)
<u>2</u> General Contractor/Builder	<u>2,3</u> Carpet Installer
<u>1</u> Civil Engineering Technician	<u>2,3</u> Pipe Fitter
<u>3</u> Highway Maintenance Worker	<u>2,3</u> Specialty Contractor
<u>1</u> Specifications Writer	<u>1</u> Surveying and Mapping Technician
<u>3</u> Restoration Technician	<u>3</u> Wastewater Maintenance Technician
<u>2,3</u> Project Inspector	<u>2,3</u> Plumber

<u>2,3</u> Manufacturer's Representative	<u>3</u> Thermal Control Technician
<u>1</u> Computer Aided Drafter (CAD)	<u>3</u> Hydro Testing Technician
<u>3</u> Refractory Technician	<u>1</u> Industrial Engineer
<u>2,3</u> Subcontractor	<u>2,3</u> Steamfitter
<u>3</u> General Maintenance Contractor	<u>3</u> Demolition Engineer
<u>2,3</u> Specialty Trades Subcontractor	<u>2,3</u> Service Contractor
<u>3</u> Heavy Equipment Operating Engineer	<u>2,3</u> Mason
<u>2</u> Construction Craft Laborer	<u>2,3</u> Carpenter
<u>2,3</u> Plasterer/Drywall	<u>2,3</u> Insulation Worker
<u>2</u> Electronic Systems Technician	<u>3</u> Reliability Engineer
<u>2,3</u> System Installer	<u>2</u> Explosives Worker
<u>2</u> Roofer	<u>2,3</u> Safety Director

END OF DOCUMENT

Exploring Careers in Architecture & Construction

Student Name: _____
(PRINT)

Date Assignment Due: _____ **Date Assignment Submitted:** _____

_____ Activity Satisfactorily Completed

_____ Activity Not Completed (see notes below)

Pathway Matching

The *Architecture & Construction Career Cluster* is divided into three Pathways according to the tasks of designing, planning, managing, building and maintaining our built environment. Our built environment involves much more than we typically think about, such as houses and skyscrapers. Our built environment also includes factories, schools, hospitals, buildings of worship, bridges, water towers, antenna towers, shopping malls, lake dams, roads, monuments and more. All of these begin with design and end with the need for maintenance.

The three Pathways for the *Architecture & Construction Career Cluster* are:

1. _____
2. _____
3. _____

Occupation – Pathway Matching

Given the list below, place the number of the Pathway from the above list next to the occupation it matches. If you think an occupation could match with more than one of the Pathways, you may put more than one number. Be ready to say why you think the occupation matches the Pathway or Pathways you listed.

____ Architect	____ Cost Estimator
____ Iron/Metalworker (structural and reinforcing)	____ Architectural and Civil Drafter
____ Education and Training Director/Coordinator	____ Drafter
____ Project Manager	____ Boilermaker
____ Safety Director	____ Regional and Urban Planner/Designer

____ Electrician	____ Materials Engineer
____ Sheetmetal Worker	____ Painter
____ Security and Fire Alarm System Installer	____ Concrete Finisher
____ Glazier	____ Mechanical Drafter
____ Field Supervisor	____ Environmental Designer
____ Facilities Engineer	____ Construction Foreman
____ Civil Engineer (structural, geotechnical, transportation, etc.)	____ Heating, Ventilation, Air Conditioning and Refrigeration Mechanic
____ Computer Programmer	____ Terrazzo Worker and Finisher
____ Mechanical Engineer (HVAC, plumbing, fire protection, etc.)	____ Maintenance Planner/Scheduler
____ Equipment and Material Manager	____ Electrical Engineer (electronics, security, telecommunications)
____ Elevator Installer	____ Paperhanger
____ Construction Inspector	____ Preservationist
____ Scheduler	____ Environmental Engineer (hydro engineering, acoustical, etc.)
____ Landscaper/Groundskeeper	____ Construction Engineer
____ Landscape Architect	____ Surveyor

____ Hazardous Materials Remover	____ Fire Prevention and Protection Engineer
____ Sales and Marketing Manager	____ Millwright
____ Tile and Marble Setter	____ Electrical and Electronic Engineering Technician
____ Maintenance Estimator	____ Environmental Engineering Technician
____ Construction Superintendent	____ Remodeler
____ Interior Designer	____ Construction Manager
____ Landscape Designer	____ Building Code Official
____ Project Manager	____ Security Controls Manager
____ Modeler (traditional and computer)	____ Renderer (traditional and computer)
____ General Contractor/Builder	____ Carpet Installer
____ Civil Engineering Technician	____ Pipe Fitter
____ Highway Maintenance Worker	____ Specialty Contractor
____ Specifications Writer	____ Surveying and Mapping Technician
____ Restoration Technician	____ Wastewater Maintenance Technician
____ Project Inspector	____ Plumber
____ Manufacturer's Representative	____ Thermal Control Technician
____ Computer Aided Drafter (CAD)	____ Hydro Testing Technician

____ Refractory Technician	____ Industrial Engineer
____ Subcontractor	____ Steamfitter
____ General Maintenance Contractor	____ Demolition Engineer
____ Specialty Trades Subcontractor	____ Service Contractor
____ Heavy Equipment Operating Engineer	____ Mason
____ Construction Craft Laborer	____ Carpenter
____ Plasterer/Drywall	____ Insulation Worker
____ Electronic Systems Technician	____ Reliability Engineer
____ System Installer	____ Explosives Worker
____ Roofer	____ Safety Director

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Careers in designing, planning, managing, building and maintaining the built environment.

Sample Career Specialties / Occupations	<p>Architect • Architectural and Civil Drafter • Drafter • Regional and Urban Planner/Designer • Industrial Engineer • Materials Engineer • Mechanical Drafter • Environmental Designer • Civil Engineer (structural, geotechnical, transportation, etc.) • Programmer • Mechanical Engineer (HVAC, plumbing, fire protection, etc.) • Electrical Engineer (electronics, security, telecommunications) • Preservationist • Environmental Engineer (hydro engineering, acoustical, etc.) • Landscape Architect • Surveyor • Fire Prevention and Protection Engineer • Cost Estimator • Electrical and Electronic Engineering Technician • Civil Engineering Technician • Environmental Engineering Technician • Surveying and Mapping Technician • Interior Designer • Landscape Designer • Specifications Writer • Building Code Official • Computer Aided Drafter (CAD) • Renderer (traditional and computer) • Modeler (traditional and computer)</p>	<p>General Contractor/Builder • Specialty Contractor • Construction Engineer • Construction Manager • Superintendent • Project Manager • Construction Foreman • Estimator • Project Inspector • Manufacturer's Representative • Sales and Marketing Manager • Equipment and Material Manager • Scheduler • Education and Training Director/Coordinator • Safety Director • Construction Inspector • Subcontractor • Preservationist • Service Contractor • Field Supervisor • Specialty Trades Subcontractor • Mason • Construction Craft Laborer • Iron/Metalworker (structural and reinforcing) • Carpenter • System Installer • Electrician • Boilermaker • Electronic Systems Technician • Sheetmetal Worker • Security and Fire Alarm Systems Installer • Concrete Finisher • Glazier • Tile and Marble Setter • Landscaper/ Groundskeeper • Elevator Installer • Roofer • Painter • Explosives Worker • Plasterer/Drywall • Paperhanger • Insulation Worker • Drywall Installer • Plumber • Pipe Fitter • Millwright • Heating, Ventilation, Air Conditioning and Refrigeration Mechanic • Carpet Installer • Electrician • Steamfitter • Terrazo Worker and Finisher</p>	<p>General Maintenance Contractor • Specialty Contractor • Construction Engineer • Construction Manager • Superintendent • Project Manager • Construction Foreman • Estimator • Facilities Engineer • Reliability Engineer • Project Inspector • Operating Engineer • Manufacturer's Representative • Sales and Marketing Manager • Equipment and Material Manager • Scheduler • Maintenance Planner/Scheduler • Maintenance Estimator • Security Controls Manager • Preservationist • Remodeler • Safety Director • Construction Inspector • Subcontractor • Service Contractor • Field Supervisor • Specialty Trades Subcontractor • Mason • Iron/Metalworker (structural and reinforcing) • Carpenter • System Installer • Electrician • Boilermaker • Cost Estimator • Sheetmetal Worker • Security and Fire Alarm System Installer • Concrete Finisher • Glazier • Tile and Marble Setter • Hazardous Materials Remover • Landscaper/Groundskeeper • Elevator Installer • Paperhanger • Insulation Worker • Drywall Installer • Insulation Worker • Plumber • Pipe Fitter • Millwright • Heating, Ventilation, Air Conditioning and Refrigeration Mechanic • Carpet Installer • Electrician • Steamfitter • Terrazzo Worker and Finisher • Refractory Technician • Hydro Testing Technician • Thermal Control Technician • Restoration Technician • Wastewater Maintenance Technician • Highway Maintenance Worker</p>
Pathways	<p>Design/Pre-Construction</p>	<p>Construction</p>	<p>Maintenance/Operations</p>
Cluster K&S	<p>Cluster Knowledge and Skills</p> <p>♦ Academics ♦ Communications ♦ Problem Solving and Critical Thinking ♦ Information Technology Applications ♦ Systems ♦ Safety, Health and Environmental ♦ Leadership and Teamwork ♦ Ethics and Legal Responsibilities ♦ Employability and Career Development ♦ Technical Skills</p>		



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Career Exploration

Students should begin this unit by getting a broad overview of the types of occupations they will find in this Career Cluster. They need to see the big picture first before exploring individual occupations.

Teacher Preparation

Identify enough occupations so you will have no more than two or three students working at any one station. Set up stations around your classroom/lab with short activities that represent the three Pathways of occupations which are *Design/Pre-Construction*, *Construction*, and *Maintenance/Operations*. Be sure to include occupations such as *building code inspector* and *surveyor*, as well as typical occupations such as *architect* and *carpenter*.

Suggested Activities

Round-Table Explorations Activity

Have students rotate through each station. (See *Round-Table Explorations Activity*) On this worksheet, the students select the level of education/training and basic skills **they think** they would need to have to successfully work in that occupation (Area Career Center, Community College, or University). Students will research specific career occupations later in the unit of study. (Print enough *Round Table Exploration Information Sheet and Worksheets* for each student)

Round-Table Exploring Examples

Surveyor – Set up an area that displays topographical maps, cut & fill diagrams, and plot plans with the location of a building. Also have a transit or builder's level set up and have students read several elevation shots preset around the room/lab. Provide an information sheet or short video on the tasks a *surveyor* must do.

Building Inspector – Set up mock rough-framed walls or a scaled model of a rough-framed house. Have students use an inspection sheet (specific requirements listed) and a framing detail drawing to try and identify framing problems. You may also have some electrical and/or plumbing as part of the model.

Class Discussion

Discuss various academic and career preparation requirements for each of the stations explored by students. Help students understand the differences between each educational level and occupational level of Technician, Technologist, and Professional. (See *Round-Table Exploration Information Sheet* in this section and *Definitions of Three Levels of Occupations* sheet in *Career Search* section of this Unit)

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Round Table Explorations Information

Every occupation requires a minimum amount of training and/or education and certain basic skills. As you rotate through each of the Occupation Stations, you will be asked to match the education and the skills **you think** are needed to enter that occupation.

Education: Different levels of education/training are required for different occupations. Below is a list with a brief description of each level. Use these definitions to determine the level needed for each occupation you examine.

REQUIRED EDUCATION LEVELS

No Schooling – not completing high school or dropping out at an age allowed by law

High School GEP (General Education Program) – graduating from high school with a general education or college preparatory program

High School CEP (Career Education Program/Area Career Center) – graduating from high school with a program in one of the career education occupations

On-the-Job Training/Apprenticeship – learning a job while you are working in that job (may or may not require a high school diploma)

Trade School – school that teaches specialized skills for specific occupations (can be public schools, private schools, or trade unions)

Military Training – similar to trade schools in that you are taught specialized skills for a specific occupation in the military (requires a minimum of a high school diploma)

Community College (2-year) – two-year college education that leads to an associate's degree and may include specialized technical skills

College/University (4-year) – four-year college education that leads to a bachelor's degree and may include higher levels of specialized technical skills, engineering, science, and mathematics on a professional level

College/University (graduate degree) – education after a bachelor's degree in professional fields such as engineering, science, medicine, law, management or education

REQUIRED SKILLS

Reading

Ability to read and comprehend at a high school level

Writing

Ability to write simple and complex sentences with correct spelling, grammar and punctuation which allows for clear communication

Calculating

Ability to perform simple mathematical operations such as add, subtract, multiply and divide and comprehend simple geometric relationships (this may include reading and measuring with a ruler or tape measure)

Computer Literacy

Ability to perform basic computer operations such as save and retrieve files, word processing and spreadsheet operations

Problem-Solving/Critical Thinking

Ability to clearly identify and solve problems through a defined process

Leadership/Teamwork

Ability to successfully lead a group and work with a group to accomplish a task or solve a problem

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Round Table Explorations

Student Name:

(Print)

Date Assignment Due:**Date Assignment Submitted:**☐ Activity Satisfactorily Completed☐ Activity Not Completed (see notes below)

Fill in the required spaces below after you have completed the activity for each station.

OCCUPATION:

Print the Name of the Occupation

Check (✓) the minimum level of education you think would be needed for entry to this occupation:

☐ No School☐ High School (GEP)☐ High School (CEP)☐ On-the-Job Training☐ Trade School☐ Military Training☐ Community College (2 years)☐ College/University (4 years)☐ College/University (Graduate Degree)

Check (✓) all the required skills you think would be needed for entry to this occupation:

☐ Reading☐ Writing☐ Calculating☐ Computer Literacy☐ Problem Solving/Critical Thinking☐ Leadership/Teamwork**SEE BACK OF THIS PAGE FOR REFLECTIVE RESPONSES**

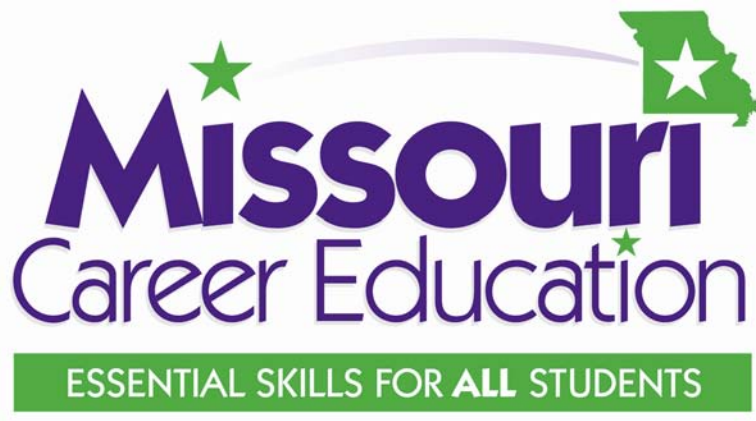
Reflective Response:

Use complete sentences, correct spelling and correct punctuation when completing the statements below. Be sure to read what you write to make sure it is clear to you and others.

1. I think this occupation would be fun to work in because

OR

1. I do not think this occupation would be fun to work in because
2. An example of how I might use problem solving in this occupation
3. An example of how I might have to use teamwork in this occupation
4. The reason I checked _____ as the minimum level of education needed for this occupation is
5. The reasons I checked the skills needed for this occupation are



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Exploring Careers in Architectural Design & Pre-Construction

Exploring Career Clusters
Course A
Architecture & Construction
Science, Technology, Engineering, and Mathematics
Manufacturing

Possible Careers: Architect • Architectural Engineer • Architectural Drafter • Regional Planner • Landscape Architect • Civil Engineer
Cost Estimator

Architecture & Pre-Construction

Our built environment begins with identifying the needs of the people (clients) who will be paying for the structures as well as the people who will be using the structures. Once these needs have been identified, the *designer (architect)* moves through the process of design ideas to construction documents. This assignment is intended to give the student an exposure to this process.

Teacher Preparation

Prepare a bulletin board or other visual display that illustrates the design process *architects* and *building designers* use. Be sure to include a mixture of gender and ethnicity in your displays. Have on hand two or three sets of construction documents for students to view.

Prepare to discuss and demonstrate the process of using client criteria to create successful designs. Help students recognize the need to consider not only client criteria but local building codes, land use requirements, and other professionals often involved in the design process such as interior designers, engineers, and product suppliers. You may want to arrange to have a city or county building code inspector speak on the need for buildings to meet minimum code requirements and why there is a need for land use restrictions. They can also share about their occupations at the same time.

This is also the time to introduce the concept of *scaling* a drawing. You may involve students as deeply as time allows. For example, you may want to use the architect's scale and teach your students to read and measure in $\frac{1}{4}" = 1'-0"$ scale or you may just want to use $\frac{1}{4}"$ graph paper. Students should understand the reason for scaling a drawing as well as what scales are typically used in construction documents.

Suggested Activity: Design/Pre-Construction

1. *Design Contract*

Review and fill out the *Design Contract* with your students. Help them understand what a contract is and how important it is to live up to a contract. (See *Design Contract Activity*)

2. *Client Criteria*

Go over the *Client Criteria* form with your students to determine what requirements will be used for the design of their structure. This example is for the playhouse project. You may choose to use another project, in which case you will need to develop a different *Client Criteria* list. (See *Client Criteria Activity*)

3. *Floor Plan Design Ideas*

This activity will give your students the opportunity to brainstorm ideas for a floor plan layout based on the criteria established in the first activity. You should review with students what is included on a floor plan and the appropriate symbols used before they begin this activity. Student Teams (or individuals) should use $\frac{1}{4}"$ graph paper to

record their floor plan ideas for the design problem. Be sure the students label each room/area and give basic dimensions. They should also indicate the square footage of the floor plan. Require students to check each other's work to make sure plans meet all of the client criteria. (See *Brainstorm Floor Plan Ideas Activity*)

4. *Exterior Elevation Ideas*

This activity will give your students the opportunity to brainstorm ideas for exterior elevations based on the criteria established in the first activity. You should review with students what is included on exterior elevations and the appropriate symbols used before they begin this activity. Student teams (or individuals) should use 1/4" graph paper to record their exterior elevation ideas for the design problem. Be sure the students label exterior materials and give basic dimensions. Require students to check each other's work to make sure plans meet all of the client criteria. (See *Brainstorm Exterior Elevation Ideas Activity*)

5. *Client Approval*

Students need to understand that the process of design includes meeting the desires and wants of the client. This activity provides accountability for the *architect* or *designer* (student). The *Client Approval* form also provides the teacher with a method of assessing the student work. (See *Client Approval form*)

END OF DOCUMENT



Possible Careers: Architect · Architectural Engineer · Architectural Drafter · Regional Planner · Landscape Architect · Civil Engineer
Cost Estimator

Architectural Design/Pre-Construction

Student Design Company, Inc. (SDCI) has been awarded a contract to design a playhouse to be used by the local Career Center Building Trades and the Architectural Design instructors as a teaching aide in their courses. This house is to be designed according to client criteria (a list of wants and needs by the person paying for the project). Plans and specifications must be included in the final project.

You have been employed by SDCI as a designer/architect to design this playhouse. You should read the Contract completely and become familiar with the requirements. It will be your responsibility as the Designer to complete the job correctly. Begin the job by completing the tasks listed below.

Learning Objectives:

Upon successful completion of this assignment, you will be able to:

1. List the steps required to design a building with specific requirements.
2. Explain why the designer needs to meet client criteria.
3. Explain why the designer needs construction documents to build a structure for a client.
4. Identify the different drawing sheets found in a set of construction documents.

Complete the following tasks to begin the design job:

Background Information:

1. Investigate what information is needed on Floor Plans, Exterior Elevations, and Wall Sections.
2. Investigate what information is included in Construction Documents.
3. Investigate the requirements for building codes and how they are used.

Designer Tasks:

1. Interview the Client to identify the design criteria, then complete the *Design Contract*. (See *Client Criteria form* and *Design Contract form*)
2. Develop at least three freehand sketches of possible floor plan ideas on separate sheets and freehand sketch matching front and side exterior elevations for each floor plan idea. (See *Brainstorming Floor Plan Ideas* and *Brainstorming Exterior Elevation Ideas* forms)
2. Obtain approval from the client on at least one of your design ideas. (See *Client Approval form*)

END OF DOCUMENT

Student Name: **Client Meeting Date:**

Print

Assessment Score:

Client Criteria

The architect or building designer is hired by a *client* (a person that needs a building designed to meet specific requirements) to design a building. The client will often have some idea of what they want in their building but will need the professional designer (architect or building designer) to develop the best plans for their building. The designer will begin by interviewing the client to gain an understanding of what the client wants and needs. This activity will provide you with an opportunity to experience finding out what the client wants and needs for this design project.

Client Criteria

Client Name:

Print Name

Location of Building Site:

Maximum Square Footage: **Sq. Ft.**

Flooring Material: ☐ Plywood ☐ T&G Plank ☐ Particle Board ☐ MDF Board

Interior Wall Material: ☐ Gypsum Board ☐ Wall Paneling ☐ Lap Siding ☐ T&G Plank

Exterior Wall Material: ☐ Plywood ☐ T&G Plank ☐ Lap Siding ☐ Masonry

Roof Style: ☐ Gable ☐ Hip ☐ Shed

Roof Material:

Electrical Requirements:

Number of windows

Number of exterior doors

Additional Requirements:

SEE MATERIALS VOCABULARY ON REVERSE SIDE

CONSTRUCTION MATERIALS VOCABULARY

Plywood • $\frac{3}{4}$ " X 4' X 8' (3/4" X 48" X 96") Laminated wood sheet material

T&G Plank • Tongue and groove wood boards (random widths of 2", 4", or 6" and random lengths)

Particle Board • Composite wood chip material pressed and glued in the form of 4' X 8' sheets similar to plywood (often a substitute for plywood)

MDF Board • Medium Density Fiber Board, wood composite material pressed and glued in the form of 4' X 8' sheets, very smooth surface

Gypsum Board • Sometimes referred to as "Sheet Rock," this is an interior wall covering made with natural gypsum material faced with paper on both sides. Gypsum board comes in various thicknesses and 4' X 8', 4' X 12' and 4' X 16' sizes. The most common size is 4' X 8'.

Wall Paneling • Paneling is a 4' X 8' sheet material used for interior surfaces. Paneling comes in various thicknesses and can be a wood product or a composite of plastic materials

Lap Siding • 4", 6", 8" or 10" wide wood, plastic, or metal planks (usually beveled) nailed horizontally on the exterior of the building

Masonry • Bricks, stones or concrete blocks used for exterior wall covering

Gable Roof • Roof slopes on two sides from center ridge

Hip Roof • Roof slopes on all four sides from ridge

Shed Rood • Roof slopes in only one direction

END OF DOCUMENT

Possible Careers: Architect · CAD Technologist · Interior Designer · Model Maker · Resource Manager

Design Contract

Assessment Score: _____

This Contract made and entered into this _____ day of _____, 20_____,
between _____

called "Client" whose address is _____
Street Address
City
State
Zip Code

and Student Design Company, Inc., called "Designer" whose address is _____

- | Class Hour/Period | School Name |
|---|-------------|
| Both parties hereby agree: | |
| 1. DESIGN CRITERIA: <u>Client</u> will provide criteria for the design of the building. | |
| 2. PRELIMINARY PLANS: <u>Designer</u> will provide preliminary designs (floor plan and one elevation view) for <u>Client</u> to choose and approve. | |
| 3. PAYMENT: <u>Client</u> agrees to pay <u>Designer</u> the agreed points of _____, together with any additional points agreed upon prior to execution of said Contract. Final payment will be made upon final approval of the completed project by the <u>Client</u> . | |
| 4. COMPLETION: <u>Designer</u> shall begin design work immediately upon obtaining signed contract and shall have project completed no later than _____, subject to permissible delays as described in School Student Handbook and/or Instructor Regulations. | |
| 5. WORK PERFORMANCE: <u>Designer</u> shall perform all work and shall not pass on or relegate work to any subcontractor (student) inside or outside of class. | |
| 6. TOOLS & EQUIPMENT: <u>Designer</u> shall be responsible for the safe and correct use of all tools and/or equipment used by <u>Designer</u> to complete the project. | |
| 7. DESIGN MATERIALS & SUPPLIES: <u>Designer</u> shall be responsible for requesting and obtaining all necessary materials and supplies for the project. | |
| 8. SAFETY: <u>Designer</u> shall be responsible for knowing and following all general and specific safety rules while working on the project. <u>Designer</u> shall keep work area clear of all clutter and/or hazards at all times during the project. | |

Design Criteria:

[illegible]

Client Signature

Designer Signature

Print Name _____

Print Name _____

Possible Careers: Architect · Architectural Engineer · Architectural Drafter · Regional Planner · Landscape Architect · Civil Engineer
Cost Estimator

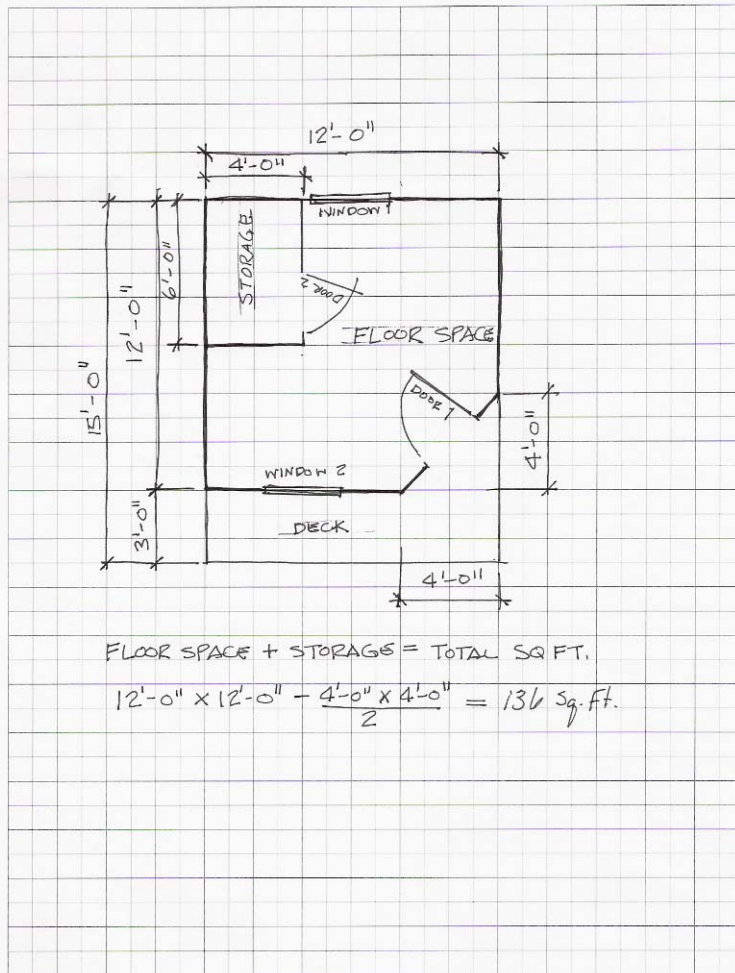
Designing Floor Plan Ideas

The architect or designer will begin sketching ideas for a floor plan layout once the client criteria (See *Client Criteria* activity) have been documented. These ideas are usually quick freehand sketches that record ideas the designer has in mind. When the sketches are drawn, the architect or designer will also put important notes such as room names, dimensions or other information to remind them later about such details. The date is also important to include on the sketches. Often, the architect or designer will produce ten, fifteen, or more ideas before deciding on one or two ideas to present to the client.

Your assignment is to sketch at least **three different ideas** for floor plans with notes that meet the client criteria. Use separate *Brainstorming Floor Plan Ideas* forms to record each of your ideas. Show your math work when calculating square footage for each of your structures. Remember, no matter what the architect or designer come up with, if it does not meet the client criteria, the architect or designer has not been successful. Once you have completed your sketches, ask another student to check and sign your design to make sure it meets the client criteria. See the example on to the right.

Brainstorming Floor Plan Ideas

Student Designer: Good Student Idea # 1 Date: 09/30/05
 Floor Plan Area: 136 Sq. Ft.



FLOOR SPACE + STORAGE = TOTAL SQ. FT.
 $12'-0'' \times 12'-0'' - \frac{4'-0'' \times 4'-0''}{2} = 136 \text{ Sq. Ft.}$

Architecture & Construction Career Cluster Brainstorming Floor Plan Ideas

Drawing 1 *Brainstorming Floor Plan Ideas*

END OF DOCUMENT

Student Designer: _____ Idea # _____ Date: _____

Checked by: _____

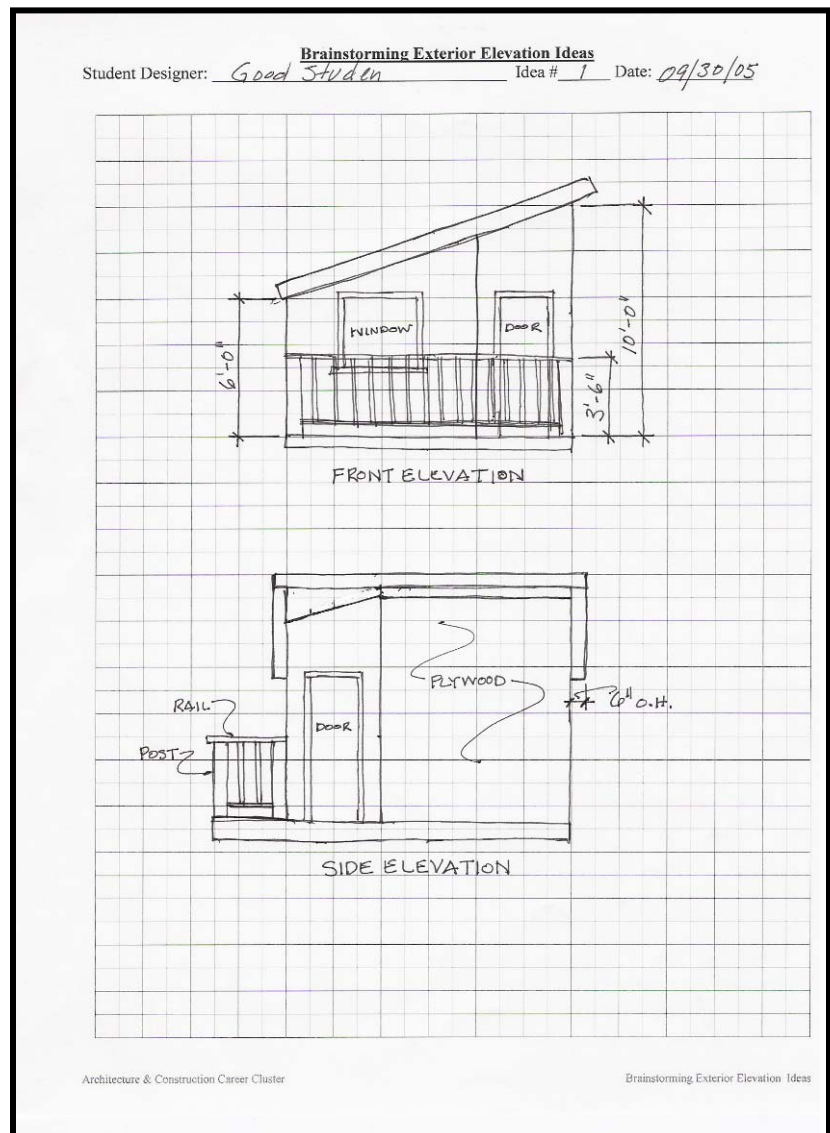
A full-page view of a blank sheet of graph paper. The page is covered by a uniform grid of thin, light gray lines forming small squares. There are no margins, text, or other markings on the paper.

Possible Careers: Architect • Architectural Engineer • Architectural Drafter • Regional Planner • Landscape Architect • Civil Engineer
Cost Estimator

Designing Exterior Elevation Ideas

After the architect or designer sketches ideas for a floor plan layout, they will sketch ideas for exterior elevations (how the outside of the building might look). These ideas are usually quick freehand sketches that record ideas the designer has in mind. When the sketches are drawn, the architect or designer will also put important notes such as type of siding material, dimensions or other information to remind them later about such details. The date is also important to include on the sketches. Often, the architect or designer will produce ten, fifteen, or more ideas before deciding on one or two ideas to present to the client.

Your assignment is to sketch the **elevations** for each of the **three floor plans** you sketched in the previous assignment that meet the client criteria. Use separate *Brainstorming Exterior Elevation Ideas* forms to record each of your ideas. Sketch **two different elevations** (front and side views) for each floor plan idea. Look at the example on the right. Remember, no matter what the architect or designer comes up with, if it does not meet the client criteria, the architect or designer has not been successful. Once you have completed your sketches, ask another student to check and sign your design to make sure it meets the client criteria. See the example on to the right.



Drawing 2 *Brainstorming Exterior Elevation Ideas*

END OF DOCUMENT



Brainstorming Exterior Elevation Ideas

Student Designer: _____ Idea # _____ Date: _____

Floor Plan Area: _____ Sq. Ft.

Checked by: _____

Student Signature _____

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form a uniform pattern of small squares across the entire surface. There are no margins, text, or other markings present.



Exploring Careers in Architecture & Construction

Possible Careers: Architect • Architectural Engineer • Architectural Drafter • Regional Planner • Landscape Architect • Civil Engineer
Cost Estimator

Client Approval Form

TO BE COMPLETED BY THE DESIGNER

- Attach three design proposals (*Floor Plan and Exterior Elevations*) in order of recommendation to this form.
- Explain below why you have chosen the first design to be number one.

Print Designer's Name

Date Designs Submitted

TO BE COMPLETED BY THE CLIENT

The Client hereby (check one)

- ☐ accepts the attached design proposal from the designer in full
- ☐ accepts the attached design in part with the following changes to be made:
- 1.

2.

3.

Use reverse side if needed

- ☐ rejects the attached design proposal based on the following:
- 1.

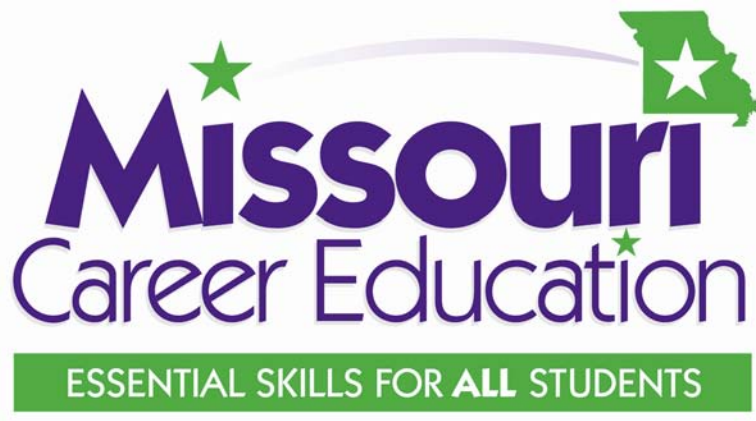
2.

3.

Use reverse side if needed

Client Signature

Date Reviewed

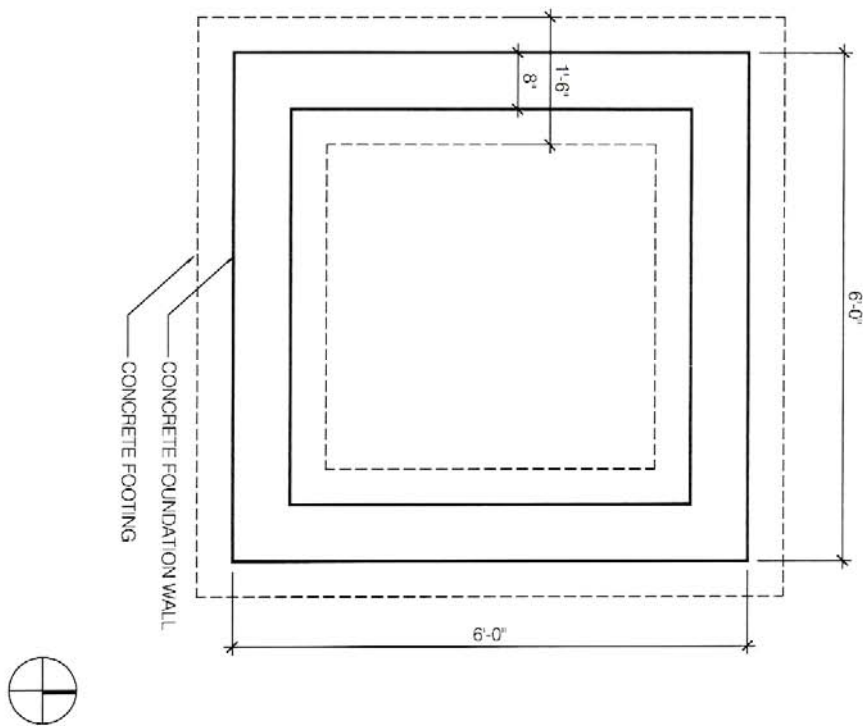


Missouri Center for Career Education
Department of Career & Technology Education
Central Missouri State University
Warrensburg, Missouri

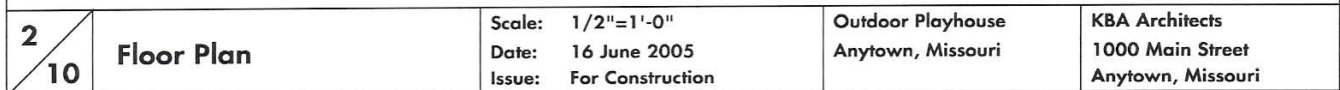
Division of Career Education
Department of Elementary & Secondary Education
Jefferson City, Missouri

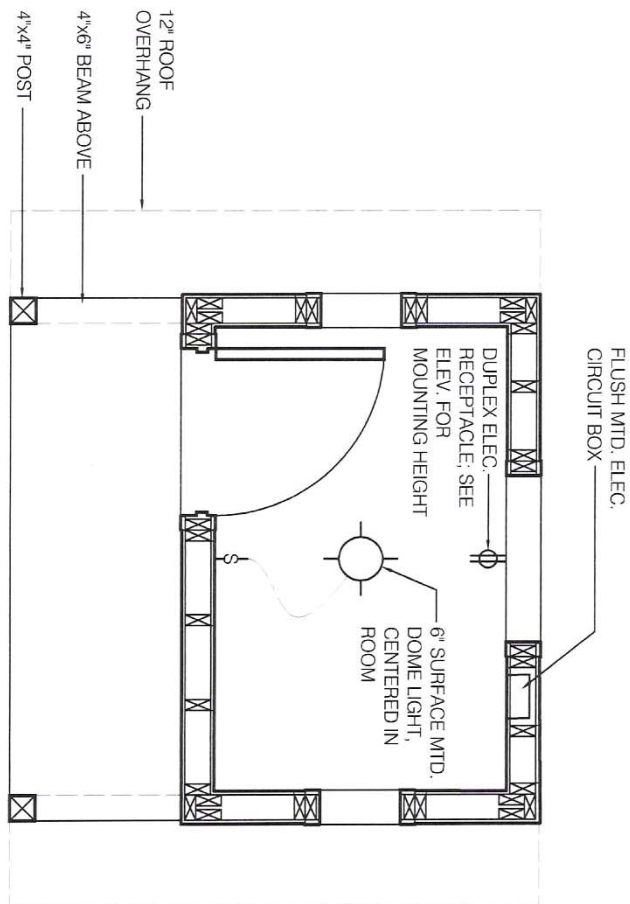
Exploring Career Playhouse Construction Documents

Exploring Career Clusters
Course A
Architecture & Construction
Science, Technology, Engineering, and Mathematics
Manufacturing

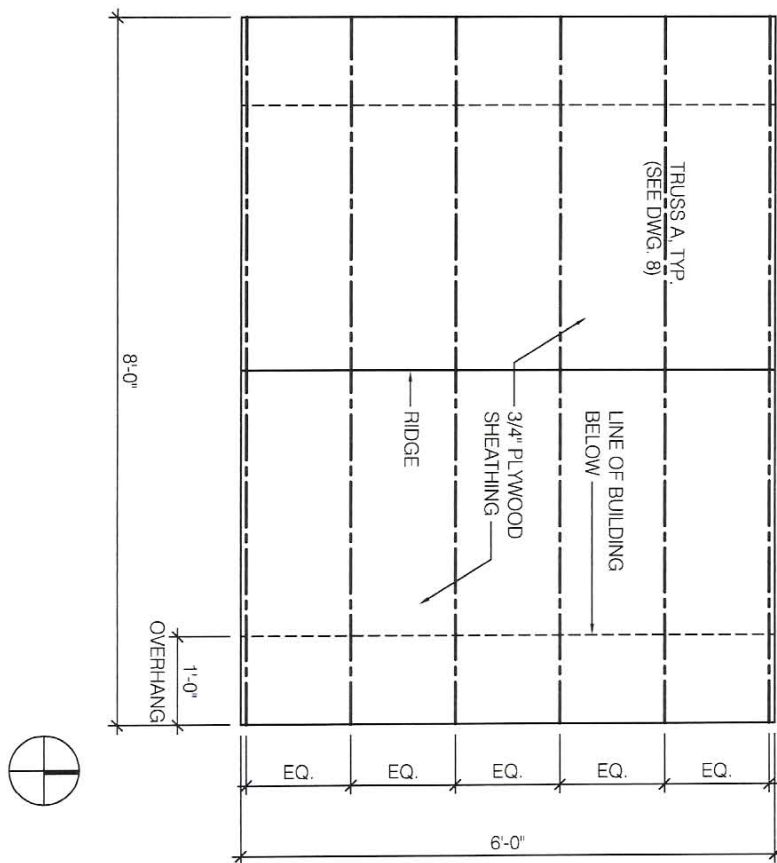


<div>1</div> <div>10</div>	Foundation Plan	Scale: 1/2"=1'-0" Date: 16 June 2005 Issue: For Construction	Outdoor Playhouse Anytown, Missouri	KBA Architects 1000 Main Street Anytown, Missouri
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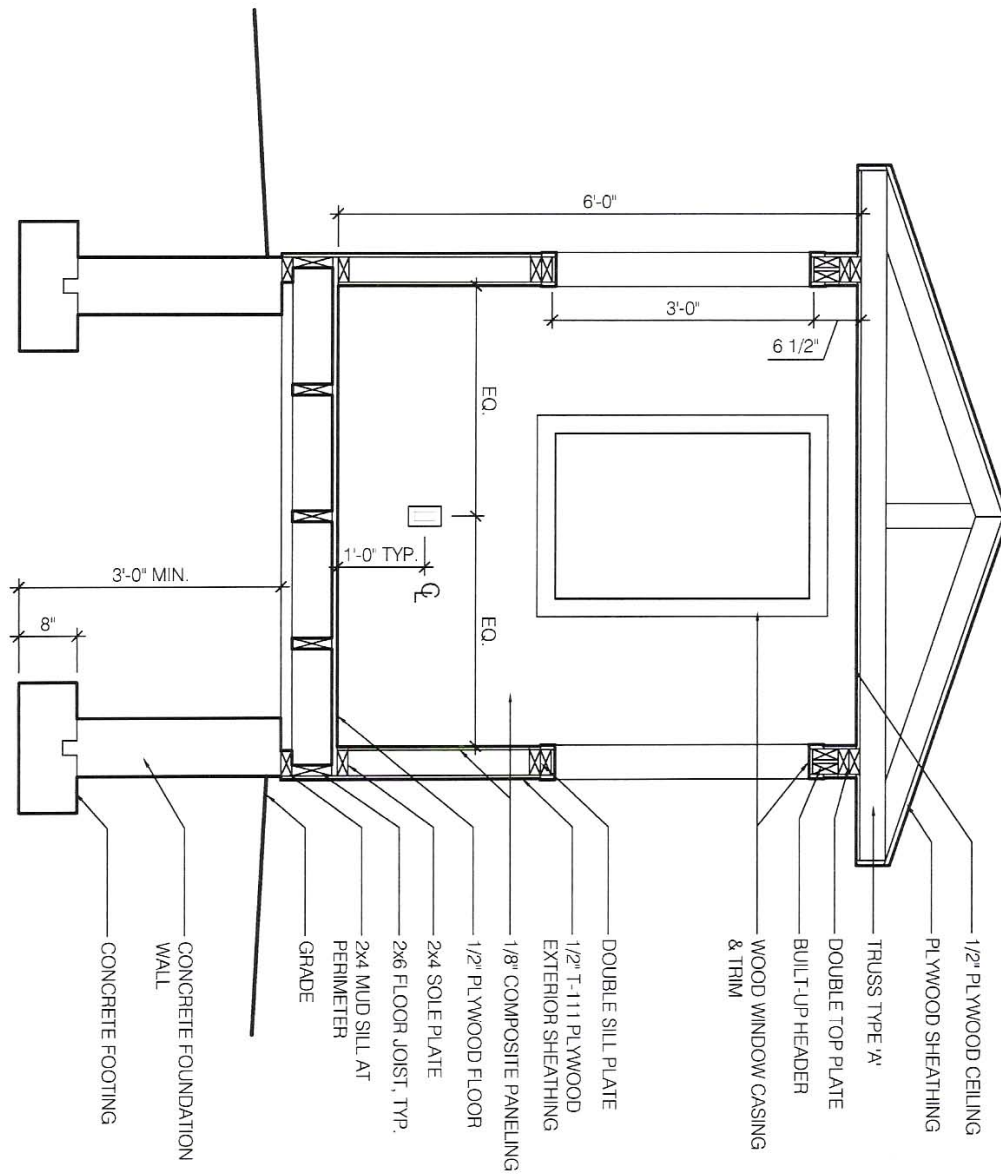




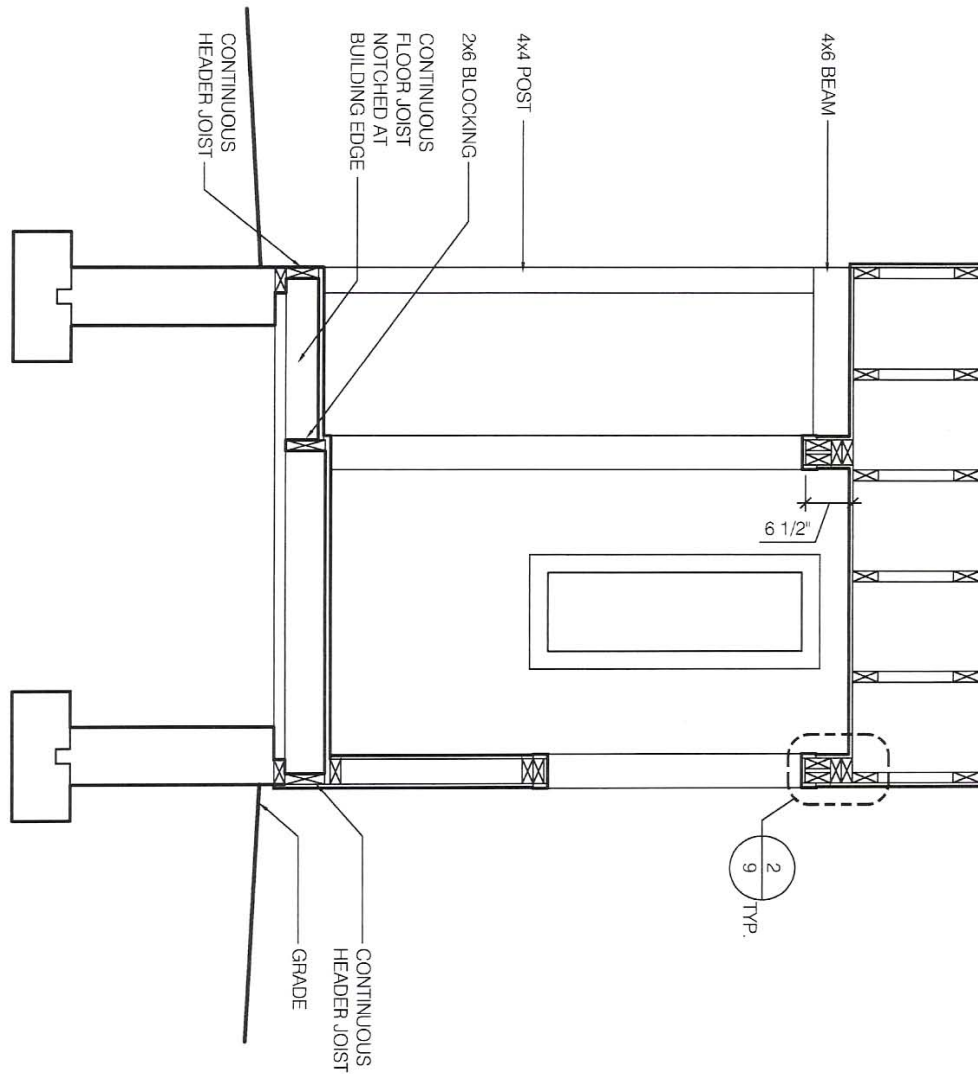
3 10	Electrical Plan	Scale: 1/2"=1'-0" Date: 16 June 2005 Issue: For Construction	Outdoor Playhouse Anytown, Missouri	KBA Architects 1000 Main Street Anytown, Missouri
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<div>4</div> <div>10</div>	Roof Plan	Scale: 1/2"=1'-0" Date: 16 June 2005 Issue: For Construction	Outdoor Playhouse Anytown, Missouri	KBA Architects 1000 Main Street Anytown, Missouri
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<div>5</div> <div>10</div>	<div>Section A-A</div>	<div>Scale: 1/2"=1'-0"</div> <div>Date: 16 June 2005</div> <div>Issue: For Construction</div>	<div>Outdoor Playhouse</div> <div>Anytown, Missouri</div>	<div>KBA Architects</div> <div>1000 Main Street</div> <div>Anytown, Missouri</div>
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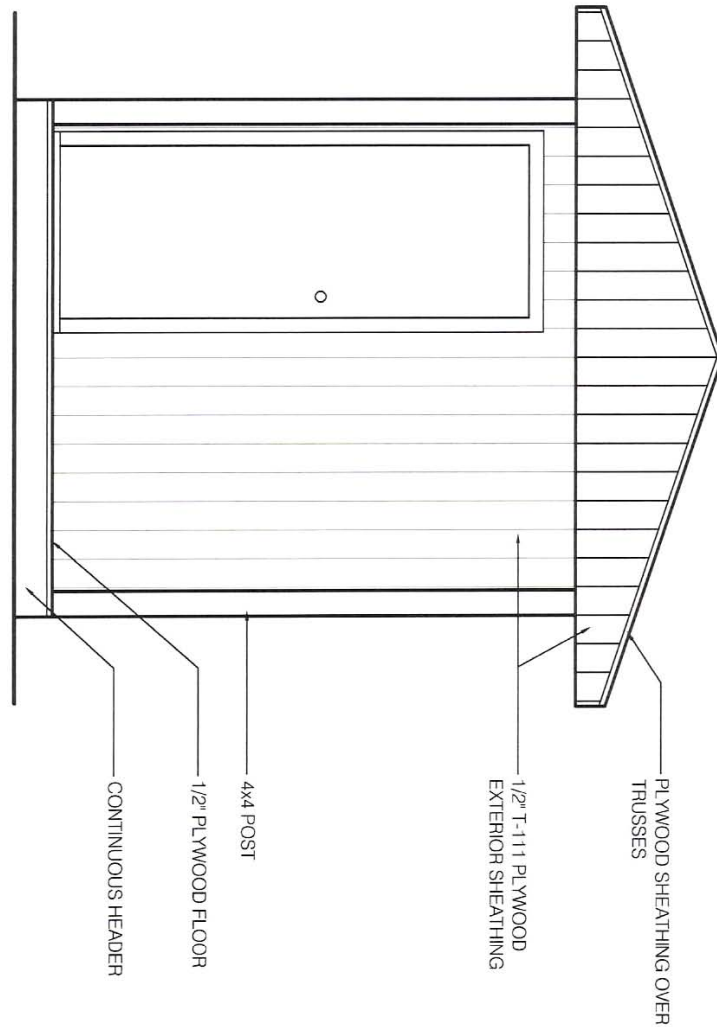
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10

Section B-B

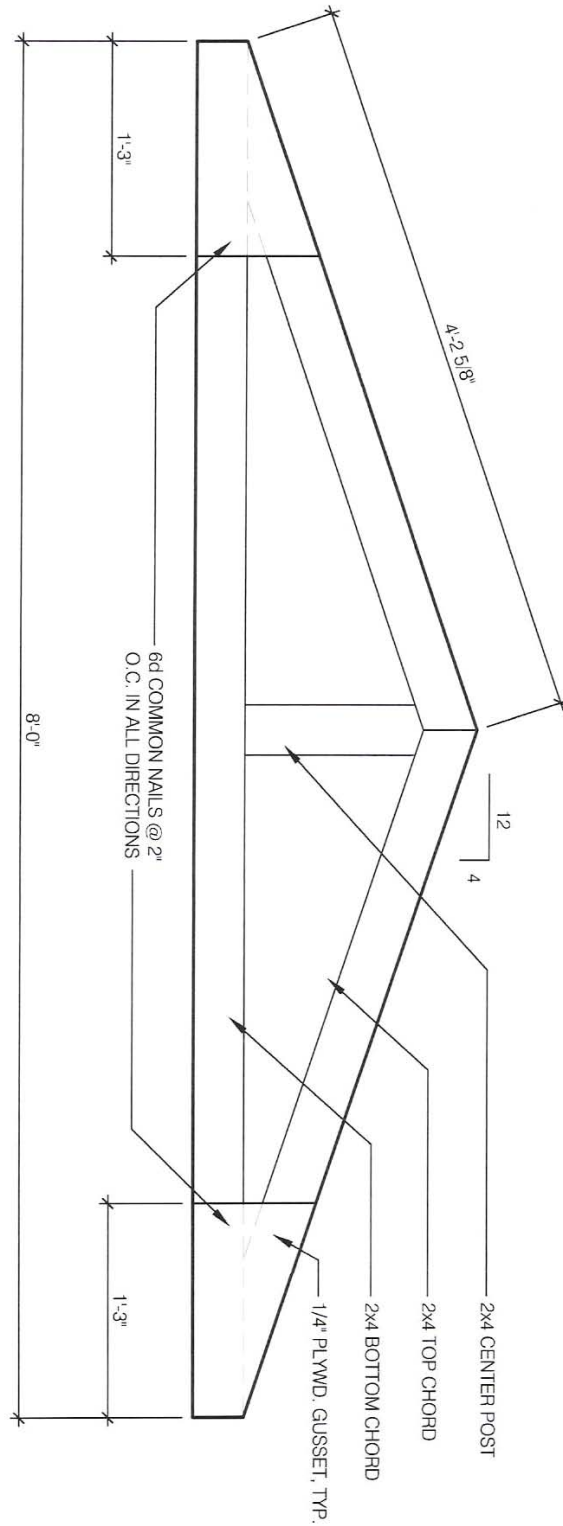
Scale: 1/2"=1'-0"
Date: 16 June 2005
Issue: For Construction

Outdoor Playhouse
Anytown, Missouri

KBA Architects
1000 Main Street
Anytown, Missouri



<div>7</div> <div>10</div>	<div>Exterior Elevations</div>	<div>Scale: 1/2"=1'-0"</div> <div>Date: 16 June 2005</div> <div>Issue: For Construction</div>	<div>Outdoor Playhouse</div> <div>Anytown, Missouri</div>	<div>KBA Architects</div> <div>1000 Main Street</div> <div>Anytown, Missouri</div>
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8
10

Truss Detail

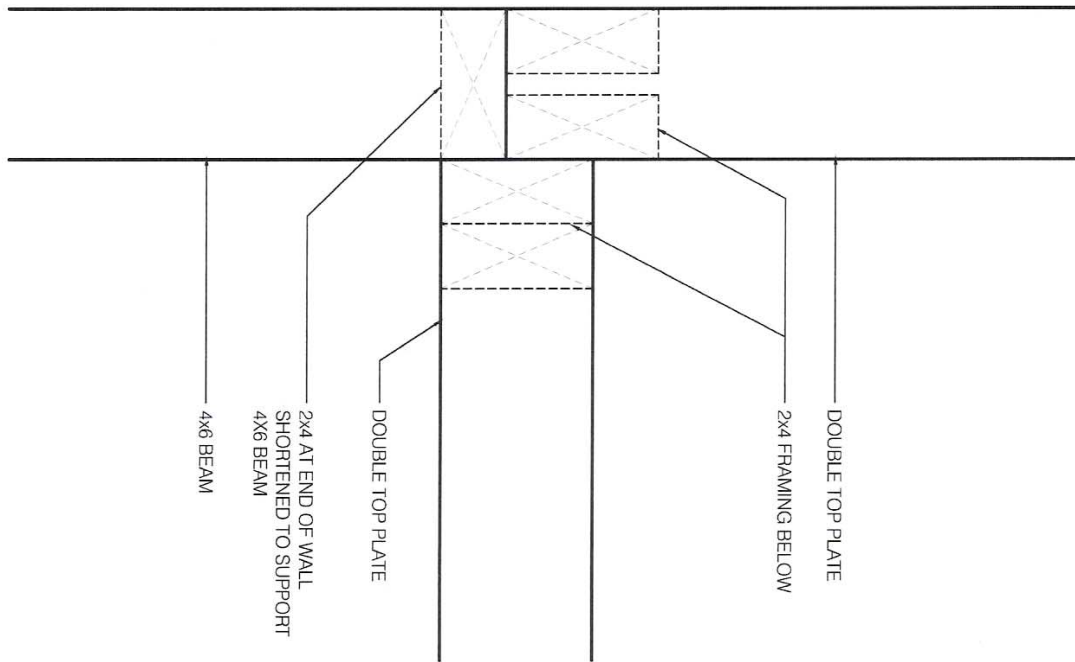
Scale: 1"=1'-0"
Date: 16 June 2005
Issue: For Construction

Outdoor Playhouse
Anytown, Missouri

KBA Architects
1000 Main Street
Anytown, Missouri

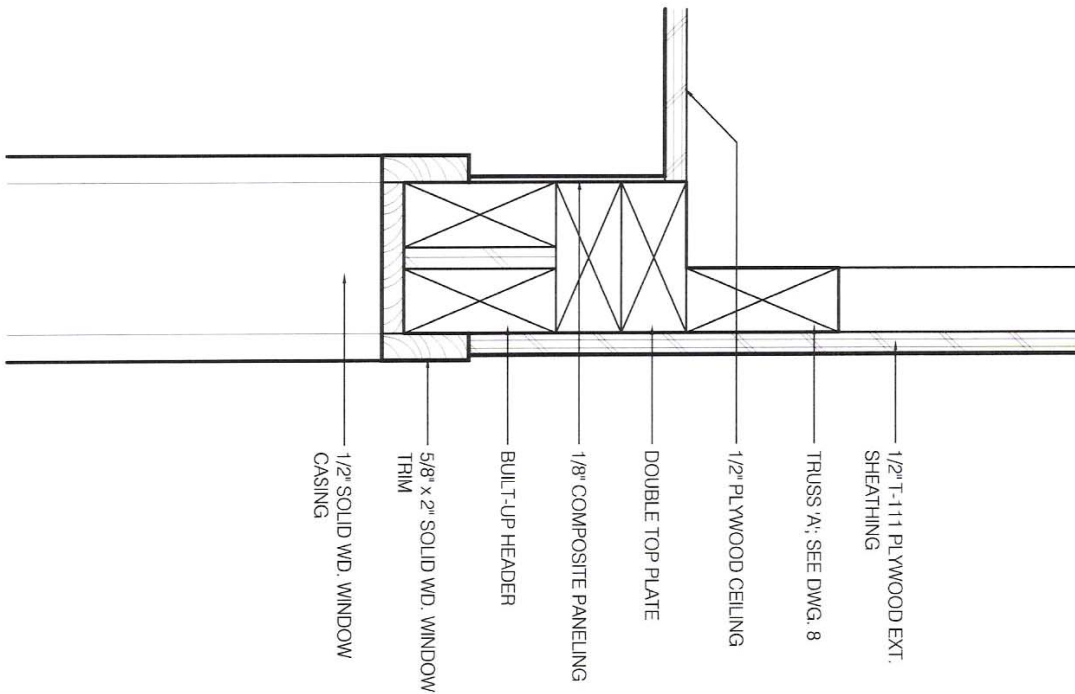
1 BEAM SUPPORT DETAIL

3"=1'-0"



2 HEADER DETAIL

3"=1'-0"



9
10

Framing Details

Scale: 3"=1'-0"
Date: 16 June 2005
Issue: For Construction

Outdoor Playhouse
Anytown, Missouri

KBA Architects
1000 Main Street
Anytown, Missouri

WINDOW SCHEDULE

WIND. NO.	ROOM NAME	MATERIAL	ROUGH OPENING		DETAIL	REMARKS
			WIDTH	HEIGHT		
1	PLAYHOUSE	WOOD	1'-0"	3'-0"	DWG. 2/9	NO GLAZING; SOLID WOOD CASING AND TRIM
2	PLAYHOUSE	WOOD	2'-0"	3'-0"	DWG. 2/9	NO GLAZING; SOLID WOOD CASING AND TRIM
3	PLAYHOUSE	WOOD	1'-0"	3'-0"	DWG. 2/9	NO GLAZING; SOLID WOOD CASING AND TRIM

DOOR SCHEDULE

DOOR NO.	ROOM NAME	MATERIAL	WIDTH	HEIGHT	THK.	DETAIL	REMARKS
1	PLAYHOUSE	WOOD	2'-0"	5'-5 1/2"	1 1/2"	DWG. 2/9	SOLID WOOD CASING AND TRIM

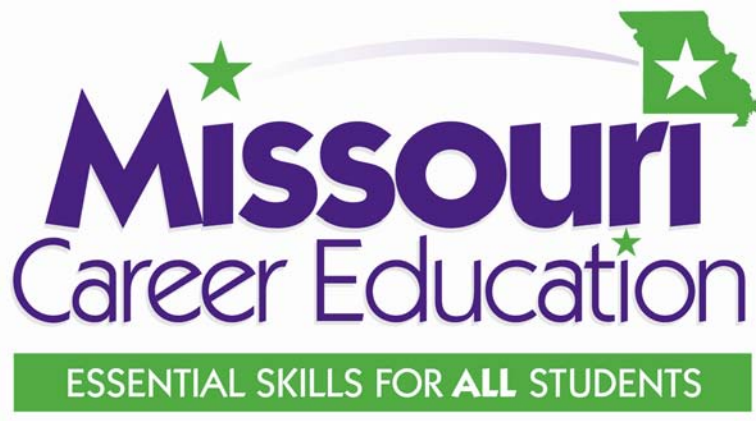
KBA Architects
1000 Main Street
Anytown, Missouri

Outdoor Playhouse
Anytown, Missouri

Scale: N.T.S.
Date: 16 June 2005
Issue: For Construction

Schedules

10/10



Missouri Center for Career Education
Department of Career & Technology Education
Central Missouri State University
Warrensburg, Missouri

Division of Career Education
Department of Elementary & Secondary Education
Jefferson City, Missouri

Exploring Careers in Construction

Exploring Career Clusters
Course A
Architecture & Construction
Science, Technology, Engineering, and Mathematics
Manufacturing



Introduction to Construction

Our built environment begins with design but ends with the construction process. This process is much more than pouring a little concrete or hammering some nails. Pre-Construction involves the bidding process for a construction contract along with estimating the cost of the project. Once a contract has been won, the construction phase begins. This might include hiring sub-contractors, establishing work schedules and delivery schedules, setting up a payroll system, as well as working with the trade unions. Depending on the size of the construction project, management and supervision may be a major task. These tasks may include working with building code officials, managing work and delivery schedules, monitoring safety on the job, or providing security. Of course, site preparation, foundation construction, rough framing, roofing, rough/finish plumbing, rough/finish electrical, heating, ventilating & air conditioning (HVAC), exterior and interior finishing, and landscaping are the foremost part of the construction process. This assignment is intended to give the student an exposure to this process its many occupational opportunities.

Teacher Preparation

Prepare a bulletin board or other visual display that illustrates the construction process. Be sure to include a mixture of gender and ethnicity in your displays. Have on hand two or three sets of construction documents for students to view.

Prepare to discuss and demonstrate the many processes required to construct a building (or other types of structures) and constructing a building. Help students recognize the purpose and need for building permits and building codes. It is also important that your students are introduced to the many professional and trade people involved in this process such as architects, engineers, contractors, building inspectors, Occupational Safety and Health Administration (OSHA) officials, carpenters, roofers, masons, plumbers, electricians, etc. You may want to arrange to have a construction contractor and/or one or more trades persons present to your students on their part in the construction process.

This is also the time to introduce some basic construction skills and general safety practices. If you are going to have your students actually construct a full size project, you will want to give them hands-on practice with the tools and machines they will use. This is also the time you can introduce your students to basic components of a structure. You will need to judge the time available to determine how involved this activity can be. Remember, exposure to many construction related careers is more important than skill building at this time.

Suggested Activity: Construction

1. *Building Components*

Illustrate through a Power Point presentation or other graphic means the basic components of a building. This should be an exposure activity to familiarize your students with the parts that make up the playhouse. Review the construction documents. (*See Construction Documents*)

2. *Basic Skills and Safety*

Students will be constructing the actual playhouse or a model of the playhouse. Introduce your students to basic tool and machine use. Provide appropriate detailed safety instruction for those tools and equipment they will be using and require them to pass safety exams before operating any machine or using any tool. (See *Safety Certificate form*)

3. *Materials & Tools List*

One of the major activities by the contractor is to estimate the cost of the building project. In small businesses this is usually done by the contractor. However, in large companies this is done by *Project Estimators*. Using the *Materials & Tools List* form and the *Construction Documents*, help your students complete the estimate. An added activity would be to have the students apply prices to the materials and then calculate the total cost of materials. The *Tool List* component of this activity is to make the students aware of what they will need to construct the project. This type of activity is used to develop a bid for a construction job. (See *Materials & Tools List form*)

4. *Construction Bid*

Contractors must submit bids (estimates) to compete for construction jobs. Using the *Materials & Tools List*, have your students complete the *Construction Bid* form (this can be done in teams or as individuals). (See *Construction Bid form*)

5. *Building Construction Contract*

Review the *Construction Contract* with your students. Help them to understand what a contract is and what it means to be bound by one. You may also want to cover the importance of having an *attorney* review the contract before it is signed. (See *Building Construction Contract form*)

6. *Building Permit*

Before any work can begin on the construction site, the contractor must obtain a building permit. This is an opportunity to help your students understand what is involved in acquiring a building permit and why it is needed. Use the *Building Permit Application* form to guide your students through this process. After the applications have been submitted, you will issue the *Building Permit*. Point out to the students that the Building Department requires the permit to be posted in a common area on the construction site. (See *Building Permit Application and Building Permit*)

7. *Work Schedule*

A schedule for each phase of the construction project must be created before the project begins. This provides scheduled time for workers to work and materials to be delivered. Review the *Work Schedule* form with your students so they will see not only what tasks have to be done, but when they need to be done. In small businesses this is usually done by the *contractor*. In large companies this is often done by the *Superintendent*. (See *Work Schedule form*)

8. *Daily Work Report*

Use this form to keep track of student performance. This activity will also allow your students to understand and experience work accountability. You should review these reports at the end of the class period or at the end of the each day. They will give you

a picture of what has been accomplished and what still needs to be completed. (See *Daily Work Report form*)

9 *Construction Project*

If you choose to use the playhouse project, here are some suggestions:

- a. Pre-construct the floor system to save time
- b. Pre-cut studs, headers and sills
- c. Form student teams who will each assemble one of the four walls
- d. Have two of the trusses pre-constructed and have each team assemble pre-cut truss components to complete the six required trusses (build a jig for ease of assembly)
- e. Have one team assemble the roof sheathing and roof tiles
- f. Have two teams apply exterior siding and one team apply the interior wall covering

10 *Building Inspection*

Building inspection is part of the construction process. Inspections should be completed at the end of each construction phase. Students should see the process work and experience what happens when something does or does not pass inspection. This is a great opportunity for students to see that when work is not satisfactory, it must be redone (or fixed). You may choose to do the inspections yourself, have another teacher act as the inspector, have an actual city building inspector do the inspections, or allow students to act as inspectors. (See *Building Inspection form*)

11 *Notice of Completion & Use*

Upon completion of the project, the contractor must certify that the building is complete and ready for occupancy. The *Notice of Completion & Use* will give you an opportunity to assign a grade for this project. (See *Notice of Completion & Use form*)

12 *Building Occupancy Permit*

When a construction project is complete and has been approved by the city or county building department, a *Building Occupancy Permit* is issued. Issue this permit when the students have successfully completed the job. (See *Building Occupancy Permit*)

END OF DOCUMENT



The Construction Process

Student Built Construction Company, Inc. (SBCCI) has been awarded a contract to construct a play house to be used by the local Career Center Building Trades and the Architectural Design instructors as a teaching aide in their courses. This house is to be built according to the plans and specifications included in the contract (see enclosed contract).

You have been employed by SBCCI as a contractor/carpenter to construct the playhouse. You should read the Contract completely and become familiar with the requirements. It will be your responsibility as the contractor/carpenter to complete the job correctly. Begin the job by completing the tasks shown below.

Learning Objectives:

Upon successful completion of this assignment, you will be able to:

1. Identify all the frame components of a conventional wood framed wall
2. Identify and safely use hand and power tools associated with the construction of a wood framed wall
3. Explain the need for a construction contract when building a structure for a client
4. Develop a materials, tools and supplies list needed to construct a conventional wood framed wall
5. Explain what a building permit is and why it is needed

Complete the following tasks to begin the construction job:

1. Review the *Construction Documents* and develop a list of materials and tools using the *Materials & Tools List* form.
2. Complete the *Building Construction Contract* form and obtain all required signatures
3. Develop a *Work Schedule* for all required tasks using *Work Schedule* form
4. Complete required tool and equipment operation and safety instructions and pass all safety exams. Complete the *Safety Certification* form
5. Fill out the *Building Permit Application* form and obtain a *Building Permit* from the Building Department
6. Follow your teacher's instructions and construct the assigned project
7. Obtain building inspections at each construction phase (*See Building Permit*)
8. Upon successful completion of the construction project, obtain a *Notice of Completion & Use* form
9. Acquire a *Building Occupancy Permit* from the Building Department.

Safety Reminder:

Before you begin your job, be sure you are familiar with all safety rules and have all required Safety Exams successfully completed and on record with the contractor (or teacher)

END OF DOCUMENT



Exploring Careers in Architecture & Construction



Student Built Construction Company, Inc.

456 High School Road, Anywhere, Missouri 64093

Job Title: _____ Name: _____ Appr'd By: _____

MATERIALS & TOOLS LIST Sheet _____ of _____

Task No.	Task Description*	Task No.	Task Description*
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

Task No.	Materials**	Unit Cost	Total Cost	Tools***
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
	TOTAL COST:			

*Make a list with brief description for each step (task) you must complete, such as: "Cut studs to length." Keep tasks in order of operation.

**Make a list of the materials you will need for each Task you will complete, such as "15 - 2 X 4 X 8' Lumber" for "Cut studs to length" task.

***Make a list of tools you will need for each Task you will complete, such as "Steel Tape Measure, Combination Square, Saw Horses, Carpenter's Pencil, Crosscut Saw (Circular Saw if permitted) for "Cut studs to length" task.



Exploring Careers in Architecture & Construction



Possible Careers: Architect ▪ General Contractor ▪ Carpenter ▪ Building Inspector ▪ Construction Manager

Construction Bid

This Construction Bid is made and submitted by *Student Built Construction Company, Inc.*, known as "Contractor," whose address is

Street (PO Box)

City

State

ZIP Code

On this day of , 20 ,

To

Known as "Owner," whose address is

Street (PO Box)

City

State

ZIP Code

The contractor shall furnish all labor, materials, and services to construct and complete in a quality and timely manner the structure described in the attached construction documents at

Street (PO Box)

City

State

ZIP Code

For the total dollar amount of \$

All changes requested by the owner, the architect, or their agents will require a Change Order prior to the change and will constitute additional charges.

Contractor's Signature

Print Name

END OF DOCUMENT

Exploring Careers in Architecture & Construction

Possible Career Majors: Architect ▪ General Contractor ▪ Carpenter ▪ Building Inspector ▪ Construction Manager

Building Construction Contract

This Contract made and entered into this _____ day of _____, 20____,

between _____, called "Owner," whose

Print Owner's Name

address is

Street Address

City

State

Zip Code

and Student Built Construction Company, Inc., called "Contractor," whose address is

Street Address

City

State

Zip Code

Both parties hereby agree:

1. WORK TO BE COMPLETED: Contractor shall request all materials, furnish all labor and services to construct and complete in a quality and timely manner a _____ hence referred to as "project" upon
Print Name of Project

the following described property:

Print Address or Location

2. CONSTRUCTION PLANS, SPECIFICATIONS AND PERMITS: The project will be constructed according to the project construction plans and specifications which have been reviewed and approved by the Owner and which are incorporated as a part of this Contract. Contractor shall obtain all required building permits.
3. PAYMENT: Owner agrees to pay Contractor the maximum points of _____. Contractor agrees that Owner has the option to reduce said total points based on quality and completeness of project. Point variation will be based on attached Scoring Guide (provided by Owner). Any additional points must be agreed to by way of a Change Order filed in a timely manner. Final payment will be made upon final inspection and approval of the completed project by the Owner.
4. COMPLETION: Contractor shall begin project work immediately upon obtaining building permit and shall have project completed no later than _____, subject to permissible delays as described in School
Print Date

Student Handbook and/or Instructor Regulations.
5. LABOR: Contractor shall perform all work and shall not pass on or relegate work to any other sub-contractor (student) inside or outside of class.
6. TOOLS & EQUIPMENT: Contractor shall be responsible for all tools and/or equipment used by Contractor to complete the project.
7. BUILDING MATERIALS & SUPPLIES: Contractor shall be responsible for requesting and obtaining all necessary materials and supplies for the project.
8. SAFETY: Contractor shall be responsible for knowing and following all general and specific safety rules while working on the project. Contractor shall keep work area at project site clear of all clutter and/or hazards at all times during the project. Contractor shall have on file with Building Department (instructor) all required records of successful completion of safety exams completed by Contractor prior to beginning project.
9. NOTICE OF COMPLETION AND USE: Owner agrees to sign and record a Notice of Completion & Use within (5) working days after the project is completed and ready for use.

OWNER SIGNATURE

CONTRACTOR SIGNATURE

Print Name

Print Name

Change Order

PROJECT:

Change Order Number:

Date:

Contract Date:

TO CONTRACTOR:

Print Name

THE CONTRACT IS CHANGED AS FOLLOWS:

Provide Drawings and/or Sketches below (or attach) as needed:

This Change Order supersedes contract and/or orders made between all parties prior to the above Change Order date.

Architect

Contractor

Owner

Signature

Signature

Signature

PRINT NAME

PRINT NAME _____

PRINT NAME

DATE _____

DATE _____

DATE _____

Exploring Careers in Architecture & Construction

Possible Careers: Architect • General Contractor • Carpenter • Building Inspector • Construction Manager		
City of High Hopes Department of Inspection, Permits & Licenses 123 W. High Hope Street, High Hopes, Missouri 60000-1000 Phone: (876) 543-2100		
Building Permit Application		
Please Fill Out All Applicable Information		
Project Address:	High Hopes, Missouri 60000-1000	FOR OFFICE USE ONLY
		Permit No.
		Issue Date:
Estimated Construction Cost (Including Labor):		Date Completed:
Describe Work To Be Done:		
Legal Description of Property:		
Type of Permit: <i>(Check All That Apply)</i> ___ Building ___ Foundation ___ Residential ___ Electrical ___ Commercial ___ Plumbing		
Owner:		Architect/Engineer:
Street:		Street:
City, State, ZIP:		City, State, ZIP:
Phone:		Phone:
General Contractor:		
Street:		Contact:
City, State, ZIP:		Phone:
Phone:		
Total Square Feet:	Cost Per Square Foot:	Total Fee:
Applicant's Signature:		Date:
Applicable Codes:	Check	Required Documents: (For Official Use Only)
2000 ICC Property Maintenance Code		For All Projects
2000 ICC Building Code		___ Plot Plan
2000 ICC Residential Code		___ Survey
2000 ICC Plumbing Code		___ Const. Documents (3 Sets) (2 Sets for Residential)
2000 ICC Mechanical Code		___ Electrical Load Analysis
2000 ICC Fuel Gas Code		___ Plumbing Riser Diagrams
2000 ICC Fire Code		___ Tap Fee Receipt
2000 Life - Safety Code		___ Homeowners Association Approval
2000 National Electrical Code		___ Certificate of Lot Elevation
		Approved By:
		Date Approved:
Effective Date:		Building Department

Exploring Careers in Architecture & Construction

Possible Careers: Architect • General Contractor • Carpenter • Building Inspector • Construction Manager			
City of High Hopes Department of Inspection, Permits & Licenses 123 W. High Hope Street, High Hopes, Missouri 60000-1000 Phone: (876) 543-2100			
Building Permit			
Project Address:		FOR OFFICE USE ONLY	
		Permit No.	
		Issue Date:	
		Date Completed:	
Describe Work To Be Done:			
Legal Description of Property:			
Type of Permit: <i>(Check All That Apply)</i> <input type="checkbox"/> Building <input type="checkbox"/> Foundation <input type="checkbox"/> Residential <input type="checkbox"/> Electrical <input type="checkbox"/> Commercial <input type="checkbox"/> Plumbing			
Owner:		Architect/Engineer:	
Street:		Street:	
City, State, ZIP:		City, State, ZIP:	
Phone:		Phone:	
General Contractor:			
Street:		Contact:	
City, State, ZIP:		Phone:	
Phone:			
Type of Inspection	Commits	Date of Inspection	Signature
Excavation			
Foundation Forms			
Rough Framing			
Rough Plumbing			
Rough Electrical			
Insulation			
Interior Sheathing			
Exterior Siding			
HVAC			
Finished Plumbing			
Finished Electrical			
Finish Work			
Finished Landscaping			
NOTES:			

Exploring Careers in Architecture & Construction

Possible Career Majors: Architect • General • Contractor • Carpenter • Building Inspector • Construction Manager • Safety Inspector • Technical Writer • Safety Instructor

Safety Certification

Date Filed:

Certificate No:

This is to certify that _____ has successfully
Print Student Name

completed the required safety exams listed below for the job of _____
Print Job Title
 and all said exams are on record with the Building Department:

- | | | |
|---|--|---|
| <input type="checkbox"/> General Hand Tools | <input type="checkbox"/> General Shop Safety | <input type="checkbox"/> Electric Drill |
| <input type="checkbox"/> Circular Saw | <input type="checkbox"/> Drill Press | <input type="checkbox"/> Band Saw |
| <input type="checkbox"/> Scroll Saw | <input type="checkbox"/> Reciprocating Saw | <input type="checkbox"/> Miter Saw |
| <input type="checkbox"/> Jig Saw | <input type="checkbox"/> Sharps | <input type="checkbox"/> Clean-up |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The above mentioned person accepts responsibility to follow all safety rules and regulations in force on the job site (on or off school campus) and agrees to report any safety violation and/or concern to the officials in charge.

Official (Instructor) Signature

Student Signature

Print Name

Print Name

END OF DOCUMENT



Exploring Careers in Architecture & Construction



Student Built Construction Company, Inc.

456 High School Road, Anywhere, Missouri 65432

Possible Careers: Architect • General Contractor • Carpenter • Building Inspector • Construction Manager

Job Title:

Name:

Appr'd By:

Work Schedule

Sheet _____ of _____

Task	Task Description*	Task	Task Description*
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

Task	Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

*Make a list with A brief description of each step (task) you must complete, such as: "Cut studs to length." Keep tasks in order of operation.



Exploring Careers in Architecture & Construction



Student Built Construction Company, Inc.

456 High School Road, Anywhere, Missouri 65432

Possible Careers: Architect • General Contractor • Carpenter • Building Inspector • Construction Manager

Job Title: *Carpenter*Name: *Aye B. Nailen*

Appr'd By:

Work Schedule

Sheet 1 of 1

Task	Job Task Description*	Task	Job Task Description**
1	Order materials	11	
2	Snap lines on sub-floor	12	
3	Cut studs to length	13	
4	Build corner post	14	
5	Cut header materials & build	15	
6	Cut rough sill & cripples	16	
7	Frame walls	17	
8		18	
9		19	
10		20	

Task	Day:	1	2	3	4	5	6	7	8	9	10				
1															
2															
3															
4															
5															
6															
7															
8															
9		SAMPLE													
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

*Make a list with a brief description of each step (task) you must complete, such as: "Cut studs to length." Keep tasks in order of operation.



Exploring Careers in Architecture & Construction

Daily Work Report

456 High School Road, Anywhere, Missouri 65432

Possible Careers: Architect • General Contractor • Carpenter • Building Inspector • Construction Manager

Job Title:

Name:

Appr'd By:

Date:

Task Description (What I did today)

[Write in complete sentences using correct spelling, punctuation and grammar.]

Task Description for Next Working Day

[Write in complete sentences using correct spelling, punctuation and grammar.]

Tools, Equipment, Supplies Needed for Next Working Day

No.	Tools	Equipment	Supplies
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			

Possible Career Majors: Architect ▪ General Contractor ▪ Carpenter ▪ Building Inspector ▪ Construction Manager													
City of High Hopes Department of Inspection, Permits & Licenses 123 W. High Hope Street, High Hopes, Missouri 60000-1000 Phone: (876) 543-2100													
Building Inspection													
Project Address:	High Hopes, Missouri 60000-1000	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center; padding: 2px;">FOR OFFICE USE ONLY</th> </tr> <tr> <td style="width: 50%; padding: 2px;">Permit No.</td> <td style="width: 50%; padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">Issue Date:</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">Date Completed:</td> <td style="padding: 2px;"></td> </tr> </table>	FOR OFFICE USE ONLY		Permit No.		Issue Date:		Date Completed:				
FOR OFFICE USE ONLY													
Permit No.													
Issue Date:													
Date Completed:													
Estimated Construction Cost (Including Labor):													
Special Notes:													
Legal Description of Property:													
Type of Inspection: <i>(Check All That Apply)</i> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Excavation</td> <td style="width: 33%;"><input type="checkbox"/> Foundation</td> <td style="width: 33%;"><input type="checkbox"/> Finish</td> </tr> <tr> <td><input type="checkbox"/> Residential</td> <td><input type="checkbox"/> Framing</td> <td><input type="checkbox"/> Roofing</td> </tr> <tr> <td><input type="checkbox"/> Commercial</td> <td><input type="checkbox"/> Electrical</td> <td><input type="checkbox"/> Plumbing</td> </tr> </table>			<input type="checkbox"/> Excavation	<input type="checkbox"/> Foundation	<input type="checkbox"/> Finish	<input type="checkbox"/> Residential	<input type="checkbox"/> Framing	<input type="checkbox"/> Roofing	<input type="checkbox"/> Commercial	<input type="checkbox"/> Electrical	<input type="checkbox"/> Plumbing		
<input type="checkbox"/> Excavation	<input type="checkbox"/> Foundation	<input type="checkbox"/> Finish											
<input type="checkbox"/> Residential	<input type="checkbox"/> Framing	<input type="checkbox"/> Roofing											
<input type="checkbox"/> Commercial	<input type="checkbox"/> Electrical	<input type="checkbox"/> Plumbing											
Owner:		Architect/Engineer:											
Street:		Street:											
City, State, ZIP:		City, State, ZIP:											
Phone:		Phone:											
General Contractor:													
Street:		Contact:											
City, State, ZIP:		Phone:											
Phone:													
Print Inspector's Name:		Time of Inspection:											
Inspector's Signature:		Date of Inspection:											
Applicable Codes: 2000 ICC Property Maintenance Code 2000 ICC Building Code 2000 ICC Residential Code 2000 ICC Plumbing Code 2000 ICC Mechanical Code 2000 ICC Fuel Gas Code 2000 ICC Fire Code 2000 Life - Safety Code 2000 National Electrical Code	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="padding: 2px;">Check</th> </tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> <tr><td style="height: 15px;"></td></tr> </table>	Check											Noted Deficiencies:
Check													
File one copy at building site, one copy in job folder, one copy to Building Inspector													

Possible Careers: Architect ■ General Contractor ■ Carpenter ■ Building Inspector ■ Construction Manager

NOTICE OF COMPLETION & USE

The Contractor, _____,
Print Student Name

hereby certifies that the project, _____,
Print Name of Project

is complete and ready for use by the Owner, _____.
Print Name of Owner

The Owner hereby accepts the project as complete and agrees to award the Contractor _____ points.
Points will be recorded no later than (5) five working days from the date of this notice.

Owner's Signature

Date

Print Owner's Name

Date

Contractor's Signature

Date

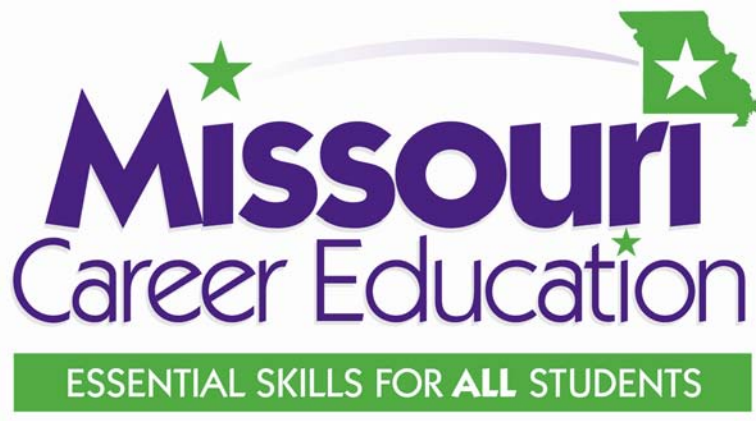
Print Contractor's Name

Date

END OF DOCUMENT

Exploring Careers in Architecture & Construction

Possible Careers: Architect ▪ General Contractor ▪ Carpenter ▪ Building Inspector ▪ Construction Manager		
City of High Hopes Department of Inspection, Permits & Licenses 123 W. High Hope Street, High Hopes, Missouri 60000-1000 Phone: (876) 543-2100		
Building Occupancy Permit		
Project Address:		FOR OFFICE USE ONLY
		Permit No.
		Issue Date:
		Date Completed:
Special Notes:		
Legal Description of Property:		
Type of Inspection: <i>(Check All That Apply)</i> <input type="checkbox"/> Residential <input type="checkbox"/> Final Building Occupancy <input type="checkbox"/> Commercial		
Owner:		
Architect/Engineer:		
Street:		Street:
City, State, ZIP:		City, State, ZIP:
Phone:		Phone:
General Contractor:		
Street:		Contact:
City, State, ZIP:		Phone:
Phone:		
Print Inspector's Name:		Time of Inspection:
Inspector's Signature:		Date of Inspection:
Applicable Codes: 2000 ICC Property Maintenance Code 2000 ICC Building Code 2000 ICC Residential Code 2000 ICC Plumbing Code 2000 ICC Mechanical Code 2000 ICC Fuel Gas Code 2000 ICC Fire Code 2000 Life - Safety Code 2000 National Electrical Code	Check	Noted Deficiencies: (For Official Use Only)
File one copy at building site, one copy in Job Folder, one copy to Building Inspector		



Missouri Center for Career Education
Department of Career & Technology Education
Central Missouri State University
Warrensburg, Missouri

Division of Career Education
Department of Elementary & Secondary Education
Jefferson City, Missouri

Architecture & Construction Career Search

Exploring Career Clusters

Course A

Architecture & Construction

Science, Technology, Engineering, and Mathematics

Manufacturing

Introduction to Career Search

Your students have spent the last few weeks in hands-on experiences within this career cluster gaining an understanding of and an appreciation for various occupations. They should also have gained some understanding of what knowledge and skills are needed to enter these occupations. This unit of study is intended to help the student gain more detailed information about specific occupations that interest them. Before attempting the search, your students should take an interest survey to give them insight and direction. Your students will then be ready to select their occupations of interest and complete the career search. Remember, a major objective of this course is for your students to gain an educated understanding of career options within specific clusters.

Teacher Preparation

There are several references available for teachers and students. You will want to view these references before finalizing your lessons and before your students begin their career search. You should visit with your guidance counselor(s) at the beginning of this course to coordinate your efforts and arrange time for the counselor to help. You should also contact your Area Career Center to arrange class presentations and/or a tour of the center facilities and programs.

Note: Your enthusiasm for this unit will be a huge encouragement for your students. Help them understand that good planning now will save them time and money later. You will also want to express the fact that plans can change and what they select now can be altered at any point in their high school and/or college life. Additionally, encourage your students to share their findings with their parents or guardians.

Although there are many resources available in print and online which you and your students can use, Missouri Kuder (<http://mo.kuder.com/>) is the official college and career planning program recognized by Missouri Guidance & Placement Services of the Department of Elementary and Secondary Education, Career and Technical Education Division. Your guidance counselor will be able to help you access the website if you have not done so.

Prepare a bulletin board that displays various educational options after high school in this career cluster. Be sure to include both local and distant schools, as well as low to high cost schools.

Resources:

- Missouri Kuder, <http://mo.kuder.com/>
- Missouri Guidance and Placement Services, http://dese.mo.gov/divcareered/career_plan.htm
- Explore Careers, <http://www.iseek.org/sv/10000.jsp>
- Gettech, <http://gettech.org/default2.asp>
- Vocational Information Center, <http://www.khake.com/>
- Technology Careers, <http://www.pathwaystotechnology.org/>
- Career Voyages, US Government, <http://www.careervoyages.gov>
- My Future.com, <http://www.myfuture.com/>

Suggested Activities

1. *Interest Assessment*

This is a very important step for your students. Subsequent activities in this section will be based on the results of this assessment. (This activity will only need to be completed once in the semester.) Your students should take the interest assessment (Kuder® Career Search with Person Match) and the skills inventory (Kuder Skills Assessment) found at <http://mo.kuder.com/>, or some other interest assessment such as “Choices” (see your guidance counselor) or the Career Cluster Interest Inventory found at <http://www.careerclusters.org/whatsnew.htm>. Enlist the help of your guidance counselor at the beginning of the course.

2. *Career Search Identity*



You will want to make sure your students have the *Architecture & Construction Pathways* chart available so they can select occupations relevant to this career cluster search. You will need to decide how many searches you want your students to complete. It is suggested that they complete one search for each of the occupational levels: Technician, Technologist, and Professional. Your students will need guidance and help with identifying which occupations are Technician, Technologist or Professional levels. You may ask them to complete more if time permits.

Handout: *Definitions of the Three Levels of Occupations*

This handout will give the students a brief description the three levels of occupations students might find in any career pathway. This is a way of recognizing different levels of education and skills needed for an occupation.

Handout: *MLA Citation Style Information*

Your students will be asked to cite their sources of information. This handout will give them the correct format for citing different sources. It is suggested you review this with them. You may also want to check with your English teachers and/or librarian to confirm the style(s) being taught in your building

3. *Career Center Presentation*

Contact your career center director or guidance counselor and make arrangements for a tour of the center facilities and a presentation of the programs the center offers. If it is not possible to tour the facilities, arrange for presentations by career center faculty in your classroom or lab. Make sure the presentations include photos. If possible, make a video tour of the center with interviews by faculty and students.

Handout: *Career Center Information* (teacher designed) Design an information sheet with appropriate questions about the various programs offered by your career center in the cluster area of *Architecture and Construction*. Include such topics as the types of activities for students, certifications available, types of jobs after completing the program, transferability to college, characteristics students should possess in order to be successful in each program, etc.

4. *Four-Year High School Plan*

Enlist the assistance of your guidance counselor. You will want your students to identify courses that will prepare them for post high school employment and/or higher education programs. Use your school's four-year high school plan form or Missouri Kuder and the *Missouri Educational Career Plan* (Architecture & Construction) form found at http://dese.mo.gov/divcareered/career_plan.htm.

END OF DOCUMENT

Definitions of the Three Levels of Occupations



TECHNICIAN

Technicians typically build, repair, maintain, and/or operate specialized, complex, technical equipment and systems. A technician receives technical training through an apprenticeship program (on-the-job), a technical certification program, or a two-year associate degree college program.



TECHNOLOGIST

Technologists typically work as technical managers and must be able to understand theories and apply the principles and concepts of mathematics, science, and applications of computer fundamentals. Generally, a technologist is college educated with a four-year degree, which includes general education, technical specializations, and technical management.



PROFESSIONAL

A professional is a person who has an occupation requiring training in the liberal arts or the sciences and usually advanced study (course work after the bachelor's degree or a master's degree) in a specialized field such as, but not limited to, architects, engineers, upper level managers, certified accountants, and educators.

Occupational Levels

Architecture & Construction		
<u>Technician</u>	<u>Technologist</u>	<u>Professional</u>
Boilermaker	Architectural and Civil Drafter	Architect
Carpenter	Civil Engineer	Landscape Architect
Carpet Installer	Computer Aided Drafter	Project Manager
Civil Engineering Technician	Computer Programmer	Regional and Urban Planner/Designer
Concrete Finisher	Construction Engineer	
Construction Craft Laborer	Construction Manager	
Construction Foreman	Construction Superintendent	
Construction Inspector	Cost Estimator	
Cost Estimator	Drafter	
Electrical & Electronic Engineering Technician	Electrical Engineer	
Electrician	Environmental Designer	
Electronic Systems Technician	Environmental Engineer	
Elevator Installer	Facilities Engineer	
Environmental Engineering Technician	Fire Prevention and Protection Engineer	
Glazier	Industrial Engineer	
Hazardous Materials Remover	Interior Designer	
Heating, Ventilation, Air Conditioning and Refrigeration Mechanic	Landscape Designer	
Heavy Equipment Operating Engineer	Manufacturer's Representative	
Highway Maintenance Worker	Materials Engineer	
Hydro Testing Technician	Mechanical Drafter	
Insulation Workers	Mechanical Engineer	
Iron/Metalworker	Reliability Engineer	
Landscape/Groundskeeper	Safety Director	
Maintenance Planner	Sales and Marketing Manager	
Mason	Security Controls Manager	
Millwright	Surveyor	

Note: The above information is referenced from various internet searches.
It is based solely on the interpretation of the author and may be altered at the teacher's discretion.

Architecture & Construction con't		
<u>Technician</u>	<u>Technologist</u>	<u>Professional</u>
Painter		
Paperhanger		
Pipe Fitter		
Plasterer/Drywall		
Plumber		
Refractory Technician		
Restoration Technician		
Roofer		
Security and Fire Alarm System Installer		
Sheetmetal Worker		
Steamfitter		
Surveying and Mapping Technician		
System Installer		
Terrazzo Worker		
Thermal Control Technician		
Tile & Marble Setter		
Wastewater Maintenance Technician		

Note: The above information is referenced from various internet searches.
It is based solely on the interpretation of the author and may be altered at the teacher's discretion.



Exploring Careers in Architecture & Construction



Career Pathways: Design/Pre-Construction • Construction • Maintenance/Operations

Career Search Identity

Student Name:

Print Name

Graduation Year:

Activity Completed:

Date

Activity Assessment:

Your career search is designed to help you gain understanding and knowledge about career possibilities within your interest of the Career Cluster *Architecture & Construction*. Based on your recent experiences in this class and the interest assessment you took in Kuder (another interest assessment), you will choose at least one occupational Pathway and an occupation from each of the three levels of occupations: Technician, Technologist, and Professional. When you have completed your search, you will:

1. know what level of education you must have.
2. know what technical skills you must have.
3. know what academic skills you must have.
4. know what the working conditions will be.
5. know what the average wage/salary will be.
6. know what the outlook for jobs will be.
7. know where the jobs will be found.

You should select your occupations from the *Architecture & Construction Cluster Pathways chart*. Within each Pathway, occupations can be divided into three levels: 1. Technician, 2. Technologist, and 3. Professional. You are to select one occupation from each of the occupational levels which may be from one Pathway or all three Pathways. Your teacher can help you decide what level your choice of occupation falls under. Complete the following information:

Occupations I will research:

_____	Technician:	_____
Pathway		Occupation
_____	Technologist:	_____
Pathway		Occupation
_____	Professional:	_____
Pathway		Occupation



Exploring Careers in Architecture & Construction



Career Pathway: Design/Pre-Construction • Construction • Maintenance/Operations

Pathway:

Activity Completed:

Date

Activity Assessment:

Student Name:

Graduation Year:

Occupation:

Level: ☐ Technician ☐ Technologist ☐ Professional
CHECK ONE ABOVE

Sources of Information - Refer to Bibliographic Style Sheet for correct format to cite references:

Work Activities - Provide at least four activities this person would do on the job:

- 1.
- 2.
- 3.
- 4.

Work Conditions - List at least three physical conditions you would work under and if you would be required to work with other people:

- 1.
- 2.
- 3.

4. Are you required to work with other people? ☐ Yes ☐ No

Skills, Abilities & Knowledge - List the required skills, abilities & knowledge in each of the areas listed below:

Communication:

Math Level:

Science Knowledge:

Technical Knowledge:

Tool/Equipment Skill:

Preparation - Check all education or training you need to enter this occupation:

☐ High School Diploma ☐ GED ☐ On-The-Job Training/Apprenticeship ☐ Technical ☐ University

Wages - List the hourly wage and the annual expected income based on a 40 hour week:

Amount per Hour

Amount per Month:

Amount per Year:

Outlook (Will there be jobs available in this occupation in the future?)

Number of Jobs now available:

Number of Jobs available in

5 Years

10 Years

Major Employers - What type of companies will hire you?

- 1.
- 2.
- 3.

- 4.
- 5.
- 6.

END OF DOCUMENT

Educational Career Plan

Career Path: Industrial & Engineering Technology

Career Cluster: Architecture & Construction

Career Pathway:

Graduation Year:

Date:

Student Name:

Student Signature:

Advisor Signature:

Parent/Guardian Signature (if required):

High School	9th Grade	10th Grade	11th Grade	12th Grade*
	English I	English II	English III	English IV
	Algebra I or Geometry	Geometry or Algebra II	Algebra II, Trigonometry or Statistics	Trigonometry or Statistics
	Physical Science or Biology I	Biology I or Chemistry	Chemistry or Physics	Physics or Environmental Science
	Geography/State History	World History	American History	Economics/Government
	PE/Health or Fine Arts	PE/Health or Fine Arts		Personal Finance
				Practical Art (if needed)
	Career Major Elective(s) Project Lead the Way TechConnect Construction Technology Education Additional Coursework Foreign Language or Computer Technology	Career Major Elective(s) Project Lead The Way TechConnect Construction Technology Education Additional Coursework Foreign Language or Computer Technology	Career Major Coursework: HVAC Carpentry Construction Technology I Construction Technology II Drafting and Design Drafting CAD Housing & Interior Design Masonry Plumbing Project Lead The Way Technical Writing	
Postsecondary	Area Career Center	Community College	College/University	Other
	<input type="checkbox"/> HVAC <input type="checkbox"/> Building Maintenance <input type="checkbox"/> Cabinetmaking <input type="checkbox"/> Carpentry <input type="checkbox"/> Construction Trades <input type="checkbox"/> Drafting CAD <input type="checkbox"/> Masonry <input type="checkbox"/> Plumbing	<input type="checkbox"/> Construction Technology <input type="checkbox"/> Drafting and CAD <input type="checkbox"/> Engineering Technology <input type="checkbox"/> HVAC-R <input type="checkbox"/> Housing & Interior Design <input type="checkbox"/> Surveying	<input type="checkbox"/> Architecture <input type="checkbox"/> Civil Engineering <input type="checkbox"/> Construction Management <input type="checkbox"/> Education <input type="checkbox"/> Electrical Engineering <input type="checkbox"/> Industrial Technology <input type="checkbox"/> Urban Planning	<input type="checkbox"/> Apprenticeship <input type="checkbox"/> Military <input type="checkbox"/> On-the-Job Training
	Work-based Learning Opportunities	Relevant High School Intra-Curricular/Co-Curricular Experiences		Graduation Exams

Career Enhancement Options	After School Employment	Career and Technical Student Organization:	___U.S. Constitution
	Cooperative Occupational Experience	SkillsUSA	
	Internship/Mentorship	Technology Students of America (TSA)	
	Job-Shadowing	Other high school activities:	___MO Constitution
	On-The-Job Training		
	Service Learning		

Adapted from National Career Cluster

*12th grade year should include at least 3 academic courses including college prep math or science.

Note: All Career and Technical Education courses count as a practical arts credit.

MLA Citation Style

This guide provides a basic introduction to the MLA citation style. It is based on the 6th edition of the MLA Handbook for Writers of Research Papers published by the Modern Language Association in 2003.

Copies are available at the Vanier Library Reference Desk, in the Webster Library Reference Collection and on 3-hour Reserve (Webster). The call number for the handbook is LB 2369 G53 2003.

The MLA Handbook is generally used for academic writing in the humanities. The handbook itself covers many aspects of research writing including selecting a topic, evaluating sources, taking notes, plagiarism, the mechanics of writing, the format of the research paper as well as the way to cite sources.

This guide provides basic explanations and examples for the most common types of citations used by students. For additional information and examples, refer to the MLA Handbook.

Parenthetical references in the text

Parenthetical documentation allows you to acknowledge a source within your text by providing a reference to exactly where in that source you found the information. The reader can then follow up on the complete reference listed on the Works Cited page at the end of your paper.

- ◆ In most cases, providing the author's last name and a page number are sufficient:

In response to rapid metropolitan expansion, urban renewal projects sought "an order in which more significant kinds of conflict, more complex and intellectually stimulating kinds of disharmony, may take place" (Mumford 485).

- ◆ If there are two or three authors, include the last name of each:

(Winks and Kaiser 176)

(Choko, Bourassa, and Baril 258-263)

- ◆ If there are more than three authors, include the last name of the first author followed by "et al." without any intervening punctuation:

(Baldwin et al. 306)

- ◆ If the author is mentioned in the text, only the page reference needs to be inserted:

According to Postman, broadcast news influences the decision-making process (51-63).

Parenthetical documentation is not used for electronic or web documents if there is no pagination.

Further examples and explanations are available in Chapter 6 of the MLA Handbook.

Works Cited

The alphabetical list of works cited that appears at the end of your paper contains more information about all of the sources you've cited allowing readers to refer to them, as needed. The main characteristics are:

- ◆ The list of Works Cited must be on a new page at the end of your text
- ◆ Entries are arranged alphabetically by the author's last name or by the title if there is no author
- ◆ Titles are underlined (not *italicized*) and all important words should be capitalized
- ◆ Entries are double-spaced (for the purposes of this handout, single-spacing is used)

Below are some examples of the most common types of sources including online sources (web and databases).

Book with one author

Mumford, Lewis. The Culture of Cities. New York: Harcourt, 1938.

Book with two or three authors

Francis, R. Douglas, Richard Jones, and Donald B. Smith. Destinies: Canadian History Since Confederation. Toronto: Harcourt, 2000.

Book with more than three authors

Baldwin, Richard et al. Economic Geography and Public Policy. Princeton: Princeton UP, 2003.

Two or more books by the same author

Replace the author's name by three hyphens and arrange alphabetically by the book's title

Postman, Neil. Amusing Ourselves to Death: Public Discourse in the Age of Show Business. New York: Viking, 1985.

---. The Disappearance of Childhood. New York: Vintage, 1994.

Anthology or compilation

Abate, Corinne S., ed. Privacy, Domesticity, and Women in Early Modern England. Burlington, VT: Ashgate, 2003.

Work in an anthology or an essay in a book

Naremore, James. "Hitchcock at the Margins of Noir." Alfred Hitchcock: Centenary Essays. Eds. Richard Allen and S. Ishii-Gonzalès. London: BFI, 1999.

Book by a corporate author

Associations, corporations, agencies and organizations are considered authors when there is no single author

Organisation for Economic Co-operation and Development. Action Against Climate Change: The Kyoto Protocol and Beyond. Paris: OECD, 1999.

Article in a reference book or an entry in an encyclopedia

If the article/entry is signed, include the author's name; if unsigned, begin with the title of the entry

Guignon, Charles B. "Existentialism." Routledge Encyclopedia of Philosophy. Ed. Edward Craig. 10 vols. London: Routledge, 1998.

A translation

Kafka, Franz. The Metamorphosis. Trans. and Ed. Stanley Corngold. New York: Bantam, 1972.

A government publication

Canada. Dept. of Foreign Affairs and International Trade. Freedom From Fear: Canada's Foreign Policy for Human Security. Ottawa: DFAIT, 2002.

United Nations. Dept. of Economic and Social Affairs. Population Division. Charting the Progress of Populations. New York: UN, 2000.

Book in a series

Bloom, Harold, ed. André Malraux. Modern Critical Views. New York: Chelsea House, 1988.

Article in a journal

Ferrer, Ada. "Cuba 1898: Rethinking Race, Nation, and Empire." Radical History Review 73 (1999): 22-49.

Man, Glenn K. S. "The Third Man: Pulp Fiction and Art Film." Literature Film Quarterly 21.3 (1993): 171-178.

Article in a newspaper or magazine

Semenak, Susan. "Feeling Right at Home: Government Residence Eschews Traditional Rules." Montreal Gazette 28 Dec. 1995, Final Ed.: A4.

Driedger, Sharon Doyle. "After Divorce." Maclean's 20 Apr. 1998: 38-43.

A review

Kirn, Walter. "The Wages of Righteousness." Rev. of Cloudsplitter, by Russell Banks. New York Times Book Review 22 Feb. 1998: 9.

Kauffmann, Stanley. "A New Spielberg." Rev of Schindler's List, dir. Steven Spielberg. New Republic 13 Dec. 1993: 30.

Television or radio program

"Scandal of the Century." Narr. Linden MacIntyre. The Fifth Estate. CBC Television. 23 Jan. 2002.

Sound recording

Ellington, Duke. "Black and Tan Fantasy." Music is My Mistress. Musicmasters, 1989.

Film, video recording or DVD

The Shining. Dir. Stanley Kubrick. Perf. Jack Nicholson, Shelley Duvall. Warner Bros., 1980.

Macbeth. Dir. Roman Polanski. Perf. Jon Finch, Francesca Annis, and Nicholas Selby. 1971. DVD. Columbia, 2002.

Musical composition, published score

Beethoven, Ludwig van. Symphony no. 4 in B-flat major, op. 60. Mineola, NY: Dover, 2001.

Work of art, photographed, in a book

Cassatt, Mary. Mother and Child. 1890. Wichita Art Museum, Wichita. American Painting: 15601913. By John Pearce. New York: McGraw, 1964. Slide 22.

• Article from a database

Provide the same information as you would for a printed journal article and add the name of the database, the platform of the database (if applicable), the access provider (Concordia University Libraries), the date of access and the general URL for the database

NOTE - If the article is in HTML only, pagination is not required. However, you can include the start page followed by a hyphen, a space and then a period. If a PDF version is available, provide pagination.

Brennan, Katherine Stern. "Culture in the Cities: Provincial Academies During the Early Years of Louis XIV's Reign." Canadian Journal of History 38.1 (2003): 19-42. CBCA Complete. ProQuest. Concordia University Libraries. 29 Mar. 2004 <<http://www.proquest.com>>.

Dussault, Marc and Bruce G. Barnett. "Peer-assisted Leadership: Reducing Educational Managers' Professional Isolation." Journal of Educational Administration 34.3 (1996): 5- . ABI/INFORM Global. ProQuest. Concordia University Libraries. 29 Mar. 2004 <<http://www.proquest.com>>.

Heming, Li, Paul Waley, and Phil Rees. "Reservoir Resettlement in China: Past Experience and the Three Gorges Dam." The Geographical Journal 167.3 (2001): 195-212. Academic Search Premier. EBSCOhost. Concordia University Libraries. 29 Mar. 2004 <<http://search.epnet.com>>.

• Web page

"Joyce Wieland." Celebrating Women's Achievements: Women Artists in Canada. 2000. National Library of Canada. 29 Mar. 2004. <<http://www.nlc-bnc.ca/women/h12-523-e.html>>.

• Internet site

Legends of our Times: Native Ranching and Rodeo Life on the Plains and Plateau. 22 Jan. 1999. Canadian Museum of Civilization. 29 Mar. 2004. <<http://www.civilisations.ca/aborig/rodeo/rodeo00e.html>>.

• Article in online periodical

Sehmby, Dalbir S. "Wrestling and Popular Culture." CCLWeb: Comparative Literature and Culture 4.1 (2002). 29 Mar. 2004 <<http://clwebjournal.lib.purdue.edu/clcweb02-1/sehmby02.html>>.

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