Y3 Q3 Unit 12 Copper Tubing and Cabinetmaking

Content Area: **Integrated Technical Arts**
Course(s): **Building and Construction: Building Technology**
Time Period: **February**
Length: **11 Weeks**
Status: **Published**

Unit Overview:

In this unit of study, students will explore the use of hand tools and become aclimated to their applications in and around the home.

- Personal and lab safety will be emphasized as various tools are introduced into lab sessions.
- Students will engage in career research relative to this unit of study.
- Environmentally friendly themes are discussed in this unit.

Aproxamate Time Frame

- **Week 1: Intro to Copper Tube**
- **Week 2-3: Fittings and Valves**
- **Week 4-5: Measuring, Cutting, Bending, Joining, and Grooving**
- **Week 6: Insulating Tubes**
- **Week 7: Cabinet Woods**
- **Week 8: Shop Tools**
- **Week 9: Cabinet construction**
- **Week 10-11: Cabinet Assembly and Finishing**

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Enduring Understandings:

Through the delivery of the unit outlined above, students will understand:

- the contractual relationships between all parties involved in the building process.
- scheduling practices which ensure the successful completion of a construction project.
- the importance of maintaining jobsite safety.
- how to safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
- troubleshooting procedures when solving a maintenance problem in buildings.

- the importance of preventative maintenance activities to service existing buildings.

Essential Questions:

What are the safety concerns to be considered when working in a lab setting in school or on the job?

What protection can be used in a laboratory environment? What should be part of an effective safety program? What characteristics are essential to a functional team?

What are the benefits of working in a team environment as opposed to individually?

Why is planning an important aspect to project work?

How does planning influence efficiency?

Why is planning vital to material usage and construction?

How is the design of a product influenced by planning?

Standards/Indicators/Student Learning Objectives (SLOs):

- 9.3.12.AC-CST.1 Describe contractual relationships between all parties involved in the building process.
- 9.3.12.AC-CST.2 Describe the approval procedures required for successful completion of a construction project.
- 9.3.12.AC-CST.3 Implement testing and inspection procedures to ensure successful completion of a construction project.
- 9.3.12.AC-CST.4 Apply scheduling practices to ensure the successful completion of a construction project.
- 9.3.12.AC-CST.5 Apply practices and procedures required to maintain jobsite safety.
- 9.3.12.AC-CST.6 Manage relationships with internal and external parties to successfully complete construction projects.
- 9.3.12.AC-CST.7 Compare and contrast the building systems and components required for a construction project.
- 9.3.12.AC-CST.8 Demonstrate the construction crafts required for each phase of a construction project.
- 9.3.12.AC-CST.9 Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

- PATHWAY: CONSTRUCTION (AC-CST)

Lesson Titles:

- Introduction to Copper
- Copper Tubing
- Fittings and Valves
- Measuring, Cutting, Bending, Joining, and Grooving
- Installing Tube Hangers and Supports
- Pressure Testing
- Intro to Cabinets
- Cabinet Woods
- Shop Tools Used in Cabinet Making
- Cabinet Construction Features and Hardware
- Cabinet Assembly and Finishing
- Laminating A Countertop

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

Inter-Disciplinary Connections:

CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and

	future education.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
CAEP.9.2.12.C.6	Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.
CAEP.9.2.12.C.9	Analyze the correlation between personal and financial behavior and employability.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

Direct Instruction

Structured Overview
Lecture
Explicit Teaching
Drill & Practice
Compare & Contrast
Didactic Questions
Demonstrations
Guided & Shared - reading, listening, viewing, thinking

Interactive Instruction

Debates
Role Playing
Panels
Brainstorming
Peer Partner Learning
Discussion

Laboratory Groups

think pair share
Cooperative Learning Groups
Jigsaw
Problem solving
Structured Controversy

Tutorial Groups

Interviewing
Conferencing
Indirect Instruction
Problem Solving
Case Studies
Reading for Meaning
Inquiry

Reflective Discussion
Writing to Inform
Concept Formation
Concept Mapping
Concept Attainment
Cloze Procedure

Independent Study

Essays
Computer Assisted Instruction
Journals
Learning Logs
Reports
Learning Activity Packages
Correspondence Lessons
Learning Contracts
Homework
Research Projects
Assigned Questions
Learning Centers

Experiential Learning

Field Trips
Narratives
Conducting Experiments
Simulations
Games
Storytelling
Focused Imaging
Field Observations
Role-playing
Model Building
Surveys

Instructional Skills

Explaining
Demonstrating
Questioning
Questioning Technique
Wait Time
Levels of Questions

Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions?Math/Science

• Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	○ Recall, observe,? & recognize facts,? principles, properties ○ Recall/ identify conversions among representations or numbers (e.g., customary and metric measures)	
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models	○ Evaluate an expression ○ Locate points on a grid or number on number line ○ Solve a one-step problem ○ Represent math relationships in words, pictures, or symbols ○ Read, write, compare decimals in scientific notation	○ Specify and e relationships (e. examples/examp ○ Make and rec observations ○ Explain steps ○ Summarize r concepts ○ Make basic i logical predictio data/observation ○ Use models / represent or exp mathematical co ○ Make and expla
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an? unfamiliar task	○ Follow simple procedures (recipe-type directions) ○ Calculate, measure, apply a rule (e.g., rounding) ○ Apply algorithm or formula(e.g., area, perimeter) ○ Solve linear equations ○ Make conversions among representations or numbers, or within and between customary and metric measures	○ Select a procedu to criteria and p ○ Solve routine pr applying multip decision points ○ Retrieve inform table, graph, or it solve a proble multiple steps ○ Translate betwe graphs, words, a notations (e.g., g from a table) ○ Construct mode criteria
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-	○ Retrieve information from a table or graph to answer a question ○ Identify whether specific	○ Categorize, clas materials, data, on characteristic ○ Organize or ord

irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct	information is contained in graphic representations (e.g.,table, graph, T-chart, diagram) o Identify a pattern/trend	o Compare/ contra data o Select appropria and organize & o Interpret data fr graph o Extend a pattern
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique		
Create **Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce**	o Brainstorm ideas, concepts, or perspectives related to a topic	o Generate conjec hypotheses base observations or knowledge and

Modifications

ELL Modifications:

- Choice of test format (multiple-choice, essay, true-false)
- Continue practicing vocabulary
- Provide study guides prior to tests
- Read directions to the student
- Read test passages aloud (for comprehension assessment)
- Vary test formats

IEP & 504 Modifications:

- Allow for redos/retakes
- Assign fewer problems at one time (e.g., assign only odds or evens)
- Differentiated center-based small group instruction
- Extra time on assessments
- Highlight key directions
- If a manipulative is used during instruction, allow its use on a test
- Opportunities for cooperative partner work
- Provide reteach pages if necessary
- Provide several ways to solve a problem if possible
- Provide visual aids and anchor charts
- Test in alternative site
- Tiered lessons and assignments
- Use of a graphic organizer
- Use of concrete materials and objects (manipulatives)
- Use of word processor

G&T Modifications:

- Alternate assignments/enrichment assignments
- Enrichment projects
- Extension activities
- Higher-level cooperative learning activities
- Pairing direct instruction with coaching to promote self-directed learning
- Provide higher-order questioning and discussion opportunities
- Provide texts at a higher reading level
- Tiered assignments
- Tiered centers

At Risk Modifications

- Additional time for assignments
- Adjusted assignment timelines
- Agenda book and checklists
- Answers to be dictated
- Assistance in maintaining uncluttered space
- Books on tape
- Concrete examples

- Extra visual and verbal cues and prompts
- Follow a routine/schedule
- Graphic organizers
- Have students restate information
- No penalty for spelling errors or sloppy handwriting
- Peer or scribe note-taking
- Personalized examples
- Preferential seating
- Provision of notes or outlines
- Reduction of distractions
- Review of directions
- Review sessions
- Space for movement or breaks
- Support auditory presentations with visuals
- Teach time management skills
- Use of a study carrel
- Use of mnemonics
- Varied reinforcement procedures
- Work in progress check

Formative Assessment:

Unit formative assessments are drawn from, but not limited to:

- Conferences between the instructor and student at various points in the semester.
- Homework exercises as review for exams and class discussions.
- In-class activities where students informally present their results.
- Observations during in-class activities; of students' non-verbal feedback during lecture.
- Question and answer sessions, formal—planned and informal—spontaneous.
- Reflections journals that are reviewed periodically during the semester.
- Student feedback collected by periodically answering specific question about the instruction and their self-evaluation of performance and progress.

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Summative Assessment:

Summative assessments are related specifically to material covered in the current unit of study.

- Final examination (a truly summative assessment).
- Instructor self-evaluation.
- NCCER Module Exams
- Performance Profile Exam
- Projects (project phases submitted at various completion points could be formatively assessed).
- Quiz, Test, MP Assessment.
- Student evaluation of the course (teaching effectiveness).

Resources & Materials:

NCCER Contren Learning Series

- Construction Technology 4th Edition
- Core Curriculum 5th Edition

- Instructional videos from various sources
- Power tools as needed

Technology:

- Chromebooks, Google Drive Storage & Related Google Apps
- MS Office Software as Needed
- SmartBoard Presentations and Peripheral Technology
- Smartphones

TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.12.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS1	Identify and define authentic problems and significant questions for investigation.
TECH.8.1.12.F.CS2	Plan and manage activities to develop a solution or complete a project.