

**Wickenburg Unified School District
Wickenburg High School
CTE Academic Integration**

**Building Measurement
Geometry with Construction I**

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Grade Level Participation: 9-12

Standards Meet:

Engineering Standard

7.0 APPLY MATHEMATICAL PROCESSES TO PROBLEMS IN CONSTRUCTION TECHNOLOGIES

7.1 Express issues in construction technologies using numeric, symbolic and/or graphic representations

7.2 Perform mathematical calculations in the context of construction technologies problems

7.3 Recognize and use metric and English units of length, weight, volume and/or temperature

7.5 Select and use the appropriate measurement tool for the task

11.0 INTERPRET SCHEMATICS, BLUEPRINTS AND TECHNICAL DRAWINGS UTILIZED IN CONSTRUCTION TECHNOLOGIES

11.1 Interpret tolerances associated with dimensions

12.0 DEMONSTRATE DRAWING AND VISUALIZATION SKILLS FOR THE CONSTRUCTION TECHNOLOGIES FIELD

12.1 Sketch, draw, and illustrate concepts and ideas in construction technologies

26.0 DEMONSTRATE MATH SKILLS RELATED TO CONSTRUCTION INDUSTRY

26.1 Add, subtract, multiply and divide whole numbers, with and without a calculator

26.2 Add, subtract, multiply and divide fractions

26.6 Recognize some of the basic shapes used in the construction industry and apply geometry to measure them

Math

Strand 4: *Geometry and Measurement*

Concept 1: *Geometric Properties- PO2*

Concept 4: *Measurement- PO4 & PO5*

Lesson:

PART I:

To be completed near the end of the Unit on Similar Figures and Scale Factors:

1. Review measuring using a ruler and tape measure.
2. Measure the dimensions of the classroom. Include the measuring of student desks, Teacher's desk, podium, and cabinets in the room.
3. Draw the classroom to Scale including furniture

PART II:

1. Do a worksheet on review of Perimeter and Area.
2. Measure outside dimensions of the building.
3. Draw a sketch of the building showing dimensions:
 - Length and width of each side
 - Height at the middle
 - Height at the edge
 - Slope

Part III:

Students will form a Company to paint and decorate the outside of the storage building. They will calculate the following information:

- Calculate the Area and Perimeter of each outside wall, and the Perimeter and Area of each door.
- Decide on paint colors for the building and doors.
- Decide on logos, pictures and writing (signs) to go on the building (the computer can be used for logo and design ideas).
- Decide on the brand and type of paint to be used.
- Decide on the amount of each type of paint needed.
- Create an itemized list with prices, then, calculate the total cost of painting and decorating the building.

Part IV: Construction Technology Application

Using drawings created by the geometry class, construction technology classes will verify the dimensions of the building and then perform the work to complete a project.

1. Using the appropriate measuring tools (Architects scale and tape measure), students will verify the drawings created by the geometry class.
2. Students will calculate the materials required and verify geometry class results
3. Students will then paint the buildings as required.
4. Once completed, students will determine the amount of material used.

Assessment:

Both classes will be measured by the following:

- Accuracy of measurements and calculations
- Neatness of drawings and work completed

Assessment Results:

This lesson reinforces concepts taught in Construction I. It further emphasizes the need for accuracy of measurement. For the geometry classes, students will see how the subject relates to real life.