# GEORGIA | PEACH STATE PATHWAYS

## Career, Technical, & Agricultural Education

# ACCT—ARCHITECTURAL DRAWING

PATHWAY:            Architectural Drawing and Design

COURSE:            Introduction to Engineering Drawing and Design

UNIT:                Graphic Communication – Unit 1

# INTRODUCTION

**Annotation:**

This unit is to introduce students to the language of technical drawing. Through demonstration, handouts and PowerPoints, the students will learn the beginning standards for technical drawing.

**Grade(s):**

| | |
|---|---|
| x | 9th |
| x | 10th |
| x | 11th |
| x | 12th |

**Time:** Fifteen (15) 50-minute periods

**Author:** Liz Pharr

**Additional Author(s):**

**Students with Disabilities:**

For students with disabilities, the instructor should refer to the student's IEP to be sure that the accommodations specified are being provided. Instructors should also familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation.

# FOCUS STANDARDS

**GPS Focus Standards:**

**ACT-IED-6. Students will create technical freehand sketches.**
Demonstrate orthographic, pictorial, schematic, and diagram sketches.
**ACT-IED-7. Students will demonstrate proper lettering techniques.**
Demonstrate vertical and inclined lettering.

**GPS Academic Standards:**

*ELA9RL5. The student understands and acquires new vocabulary and uses it correctly in reading and writing.*
*MM1P5. Students will represent mathematics in multiple ways.*
*SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.*

**National / Local Standards / Industry / ISTE:**

**ADDA:** Fundamental drafting skills

# UNDERSTANDINGS & GOALS

**Enduring Understandings:**

Graphic communication is a universal language used to transform ideas into working drawings.

**Essential Questions:**

- Why is it important for drawing to be a standard, common language among all drafters or designers?

**Knowledge from this Unit:**

- Understand the difference in artistic and technical drawing.
- See the purpose of technical sketching the design process.
- Understand the need for standardization in drawing.
- See the relationship between two-dimensional and three-dimensional drawings.
- Identify different types of pictorials.

**Skills from this Unit:**

- Prepare hand-drawn technical sketches using regular and isometric grid paper.
- Demonstrate inclined and vertical style hand-lettering.

# ✓ ASSESSMENT(S)

**Assessment Method Type:** Select one or more of the following. Please consider the type(s) of differentiated instruction you will be using in the classroom.

|        | Pre-test |
|--------|----------|
| x      | Objective assessment - multiple-choice, true- false, etc. |
|        | __x Quizzes/Tests |
|        | __x Unit test |
|        | Group project |
| x      | Individual project |
|        | Self-assessment - May include practice quizzes, games, simulations, checklists, etc. |
|        | __ Self-check rubrics |
|        | __ Self-check during writing/planning process |
|        | __ Journal reflections on concepts, personal experiences and impact on one's life |
|        | __ Reflect on evaluations of work from teachers, business partners, and competition judges |
|        | __ Academic prompts |
|        | __ Practice quizzes/tests |
|        | Subjective assessment/Informal observations |
|        | __ Essay tests |
|        | __ Observe students working with partners |
|        | __ Observe students role playing |
|        | Peer-assessment |
|        | __ Peer editing & commentary of products/projects/presentations using rubrics |
|        | __ Peer editing and/or critiquing |
| x      | Dialogue and Discussion |
|        | __ Student/teacher conferences |
|        | __ Partner and small group discussions |
|        | _x_ Whole group discussions |
|        | __ Interaction with/feedback from community members/speakers and business partners |
|        | Constructed Responses |
|        | __ Chart good reading/writing/listening/speaking habits |
|        | __ Application of skills to real-life situations/scenarios |
|        | Post-test |

## Assessment(s) Title:

**Pictorials Quiz 1**
**Pictorials Quiz 2**
**Sketching assignments**
**Lettering assignments**
**Sketching and dimensioning assignments**

## Assessment(s) Description/Directions:

## Attachments for Assessment(s):

**Pictorials Quiz 1**
**Pictorials Quiz 1 key**
**Pictorials Quiz 2**

**Pictorials Quiz 2 key**
**Lettering Rubric**
**Graphic Communications unit test**
**Graphic Communications unit test key**

# LEARNING EXPERIENCES

**Sequence of Instruction**

**Introduction**

**1. Identify the Standards. Standards should be posted in the classroom for each lesson.**

> **ACT-IED-6. Students will create technical freehand sketches.**
> Demonstrate orthographic, pictorial, schematic, and diagram sketches.
> **ACT-IED-7. Students will demonstrate proper lettering techniques.**
> Demonstrate vertical and inclined lettering.

**2. Review Essential Questions.**

> Why is it important for drawing to be a standard, common language among all drafters or designers?

**3. Identify and review vocabulary throughout lessons.**

| | |
|---|---|
| Graphic communication | Alphabet of lines |
| Sketching | Annotation |
| Technical drawings | Dimensioning |
| Orthographics | Guidelines |
| Pictorials | Ames lettering guide |
| Perspectives | Symmetrical |
| Isometrics | Ellipse |
| Obliques | Rhombus |

**4. Interest approach – Mental set**

> Explain the "universality" of the graphic language and the need for all drafters and designers to be able to communicate worldwide in a common way. Explain the use of standards. Emphasize how drawing is a language made through symbols and the usage of lines to "speak" without using words.

> For all the lessons, list new vocabulary discussed each day and review at end of class and begin the next day class with review of the terms.

**LESSON 1 INTRODUCTION TO DRAWING PRACTICES**

> Discussion

1. Ask students the kinds of drawings they can name. List them as they name them and ask whether they know what kind of designer does that kind of drawing, e.g., floor plans. Then list architect beside the term. Have students take notes from the list.

2. Explain process of going from idea into production. Show Graphic Communications PPT.

3. Explain and demo traditional (board) drafting and CAD drafting.

4. Show slide show "Intro examples of drawings."

5. Explain standards and why they are set. Explain ANSI and its purpose and have students list in notes as vocabularies.

6. Draw or show drawings with different kinds of lines to demonstrate a standard, e.g., hatching or hidden lines. Give handout or PPT of "Alphabet of lines."

**LESSON 2 SKETCHING**

1. Access http://www.ikerd.com/unt/TEXTBOOK/HAND_DRAWING/Freehand_Sketching.pdf for notes on Intro to Sketching. See also copy of Freehand_Sketching in Sketching folder.

2. Show the difference in orthographics and pictorials. Give definitions and have students list in notes. Show PPT "Technical Sketching" and/or PPT "Sketching."

3. Sketch a person as a pictorial and then a person as an orthographic. Do the same thing with a common object such as a chair. Explain what determines whether orthographics or pictorials are to be used.

4. Show simple examples of pictorials and label isometrics, obliques (cabinet and cavalier), and perspectives. Explain when each is used.

5. Explain the three dimensions. Ask which dimension (width, depth, and height) would show on the sketch of the person.

6. Ask what kind of thing you draw that would only need two dimensions to fully describe. Get them to finally come up with objects that are symmetrical, such as a screwdriver or a bike wheel. Explain center line as basis for symmetry.

7. Have students copy a simple isometric on isometric grid paper. (Can be downloaded)

8. Show "Pictorials –PPT."

9. Continue to have students practice sketching on regular grid and isometric grids.

**LESSON 3 LETTERING**

1. Explain the need for learning to use a "common" style of lettering because board drawings often having many people working on them.

2. Show examples of inclined and vertical (architectural) lettering. Explain annotation.

3. Demonstrate the use of an Ames lettering guide. At www.youtube.com, there is a 3 minute video, "How to letter with lead" at http://www.youtube.com/watch?v=pmttakfeyVA demonstrating the Ames lettering guide and architectural lettering and "How to write like an architect" at http://www.youtube.com/watch?v=Ky5p-L_m6BQ.
   If you do not have access to any board drawing equipment, print sheets with guidelines for quiz and worksheets.

4. Give worksheets for students to practice lettering.

5. Give students specific examples of hand-lettered inclined and architectural texts to copy rather than just going through the alphabet for practice. See Architectural Lettering handout.

6. For quiz grade, have students letter both styles from printed text. See Lettering Rubric.

7. Have students fill out all worksheets and quizzes using one of the lettering styles and give lettering grade in addition to assignment grade.

**LESSON 4 ADDING DIMENSIONS TO SKETCHES**

1. Show general rules about dimensioning sketches. Demo correct spacing of mixed numbers (when to use slash vs. horizontal bar in fractions, etc.). Explain proportion. Explain annotation.

2. Give a sketch assignment with printed dimensioning for students to sketch and dimension without tools.

**Test students on vocabulary and concepts in "Graphic Communications unit test."**

**Attachments for Learning Experiences:**

| | |
|---|---|
| Employability folder | Prep notes for sketching |
| Intro examples of drawings – slide show | Sketching – PPT |
| Alphabet of lines – handout | Technical drawing Wiki |
| Alphabet of lines - PPT | Technical Sketching - PPT |
| Architectural Lettering - handout | Lettering Rubric |
| Freehand Sketching | Pictorials Quiz 1 |
| Graphic Communication - PPT | Pictorials Quiz 1 key |
| Iso grid | Technical Drawing – Wikipedia Pictorials Quiz 2 |
| Lettering – handout | Pictorials Quiz 2 key |
| Prep notes for pictorials | Pictorials - PPT |

**Notes & Reflections:**

Based on the texts you use, you will need to prepare lessons with specific drawings for students to use in sketching exercises. They should sketch pictorials and orthographics. After you explain some basic dimensioning procedures, have them add dimensions to sketches. After they've practiced lettering, have them letter all their worksheets and quizzes as a separate grade.

# CULMINATING PERFORMANCE TASK (Optional)

**Culminating Unit Performance Task Title:**

Graphic Communication unit test (Instructor will need to add any sketch problems to the test.)

**Culminating Unit Performance Task Description/Directions/Differentiated Instruction:**

Given the test, students will answer the questions and draw the figures as directed in pencil using either

inclined or vertical lettering.

**Attachments for Culminating Performance Task:**

Graphic Communication unit test

# UNIT RESOURCES

**Web Resources:**

**Attachment(s):**

Employability resources containing Employability Skills PPT, Employability matrix and Weekly Employability rubric

**Materials & Equipment:**

**What 21st Century Technology was used in this unit:**

| | | | | | |
|---|---|---|---|---|---|
| x | Slide Show Software | | Graphing Software | | Audio File(s) |
| | Interactive Whiteboard | | Calculator | | Graphic Organizer |
| | Student Response System | | Desktop Publishing | | Image File(s) |
| | Web Design Software | | Blog | | Video |
| | Animation Software | x | Wiki | | Electronic Game or Puzzle Maker |
| | Email | x | Website | | |