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| **TEXAS CTE LESSON PLAN**[www.txcte.org](http://www.txcte.org) |
| **Lesson Identification and TEKS Addressed** |
| **Career Cluster** | Manufacturing |
| **Course Name** | Introduction to Welding |
| **Lesson/Unit Title** | Basic Lines and Views |
| **TEKS Student Expectations** | 130.362. (c) **Knowledge and Skills**(4) The student compares and contrasts welding joint design, material symbols, and welds. The student is expected to:(A) demonstrate knowledge of welding sketches (B) identify types of welds such as fillet, groove, spot, plug, and flanged. |
| **Basic Direct Teach Lesson**(Includes Special Education Modifications/Accommodations and one English Language Proficiency Standards (ELPS) Strategy) |
| **Instructional Objectives** | * Identify types of lines, descriptions, and their purposes
* Analyze basic views of object drawings for fabrication
* Interpret welding plans
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| **Rationale** | The student will be able to read and comprehend various lines and views to properly read and interpret welding plans. |
| **Duration of Lesson** | 3 45-minute class periods |
| **Word Wall/Key Vocabulary***(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | * Oblique View- the view that is parallel, but the projection is oblique to plane
* Isometric View- an axonometric projection in which the three spatial axes of the object are represented as equally inclined to the drawing surface and equal distances along the axes are drawn equally
* Pictorial View- the view of an object as it would be seen in either a chosen direction or from a selected point of view
* Orthographic Projection- the means of representing a three-dimensional object in two dimensions
* Object Line- a thick line to show the visible shape of a part
* Hidden Line- broken line of medium thickness to show edges and outlines not visible to the eye
* Center Line- fine, broken line made up of a series of short and long dashes alternately spaced; to show the center of circles, arcs, and symmetrical objects
* Extension Line- a line extended from the object with a slight break between the object and line that show dimensions of an object
* Leader Line- a fine, straight line with either an arrow or round dot at one end that points directly to a surface for dimensioning or notes
* Cutting-plane Line- a line that is either a heavy, broken line with a series of long and two short dashes, or a solid, heavy line with a series of long dashes that indicate an imaginary cut through an object
* Section Line- a series of lines arranged in a specific pattern to represent a variety of materials
* Chain Line- heavy, broken line made up of a series of long and short dashes that indicate the location and extent of a surface area
* Short-break Line- heavy, irregular line drawn by freehand that indicates a break to show a partial section
* Long-break Line- light line with zigzags that show a long break to conserve space
* Phantom Line- light, broken line made up of a series of one long and two short dashes to show alternating positions of a part
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| **Materials/Specialized Equipment Needed** | **Materials*** Lines and views handouts
* Test
* 3 X 5 index cards, lined on one side, blank on the other (15 per student)

o Stack cards for each student. The cards should have lines on one side and be blank on the other.* Class copies of blueprint
* Prior to lesson, divide 3 X 5 index cards into

**Equipment**Instructor* Computer for slide presentation

Instructional Aids* Basic Lines and Views slide presentation
* Basic Lines and Views Exercise
* Basic Lines and Views Exercise Key
* Basic Lines Worksheet 1
* Basic Lines Worksheet 1 Key
* Basic Lines Worksheet 2
* Basic Lines Worksheet 2 Key
* Basic Lines Worksheet 3
* Basic Lines Worksheet 3 Key
* Basic Lines Exam
* Basic Lines Exam Key
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Prior knowledge of basic welding terminology |
| **Direct Instruction \*** | The purpose of this lesson is to introduce students to basic line types and views to equip them with the ability to properly interpret welding plans.Arrange student desks so that desks are placed in various spots around the room, but all pointing to the center of the room where a table is located.* Show

o Place a 3-D object on a table in the center of the room.* Say

o Using a sheet of paper, draw what you see.* Ask

o What are the different views and details seen from each side of the room?* Say

o See how objects look from varying viewpoints? And how we need to see all parts of an object and/or drawing to create a correct design?*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*none |
| **Guided Practice \*** | I. Introduction - Begin the Basic Lines and Views slide presentation. Students take notes from the presentation on the Basic Lines and Views Worksheets 1, 2 and 3.II. Basic Lines and Views slide presentation - On the 3 X 5 index cards, have students draw the different types of lines on one side of the card, turn the card over and write the definition and purpose of the line (to create flash cards for a memory game). Students can match the definitions with the correct line card.A. Basic Views (Pictorial)B. Basic Views (Multi-view)C. Types of Lines ID. Types of Lines IIE. Types of Lines IIIF. Types of Lines IVIII. Use slide presentation of views and lines (students use worksheets)A. Students will draw in the correct line on the Basic Lines Worksheets 1, 2, and 3.IV. Guided practice for studentsA. Write the name of line on one side of card.B. Draw the line on the back side of card.C. Create a memory game. V. Independent practice - As students work on Basic Lines and Views Exercise, have some solid objects for them to see different views of. (If possible, recreate the objects on the exercise sheet.)A. Working in teams, students can complete BasicLines and Views Exercise.B. Students can exchange work with other teamsto discuss if there were any differences inviews.VI. ReviewVII. Basic Lines Exam at the end of lesson. - Distribute and administer the Basic Lines Exam. Grade exam using the answer key.*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*NONE |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Guided PracticeStudents take notes on handout Basic Lines Worksheet 1, 2, and 3 during the Basic Lines and Views slide presentation. After the presentation, students are to take notes on 3 X 5 cards using one card for each line presented. The type of line will be drawn on the blank side and the purpose and description for the line written on the other side. (Note that, usually, a view that shows the most detailed shape of the object is chosen as the front view. Three views are most commonly presented.)Independent PracticeStudents will complete the Basic Lines and Views Exercise for a grade. This worksheet will help the students see the most common views (top, front, and right side). As students work on the exercise, have them exchange exercises with other students to collaborate on the views. When it comes to seeing views of an object, people see things differently, and this concept will help students. |
| **Lesson Closure** | Have students use flash cards to quiz one another on the basic line drawn, descriptions, and purpose of the line. |
| **Summative/End of Lesson Assessment \***  | Informal AssessmentTeacher monitors during partner quiz review activity.Formal AssessmentStudents complete the Basic Lines Exam*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:* |
| **References/Resources/****Teacher Preparation** | * Bennett, A. E., & Siy, L. J. (1999). Blueprint reading for welders. Independence, KY: Cengage Learning.
* Giachino, J. W. (1978). Print reading for welders. 2nd ed. Orland Park, IL: American Technical Publishers.
* Giesecke, F. E. & Mitchell, A. & Spencer, H.C. & Hill, I. L. & Dygdon,
* J. E. & Novak. (2003). Technical drawing 12th ed. Upper Saddle River, NJ: Prentice Hall, Inc.
* Merriam-Webster Dictionary
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| **Additional Required Components** |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy****Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies****Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication****90 Second Speech Topics** |  |
| **Other Essential Lesson Components** |
| **Enrichment Activity**(e.g., homework assignment) |  |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)