Why:
Sketching is used as a rapid thinking tool in developing design alternatives. Many common designs are not limited to straight edges, but utilize curves, slots, holes, etc. Engineers must be able to sketch the designs properly in order to communicate conceptual ideas. The ability to understand curved, holes, slots, etc., orthographic projections is another vital skill of the successful engineer.

Learning Objectives:
• To generate the correct standard orthographic views from a pictorial drawing which has a variety of different contours and shapes present.
• Proper use of dimensioning lines and arrows.
• Proper use of centerlines.

Performance Criteria:
• Professional appearance of the sketches.
• Correct views are present.
• Proper use of construction, object, hidden lines, and centerlines.
• Appropriate number of dimensions.
• Appropriate location of dimensions.
• Dimensions spaced and located properly.

Resources besides Class Notes, Other Students, Instructor, Textbook, and Past Hands-Ons:
• Penn State Erie Standards Feature Dimensions
• Dimension Modules: Lesson 3
  • SI
  • Tutors

Plan:
1. For each of the problems on the attached sheet, sketch the necessary views on engineering calculation paper. Use the standard border and allow enough space between views to place dimensions and not be crowded. Each ‘dot’ on the pictorials corresponds to one space on the calculation paper. Each grid on the engineering paper equals 0.2. (Don’t forget centerlines.)
2. Show construction work (lightly) for all circles and arcs.
3. Add the appropriate dimensions to the views to completely describe the size of the part.
   (Remember to use 2 place chain dimensions.) The general tolerance is ±.01. Design Intent: Holes, slots, notches, etc., are the important dimensions. If a feature is not aligned with the center of an arc or a hole locate it from the lower left farthest forward corner of the object, except for 9-5. Locate the pad on 9-5 from the center of the hole.

Critical Thinking Questions:
1. How does the dimensioning of a blind hole and a thru hole differ?
2. How does the dimensioning of a keyseat differ from dimensioning a slot?
3. What difficulties were encountered in sketching the objects with slots and holes?