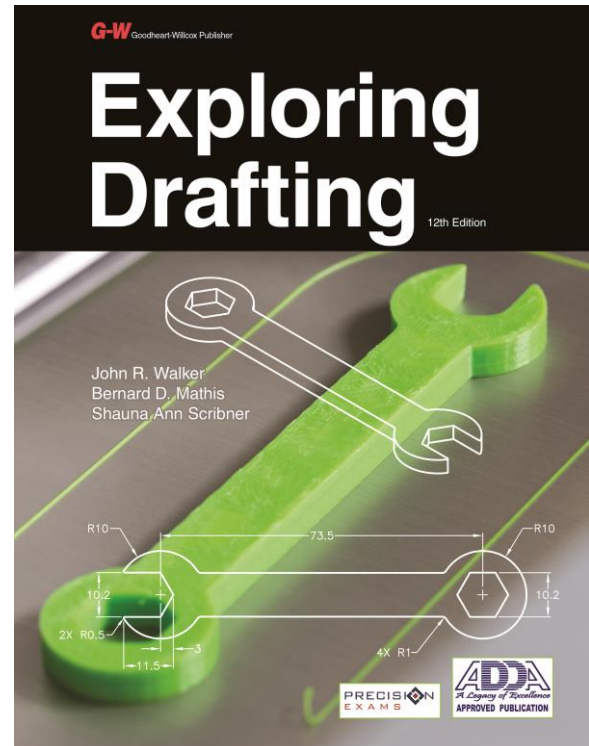


Correlation of
Exploring Drafting, Walker, Mathis, and Scribner
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to
Precision Exams CAD Mechanical Design I

Goodheart-Willcox is pleased to partner with Precision Exams by correlating *Exploring Drafting* to their CAD Mechanical Design I standards. Precision Exams standards and Career Skills Exams were created in concert with industry and subject matter experts to match real-world job skills and marketplace demands. Students that pass the exam and performance portion of the exam can earn a Career Skills Certification.

The correlation chart below lists the Standards, Objectives, and Indicators for the CAD Mechanical Design I exam in the left column. Corresponding content from *Exploring Drafting* that can be used by a student to help achieve the standard, objective, or indicator is listed in the right column.

For more information on Precision Exams, including a complete listing of their 150+ Career Skills Exams and Certificates, please visit www.precisionexams.com.



Standards / Objectives / Indicators	Textbook Pages
Standard 1: Students will investigate career opportunities in engineering and engineering technology.	
Objective 1. Identify occupations related to engineering and engineering technology.	3–9, 13–24, 219, 410, 420, 432, 460, 502, 518
Objective 2. Differentiate among different engineering and engineering technology disciplines.	13–24, 8, 20, 115, 149, 219, 370, 391, 410, 420, 432, 444, 460, 488, 502, 518, 555
Objective 3. Investigate different forms of occupational training and educational opportunities for careers in engineering and engineering technology.	13–24, 219, 410, 420, 432, 460, 502, 518
Standard 2: Students will understand the elements of an organized approach to solving an engineering design problem.	
Objective 1. Form a basic design process that can be used to solve an engineering problem.	

Standards / Objectives / Indicators	Textbook Pages
Indicator 1: Identify and define the design problem	329, 419–423
Indicator 2: Brainstorm solutions	35, 302, 329, 365
Indicator 3: Create models and build a prototype	423–424, 428–437, 560–563
Indicator 4: Test the prototype	423–424, 428–437, 560–563
Indicator 5: Redesign and optimize	430–436
Objective 2. In order to better comprehend the engineering design process, students should learn that: Indicator 1: Design problems are seldom present in a clearly defined form.	416–424
Indicator 2: The design needs to be continually checked and critiqued, and the ideas of the design must be refined and improved.	416–424, 428–437
Indicator 3: Requirements of a design, such as criteria, constraints, and efficiency, sometimes compete with each other.	418–422
Indicator 4: Engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.	416–424
Indicator 5: The process of engineering design takes into account a number of factors including safety, reliability, cost, quality control, the environment, manufacturability, maintenance and repair, and human factors.	419–423
Standard 3: Students will document the design process and communicate the results of that process using appropriate techniques.	
Objective 1. Make accurately proportioned sketches using correct drawing conventions. Indicator 1: Understand and use accepted dimensioning practices for sketches.	248–263
Indicator 2: Create freehand sketches using paper, pencil, and an eraser which is neat, clear, and smudge-free.	36–47
Indicator 3: Views can be isometric, orthogonal, sections, or assemblies.	332–348
Indicator 4: Understand and demonstrate the use of the alphabet of lines.	31–46, 82–85
Indicator 5: Use letters and numerals that conform to a Gothic style.	198–203
Indicator 6: Notes are neat and legible.	198–200
Objective 2. Create and utilize an engineering notebook per established conventions.	

Standards / Objectives / Indicators	Textbook Pages
Indicator 1: Entries are sequential and chronological.	25
Indicator 2: Accurate and complete reflection of the progress being recorded.	25
Indicator 3: Sketches or pictures are included where appropriate.	25
Indicator 4: No loose entries or pages.	25
Indicator 5: Each page is dated and witnessed.	25
Indicator 6: Unused spaces are identified, lined out, and initialed.	25
Indicator 7: Errors are not erased or obliterated.	25
Indicator 8: Test data and calculations are included.	25
Standard 4: Students will understand and apply mathematics, measuring conventions, and scale.	
Objective 1. Perform basic arithmetic functions using fractions and decimals. Indicator 1: Add, Subtract, Multiply, Divide.	84
Objective 2. Accurately and efficiently convert between fractions and decimals. Indicator 1: Decimal/fraction equivalent chart.	84, 574
Objective 3. Convert between metric and imperial measurements	76
Objective 4. Demonstrate an ability to make and record basic measurements. Indicator 1: Use scales, micrometers, and calipers (dial and digital) to take measurements.	71–72, 86–89
Indicator 2: Understand and demonstrate the conversion of actual lengths to common technical drawing scales.	71–72, 86–89
Indicator 3: Accurately scale drawings using CAD techniques when drawing and plotting.	46–47
Indicator 4: Record measurements using Cartesian and polar coordinates, as well as absolute and relative distances.	148–152
Standard 5: Students will be able to develop orthographic views of a part with the correct dimensions and geometry.	
Objective 1. Demonstrate exactness and precision when producing drawing geometry. Indicator 1: Apply correct 2D geometric construction techniques.	116–129

Standards / Objectives / Indicators	Textbook Pages
Indicator 2: Drawing elements are accurate and drawn to scale.	86–89, 221–229
Indicator 3: Draw on the correct plane.	216–221
Indicator 4: The top, front, and side views are used unless otherwise required using orthographic projection.	227
Indicator 5: All views are properly aligned and use third-angle projection.	116–129, 229–234, 216–219
Indicator 6: Appropriate lines and surfaces are located on each view.	221–227
Objective 2. Be proficient in the use of terminology associated with drafting and design. Indicator 1: Axis, concentric, diameter, coordinate, fillet, horizontal, orthographic view, parallel, perpendicular, plane, radius, round, sketch, tangent, third angle projection, vertical.	28–47, 92–93, 127, 148–158, 161–162, 171, 216–229, 258–259, 272, 274, 342–348, 486–487, 493–494, 591, 593, 595, 601, 602, 605, 606
Standard 6: Students will be able to understand and demonstrate the use of correct line types.	
Objective 1. Understand and use the recommended thickness of lines.	31–33, 82–83
Objective 2. Understand and correctly employ conventionally used line types. Indicator 1: Object, Hidden, Center, Dimension, Extension, Leader, Border, Phantom, Section, Cutting Plane, Construction.	31–36, 82–85, 249–250, 288–291
Standard 7: Know and follow ANSI 14.5 dimensioning standards and apply the appropriate dimensions to drawings.	
Objective 1. Understand and choose the best location for dimensions. Indicator 1: Locate dimensions on the profile view and between views.	249, 252–254
Indicator 2: Apply appropriate spacing between the object and the first dimension.	249–250, 252–254
Indicator 3: Apply uniform spacing between dimension lines.	250
Indicator 4: Use correct dimension line terminators, such as arrowheads ticks, and dots.	249–250
Objective 2. Understand and appropriately use baseline and chain dimensioning.	254
Objective 3. Demonstrate an ability to fully dimension a part.	252–255
Objective 4. Demonstrate the correct use of leaders and notes.	

Standards / Objectives / Indicators	Textbook Pages
Indicator 1: Understand and correctly form callouts for thru holes, countersinks, counterbores, and spotfaces.	256–262
Indicator 2: Demonstrate correct dimensioning for fillets and rounds.	261–262
Indicator 3: Understand and correctly form callouts for threaded holes.	486–488
Indicator 4: Use appropriate angles for leaders.	259–261
Standard 8: Students will be able to understand and use 2D computer software to create technical drawings.	
Objective 1. Know how to save, open, rename, and move data files using common computer operating system software.	147–148, 164–165
Objective 2. Originate technical drawings using 2D CAD software features.	
Indicator 1: Create a new drawing setup to support both English and metric drawing standards.	156–157
Indicator 2: Create drawing setups for different sizes of drawing sheets.	156–157
Indicator 3: Use and control accuracy enhancement tools. Use snap, grid, and positioning methods.	153–154
Indicator 4: Analyze drawings using the software features, X,Y coordinates, area, distance, perimeter, etc.	148–153, 163
Objective 3. Prepare and understand proper title blocks.	97–99
Objective 4. Add correct annotation to drawings.	
Indicator 1: Use the correct text height.	204
Indicator 2: Use Gothic letters and numerals.	204
Indicator 3: Understand the placement and use of general notes.	274
Objective 5. Revise existing technical drawings using the software features.	168–173, 297, 318
Objective 6. Reproduce originals using different methods.	408–409
Objective 7. Plot to scale and use correct plot specs.	
Indicator 1: Plot drawings with correct line widths.	33, 148, 408–409