Offset Press Operations and Binding and Finishing Blueprint

The PrintED/SkillsUSA Offset Press Operations/Binding & Finishing competencies encompass the knowledge and skill set a student should master to exhibit proficiency in offset press operations/binding & finishing. The PrintED/SkillsUSA Offset Press Operations/Binding & Finishing Career Essentials Assessment test questions align with the PrintED/SkillsUSA Offset Press Operations/Binding & Finishing competencies.

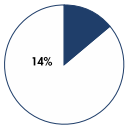
This Blueprint contains the subject matter content for the Career Essentials - Assessment.

Note: To fully prepare for the SkillsUSA Championships contest, refer to the current year's SkillsUSA Championships Technical Standard, now included with your SkillsUSA Professional Membership. If you need help in accessing this benefit, contact the SkillsUSA Customer Care Team at 844-875-4557 or customercare@skillsusa.org.

Standards and Competencies

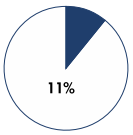
Competencies are weighted throughout the assessment. The percent shown is the weight of the competency. There are 50 questions per assessment.

Offset Press Technologies



- Review mechanical safety requirements when working with offset press equipment
- Describe a job jacket/ticket
- Identify the basic systems and parts of an offset press a. Feeder b. Printing unit c. Delivery
- Describe the paper path of a sheet fed offset press
- List common speeds maximum speeds (impressions per hour) of sheet fed presses and web fed presses
- Describe the paper path of a web (roll) fed offset press
- Compare the advantages and disadvantages of a web fed offset press versus a sheet fed offset press
- Describe perfecting and compare the features of a perfecting press versus non perfecting press
- Identify components of a printing unit by sketching an illustration
- Describe a single color offset press
- Describe a multi-color offset press
- Describe an offset lithographic plate and explain how it separates an image from a non-image area
- Describe the function of the blanket
- Describe the function of the impression cylinder
- Describe the operation of an offset printing press from feeding, through the printing unit, to delivery
- Rate the advantages and disadvantages of offset printing versus digital printing
- Compare the features and capabilities of offset presses offered by three manufacturers
- Describe how automation tools are being employed on an offset press

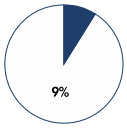
Paper



- Identify characteristics of paper a. Weight b. Finish c. Thickness d. Brightness e. Opacity f. Grain Direction
- Identify weight, coating and size from a label found on a ream, box, or skid of paper
- Determine grain direction of 5 different types of papers used in the offset printing process

- Describe how grain direction will affect the running of a press, folding, scoring and binding
- Describe wire versus felt side of paper
- Describe a watermark in paper
- Identify specialty substrates a. Carbonless b. Pressure Sensitive c. Gummed Label d. Plastic Based e. Metal
- Explain the importance of paper conditioning and describe potential problems that can be created by poor paper conditioning prior to running the press
- Describe workflow steps required in printing a process color job on coated versus uncoated paper

Ink

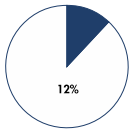


- Describe inks used with an offset press a. Oil-based b. Rubber-based c. Soy-based d. UV
- Describe the process (CMYK) and spot (PMS) color inks
- Identify process and spot color areas from selected sample print job
- Describe the procedure for mixing and testing custom colored inks
- Describe causes of ink problems and possible solutions
- Review solutions for common ink problems.
- Discuss coating a. Aqueous b. Ultraviolet Cured c. Varnish
- Describe the purpose and operation of a dampening system
- Demonstrate the proper mixing of dampening solution using appropriate ratios
- Describe and demonstrate the use of pH strips and conductivity meters to monitor dampening solution to maintain print quantity

Dampening Solution

- Describe the components of dampening systems

Make-ready

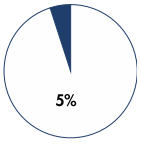


- Analyze a job ticket for printing instructions
- Describe a folding dummy
- Distinguish imposition of printing jobs a. Streetwise b. Work-and-turn c. Work-and-tumble
- Identify the marks on press sheet a. Registration b. Trim c. Bleed d. Fold
- Specify the steps required to execute make-ready for a printing job
- Describe the purpose of a gripper
- Describe the purpose of a side bar
- Describe types of blankets a. Compressible b. Conventional
- Describe cylinder to cylinder pressure measurements
- Describe packing sheets (Blanket and Plate)
- Demonstrate paper handling make-ready jobs
- Demonstrate mounting plate to plate cylinder
- Demonstrate inking system make-ready
- Demonstrate dampening system make-ready
- Demonstrate printing unit make-ready
- Estimate time and materials used during five make-ready jobs

SkillsUSA | Career Essentials: *Assessments*

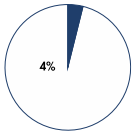
PRINT ED

Print



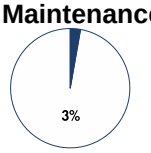
- Explain the operational procedures, controls, adjustments for each system (feeding, printing, delivery) on the press
- Describe the use of flags to signify waste sheets during a pressrun
- Print a single-color one-sided job
- Print a process color job on coated paper
- Explain the purpose of spray powder on an offset press
- Demonstrate wash-up techniques for the inking system (including a color wash), dampening system, and cylinders
- Describe the use of a press console

Quality



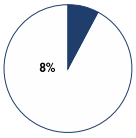
- Describe the use of color bars for quality control
- Describe the function of optical measurement tools used for quality control a. Densitometer b. Spectrophotometer
- Describe the importance of print industry specifications a. Web Offset Publications (SWOP) b. Specifications for Newsprint Advertising Production (SNAP) c. General Requirements for Applications of Commercial Offset Lithography (GrRACol)

Maintenance



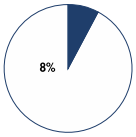
- Review the procedures for daily, weekly and monthly maintenance on a press

Math and Measurement



- Solve addition of fraction problems
- Solve subtraction of decimal problems – two and three digits
- Solve basic ratio and proportion problems
- Solve basic liquid measurement problems
- Convert English to Metric
- Estimate a small offset press job. Labor costs to include make-ready, running and clean up
- Estimate ink and paper costs on a common print job

Bindery and Finishing Technologies



- Review the mechanical safety requirements when working with bindery and finishing equipment
- Summarize the finishing production information on a job jacket/ticket
- Demonstrate how to check the squareness of stock
- Demonstrate paper jogging techniques
- Demonstrate paper sheet counting techniques by a. Ream marker b. Weight c. Caliper
- Identify hand tools, equipment, and materials in bindery operations
- Identify in-line finishing systems operations
- Describe specialty finishing techniques a. Foil Stamping b. Embossing/Debossing c. Perforation d. Drilling/punching e. Scoring f. Die Cutting g. Coating h. Lamination
- Determine key activities within a binder operation in a commercial printing plant either on site or online via a virtual tour
- Determine the skills required to work in a bindery operation

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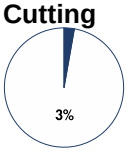
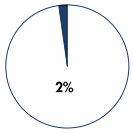
Cutting



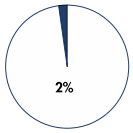
- Identify a guillotine cutter
- Calculate basic paper cuts from a parent sheet, considering job requirements and grain direction

Folding



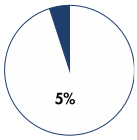
- Describe folding configurations a. Half fold b. Trifold c. Z fold d. Accordion fold e. Gate fold f. French fold
- Describe the uses and customer application of common fold
- Describe folding techniques a. Right angle folding b. Knife folding c. Buckle folding c. combination folding

Collation



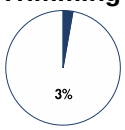
- Review the workflow steps used for collating sets of print

Binding



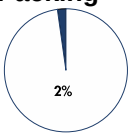
- Describe binding a. Side stitch b. Saddle stitch c. Perfect bind d. Coil bind e. Wire bound f. Comb binding g. Velo binding h. Padding
- Discuss reasons why customers choose different binding applications
- Identify spiral binding, perfect bind, and wire binding equipment
- Define crossover
- Define creep of pages when folding a signature

Trimming



- Discuss type of project that requires trimming
- Explain the role of trimming to create a bleed effect

Packing

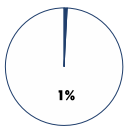


- Identify packaging and shrink wrap equipment and materials
- Summarize packaging information on job jacket/ticket

Mailing

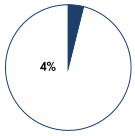
- Review USPS capabilities
- Review USPS postal regulations

Maintenance



- Determine when a blade needs to be changed on a paper cutter

Math and Measurement



- Solve subtraction of whole number problems – two and three digits
- Solve the multiplication of decimal problems – two and three digits
- Solve basis paper cutter calculations
- Estimate the cost of materials and production for performing three instructor-specified bindery operations

SkillsUSA *is of the understanding that students who take the PrintED/SkillsUSA Offset Press Operations, Binding and Finishing Career Essentials Assessment have been enrolled in a offset press operations, binding and finishing training program with the following competencies embedded within the curriculum.*

Identified Academic Skills

Math Skills
- Use fractions to solve practical problems
- Simplify numerical expressions
- Solve practical problems involving percents
- Solve single variable algebraic expressions

Language Arts Skills
- Provide information in conversations and in group discussions
- Provide information in oral presentations
- Demonstrate use of nonverbal communication skills: eye contact, posture and gestures using interviewing techniques to gain information
- Demonstrate knowledge of appropriate reference materials

Connections to National Standards

State-level academic curriculum specialists identified the following connections to national academic standards.

Math Standards
- Geometry
- Measurement
- Problem solving
- Communication
- Connections
- Representation

Source: NCTM Principles and Standards for School Mathematics. To view high school standards, visit: http://www.nctm.org/standards/content.aspx?id=16909. Select “Standards” from menu.

Science Standards
- Understands the structure and properties of matter
- Understands the sources and properties of energy
- Understands forces and motion
- Understands the nature of scientific inquiry

Source: McREL compendium of national science standards. To view and search the compendium, visit: www.mcrel.org/standards-benchmarks/.

Language Arts Standards
- Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

- Students apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, and graphics).
- Students adjust their use of spoken, written and visual language (e.g., conventions, style, and vocabulary) to communicate effectively with a variety of audiences and for different purposes.
- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks and video) to gather and synthesize information and to create and communicate knowledge.
- Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion and the exchange of information).

Source: http://www.ncte.org/standards/ncte-ira. To view the standards, visit: www.readwritethink.org/standards/index.html.