



MASSACHUSETTS
DEPARTMENT of
EDUCATION

**Vocational Technical Education
Framework**

Arts and Communications Cluster

Graphic Communications

August 2007

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Strand 1: Safety and Health Knowledge and Skills

1.A Define health and safety regulations.

- 1.A.01a Identify and apply OSHA and other health and safety regulations that apply to specific tasks and jobs in the occupational area.
- 1.A.02a Identify and apply EPA and other environmental protection regulations that apply to specific tasks and jobs in the occupational area.
- 1.A.03a Identify and apply Right-To-Know (Hazard Communication Policy) and other communicative regulations that apply to specific tasks and jobs in the occupational area.
- 1.A.04a Explain procedures for documenting and reporting hazards to appropriate authorities.
- 1.A.05a List penalties for non-compliance with appropriate health and safety regulations.
- 1.A.06a Identify contact information for appropriate health and safety agencies and resources.
- 1.A.07 Create a systematic safety program which would achieve OSHA compliance and promote a safe working environment.
- 1.A.08 Illustrate a safe environment for students in printing.

1.B Demonstrate health and safety practices

- 1.B.01a Identify, describe and demonstrate the effective use of Material Safety Data Sheets (MSDS)
- 1.B.02a Read chemical, product, and equipment labels to determine appropriate health and safety considerations
- 1.B.03a Identify, describe and demonstrate personal, shop and job site safety practices and procedures
- 1.B.04a Demonstrate safe dress and use of relevant safety gear and personal protective equipment (PPE), including wrist rests, adjustable workspaces and equipment, gloves, boots, earplugs, eye protection, and breathing apparatus
- 1.B.05a Illustrate appropriate safe body mechanics, including proper lifting techniques and ergonomics
- 1.B.06a Locate emergency equipment in your lab, shop, and classroom, including (where appropriate) eyewash stations, shower facilities, sinks, fire extinguishers, fire blankets, telephone, master power switches, and emergency exits
- 1.B.07a Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop, and classroom
- 1.B.08a Describe safety practices and procedures to be followed when working with and around electricity
- 1.B.09a Properly handle, store, dispose of, and recycle hazardous, flammable, and combustible materials.
- 1.B.10a Demonstrate proper workspace cleaning procedures

Performance Examples:

1. Use the Hazard Communication Standard (HazCom) that requires the communication of chemical hazards including the recording of chemical inventory, the labeling of containers, the proper use of personal protective equipment, and employee training.
2. Using the HazCom chemical inventory, keep records of every chemical used in the printing shop and corresponding Material Safety Data Sheets.

1.C Demonstrate responses to situations that threaten health and safety.

- 1.C.01a Illustrate First Aid procedures for potential injuries and other health concerns in the occupational area.
- 1.C.02a Describe the importance of emergency preparedness and an emergency action plan.
- 1.C.03a Illustrate procedures used to handle emergency situations and accidents, including identification, reporting, response, evacuation plans, and follow-up procedures.
- 1.C.04a Identify practices used to avoid accidents.
- 1.C.05a Identify and describe fire protection, precautions and response procedures.
- 1.C.06a Discuss the role of the individual and the company/organization in ensuring workplace safety.
- 1.C.07a Discuss ways to identify and prevent workplace/school violence.

Performance Examples:

1. Operate work environment equipment safely.
2. Maintain a clean and orderly work environment.
3. Maintain good safety records and carefully document injuries.
4. Comply with company personnel policies (e.g., personal protection equipment: safety shoes, hearing protection, glasses, gloves, etc.).
5. Create information and training materials to promote a safe workplace.

1.D Compare and contrast how the responsibility for health is dependent upon the individual, as opposed to a supervisor or others.

- 1.D.01 Demonstrate preventive maintenance and lubrication procedures.
- 1.D.02 Demonstrate awareness that all machine guards are in place and operating properly before using equipment.
- 1.D.03 Identify the existence of pinch points located behind the machine guarding on a sheet fed-offset press.
- 1.D.04 Create a Lockout/Tagout system.

Performance Examples:

1. Create a chemical container label that quickly communicates potential hazards such as how the chemical reacts with other chemicals, whether it is flammable, and what type of protective equipment should be used when handling it.
2. Comply with safety requirements for operating binding, finishing, mailing and distribution equipment by following manufacturer's instructions and company policies.
3. Use proper procedures to ensure that safety devices are working.
4. Follow company reporting procedures for unusual wear, machine noises, and other faults.

Strand 2: Technical Knowledge and Skills

2.A Demonstrate effective pre-production practices.

- 2.A.01c Describe duties of production personnel.
- 2.A.02c Explain the importance of and skills used when meeting with clients.
- 2.A.03c Demonstrate project management skills to estimate costs and establish a budget.
- 2.A.04c List practices used to schedule project workflow.
- 2.A.05c State the importance of obtaining approval / sign-off.
- 2.A.06 Explain how to establish and maintain a positive relationship with the client.
- 2.A.07 Illustrate ways to match customer needs and expectations with production process requirements.
- 2.A.08 Discuss methods for planning and coordinating production.
- 2.A.09 Develop metrics used to monitor production quality.
- 2.A.10 List ways to back-up and archive files.
- 2.A.11 List common file errors and their resolution.
- 2.A.12 Scan materials into appropriate file formats and resolutions.
- 2.A.13 Calibrate and maintain input and output devices.
- 2.A.14 Modify images to conform to layout design.
- 2.A.15 Assemble a digital file for output.
- 2.A.16 Print with output devices to given specifications.
- 2.A.17 Expose, process, and store plates.
- 2.A.18 Demonstrate techniques used to maintain platemaking equipment.
- 2.A.19 Identify common output errors and their resolution.
- 2.A.20 Describe major imaging operations and workflow through the imaging process (e.g., digital/mechanical proofing, basic photographic skills, dot gain).
- 2.A.21 Demonstrate proficiency in using current major publishing software.
- 2.A.22 Explain and adhere to the rules of basic color theory as they apply to the imaging process (e.g., RGB, CMYK, additive and subtractive, gray balance).

Performance Examples:

1. Build and prepare a document, including previewing, trapping, creating and inspecting proofs.

2.B Demonstrate effective production (press) practices.

- 2.B.01c Identify Total Quality Management principles / disciplines.
- 2.B.02c List checks used to ensure proper execution of a production plan.
- 2.B.03c Describe techniques used to monitor, review and adjust production schedule as necessary to meet quality standards.
- 2.B.04c List criteria to which the professional should follow when making final adjustments.
- 2.B.05 Identify the primary components, principal functions, and purposes of different printing systems, including: delivery system, dampening system, feeding system, inking system, printing system, and console.
- 2.B.06 Discuss the impact of prepress (imaging) and finishing processes on press operations.
- 2.B.07 Explain the fundamentals of how light and paper characteristics affect color perception.

- 2.B.08 Explain the basic principles underlying the platemaking process and the manner in which plates are created.
- 2.B.09 Compare plate characteristics.
- 2.B.10 Compare and contrast conventional and compressible blankets.
- 2.B.11 Evaluate various methods of packing plates and blankets.
- 2.B.12 Identify the causes of and list solutions for blanket problems.
- 2.B.13 Identify basic cylinder configurations.
- 2.B.14 Demonstrate the use of common printing hand tools and measuring instruments.
- 2.B.15 Explain the characteristics of various printing substrates.
- 2.B.16 List paper classifications.
- 2.B.17 Identify a watermark and explain when one is used in manufacturing paper.
- 2.B.18 Explain the characteristics of different inks.
- 2.B.19 Explain the characteristics of various chemicals used in the printing process.
- 2.B.20 Demonstrate lockout/tagout procedures.
- 2.B.21 Jog and load papers into a feeder system.
- 2.B.22 Describe the components of the various types of registration systems.
- 2.B.23 Adjust the feeder to transport various substrates squarely.
- 2.B.24 Properly set up and monitor the delivery system.
- 2.B.25 Prepare and monitor dampening system.
- 2.B.26 Perform make-ready.
- 2.B.27 Prepare the ink and inking system.
- 2.B.28 Prepare and mount plates.
- 2.B.29 Prepare the blanket for printing.
- 2.B.30 Prepare cylinders for printing.
- 2.B.31 Set drying system.
- 2.B.32 Perform printing operations.
- 2.B.33 Measure and monitor color quality.
- 2.B.34 Demonstrate techniques used to maintain register.
- 2.B.35 Perform appropriate press wash-up.
- 2.B.36 Identify common printing problems and their resolution.
- 2.B.37 Identify policies and procedures for press maintenance.
- 2.B.38 Demonstrate the use of quality control devices.

Performance Examples:

1. Select inks.
2. Mix inks.
3. Match colors.
4. Clean equipment.
5. Lubricate equipment.
6. Troubleshoot and maintain mechanical devices and systems.

2.C Demonstrate effective post-production practices.

- 2.C.01c Describe procedures that prepare products for publishing/distribution.
- 2.C.02c Choose appropriate methods of invoicing and delivery.
- 2.C.03c List criteria upon which to analyze and critique a product.

2.D Demonstrate effective bindery practices.

- 2.D.01 Illustrate the sequence of production operations within the finishing and distribution area.
- 2.D.02 Discuss the principles of binding and finishing.
- 2.D.03 Identify common imaging and press problems that could adversely affect binding, finishing, and distribution quality.
- 2.D.04 Summarize workflow operations undertaken within finishing and distribution operations.
- 2.D.05 Discuss the impact of input quality on the binding and finishing.
- 2.D.06 Explain the importance of image control marks to identify centers, bleeds, trims, register marks, side guides, and signature collation.
- 2.D.07 Explain how paper characteristics affect binding and folding operations.
- 2.D.08 Minimize paper waste and spoilage and manage waste disposal in finishing and distribution operation.
- 2.D.09 List procedures for storing raw materials and finished products.
- 2.D.10 Demonstrate safety procedures when using paper cutters.
- 2.D.11 Cut materials to given specifications.
- 2.D.12 Demonstrate proper folding steps and processes.
- 2.D.13 Demonstrate adhesive or perfect binding techniques.
- 2.D.14 Collate signatures.
- 2.D.15 Trim printed materials.
- 2.D.16 Drill holes with drill press.
- 2.D.17 Perform saddle-stitching technique.
- 2.D.18 Perform mechanical binding techniques.

2.E Apply basic printing knowledge to the production process.

- 2.E.01 Describe various printing processes.
- 2.E.02 List the sequence of printing operations.
- 2.E.03 Describe the development of the offset press.
- 2.E.04 Describe the origins of lithography and basic lithographic principles.
- 2.E.05 Compare and contrast the features of single-color, multicolor, and perfecting presses.
- 2.E.06 Identify Industry Standards such as SWOP, SNAP, and GRACoL.

Strand 3: Embedded Academic Knowledge and Skills

3.A English Language Arts

VTE #	Acad #	Standard	Grade	Topic
3.A.01c	2.4	Integrate relevant information gathered from group discussions and interviews for reports.	Pre-9th	Language
3.A.02c	13.19	Identify and use knowledge of common graphic features (charts, maps, diagrams).	Pre-9th	Reading
3.A.03c	19.21	Write reports based on research that include quotations, footnotes or endnotes, and a bibliography.	Pre-9th	Composition
3.A.04c	24.4	Apply steps for obtaining information from a variety of sources, organizing information, documenting sources, and presenting research in individual projects:	Pre-9th	Composition
3.A.05c	26.4	Analyze the effect on the reader's or viewer's emotions of text and image in print journalism, and images, sound, and text in electronic journalism, distinguishing techniques used in each to achieve these effects.	Pre-9th	Media
3.A.06c	1.5	Identify and practice techniques such as setting time limits for speakers and deadlines for decision-making to improve productivity of group discussions.	9/10	Language
3.A.07c	2.5	Summarize in a coherent and organized way information and ideas learned from a focused discussion.	9/10	Language
3.A.08c	20.5	Use different levels of formality, style, and tone when composing for different audiences.	9/10	Composition
3.A.09c	23.13	Organize ideas for a critical essay about literature or a research report with an original thesis statement in the introduction, well constructed paragraphs that build an effective argument, transition sentences to link paragraphs into a coherent whole, and a conclusion.	9/10	Composition
3.A.10c	24.5	Formulate open-ended research questions and apply steps for obtaining and evaluating information from a variety of sources, organizing information, documenting sources in a consistent and standard format, and presenting research.	9/10	Composition

3.A.11c	26.5	Analyze visual or aural techniques used in a media message for a particular audience and evaluate their effectiveness.	9/10	Media
3.A.12c	27.7	Develop and apply criteria for assessing the effectiveness of the presentation, style, and content of films and other forms of electronic communication.	9/10	Media
3.A.13c	3.17	Deliver formal presentations for particular audiences using clear enunciation and appropriate organization, gestures, tone, and vocabulary.	11/12	Language
3.A.14c	4.27	Use general dictionaries, specialized dictionaries, thesauruses, histories of language, books of quotations, and other related references as needed.	11/12	Language
3.A.15c	19.27	Write well-organized research papers that prove a thesis statement using logical organization, effective supporting evidence, and variety in sentence structure.	11/12	Composition
3.A.16c	21.9	Revise writing to improve style, word choice, sentence variety, and subtlety of meaning after rethinking how well questions of purpose, audience, and genre have been addressed.	11/12	Composition
3.A.17c	22.1	Use all conventions of standard English when writing and editing.	11/12	Composition
3.A.18c	23.14	Organize ideas for emphasis in a way that suits the purpose of the writer.	11/12	Composition
3.A.19c	24.6	Formulate original, open-ended questions to explore a topic of interest, design and carry out research, and evaluate the quality of the research paper in terms of the adequacy of its questions, materials, approach, and documentation of sources.	11/12	Composition
3.A.20c	26.6	Identify the aesthetic effects of a media presentation and identify and evaluate the techniques used to create them.	11/12	Media
3.A.21c	27.8	Create coherent media productions that synthesize information from several sources.	11/12	Media
3.A.22		Analyze how visual characteristics, content, and a message convey the time and place of a completed work.		Voc

3.A.23		Evaluate a visual work to determine the time and place using content, characteristics and purpose as criteria.		Voc
3.A.24		Define and utilize technical terminology associated with the graphics industry in written and oral communications.		Voc

3.B Mathematics

VTE #	Acad #	Standard	Grade	Topic
3.B.01c	8.M.2	Given the formulas, convert from one system of measurement to another. Use technology as appropriate.	Pre-9th	Measurement
3.B.02c	8.N.1	Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.	Pre-9th	Numbers
3.B.03c	10.D.1	Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf plots, box-and-whisker plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data.	9/10	Data Analysis, Statistics and Probability
3.B.04c	10.P.8	Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.	9/10	Patterns, relations, algebra
3.B.05c	12.D.1	Design surveys and apply random sampling techniques to avoid bias in the data collection.	11/12	Data Analysis, Statistics and Probability
3.B.06	8.G.5	Use a straight-edge, compass, or other tools to formulate and test conjectures, and to draw geometric figures.	Pre-9th	Geometry
3.B.07	10.G.1	Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry.	9/10	Geometry

3.B.08	10.G.2	Draw congruent and similar figures using a compass, straightedge, protractor, and other tools such as computer software. Make conjectures about methods of construction. Justify the conjectures by logical arguments.	9/10	Geometry
3.B.09	10.G.3	Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. Recognize and solve problems associated with radii, chords, and arcs within or on the same circle.	9/10	Geometry
3.B.10	10.G.9	Draw the results, and interpret transformations on figures in the coordinate plane, e.g., translations, reflections, rotations, scale factors, and the results of successive transformations. Apply transformations to the solutions of problems.	9/10	Geometry
3.B.11	10.M.3	Relate changes in the measurement of one attribute of an object to changes in other attributes, e.g., how changing the radius or height of a cylinder affects its surface area or volume.	9/10	Measurement
3.B.12	10.M.4	Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.	9/10	Measurement
3.B.13	12.G.5	Apply properties of angles, parallel lines, arcs, radii, chords, tangents, and secants to solve problems.	11/12	Geometry
3.B.14		Scale copy and compute page/photo/illustration using ratios and proportion formulas.		Voc
3.B.15		Calculate ink, stock, material and sheet layout ratios and proportions required to complete and price a job.		Voc
3.B.16		Read, calculate, and plot/graph measurements for temperature, weight, volume and other production factors.		Voc
3.B.17		Read, convert and measure using points and picas.		Voc

3.C Science and Engineering/Technology

VTE #	Acad #	Standard	Grade	Topic
3.C.01c	1	Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.	Pre-9th	Physics/Chem
3.C.02c	3	Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits.	Pre-9th	Physics/Chem
3.C.03c	1.3	Describe the characteristics of waves (wavelength, frequency, velocity, amplitude).		Earth/Space
3.C.04c	6.2	Explain how information travels through different media, e.g., electrical wire, optical fiber, air, space.		Eng/Tech
3.C.05c	1.5.	Interpret plans, diagrams, and working drawings in the construction of a prototype.		Eng/Tech
3.C.06c	5.5.	Identify appropriate units of measurement for current, voltage, and resistance, and explain how they are measured.		Eng/Tech
3.C.07c	6.1.	Identify and explain the applications of light in communications, e.g., reflection, refraction, additive, and subtractive color theory.		Eng/Tech
3.C.08c	6.3.	Compare the difference between digital and analog communication devices.		Eng/Tech
3.C.09	14	Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.	Pre-9th	Eng/Tech
3.C.10	2	Differentiate between volume and mass. Define density.	Pre-9th	Physics/Chem
3.C.11	1.3	Describe the four states of matter (solid, liquid, gas, plasma) in terms of energy, particle motion, and phase transitions.		Chemistry
3.C.12	1.1	Identify and explain the steps of the engineering design process, i.e., identify the problem, research the problem, develop possible solutions, select the best possible solution(s), construct a prototype, test and evaluate, communicate the solution(s), and redesign.		Eng/Tech

3.C.13	1.4	Apply scale and proportion to drawings, e.g., 1/4" = 1'0".		Eng/Tech
3.C.14	1.5	Interpret plans, diagrams, and working drawings in the construction of a prototype.		Eng/Tech
3.C.15	7.2	Differentiate the selection of tools and procedures used in the safe production of products in the manufacturing process, e.g., hand tools, power tools, computer-aided manufacturing, three-dimensional modeling.		Eng/Tech
3.C.16	1.9	Qualitatively distinguish between static and kinetic friction, what they depend on and their effects on the motion of objects.		Physics
3.C.17	4.6	Recognize the effects of polarization, wave interaction, and the Doppler effect.		Physics
3.C.18	5.1	Recognize the characteristics of static charge, and explain how a static charge is generated.		Physics
3.C.19	6.1	Describe the electromagnetic spectrum in terms of wavelength and energy, and be able to identify specific regions such as visible light.		Physics
3.C.20	6.4	Recognize and explain the ways in which the direction of visible light can be changed.		Physics

Strand 4: Employability Knowledge and Skills

4.A Develop employability skills to secure and keep employment in chosen field.

- 4.A.01a Evaluate industries, organizations, and careers based on multiple sources of research and information.
- 4.A.02a Assess interest areas to determine potential career pathways, including career ladders.
- 4.A.03a Develop a career plan with alternatives.
- 4.A.04a Complete job applications and related employment documents (e.g. W-4).
- 4.A.05a Create professional cover letters, resumes, and portfolios in a variety of formats (print and electronic).
- 4.A.06a Apply job search skills to seek, evaluate, apply for, and accept employment.
- 4.A.07a Demonstrate good interviewing skills.
- 4.A.08a Demonstrate employability skills needed to get and keep a job.
- 4.A.09a Assess alternative occupational choices (e.g. working conditions, benefits, and opportunities to change).

Performance Examples:

1. Research positions open within a variety of companies and compare/contrast their descriptions, duties, and expectations.
2. Prepare responses to standard interview questions.
3. Participate in a mock-interview with industry professionals.

4.B Communicate in multiple modes to address needs within the career and technical field.

- 4.B.01a Apply strategies to enhance effectiveness of all types of communications in the workplace.
- 4.B.02a Apply reading skills and strategies to work-related documents.
- 4.B.03a Locate information from books, journals, magazines, and the Internet.
- 4.B.04a Apply basic writing skills to work-related communication.
- 4.B.05a Write work-related materials.
- 4.B.06a Explain information presented graphically.
- 4.B.07a Use writing/publishing/presentation applications.
- 4.B.08a Apply basic skills for work-related oral communication.
- 4.B.09a Explain proper telephone etiquette and skills.
- 4.B.10a Lead formal and informal group discussions.
- 4.B.11a Demonstrate effective negotiation and conflict management.
- 4.B.12a Apply active listening skills to obtain and clarify information.
- 4.B.13a Communicate with others in a diverse workforce.

Performance Examples:

1. Review a professional journal; choose one article to summarize.
2. Call the publisher for free products in journal.
3. Develop an oral presentation regarding an article in a journal.
4. Summarize trends presented in a graph.

4.C Solve problems using critical thinking.

- 4.C.01a Demonstrate skills used to define and analyze a given problem.
- 4.C.02a Explain the importance and dynamics of individual and teamwork approaches of problem solving.

- 4.C.03a Describe methods of researching and validating reliable information relevant to the problem.
- 4.C.04a Explain strategies used to formulate ideas, proposals and solutions to problems.
- 4.C.05a Select potential solutions based on reasoned criteria.
- 4.C.06a Implement and evaluate solution(s).

4.D Demonstrate positive work behaviors.

- 4.D.01a Identify time management and task prioritization skills.
- 4.D.02a Explain the importance of following workplace etiquette/protocol.
- 4.D.03a Demonstrate willingness to learn and further develop skills.
- 4.D.04a Demonstrate self-management skills.
- 4.D.05a List causes of stress and effective stress management techniques.
- 4.D.06a Describe the importance of having a positive attitude and techniques that boost morale.
- 4.D.07a Show initiative by coming up with unique solutions and taking on extra responsibilities.
- 4.D.08a Explain the importance of setting goals and demonstrate the ability to set, reach, and evaluate goals.
- 4.D.09a Explain the importance of taking pride in work accomplished and extrinsic and intrinsic motivators that can be used to increase pride.
- 4.D.10a Value the importance of professionalism, including reliability, honesty, responsibility, and ethics.
- 4.D.11a Demonstrate a respect for diversity and its benefit to the workplace.

Strand 5: Management and Entrepreneurship Knowledge and Skills

5.A Analyze basic business practices required to start and run a company/organization.

- 5.A.01a Define entrepreneurship.
- 5.A.02a Describe the relationship between suppliers, producers, and consumers.
- 5.A.03a Compare and contrast types of businesses, including sole proprietorships, small businesses, companies, corporations, governmental agencies, and non-profit organizations.
- 5.A.04a Describe practices that ensure quality customer service.
- 5.A.05a Explain the value of competition in business/field.

Performance Examples:

1. Prepare a business plan for a new company in your community.
2. Participate in a discussion with members of a local small-business incubator or chamber of commerce, identifying opportunities and summarizing best practices of new companies.
3. Create an equipment list, with costs, of equipment required for doing specific tasks.
4. Identify local zoning and environmental laws that apply to businesses in your industry.

5.B Manage all resources related to a business/organization.

- 5.B.01a Identify a company's/organization's chain of command and organizational structure.
- 5.B.02a Define and demonstrate leadership and teamwork skills.
- 5.B.03a Explain ways a company or organization can market itself, including choosing a name, designing logos and promotional materials, advertising, and the importance of word-of-mouth.
- 5.B.04a Identify methods to track inventory, productivity, income, expenses, and personnel.
- 5.B.05a Explain the importance of written operating procedures and policies.
- 5.B.06a Identify professional organizations and their benefits.
- 5.B.07a Explain methods to effectively run a meeting.

Performance Examples:

1. Create a plan to keep track of tools and supplies in your classroom/shop.
2. Work as a team to complete a project, including running and participating in problem-solving meetings.
3. Contact a relevant professional organization and request information about its benefits, membership requirements, and costs.
4. Clip print advertisements from local companies, identifying common themes and contrasting different styles.

5.C Describe methods for managing, organizing, retrieving and reporting financial data.

- 5.C.01a Explain the role of small businesses in the economy.
- 5.C.02a Extract and extrapolate data from financial documents, such as a pay-stub, budget, tax statement, and financial report.

Performance Examples:

1. Create and follow a budget for an in-class project.

2. Identify equipment in your shop/lab that are considered as capital.
3. From a pay-stub, determine gross salary, deductions, and net pay for a calendar year.
4. Create a rate card or other list of standardized costs for services provided, based on research of local rates and practices.

5.D Apply labor and civil rights law and guidelines to business practice and decisions.

- 5.D.01a List federal and state mandated employee rights.
- 5.D.02a Describe proper working conditions for your industry.
- 5.D.03a Explain the role of labor organizations.
- 5.D.04a Discuss the importance of diversity and list methods of encouraging diversity in the workplace.
- 5.D.05a Describe standard forms of employment contracts applicable to your industry.
- 5.D.06a State the current minimum wage, as well as wages for common jobs found within the field.
- 5.D.07a List opportunities for continual professional development.

Performance Examples:

1. Participate in and summarize a discussion with a member of a labor organization.
2. Participate in and summarize a discussion with a member of a civil rights organization.
3. While participating in a group project, write and follow job descriptions for each member of the team.
4. Evaluate a shop/lab in terms of safety, ergonomics, and workflow.

5.E Evaluate the effects of community relations on companies and the industry.

- 5.E.01a Describe the role that the industry/organization plays in different communities.
- 5.E.02a Describe the role that community interests play in a company's/organization's decision-making process.

Performance Example:

1. Participate in a service project or community-centered event.

5.F Apply legal requirements and ethical considerations to business practice and decisions.

- 5.F.01a Identify laws that regulate businesses/organizations in your field.
- 5.F.02a Define the requirements for and protections given by copyright and trademark law.
- 5.F.03a Define the impact of the Americans with Disabilities Act and other civil rights legislation on your business/organization, employees, and customers.
- 5.F.04a Define ethical business practices for your field.
- 5.F.05a Identify trade-specific practices that support clean energy technologies and encourage environmental sustainability.

Performance Examples:

1. Research the ethical guidelines set forth by a professional organization related to your industry and participate in a debate over how to apply these guidelines to a variety of situations.
2. Create a portfolio of a variety of completed contracts and their uses.
3. Participate in and summarize a discussion with a lawyer, consumer advocate, or other legal professional.
4. Create a quick reference outline listing legal topics and related resources.

5.G Describe the formal and informal influences in the abstract and formal structures of business organizations within the career cluster.

- 5.G.01c Define influences of government and cultural perspectives as they relate to media communications visual arts or performance as a business.
- 5.G.02c Define the influence of government regulations on media, audio-video productions, telecommunications, printing and artistic authorship.
- 5.G.03c Analyze a variety of persistent cultural issues and dilemmas within society that commonly affect how cultures are portrayed within art forms and communication.

5.H Analyze the history and evolution of the arts, audio-video technology, and communications to their current place in society and the economy.

- 5.H.01c Identify positive and negative impacts of the arts on current society.
- 5.H.02c Identify key factors that have impacted the evolution of the arts, communications, and audio-video technologies.
- 5.H.03c Identify key local and national issues for arts and communications technologies.

5.I Prove evidence of interdependence of the technical and the artistic sides of this industry.

- 5.I.01c Analyze how technical areas and the arts partner to produce high quality presentations and productions.
- 5.I.02c Analyze the roles of creators, performers, technicians, and others involved in production, performance, and media to identify similarities and differences.
- 5.I.03c Analyze the skills required by both technical and artistic partners to provide audiences with quality works and productions.

Performance Example:

1. Design a presentation that illustrates the similarities and differences of the various roles.

Strand 6: Technological Knowledge and Skills

6.A Demonstrate proficiency in the use of computers and applications as well as an understanding of concepts underlying hardware, software, and connectivity.

- 6.A.01a Select and utilize the appropriate technology to solve a problem or complete a task.
- 6.A.02a Demonstrate file management skills (e.g., install new software, compress and expand files as needed, download files as appropriate).
- 6.A.03a Differentiate between different operating systems and demonstrate use of at least one to open and switch between programs and files.
- 6.A.04a Identify and demonstrate resolutions to simple hardware and software problems as they occur (e.g., frozen screen, disk error, printing problems).
- 6.A.05a Save, retrieve, load, format, and import data into, and export a variety of electronic documents (word processing, spreadsheet, database, AND desktop publishing).
- 6.A.06a Demonstrate the proper use of a variety of external peripherals and how they connect to a computer.
- 6.A.07a Illustrate methods of selecting and using search engines.
- 6.A.08a Send, receive, and manage electronic correspondence and files, in accordance with school policy.
- 6.A.09a Demonstrate proper use of electronic proofreading tools and explain reasons why these shouldn't be relied upon solely.

Performance Example:

1. In the development of work-based projects, students demonstrate computer skills inherent in the word processing techniques used, the organization of data, use of photographic representation, research projects, and other relevant project based activities.

6.B Demonstrate responsible use of technology and an understanding of ethics and safety issues in using electronic media.

- 6.B.01a Identify ways in which technology is used in the workplace and in society.
- 6.B.02a Summarize the rights and responsibilities of the school's Acceptable Use Policy.
- 6.B.03a Explain laws restricting use of copyrighted materials on the Internet.
- 6.B.04a Discuss the concerns about electronic communications, privacy and security, including protection from spyware and viruses.
- 6.B.05c Explain how to evaluate electronic sources of information.

Performance Example:

1. Describe how computers are used to increase efficiency, accuracy, and professionalism in the industry.

6.C Demonstrate ability to use technology for research, problem solving, and communication.

- 6.C.01a Locate, evaluate, collect, and process information from a variety of electronic sources.
- 6.C.02a Demonstrate the use of telecommunications and other media to interact or collaborate with peers, experts, and other audiences.

- 6.C.03a Demonstrate the use of appropriate electronic sources to conduct research (e.g., Web sites, online periodical databases, and online catalogs).
- 6.C.04a Demonstrate proper style (with correct citations) when integrating electronic research results into a research project.
- 6.C.05a Collect, organize, analyze, and graphically present data using the most appropriate tools.
- 6.C.06a Present information, ideas, and results of work using any of a variety of communications technologies (e.g., multimedia presentations, Web pages, videotapes, desktop-published documents).
- 6.C.07a Identify capabilities of technology resources and describe how they can be used for lifelong learning.
- 6.C.08a Demonstrate the proper use of electronic tools and office communications equipment (telephone, fax, copier, etc).

Performance Example:

1. Student is able to effectively use various technologies in the workplace.

6.D Use advanced features in writing/publishing applications.

- 6.D.01c Create documents (letters, memos, reports) both with and without templates.
- 6.D.02c Format text using basic formatting functions (e.g., paragraph spacing, margins, bullets, numbering).
- 6.D.03c Use advanced formatting features (headers, footers, page numbering, styles).
- 6.D.04c Customize tables (add borders and shading, merge rows and columns, adjust row/column sizes).
- 6.D.05c Use insert picture/object function to place graphics in documents and adjust text formatting accordingly.
- 6.D.06c Employ document organization tools (e.g., outline, footnotes, and endnotes).
- 6.D.07c Make changes to format or layout of an existing complex publication or template (e.g., 8-page, 2-color newsletter with columns, sidebars, photos, and graphics, multi-color output, etc).
- 6.D.08c Organize content and standardize format from various sources.

6.E Use presentation applications.

- 6.E.01c Create a new presentation using both text and content layouts.
- 6.E.02c Change color scheme for a slide design.
- 6.E.03c Create/edit external graphic elements (e.g., scanned photo) and insert into a slide.
- 6.E.04c Edit existing animations and actions buttons.
- 6.E.05c Create new slide transitions.
- 6.E.06c Create and distribute presentation handouts or speaker notes.
- 6.E.07c Print either key slides or an entire presentation in handout or notes format.
- 6.E.08c Create an automated slide show.

6.F Use advanced features in spreadsheet applications.

- 6.F.01c Create new spreadsheet, based on a set of data where you must identify the appropriate structure (e.g., rows and columns) for data display and analysis.
- 6.F.02c Apply cell type formatting (e.g., date, dollar, text, decimal) appropriate to data type.
- 6.F.03c Add document identification (e.g., page numbers, dates, and titles in headers and footers).
- 6.F.04c Print only relevant data so that it is readable (e.g., uses set print area to fit into one or multiple pages).
- 6.F.05c Employ simple formulae.

6.G Use database applications.

- 6.G.01c Enter data using a form.
- 6.G.02c Locate/replace data using search and replace functions.
- 6.G.03c Process data using database functions (e.g., structure, format, attributes, relationships, keys).
- 6.G.04c Search a database table to locate records.
- 6.G.05c Print forms, reports, and results of queries.
- 6.G.06c Verify accuracy of outputs.