UNIT: 3D ANIMATION AND DESIGN

Essential Questions

1. Why is a storyboard used in animation?
2. How do you set up your files to be manageable in an animation?
3. Why should you understand the various modeling techniques?
4. What are the different lighting techniques and their uses?
5. What are differences between camera angles and when would you use them?
6. What are ways to develop different textures?
7. How do you incorporate principles of animation into the software?
8. Why is rendering important?
9. Why would you use different effects?
10. What are advantages and disadvantages to using sfx/vo in an animation?

Lessons

1. Concept and Design (DOK)
   a. Identify pre-visualization and/or conceptual design techniques to tell a story. (2)
   b. Identify the importance of storyboards/animatic for an animated sequence. (2)
   c. Focus on the elements and the principles of design for a 3d animated short. (2)

2. Project Management (DOK)
   a. Demonstrate proper object naming. (2)
   b. Demonstrate how to add objects in layers. (2)
   c. Demonstrate how to save files. (2)
   d. Demonstrate how to backup files. (2)
   e. Demonstrate how to set a project folder. (2)
   f. Demonstrate how to set undo levels. (2)
   g. Demonstrate how to group objects. (2)
   h. Create a selection set. (2)
   i. Understand how to work in a team. (2)

3. 3D Modeling (DOK)
   a. Edit Splines/2D curves to create 3D models viewport shading modes. (4)
   b. Use Extrude, Loft and Revolve/Lathe commands to make a 3D geometry from 2D shapes. (4)
   c. Demonstrate knowledge of pivot points in creating 3D models from 2D shapes. (4)
   d. Demonstrate knowledge of how to set up units for scene creation. (4)
   e. Model from the world origin. (4)
   f. Use the Bend, Taper, Twist and Lattice functions to modify 3D geometry. (4)
   g. Utilize the Extrude command for polygonal modeling. (4)
   h. Utilize the Bridge command for polygonal modeling. (4)
   i. Maintain a good edge loop workflow whole modeling. (4)

j. Weld and merge vertices and edges. (4)
k. Demonstrate knowledge of beveling or chamfering edges. (4)
l. Demonstrate knowledge of Quads vs Tris. (4)
m. Demonstrate knowledge of mirroring geometry. (4)
n. Demonstrate knowledge of smoothing geometry. (4)
o. Demonstrate knowledge of transforms. (4)

4. Lighting (DOK)
   a. Utilize different light types in the scene. (3)
   b. Demonstrate understanding of basic color theory. (3)
   c. Utilize three point lighting. (3)
   d. Apply standard light theory. (3)
   e. Demonstrate ability to light only certain objects in your scene. (3)
   f. Apply light intensity to a scene. (3)
   g. Demonstrate understanding of light color. (3)
   h. Demonstrate understanding of shadows. (3)

5. Cameras (DOK)
   a. Demonstrate knowledge of camera angles-Close up, Extreme close up, Medium close up, Establishing shot. (3)
   b. Demonstrate knowledge of the Rule of Thirds. (3)
   c. Demonstrate knowledge of focal length. (3)
   d. Demonstrate knowledge of safe Frames. (3)
   e. Utilize background images within camera placement. (3)
   f. Demonstrate knowledge of clip planes. (3)
   g. Demonstrate knowledge of depth of field. (3)

6. Textures (DOK)
   a. Demonstrate knowledge of the importance of mapping. (3)
   b. Utilize 2D and 3D procedural textures. (3)
   c. Utilize bitmaps as your textures. (3)
   d. Demonstrate the importance of alpha channels in maps. (3)
   e. Demonstrate knowledge of different shaders such as Blinn, Phong, and Anisotropic. (3)
   f. Demonstrate knowledge of transparency and opacity. (3)
   g. Utilize the specular feature. (3)
   h. Utilize the ambient feature. (3)
   i. Utilize the diffuse feature. (3)
   j. Utilize the relections feature. (3)
   k. Utilize the raytrace feature. (3)

7. Animation (DOK)
   a. Understand how to set keyframes with autokey and set key. (3)

b. Demonstrate how to animate on a path. (3)
c. Understand the importance of the Curve/Graph Editor for animation. (3)
d. Understand the importance of the Dope Sheet in manipulating keyframes. (3)
e. Demonstrate knowledge of Frames Per Second (fps). (3)
f. Demonstrate knowledge of object hierarchy with linking and parenting. (3)
g. Utilize playback controls. (3)
h. Demonstrate how to preview an animation. (3)
i. Demonstrate how to copy and paste keyframes. (3)
j. Understand the importance of Safe Frames in animation. (3)
k. Utilize safe frames. (3)
l. Demonstrate knowledge of animation principles and animation states. (3)

8. Rendering/Output (DOK)
   a. Render files into an .avi or a .mov format. (3)
   b. Correctly render still images. (3)
   c. Apply proper render resolution to files. (3)
   d. Utilize motion blur. (3)
   e. Utilize antialiasing. (3)

9. Effects (DOK)
   a. Utilize the glow effect. (1)
   b. Utilize the fire effect. (1)
   c. Utilize the smoke effect. (1)
   d. Utilize the fog effect. (1)

10. Audio (DOK)
   a. Understand the differences in audio file types. (1)
   b. Record voiceover. (1)
   c. Create foley/sfx. (1)
   d. Utilize sfx/voice over in a scene. (1)
   e. Use a microphone and know different types of recording features. (1)

UNIT: ADVERTISING

Essential Questions

1. What are the advantages and disadvantages of digital production over traditional techniques?
2. How does formatting elements on a page facilitate readability?
3. How does the typography choice engage the audience?
4. How does the creative process impact the over-all effectiveness of design? Who is the audience and what is the benefit?
5. How do elements and principles affect design?

Lessons

1. Orientation (DOK)
    a. Safety - Demonstrate proper use of x-acto knife, t-square, and triangles. (1)
    b. Law - copyright rules and regulations. (1)
    c. Demonstrate keyboard typing proficiency; use of a digital dictionary; spell checker; automatic hyphenation; and, keyboard shortcuts. (1)
    d. Define removable storage media. (1)
    e. Write a professional resume. (2)
    f. Create an electronic portfolio. (4)

2. Design Principles (DOK)
    a. Identify the basic elements of design (i.e., line; shape; direction; size; texture; value; and, color). (1)
    b. Identify the basic principles of design (i.e., unity; proportion; balance; emphasis; and, sequence). (1)
    c. Demonstrate an understanding of color theory by describing primary, secondary, and tertiary colors including hue, tint, value and shade, and the effect of light and distance on color. (1)
    d. Demonstrate an understanding of color relationships (complimentary, analogous, monochromatic, etc.). (1)
    e. Demonstrate an understanding of additive and subtractive color, i.e., Red-Green-Blue (RGB) and Cyan-Magenta-Yellow-Key/black (CMYK). (1)

3. Design Process (DOK)
    a. Brainstorm keywords for a design concept based on customer need and target audience. Identify the unique selling point or benefit. (4)
    b. Create thumbnail sketches. (4)
    c. Critique a layout to determine if it meets the customer's needs, and suggest improvements. (3)
    d. Create rough layout improving upon thumbnail sketch. (4)
    e. Use markers or colored pencils to show color as a comprehensive layout. (1)
    f. Pitch a concept to demonstrate an understanding of the relationship between message; color; typography; images; and, layout. (2)
    g. Use correct printer selection and attributes for an appropriate digital print (proof). (1)
    h. Create a storyboard to demonstrate a time-based concept. (4)

4. Typography (DOK)
    a. Demonstrate typography anatomy x-height; mean-line; base-line; ascenders; descenders; serifs, and leading. (1)
    b. Illustrate caps; lowercase; uppercase; small caps; and, ligatures. (1)
    c. Define dingbats; bullets; rules; glyphs; symbols; and, their uses in publications. (1)
    d. Distinguish between display (headline) type and body (text) type by their point sizes, styles, weights and uses. (2)
    e. List the major type faces/font families and their uses. (1)
    f. Measure type in units of points, picas, ems, and inches. (1)
    g. Explain letter spacing; tracking; kerning; baseline shift; and, horizontal scale. (2)
    h. Demonstrate paragraph styles: flush left-ragged right; flush right-ragged left; centered; justified; force justified; and, widows and orphans. (1)
    i. Manipulate text features and formats (e.g., text wrap, hyphenations, drop cap, color, gradient, text path)
    j. Create a text frame.
    k. Convert text to objects (e.g., create outlines, raster, molded text/area type tool)
    l. Compose text (e.g., headings, captions, body text)

5. Digital Page Layout (DOK)
    a. Select appropriate page layout software for a given job. (2)
    b. Set text with appropriate margins; formatting; gutters; and, proper leading. (2)
    c. Prepare computer generated layouts incorporating appropriate marks (i.e., gutters, register marks, trim marks, fold lines, etc.). (1)
    d. Design and produce a document using desired fonts; styles; margins; indents; tabs; and, colors. (4)
    e. Proofread and edit using common editing marks. Make corrections/adjustments to copy on screen. (3)
    f. Create multiple page documents using text blocks; graphics; frames; and, headings using drop caps and wrap-a-rounds (run-a-rounds). (4)
    g. Create documents using grids; templates; master pages; paragraph style sheets; and, character style sheets. (4)
    h. Repurpose files for a print project for use in web design, and demonstrate appropriate file formats for web development. (3)
    i. Demonstrate the proper procedures for printing a black/white proof or a color proof to a laser or inkjet printer. (1)
    j. List the advantages/disadvantages of hard proofing versus soft proofing. (1)
    k. Preflight and package a native file. (2)
    l. Export a print-ready Portable Document Format (PDF) using page layout software. (1)
    m. Identify trim size; bleed size; and, live area of a project. (1)
    n. Locate examples of ad sizes from publications (full page, half-page, and quarter-page ads). (1)
    o. Demonstrate an understanding of file formats (.ai; .jpg; psd; gif, tif; indd; pdf, etc.), file organization, and file naming conventions. (1)
    p. Demonstrate various United States Postal Service (USPS) design constraints and provide resources for more information on USPS requirements. (1)

6. Image Capture and Editing (DOK)
    a. Capture digital images using a scanner and digital camera. (1)

b. Demonstrate appropriate scanner/program operations for line artwork and continuous tone in both black/white and color. (1)
c. Identify high/low resolution images and describe the uses of each. (1)
d. Download a digital image from a stock photography website or CD. (1)
e. Scale a raster image using the proper settings in order to maintain the appropriate resolution for print or web. (1)
f. Edit a raster image by using color correction; tone control; cropping; and, scaling, etc. (3)

7. Digital Illustration (DOK)
   a. Demonstrate an understanding of the differences between raster and vector files. (2)
   b. Use the appropriate graphics program to create a design or logo using manipulated type (rotated, circled, extended, tints and fills, etc.). (4)
   c. Demonstrate an understanding of corporate identity including how branding affects consumer recognition. (3)
   d. Create or trace drawings/photographs using a vector illustration program. (1)
   e. Create or edit images in a raster based program using layers; transparencies; layer modes; masks; and, selections, etc. (1)
   f. Create a spot color illustration or logo using Pantone Matching System (PMS) or other color matching system, and view or print separations. (1)

UNIT: EMBROIDERY

Lessons

1. Safety (DOK)
    a. Using embroidery machines safely. (4)

2. Design Management (DOK)
    a. Using a variety of design files and formats. (4)
    b. Editing design files. (3)
    c. Loading the design. (2)
    d. Understand fill and column stitches

3. Embroider the Product (DOK)
    a. Stabilizing the fabric. (3)
    b. Embroidering the fabric. (2)
    c. Hoop the fabric
    d. Control static

4. Cleanup of Product (DOK)
    a. Finishing the fabric. (3)
    b. Cleaning the machines (3)

UNIT: INTRODUCTION TO GRAPHIC COMMUNICATIONS

Essential Questions

1. What is the role of graphics in the free enterprise system?
2. What basic training is needed for a career in the printing industry?
3. What are the health and safety procedures for printing facilities?
4. How does a graphic communications professional prepare digital files and digital file output?
5. How does color theory impact graphic communications?
6. What skills are necessary for bindery operations?
7. How are math skills used in the graphic communications industry?

Lessons

1. Industry Overview (DOK)
    a. Define the role of graphics in the free enterprise system. (1)
    b. Identify and list print markets and types of print businesses. (1)
    c. List printings ranking among other manufacturing industries. (1)
    d. Identify and describe the major printing processes: flexography, gravure, lithography, screen printing, and digital. (1)
    e. List the advantages and disadvantages of each major printing process. (1)
    f. List typical products produced by each major process. (1)
    g. Show a typical business flow of printing from initial concept to finished product. (2)
    h. Identify these major occupations in the graphic communications industry and describe the basic training needed for each: sales representative; customer service representative; prepress technician; press operator; bindery operator; and, management personne
    i. Identify basic salary/wage expectation ranges. (1)
    j. Identify and describe basic production equipment used in a commercial printing plant, including: computer workstation; proofing device; platesetter; scanner; offset press; digital press; paper cutter; folder; saddle stitcher; perfect binder; paper padder;
    k. Identify the types of major companies that employ people with graphic communications skills, including: commercial printers; in-plant printers; book printers; packaging, label & wrapper printers; catalogs & directories printers; direct mail printe
    l. Read and interpret production information on a job ticket. (2)
    m. Identify these major printing industry associations: National Association for Printing Leadership (NAPL); Printing Industries of America (PIA) and the local PIA affiliate; Flexographic Technical Association (FTA); Specialty Graphic Imaging Association (SG
    n. Define counterfeiting and copyright laws. (1)

2. Environmental Health, Safety, and First Aid (DOK)
    a. Identify location(s) and describe proper use of fire safety equipment in the facility. (1)
    b. List safety rules involving flammable liquids. (1)
    c. List the steps to be taken in case of injury in the lab. (1)

d. Identify location(s) of first aid kit(s) and eye wash station(s).
e. Read and interpret Material Safety Data Sheets (MSDS). (2)
f. Describe protective safety equipment, if needed (e.g., gloves, goggles, ear plugs, lab dress, etc.). (2)
g. Describe appropriate safety procedures to follow when operating equipment. (2)
h. Pass a general lab safety test. (1)
i. Identify approved methods for disposing of waste materials. (1)
j. Read, interpret, and follow instructions on warning labels. (2)
k. Identify the safety color code. (1)

3. Digital File Preparation (DOK)
    a. Identify professional prepress software applications and uses, including: page layout (QuarkXPress, InDesign); image editing (Photoshop); illustration (Illustrator); PDF generation and editing (Acrobat, PitStop); and, imposition (Preps).
    b. Describe the disadvantages of using office/home-based software for professional graphic purposes.
    c. Describe the difference between a raster image and a vector graphic image.
    d. List advantages/disadvantages of removable storage media.
    e. Explain the significance of PDF as it pertains to the printing industry.
    f. Explain the difference between supplying PDF files versus native files for print.
    g. Identify various file formats and their extensions: .doc; .qxd; .pdf; .tif; .eps; .rtf; .raw; .jpg; .bmp; .txt; .indd; .psd; .ai; .pub; .html; .gif; .xls; .zip; .dmg; .png; .dng.
    h. Explain the purpose of a folding dummy.
    i. Explain the purpose of imposition.

4. Image Capture (DOK)
    a. Explain basic scanning hardware.
    b. Explain basic digital camera hardware.
    c. Explain and identify the difference between line art and continuous tone originals.

5. Color Theory (DOK)
    a. Explain additive and subtractive color theory.
    b. Explain the effect of lighting on color perception.
    c. Explain the effect of the surround on color perception.
    d. Explain the significance of standard viewing conditions in the graphic communications industry.
    e. Explain the influence of the substrate on color reproduction.

6. Digital File Output (DOK)
    a. Explain and describe trapping and why it is necessary.
    b. Explain the purpose of proofing.
    c. Explain the difference between hard and soft proofs.
    d. Explain digital platemaking equipment for offset plates.

e. Explain the difference between static output and variable output.
f. Explain the process of creating digital output from a computer file.

7. Press Operations (Offset and Digital) (DOK)
    a. Identify basic safety press procedures.
    b. Identify basic press systems.
    c. List and describe quality control devices for press (color bars, densitometer, etc.).

8. Bindery Operations (DOK)
    a. Describe the differences between, and the advantages/disadvantages of: in-line; off-line; and, near-line finishing.
    b. List basic paper types, weights, grades and classifications commonly used in the printing industry. (1)
    c. Explain operational and safety features of a paper cutter. (2)
    d. Identify grain direction of paper, and explain its importance.
    e. Calculate basic paper cuts from a parent sheet. (3)
    f. Create an accurate master cutting diagram for making cuts.

9. Measurement (DOK)
    a. Measure linear dimensions for printing materials in inches and fractions of inches. (1)
    b. Measure type in points and line length in picas. (1)
    c. Measure volume for mixing chemicals for pressroom operations. (1)
    d. Measure original images for reduction and enlargement using various methods to determine the percentage for final reproduction. (1)

10. Basic Math (DOK)
    a. Solve addition of whole number problems - two and three digits. (3)
    b. Solve addition of fraction problems. (3)
    c. Solve addition of decimal problems-two and three digits. (3)
    d. Solve subtraction of whole number problems with two and three digits. (3)
    e. Solve subtraction of fraction problems. (3)
    f. Solve subtraction of decimal problems-two and three digits. (3)
    g. Solve multiplication of whole numbers-two and three digits. (3)
    h. Solve multiplication of decimal problems-two and three digits. (3)
    i. Solve division of whole number problems-two and three digits. (3)
    j. Solve various problems that require dividing a given dimension in half. (3)
    k. Solve division of decimal problems-two and three digits. (3)
    l. Solve decimals to percent conversion problems. (3)
    m. Solve percent to decimal conversion problems. (3)
    n. Solve basic ratio and proportion problems. (3)
    o. Solve basic linear measurement problems. (3)
    p. Solve basic type calculation problems. (3)

q. Solve basic liquid measurement problems. (3)
r. Solve basic paper cutting calculations. (3)
s. Solve word problems that require an understanding of estimating. (3)

UNIT: LASER ENGRAVING

Lessons

1. Safety
   a. Eye safety while using lasers. (4)

2. Image Design
   a. Using color in laser designs. (4)
   b. Use a variety of design files and formats. (4)
   c. Edit design files. (3)
   d. Load the design. (2)

3. Substrate Preparation
   a. Preparing surfaces for the laser. (3)

4. Test for Power and Speed
   a. Determining proper power and speed settings. (4)

5. Print
   a. Autofocusing the machine. (4)
   b. Printing. (3)
   c. Enhancing the final project. (2)

UNIT: OFFSET PRESS OPERATIONS

Essential Questions

1. In what order do you perform a press wash?
2. In what order would you set-up a feeder to load paper in an offset press?
3. In what order would you set-up delivery on an offset press?
4. What would you check for when inspecting a plate?
5. What problems could occur when printing heavy solid ink?

Lessons

1. Safety
   a. Jog paper manually or by machine. (1)
   b. Make cuts according to cutting sequence or other instructions given. (2)
   c. Set up and run folder. (2)
   d. Perforate/score with wheel attached to delivery end of paper folder. (2)
   e. Perform saddle-and side-wire binding (wire staples). (2)
   f. Identify different binding methods and their uses (e.g. perfect, thermal, and case binding). (1)
   g. Perform spiral wire and plastic cylinder binding. (2)
   h. Perform padding. (2)
   i. Pad carbonless stock. (2)
   j. Drill stock. (2)
   k. Gather and collate by hand and machine. (2)
   l. Perform preventative maintenance on finishing equipment. (2)

2. Offset Press Operating Procedures and Cost Analysis.
   a. Work Flow:
      a) Read and interpret production information on job docket/ticket. (1)
      b) Perform make-ready steps for paper handling.
      c) Describe sheetwise, work-and-turn, and work-and-tumble jobs, and how they differ. (2)
      d) Explain the purpose of registration, crop, and bleed marks. (1)
      e) Explain the major functions of a densitometer as a quality control device. (1)
      f) Identify problems inherent in printing heavy solid work on a duplicator press. (1)
      g) Estimate small offset press labor costs to include make-ready, running and clean-up. (2)
      h) Estimate ink and paper costs. (2)
      i) Explain procedures for daily, weekly, and monthly maintenance on a press; explain importance of recording this information in a log. (1)
      j) Perform basic press maintenance and record the information in a log. (2)

   b. Paper:
      a) Identify basic paper types, sizes, and weights.

b) Determine grain direction of paper and explain the importance of proper grain direction when running the press, including folds and scoring.
c) Handle and jog paper stock (wire/felt, watermarks, and carbonless sequence).
d) Locate paper weight, coating, and sizes on a ream, box, or skid.
e) Describe the importance of paper conditioning prior to running the press.
f) Demonstrate the use of flags to count sheets during a pressrun. (2)

c. Ink:

a) Compare offset ink types and uses including oil-based, rubber-based, soy-based, and Ultraviolet (UV). (2)
b) Identify ink ingredients. (1)
c) Identify causes of ink problems and suggest appropriate solutions. (3)
d) Explain the purpose of using spray powder on an offset press. (1)
e) Explain the purpose of an infrared dryer on an offset press. (1)
f) Describe the procedure for mixing and testing custom colored inks. (1)
g) Explain the purpose and use of fountain solution and fountain solution additives. (2)
h) Mix fountain solutions using appropriate ratios and demonstrate understanding and use of monitoring techniques. (2)
i) Perform make-ready of the inking system. (2)

d. Press Operations:

a) Explain how an offset lithographic plate works. (1)
b) Identify and demonstrate safe work habits in press operations. (1)
c) Identify basic systems and parts of an offset press. (1)
d) Describe the attributes of sheet-fed, web-fed, stream-fed, and perfecting presses. (2)
e) Perform make-ready of the dampening system. (2)
f) Perform make-ready of the printing unit. (2)
g) Perform roller care and maintenance of inking and dampening systems. (2)
h) Demonstrate ink roller, dampener roller, and cylinder pressure settings on a press. (2)
i) Install a blanket and explain follow-up procedures. (2)
j) Demonstrate proper wash-up techniques for the inking system, dampening system, and cylinders. (2)

e. Print:

a) Print a single color one-sided job. (2)
b) Print a single color properly registered two-sided job. Indicate gripper and guide sides. (2)
c) Print a single color properly registered job on carbonless stock (two-parts or three parts). (2)
d) Print a single color job on envelopes. (2)
e) Print a job on heavy stock. (2)
f) Print a two-sided job using one of the following methods: sheetwise, work-and-turn, or work-and-tumble. (2)
g) Print a multicolor job with register marks and color bars. Maintain accurate registration and monitor ink density. (2)

h) Print a multicolor, two-sided job. (2)

UNIT: PHOTOGRAPHY

Essential Questions

1. How do I set up professional lighting for photographs?
2. What are the procedures to produce quality images?
3. How do I appropriately use photography software?
4. How do I repair damaged photographs?

Lessons

1. Basic concepts and introduction to photography
   a. Define terms related to graphic arts/desktop publishing
   b. explain copyright issues related to graphic arts/desktop publishing (e.g., legal, ethical)
   c. Demonstrate sensitivity to bias (e.g., culture, gender, age
   d. Manage electronic files (e.g., storage, naming files, retrieval)
   e. identify careers/self-employment opportunities in photography.
   f. Exhibit leadership skills through a student organization (e.g.,SkillsUSA)

2. Safety
   a. Inspect and use camera straps, lens cap, battery, and card
   b. Demonstrate proper care of light systems (be aware of overheating and turn off when not in use)
   c. Explain the proper use of camera's flash t(do not use a camera's flash if facing a person who is operating a vehicle.)
   d. Be respectful of others
   e. Arrange equipment so that traffic flow areas should are free from stand and cords
   f. Learn the proper use and location of fire extinguishers and emergency exits
   g. Don't stand (or cause others to stand) in the way of stairs, aisles, escalators or doorways.

3. Demonstrate knowledge and understanding of light; as it relates to the field of photography
   a. Demonstrate knowledge and understanding of natural light
   b. Demonstrate knowledge and understanding of artificial (studio) light
   c. Demonstrate an understanding of proper lighting patterns on a subject's face in a head-and-shoulder portrait (i.e., Split, Rembrandt, Loop, Butterfly, etc.)
   d. Demonstrate an understanding of main and fill light
   e. Demonstrate an understanding of main and fill light placement
   f. Demonstrate the correct use of settings for main and fill lights (i.e., main light, = f/8 and fill light = f/4)

4. Demonstrate knowledge and understanding of a digital SLR camera
   a. Demonstrate knowledge of camera equipment (case, lens caps, UV filters, tripods, straps, memory cards)
   b. Demonstrate proper handling and cleaning
   c. Identify the parts of camera anatomy (compartments, ports, dials, screen, lens, etc.)
   d. Demonstrate knowledge and understanding of camera functions
   e. Use a variety of Menus and settings

f. Explain A, S, M, and P setting on the camera dial
g. Demonstrate understanding of correct camera settings and their applications, including:
h. Aperture, Shutter speed, ISO, White balance, and Crop an image in-camera (i.e., head-and-shoulder cropping, etc.)

5. Demonstrate knowledge and understanding of standard rules of art and design
   a. Demonstrate technical proficiency through proper exposure, focus, etc.
   b. Demonstrate artistic ability through use of standard rules of art and design, such as:
      - The rule of thirds
      - Leading lines
      - Texture
      - Use of positive-negative space
      - Meet required image size of 11"x14" (min) up to 16"x20"(max)

6. Demonstrate knowledge of editing tools such as Adobe Photoshop and their commonly used functions
   a. Change the orientation of an image
   b. Change the size of an image
      - Make tonal adjustments on an image
      - Reconstruct an image
      - Crop an image
      - Utilize layer masks
      - Utilize modes
      - Utilize profiles
      - Save and name an image
      - Color correct an image
   c. Use a digital camera to acquire appropriate resolution images (e.g., portrait, landscape, moving objects)
   d. Use a scanner to digitize images with appropriate resolution for intended use
   e. Import files from a digital camera
   f. Import images from various sources (e.g., software-specific library, other applications, Internet)
   g. Edit images (e.g., color, filter, tint, contrast, watermark, brightness)
   h. Apply image modes (e.g., convert RGB, CMYK, grayscale)
   i. Manipulate images (e.g., mask, resize, crop, scale, rotate, group/ungroup)
   j. Determine appropriate image file formats (e.g., bmp, tiff, jpeg, gif, pict, eps)
   k. Apply appropriate resolution settings for intended use of image

7. Identify common problems in digital photography
   a. Identify over-exposure
   b. Identify blooming
   c. Identify a clogged printer nozzle
   d. Identify aliasing
   e. Identify JPEG artifacts

f. Identify noise
g. Identify improper white balance
h. Identify over-sharpening
i. Identify Newton rings
j. Identify posterization

8. Demonstrate knowledge and understanding of digital printing
   a. Identify improper white balance
   b. Identify over-sharpening
   c. Identify Newton rings
   d. Identify posterization
   e. Demonstrate knowledge of monitor calibrations
   f. Demonstrate knowledge of printer and paper profiles

9. Demonstrate professional development skills in a simulated customer service or employment situation. Examples may include:
   a. Job interview
   b. Customer service scenario
   c. Communications
   d. Decision making, problem solving and/or critical thinking

10. Develop a portfolio
   a. Explain ways portfolios can be used
   b. Create a resume highlighting graphic arts/desktop publishing and related skills.
   c. Select sample projects to show graphic arts/desktop publishing concepts mastered
   d. Explain the reasons for selecting the sample projects in the portfolio
   e. Arrange a selection of same projects into professional presentation

UNIT: SCREEN PRINTING

Essential Questions

1. What elements should be considered when selecting screen mesh count?
2. What information should be included on a job ticket?
3. When loading screens on to a press what considerations should be taken to determine screen order?
4. Identify different applications of screen printing.
5. What would be some results you would get if you printed with an improperly stretched screen?

Lessons

1. Safety (DOK)
   a. Chemicals (2)
   b. Flash units and dryers (2)
   c. Spot guns (2)
   d. Spray booth (2)

2. Frames and Screen Preparation (DOK)
   a. Choose appropriate frame size for the job. (3)
   b. Choose appropriate mesh thread count & color for the job. (3)
   c. Attach fabric on fixed and/or re-tensionable systems such as Hix Reten and Newman Roller Frames. (1)
   d. Make adjustments to correct for fabric elongation or extension. (1)
   e. Measure fabric tension with a tension meter. (1)
   f. Abrade and degrease the screen. (2)
   g. Dry the screen using appropriate screen drying methods. (2)
   h. Choose appropriate type of emulsion for the job. (2)
   i. Apply emulsion using appropriate methods. (2)

3. Stencil Systems (DOK)
   a. Generate a job ticket to specify print size, colors and placement (2)
   b. Create color separations and consider color trapping and white block if necessary. (3)
   c. Output film or vellum separations to include registration marks, color information and quality control targets. (2)
   d. Align positives on screen using correct placement and orientation. (2)
   e. Determine correct screen exposure based on emulsion, screen type, positive material, and toner density. (4)
   f. Wash out image area of stencil. (2)
   g. Evaluate stencil quality and identify if screen is under or over exposed. (4)

4. Print Production (DOK)
   a. Identify different types of screen printing presses. (1)
   b. Load screen onto printing press in proper order determined by ink color. (2)
   c. Select appropriate squeegee for the job. (3)
   d. Choose appropriate type of ink for the job. (4)

e. Confirm ink color to job specs. (3)
f. Prepare ink and apply to screen. (1)
g. Align screen(s) for proper registration. (2)
h. Set appropriate off contact to control image quality. (2)
i. Load and align substrate on printing press. (2)
j. Apply correct squeegee pressure and angle to flood and print strokes (3)
k. Operate printing press and verify printing quality. (2)
l. Check color register and make adjustments as needed. (4)
m. Complete production run according to job specs. (1)
n. Dry or cure printed substrate using appropriate equipment. Identify when flash cure is needed. (1)
o. Organize or package finished product according to job specs. (2)

5. Clean-up Process (DOK)
   a. Remove ink clean & store squeegee(s). (2)
   b. Remove ink from screen; store or dispose of ink as specified by Material Safety Data Sheets (MSDS). (2)
   c. Clean additional auxiliary equipment as needed. (2)
   d. Remove frame from press. (2)
   e. Use personal protection safety equipment. (2)
   f. Select/use appropriate chemistry and washout equipment to reclaim stencil. (3)
   g. Inspect screens to ensure they are reusable. (4)
   h. Complete de-hazing procedures to ensure usability. (2)
   i. Properly store screen.

6. Quality Control (DOK)
   a. Demonstrate block out process. (2)
   b. Determine if ink is cured. (3)
   c. Identify process to remove finger prints and/or spots. (1)
   d. Verify correct image placement and colors. (3)
   e. Verify print density and clarity. (3)
   f. Verify registration. (3)

UNIT: VINYL PRODUCTS

Essential Questions

1. What drives your ideas for designing a vinyl sign?
2. How can you make your design stand out from the competition?
3. What types of components are utilized to create effective artwork?
4. What types of tools are needed for vinyl project completion?
5. How do you load and set a plotter/cutter?
6. How can you utilize your resources to save money?
7. What proves you successfully applied your vinyl?
8. What do you do when things don't go as planned?
9. What would make you qualified for employment in this field?

Lessons

1. Communication (DOK)
    a. Demonstrate the ability to read and comprehend instructions. (3)
    b. Demonstrate the ability to plan and communicate ideas through thumbnails and roughs. (3)

2. Concept/Principles of Sign Design (DOK)
    a. Explain visibility and location. (3)
    b. Create a message to communicate, convince, reassure, or sell to a target audience. (3)
    c. Apply typography elements (letter family and size for readability). (3)
    d. Apply appropriate color use (contrast, thematic, psychological). (3)

3. Create Artwork (DOK)
    a. Create reverse artwork for heat press processes. (1)
    b. Create a layout consistent with design principles. (1)
    c. Convert a bitmap image to a vector graphic. (1)
    d. Create an impositions layout (lay out multiple objects when making pieces like stickers or labels). (1)
    e. Generate a cut line for cutting around a shape when sending a design to a vinyl cutter, laser or print-cut solution. (1)
    f. Apply Design Concepts (e.g. Whitespace, color, focal points, headlines, design principles, layering). (1)
    g. Manipulate graphics and images (scale, crop, rotate, group/ungroup). (1)
    h. Create and use color registration marks for layering vinyl. (1)
    i. Open, edit and save files as industry-standard format. (e.g. .ai, .eps, .pdf, .jpg). (1)

4. Tools (DOK)
    a. List vinyl material and application surfaces. (1)
    b. Identify various tools used in vinyl sign making (e.g. squeegees, rulers, cutting and weeding tools, stabilo pencils). (1)
    c. Explain the use of various application tapes (e.g. masking, clear, tack levels). (1)

5. Plotter/cutter (DOK)
    a. Demonstrate loading vinyl into a plotter/cutter. (2)
    b. Demonstrate correct settings on a plotter/cutter. (2)

6. Vinyl prep (DOK)
    a. Apply correct cutting and weeding techniques. (3)
    b. Select and apply proper application tape for vinyl and substrate application. (3)
    c. Demonstrate waste management in utilizing vinyl and tape. (3)

7. Vinyl Application (DOK)
    a. Demonstrate ability to accurately measure for placement of vinyl using guide markers. (4)
    b. Demonstrate vinyl placement techniques (substrate prep, laying/layering pieces, squeegee technique, removal of application tape, cleaning). (4)
    c. Apply vinyl to a variety of substrates. (4)
    d. Remove bubbles and other imperfections using proper tools. (4)

8. Troubleshooting (DOK)
    a. Connect the plotter/cutter to the computer and power supply. (3)
    b. Load cutting software. (3)
    c. Convert files for cutting software. (3)
    d. Hand cut designs in vinyl not properly cut by cutter. (3)

UNIT: WEB DESIGN

Essential Questions

1. What actions create an effective website design?
2. Why is understanding image editing software important in web design?
3. How does web authoring software simplify web design?
4. What site management techniques are needed to enhance your employability?
5. What are advanced web creation techniques?
6. What do you do to prepare for a job search?

Lessons

1. Design An Effective Web Site (DOK)
    a. Define Web page design principles and elements. (4)
    b. Evaluate Web sites based on design elements and principles (e.g., alignment, color, navigation, user feedback). (4)
    c. Determine the purpose of the Web site. (4)
    d. Identify the target audience. (4)
    e. Select and develop content for site (e.g., research techniques, interview of client). (4)
    f. Plan an organized layout. (4)
    g. Select an appropriate navigational structure. (4)
    h. Use Web-safe colors and fonts. (4)
    i. Employ proofreading and editing techniques. (4)
    j. Apply Web accessibility standards. (4)

2. Demonstrate Image Creation and Manipulation Skills (DOK)
    a. Recognize the different image types and their extensions (e.g., gif, jpg). (3)
    b. Utilize images from various sources (e.g., Internet, CD, scanner, digital camera). (3)
    c. Use image editing program to create original raster images (e.g., collages, banners, buttons). (3)
    d. Use selection tools in image editing program (e.g., lasso, magic wand). (3)
    e. Use layering techniques in image editing program to better manage images (e.g., ordering, arranging, naming). (3)
    f. Use image editing program to adjust and transform images (e.g., crop, rotate, skew, color, image dimension size). (3)
    g. Optimize an image to improve load time. (3)
    h. Slice an image into separate parts. (3)
    i. Explain how resolution affects Web page creation. (3)

3. Demonstrate Page Creation Skills (DOK)
    a. Use Web authoring software to create Web pages. (3)
    b. Identify and apply HTML tags and attributes for basic Web page design (e.g., title, metadata, table, link). (3)
    c. Create and use a template. (3)

4. Apply Effective Web Page Management Techniques (DOK)
    a. Describe various Web publishing techniques. (4)
    b. Compare and contrast Web hosting account options. (4)
    c. Explain the process of obtaining a domain name. (4)
    d. Create an electronic portfolio. (4)
    e. Organize all content files into folder management. (4)
    f. Implement time management techniques. (4)
    g. Create meta tags to be utilized by a variety of search engines. (4)
    h. Demonstrate ethical behavior. (4)
    i. Conduct usability testing. (4)
    j. Apply copyright laws in all Web-related projects. (4)
    k. Describe security issues (e.g., viruses, firewalls, passwords, filters). (4)
    l. Differentiate among platforms and browsers in relationship to the Web. (4)

5. Use Advanced Web Creation Techniques (DOK)
    a. Create interactive design elements (e.g., rollover, swap image, slideshow). (3)
    b. Incorporate browser plug-ins (e.g., Adobe Acrobat.pdf, Flash.swf, Quicktime.mov). (3)
    c. Use Cascading Style Sheets (CSS) to control page elements (e.g., external, internal, inline). (3)
    d. Apply animation tools and techniques. (3)

UNIT: LEADERSHIP & EMPLOYMENT SKILLS

Essential Questions

1. What would make you qualified for employment in the Graphic Communications industry?
2. How do you prepare for a successful interview?
3. What work readiness skills should you demonstrate for a position in the Graphic Communications industry?

Lessons

1. Employability & Interpersonal Skills
   a. Select sample projects to demonstrate skills mastered.
   b. Demonstrate professionalism.
   c. Actively participate in a CTSO, such as SkillsUSA.
   d. Demonstrate the ability to read and comprehend instructions.
   e. Demonstrate the ability to plan and communicate ideas.
   f. Describe work ethics that should be exhibited by employees in the graphic communications industry.

2. Job related practice (DOK)
   a. Check specifications and planning.
   b. Estimate job costs (labor and supplies).
   c. Compare estimate with actual costs.
   d. Keep work areas organized and neat.
   e. Gang-up jobs to utilize materials as allowable.
   f. Orientate jobs to eliminate waste.
   g. Organize and utilize scraps when applicable.
   h. Plan a job timeline.

3. Job Application and Interpersonal Skills
   a. Demonstrate how to locate job listings through a variety of sources (e.g., Internet; job boards; help wanted ads; job fairs; agencies, etc.).
   b. Read and interpret the content of want ads and job postings.
   c. Write a personal resume that includes three references.
   d. Write a cover letter to obtain a job in the graphic communications industry.
   e. Read and complete an employment application form.
   f. Describe ways to prepare for a successful job interview.
   g. Prepare for a job telephone interview by participating in a mock interview conducted by a teacher, parent, or another student.
   h. Describe the reasons for job interview follow-up.
   i. Write a letter or email to follow-up a job interview.
   j. Evaluate an employment benefits package.
   k. Compare job opportunities to include wages, benefits, and employment responsibilities.