COMPUTER/PRESS SKILLS & ABILITIES

Adobe Illustrator Worksheet

Screen Printing

For this project you will be creating a one color t-shirt design. You will need to purchase your own shirt(s) for this project. The instructor will sell you shirts for $4 per shirt. You may print as many shirts as you can create in one day (using tutorial, class period, and after school), the usual amount is 15-20.

YOU MUST PAY FOR THE SHIRTS BEFORE YOU PRINT ON THEM.

Directions

1. Create thumbnail drawings of your shirt design and get approval by the instructor.

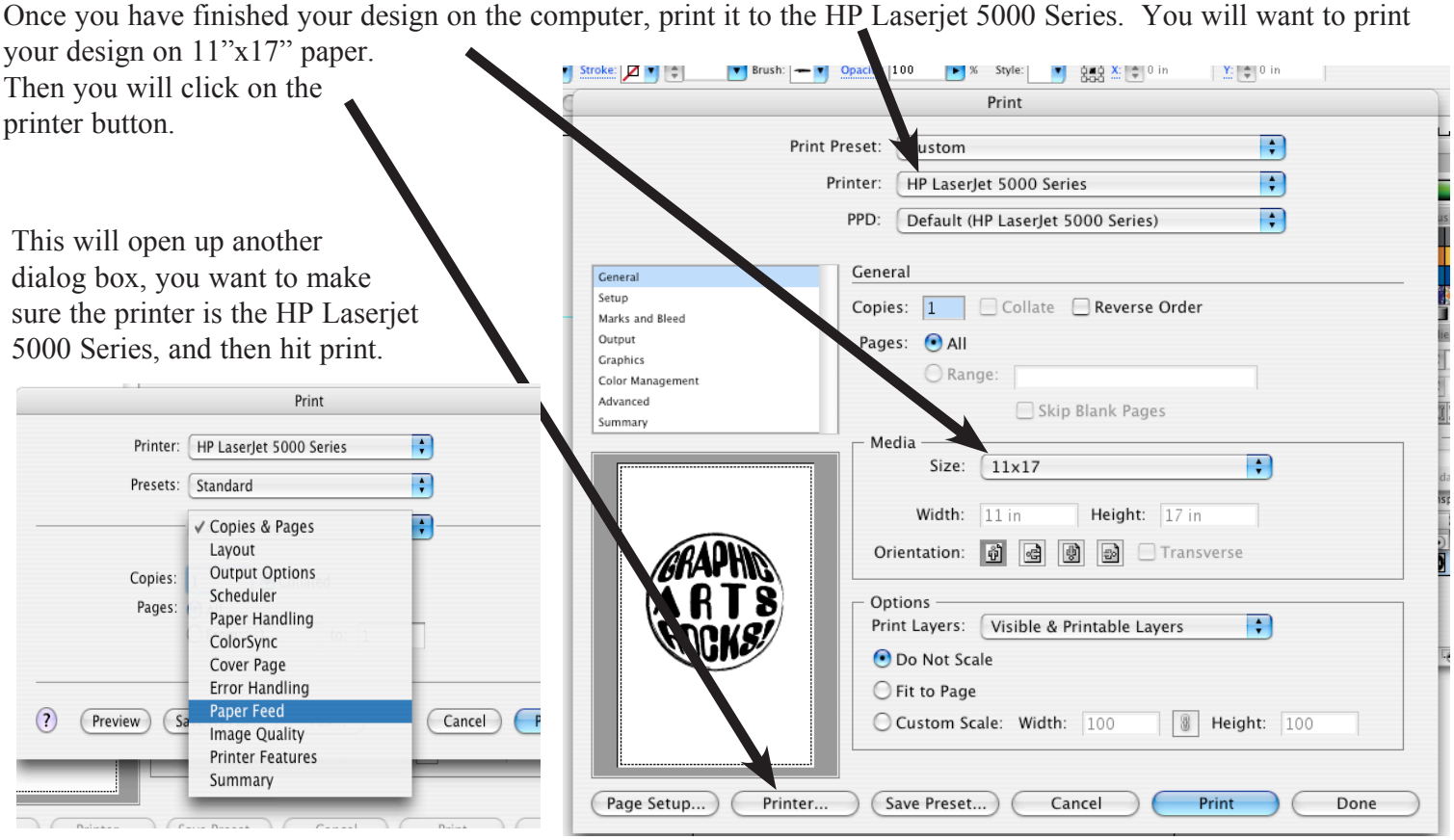
2. Open up Adobe Illustrator CS4, then open the tshirt template under the Graphic Arts 1 Server>Q4>ScreenPrinting. Make sure you create a new folder in your folder on the server and call it screen printing. **Name your file <your name> shirt.ai.**

3. Using the guides, pull it down 5" from the top. You will not design above the 5" mark. This makes it so the design will be 5" below the neckline, therefore centered on the shirt.

4. When you are designing your shirt, you are using line art or halftone dots, no shades or gradients.

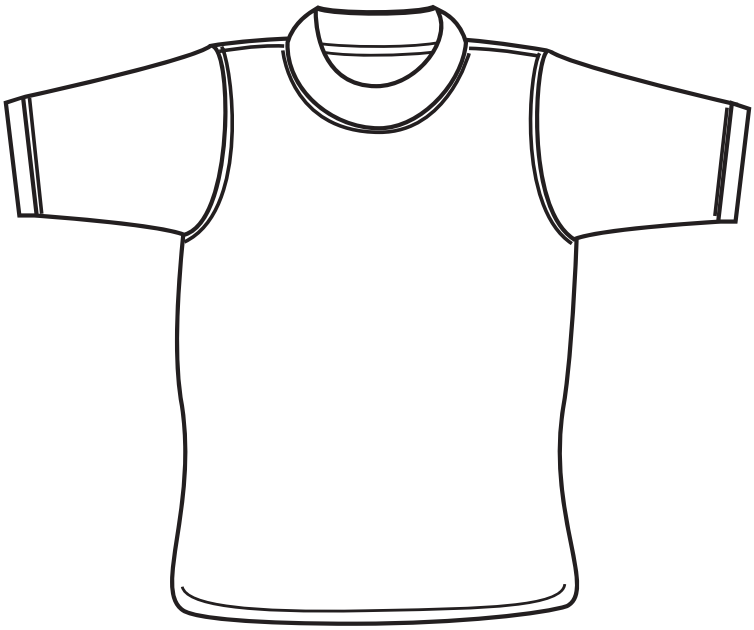
5. Once you have finished your design on the computer, print it to the HP Laserjet 5000 Series. You will want to print your design on 11"x17" paper. Then you will click on the printer button.

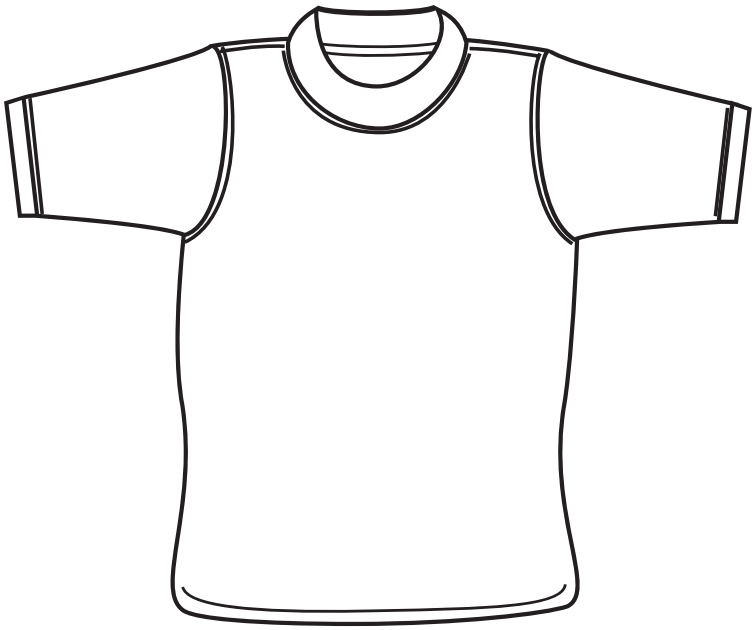
6. This will open up another dialog box, you want to make sure the printer is the HP Laserjet 5000 Series, and then hit print.

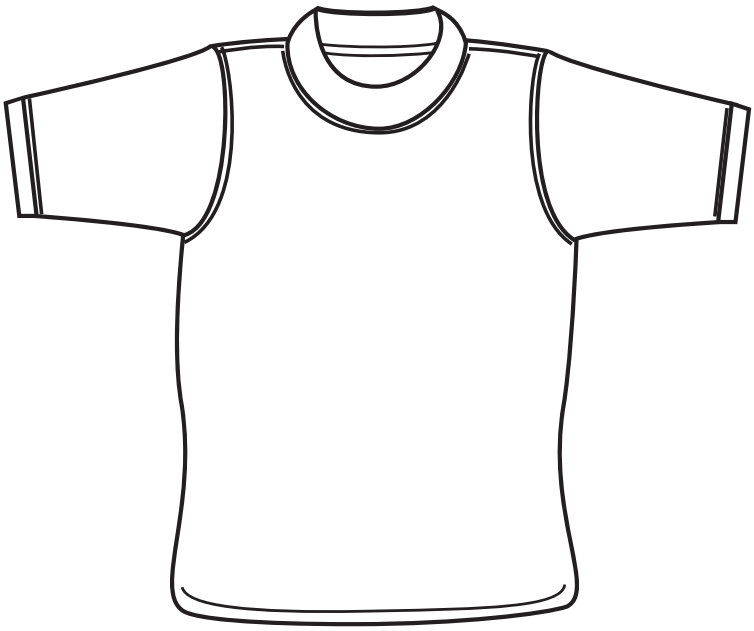


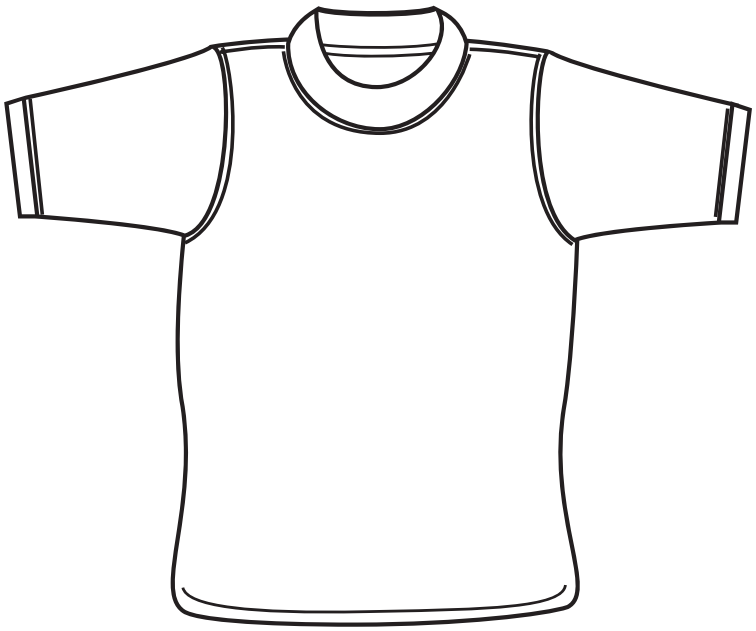
7. Hold up the print out on yourself to make sure the design is the size you want. If it looks good to you, then you are ready to print out your vellum. **Make sure to tell other classmates not to print to the 5000.** Put a piece of vellum into the printer.

T-Shirt Thumbnail Drawings









Screens to use

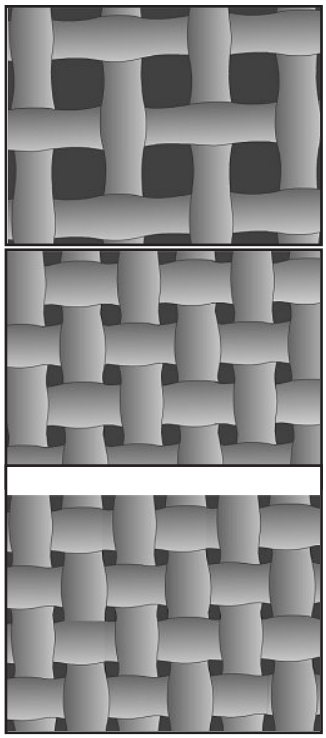
There are many different meshes to choose from, selecting the best mesh for your plastisol printing needs use the following information as a guide.

Design:

1.Blocky Design (no fine Lines) Mesh 110-150
2. Some Fine Lines (dots and some fine lines) Mesh 150-200
3. Many Fine Lines (lots of detail, fine lines) Mesh 200-300

Inks:

Glitter Plastisol Ink: Use 30 – 38 mesh
Athletic Prints: Use 60 – 85 mesh
Fleece Items: Use 60 – 110 mesh
Puff Inks: Use 60 – 85 mesh
Metallic Plastisol Ink: 60 – 85 mesh
Super Opaque/Bleed Resistant Plastisol: 60 – 85 mesh
Hot-Split Heat Transfers: 60 – 85 mesh
General Plastisol Prints: 110 – 125 mesh
Multi-Color, Wet-on-Wet Plastisol Printing: 180 – 200 mesh
Nylon Jacket Printing: 180 – 230 mesh
Simulated & 4-Color Process: 230 – 305 mesh



Exposure Unit

- Choose the correct screens to use for the job.

- Make sure the design is touching the top of the line and centered. Use a T-Square to make sure it is straight. Tape down your screens with tape in the same direction.

- The vellum positives have to be tight against the screen to provide the sharpest possible image.
- Rinse out your screen, do not remove your vellum from the exposure unit. If it rinses out perfectly, then you can set up for the second screen.

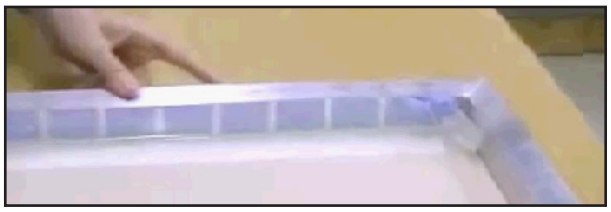
- Don't remove the first vellum from the exposure unit, overlay the second one on top of it. Line up the registration marks. Make sure it lines up perfectly, then tape it down in the opposite direction from the first vellum.

- Once the second vellum is taped down, untape the first vellum and pull it out from underneath the 2nd vellum.

- Rinse out your screen, do not remove your vellum from the exposure unit. If it rinses out perfectly, then you can remove the vellum from the exposure unit.

• Keep the vellums to line up your screens on the press.

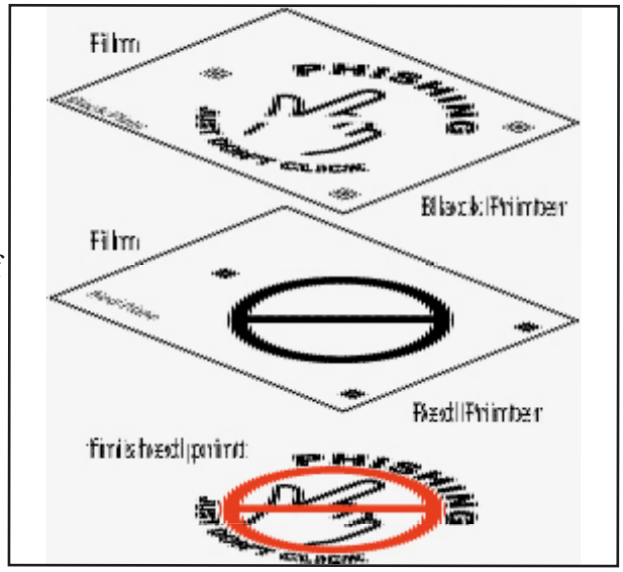
Tape and line up your screens



- After the screens are dry you can tape them up.
  You can only do this if you have ordered your shirts!

SCREENS CAN ONLY BE UP FOR 3 DAYS MAX.

- Tape up your screens with the red/white split tape. The red part of the tape is the non sticky side.
- Make sure to tape up all the sides with the non sticky red on the frame and the sticky tape side on the mesh.
- Then you are going to put your screen into the press brackets and figure out how far down to put the vellums on the platens.
- Make sure the design is evenly placed from the left and right sides of the platen and that all type is straight. Use the smaller Tsquares to align your vellums. Once the vellums are aligned on the platen, tape them down.



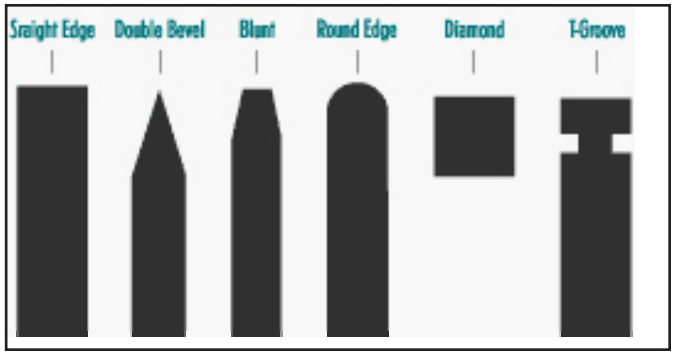
- Using the registration marks align your screen to the vellum registration marks. Once the first screen is aligned, tighten it and make sure it has off contact.
- Using the same vellum on the platen, align the second screen to the registration marks. Once the second screen is aligned, tighten it and make sure it has off contact.

Applying Ink

- Make sure to wear and apron. Open the ink containers and move them next to your screen on press. Using a spatula put the ink on your screen.
- Clean off the spatula and any messes you make on the ink container. Put all supplies you use back where they belong.

Squeegee to use

- Squeegees are made from 3 basic types of materials: Rubber, Neoprene, and Polyurethane.
  1. **Rubber** is the least expensive and suffers from poor abrasion resistance to poor resistants from solvents.
  2. **Neoprene**, is a synthetic rubber, a little more expensive and is resistant to chemical and abrasion.
  3. **Polyurethane**, is a synthetic plastic and is used for extended use and on automatic to semi-automatic presses.
- When selecting a Squeegee, the first task is to determine your desired durometer, or hardness. The durometer is the value that reflects the physical hardness of the Squeegee material. Depending on what you print, depends on the hardness needed for the squeegee.
  1. Hard durometer squeegees are normally recommended for high speed automatic presses.
  2. Softer durometer squeegees are typically used for low-pressure low speed manual and semi-automatic presses.

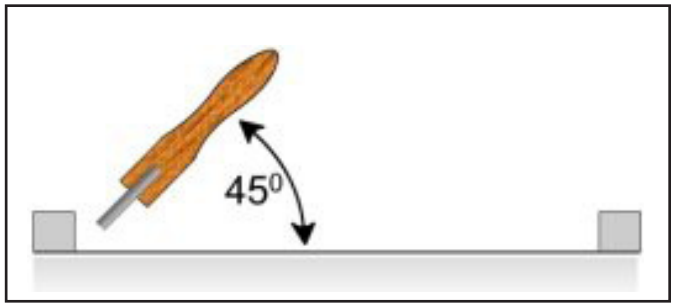


- Squeegee profiles determines the thickness of the ink deposit laid down and the effectiveness on different substrates.
  1. **Square Edge** - are the most common, and mainly used on cylinder, textile, and manual presses.
  2. **Square Edge with rounded corners**

3. **Rounded Edge** - are generally limited to the textile industry, and are used when a very heavy deposit is required.
4. **Double-sided Beveled Edge** - are more efficient on high-speed automatic machines and are typically used for printing rounded surfaces where fine definition is required.
5. **Single Beveled edge** - produce excellent results when printing heavy solids.

Printing

The best way to print a lot of shirts is to utilize the gauntlet style of printing. This entails one person to put on the shirts, one person prints 1 color on all the platens, then another person prints the other color on all the platens, and another person takes the shirts off.



- Again, make sure you wear an apron.
- Always use a test shirt to print your design, never print on the actual shirts unless you are positive the design is aligned properly and the screen is tightened.
- Use the squeegee to flood the ink on the screen.
- Then put the screen against the shirt, push the squeegee at a 45* angle away from you at least twice. Make sure you are pushing down hard.
- Lift the screen and rotate under the flash/spot cure dryer. You need to cure the ink before putting the other color over it.

  Flash or Spot Cure Drying: Plastisol ink can generally be fully cured with a flash cure unit – sometimes also called a spot dryer. Set the flash cure heater to the highest temperature and placed heating element 3 inches over the garment for 25 - 35 seconds (generally speaking). For curing between colors where only a partial cure is required, the time will be less (usually between 5 – 10 seconds).

- When both colors are printed, carefully remove the shirt and place it on the conveyor. Make sure that nothing is hanging over the mesh on the conveyor.

Cleaning the Screens

- When you finish printing all of your shirts, triple check that you have the correct quantities.
- Tear a piece of craft paper and lay it down on the table.
- Then remove your screens from the press and place on the craft paper.
- Scrape all ink back into the correct ink buckets.
- Clean all spatulas and squeegees with press wash and a snowtek towel, dispose of in the red hazardous trash cans.
- Remove the tape and discard.
- Put the screens in the dunk tank for at least 15 minutes.
- Then put the screens, ink side away from you, in the spray booth and using the power washer spray out the ink and emulsion.
- Use the stencil remover in the spray bottle on top of the booth to spray both sides of the screen and use the scrubber to make sure it penetrates the mesh.

- Then thoroughly rinse the screen, both sides.
- Take the screens and put it back on the kraft paper, clean the edges with press wash and a snowtek towel, dispose of in the red hazardous trash cans.
- Have a instructor double check that the screen is clean.

When you are finished cleaning your screens, put your pellum and rubric on the instructors desk for grading.

PRINT ED

SP A. 1, 3, 6; SP B. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 32; SP C. 35, 36, 37, 38, 44; SP D. 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56; SP E. 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 67=8, 69, 70, 71, 72, 73, 74, 75, 76; SP F. 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96

*PrintEd - Screen Printing

A. Technology

_____ SP A A. 1) Describe the screen printing process

_____ SP A A. 3) Describe the components of a screen printing press
- a. Frame
- b. Mesh
- c. Squeegee blade

_____ SP A A. 6) Describe the workflow steps of screen printing process (Single color/Inline or Rotary press)
- a. File creation
- b. Film output
- c. Screen creation
- d. Mounting screen on press
- e. Print production
- f. Clean up

B. Design and Prepress

_____ SP A B. 10) Review features and capabilities of professional Page Layout software applications

a. Adobe Illustrator

_____ SP A B. 11) Demonstrate use of computer menus, shortcut keys, and panels in illustration software

_____ SP A B. 12) Describe different types of graphics used in screen printing
- a. Line art
- b. Continuous tone
- c. Raster
- d. Vector

_____ SP A B. 13) Define Pixels Per Inch Resolution (Screen Disp alay)

_____ SP A B. 14) Define Dots Per Inch

_____ SP A B. 15) Define Lines Per Inch Resolution (Printing Press)

_____ SP A B. 16) Describe an Encapsulated PostScript (EPS) file

_____ SP A B. 17) Explain the use of a EPS file

_____ SP A B. 18) Demonstrate the proper setup of a document using an instructor specified page size

_____ SP A B. 19) Describe the use of paths in an illustration software program

_____ SP A B. 20) Define trapping

_____ SP A B. 21) Define knockout

_____ SP A B. 22) Define overprint

_____ SP A B. 23) Discuss the use of layers in an illustration software program

_____ SP A B. 24) Define registration

_____ SP A B. 25) Describe a frame, stencil and mesh

_____ SP A B. 26) Demonstrate the proper setup of a document using instructor specified frame, stencil, mesh and ink

_____ SP A B. 27) Demonstrate applying trapping in an illustration software program

_____ SP A B. 30) Produce instructor specified art with all design elements, registration targets, color identification, and screen position on press

_____ SP A B. 32) Produce a positive film for stencil exposure

C. Frame and Mesh Preparation

_____ SP A C. 35) List different mesh counts and thread diameters and mesh type (Calendared, Steel, Fabric)

_____ SP A C. 36) Determine the appropriate choice of mesh count and thread diameter for an instructor specified substrate/image

_____ SP A C. 37) List different frame types/construction

_____ SP A C. 38) Choose an appropriate frame for an instructor specified job

_____ SP A C. 44) Inspect the quality of a frame and mesh preparation

D. Stencil and Screen Preparation

_____ SP A D. 45) Specify the workflow steps used to make a screen

_____ SP A D. 46) Describe emulsion used to make a screen (capillary, liquid and film)

_____ SP A D. 47) Explain the use of emulsion when making a screen

_____ SP A D. 48) Choose appropriate type of emulsion for an instructor specified job

_____ SP A D. 49) Describe requirements to prepare the screen for a stencil application

_____ SP A D. 50) Demonstrate the proper application of emulsion to the screen

_____ SP A D. 51) Demonstrate the proper drying requirements of the screen

_____ SP A D. 52) Demonstrate the proper steps of exposing the screen while maintaining screen to screen registration

_____ SP A D. 53) Demonstrate the proper steps of washing image area of a screen and allowing to dry

_____ SP A D. 54) Specify the possible defects that will affect the quality of print

_____ SP A D. 55) Evaluate a stencil for quality defects

_____ SP A D. 56) Demonstrate the proper step of masking a stencil for production use

E. Print Production

_____ SP A E. 57) List workflow steps used during printing
_____ SP A E. 58) Demonstrate proper loading of screen onto press
_____ SP A E. 59) Describe characteristics of squeegees used
- a. Durometer
- b. Shape
- c. Width

_____ SP A E. 60) Demonstrate the proper choice of squeegee for a specific job
_____ SP A E. 61) List the types of ink used in screen printing
_____ SP A E. 62) Choose the proper choice of ink for a specific job
_____ SP A E. 64) Describe the alignment of screens for proper registration
_____ SP A E. 65) Demonstrate the proper alignment of screens for a specific job
_____ SP A E. 66) Define flood stroke
_____ SP A E. 67) Define print stroke
_____ SP A E. 68) Define off contact and peel
_____ SP A E. 69) Demonstrate the proper setting of off contact to control image quality
_____ SP A E. 70) Demonstrate the proper application of ink to screen
_____ SP A E. 71) Demonstrate the proper loading and alignment of substrate on press
_____ SP A E. 72) Demonstrate the proper adjustment of squeegee pressure for an instructor specified job
_____ SP A E. 73) Demonstrate the proper operation of press
_____ SP A E. 74) Determine quality control procedures to ensure print quality
_____ SP A E. 75) Determine corrective actions required to maintain quality
_____ SP A E. 76) Describe drying systems
- a. Flash
- b. Conveyor

_____ SP A E. 77) Evaluate an instructor specified finished product

F. Clean-up Process

_____ SP A F. 80) Describe a Safety Data Sheet
_____ SP A F. 81) Explain the use of a Safety Data Sheet
_____ SP A F. 82) Demonstrate proper procedures when handling cleaning chemicals
_____ SP A F. 83) List workflow steps used during cleaning
_____ SP A F. 84) Demonstrate the proper removal, cleaning and storing of squeegee(s)
_____ SP A F. 85) Demonstrate the proper removal of remaining ink from screen
_____ SP A F. 86) Demonstrate the proper cleansing of screen
_____ SP A F. 87) Demonstrate the proper storage or disposal of ink as sp aecified by local regulations
_____ SP A F. 88) Demonstrate the proper removal of frame from a press
_____ SP A F. 89) Demonstrate the proper preparation of screen for reuse or reclamation
_____ SP A F. 90) Demonstrate the proper selection and use of appropriate chemistry and washout equipment to remove stencil
_____ SP A F. 91) List possible defects in a screen
_____ SP A F. 92) Describe strategies for reuse of screen
_____ SP A F. 93) Demonstrate the proper chemical or mechanical adjustments to screen for reuse
_____ SP A F. 94) Demonstrate the proper storage of screen
_____ SP A F. 95) Demonstrate proper cleaning of additional auxiliary equipment
_____ SP A F. 96) Assess the cleanup activities completed within shop

PRINT ED

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COMPUTER/PRESS SKILLS & ABILITIES

Screen Printing Project

Student Name _____ Date _____

	Commendable 18-20	Acceptable 17-15	Not Acceptable 10-14	Score
Appearance	Very professional appearance; great balance; eye catching.	Somewhat professional appearance; good balance; pleasant.	Not professional in appearance; balance not achieved; boring.	
Design/Graphics	Demonstrates superior knowledge of Typography, Composition, and the Elements and Principles of Design..	Demonstrates an understanding of Typography, Composition, and the Elements and Principles of Design.	Does not demonstrates an understanding of Typography, Composition, and the Elements and Principles of Design..	
Burning Screen	Correctly burnt the screen.	Had some trouble, but could still use the screen	Incorrectly burnt the screen and had to reburn it.	
Printing	Correctly lined up the screen and printed the design centered on the front of the shirt, 5” from the neckline.	Has some problems with lining up the screen, centering the design on the shirt, or printing 5” from the neckline.	Has some major problems with lining up the screen, centering the design on the shirt, or printing 5” from the neckline.	
Cleaning	Screen and frame all totally cleaned off.-	Screen and frame all somewhat cleaned off..	Screen and frame all aren’t cleaned off.	

Mastery	**80-100**
Acceptable	**60-79**
Not Acceptable	**59 or less**