



Graphic Arts Merit Badge

Troop 344 and 9344
Pemberville, OH

Requirements



1. Review with your counselor the processes for producing printed communications: offset lithography, screen printing, electronic/digital, relief, and gravure. Collect samples of three products, each one produced using a different printing process, or draw diagrams to help with your description.
2. Explain the differences between continuous tone, line, and halftone artwork. Describe how digital images can be created and/or stored in a computer.
3. Design a printed piece (flier, T-shirt, program, form, etc.) and produce it. Explain your decisions for the typeface or typefaces you use and the way you arrange the elements in your design. Explain which printing process is best suited for printing your design. If desktop publishing is available, identify what hardware and software would be appropriate for outputting your design.

Requirements



4. Produce the design you created for requirement 3 using one of the following printing processes:
 - a. **Offset lithography**
Make a layout and produce a plate using a process approved by your counselor. Run the plate and print at least 50 copies.
 - b. **Screen printing**
Make a hand-cut or photographic stencil and attach it to a screen that you have prepared. Mask the screen and print at least 20 copies.
 - c. **Electronic/digital printing**
Create a layout in electronic form, download it to the press or printer, and run 50 copies. If no electronic interface to the press or printer is available, you may print and scan a paper copy of the layout.
 - d. **Relief printing**
Prepare a layout or set the necessary type. Make a plate or lock up the form. Use this to print 50 copies.

Requirements



5. Review the following postpress operations with your counselor:
 - a. Discuss the finishing operations of padding, drilling, cutting, and trimming.
 - b. Collect, describe, or identify examples of the following types of binding: perfect, spiral, plastic comb, saddle stitched, and case.
6. Do ONE of the following, then describe the highlights of your visit:
 - a. Visit a newspaper printing plant: Follow a story from the editor to the press.
 - b. Visit a retail, commercial, or in-plant printing facility: Follow a project from beginning to end.
 - c. Visit a school's graphic arts program: Find out what courses are available and what the prerequisites are.
 - d. Visit three websites (with your parent's permission) that belong to graphic arts professional organizations and/or printing-related companies (suppliers, manufacturers, printers): With permission from your parent or counselor, print out or download product or service information from two of the sites.

Requirements



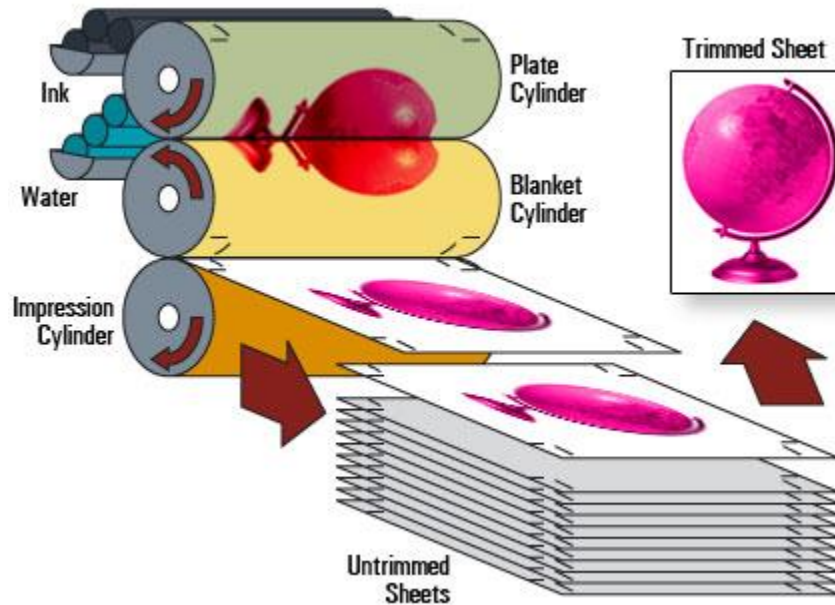
7. Find out about three career opportunities in graphic arts. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

Requirement 1

Review with your counselor the processes for producing printed communications: offset lithography, screen printing, electronic/digital, relief, and gravure. Collect samples of three products, each one produced using a different printing process, or draw diagrams to help with your description.

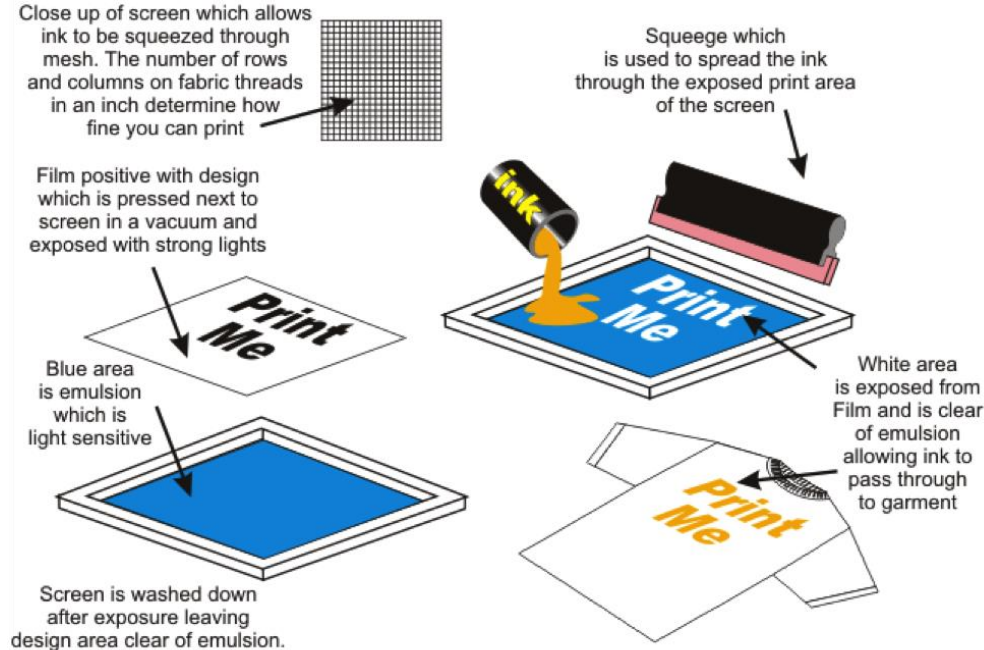
Requirement 1

Offset printing, also called **offset lithography**, is a method of mass-production printing in which the images on metal plates are transferred (offset) to rubber blankets or rollers and then to the print media. The print media, usually paper, does not come into direct contact with the metal plates.



Requirement 1

Screenprinting is a printing technique where a mesh is used to transfer ink onto a substrate, except in areas made impermeable to the ink by a blocking stencil.



Requirement 1

Digital printing is a modern method of production that makes prints from electronic files. It involves your artwork being created on a computer and then printed directly onto the material of your choice.



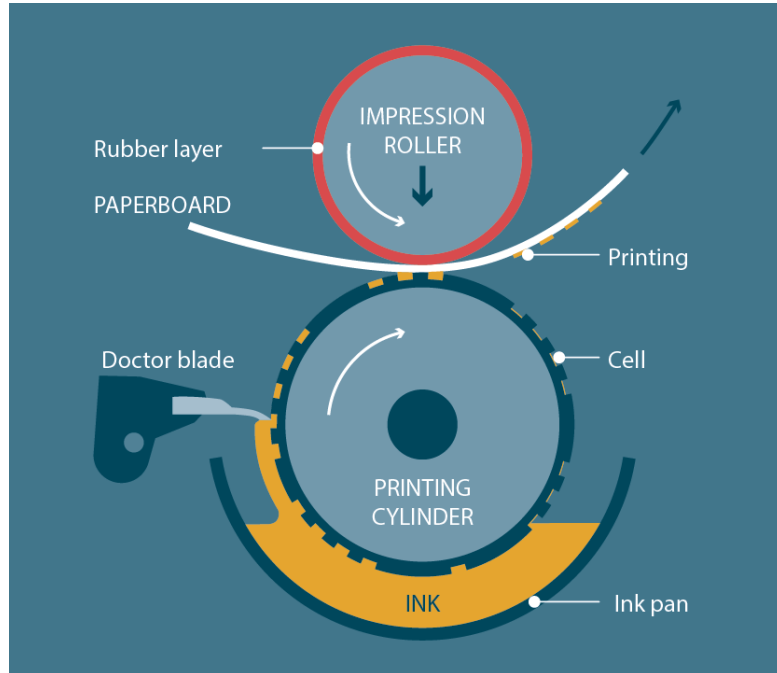
Requirement 1

Relief printing is a process consisting of cutting or etching a printing surface into a block, plate, or matrix in such a way that all that remains of the original surface is the design to be printed. The printing block, plate, or matrix has ink applied to its surface, but not to any recessed areas, is then brought into contact with paper.



Requirement 1

Rotogravure – **gravure** for short – is a type of intaglio printing process in which the image is engraved onto a cylinder because, like offset printing, it uses a rotary printing press.



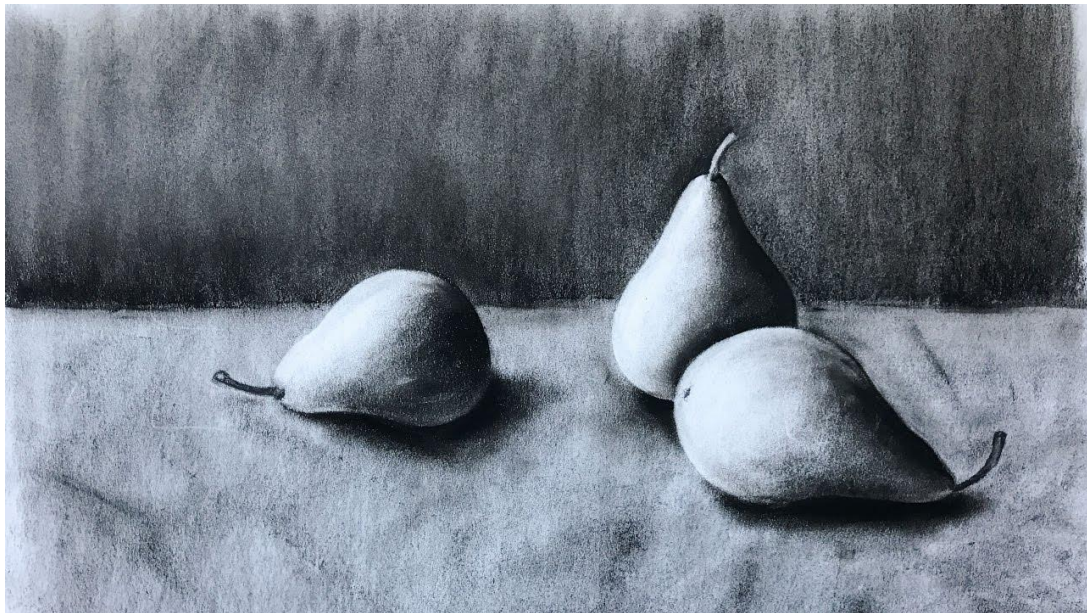


Requirement 2

Explain the differences between continuous tone, line, and halftone artwork. Describe how digital images can be created and/or stored in a computer.

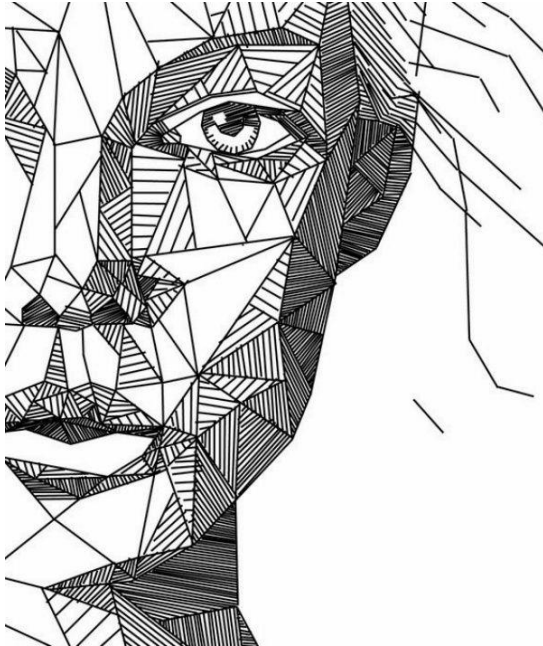
Requirement 2

Continuous Tone Artwork - Image in which colors and shades of gray smoothly merge into the neighboring colors or shades, instead of producing distinct, sharply-outlined areas of color or shade.



Requirement 2

Line Artwork - is any image that consists of distinct straight or curved lines placed against a background, without gradations in shade or hue to represent two-dimensional or three-dimensional objects. Line art can use lines of different colors, although line art is usually monochromatic.



Requirement 2

Halftone Artwork - is artwork comprised of discrete dots rather than continuous tones. When viewed from a distance, the dots blur together, creating the illusion of continuous lines and shapes.



Requirement 2

A digital image is a representation of a real image as a set of numbers that can be stored and handled by a digital computer. In order to translate the image into numbers, it is divided into small areas called pixels (picture elements). For each pixel, the imaging device records a number, or a small set of numbers, that describe some property of this pixel, such as its brightness (the intensity of the light) or its color. The numbers are arranged in an array of rows and columns that correspond to the vertical and horizontal positions of the pixels in the image.



Requirement 2

An advantage of a digital image is the ability to change them according to one's needs. There are several programs available now which give a user the ability to do that, including Photoshop, Photopaint, and Gimp. With such a program, a user can change the colors and brightness of an image, delete unwanted visible objects, move others, and merge objects from several images, among many other operations. In this way a user can retouch family photos or even create new images.



Requirement 2

Computer-generated images can be stored in several different formats and differing resolutions. But all computer files, whether numbers, words or graphics, are stored as digital information. What computers do is translate the image into digital code for storage and then interpret the file back into an image for display. How the computer does this involves the manner in which the image was created and the code and formats needed for making a graphic image file and then creating a graphic image display.

Computers store graphic information in several formats.



WHAT IMAGE FORMAT TO USE?

There is no universal image format that is best for all scenarios. Every type of image format has their own advantages and disadvantages. Here's a summary of each formats best uses.

JPEG

WEB GRAPHICS

Probably the most web friendly image format there is. JPEG is great for images when you need to keep the size small, such as when you need to upload it online. If you don't mind compromising the quality of the image a bit, use JPEG.

GIF

WEB GRAPHICS / ANIMATION / CLIP ART

Out of the three formats (GIF, JPEG & PNG) GIF is the worst choice for web graphics, although file sizes are very small, and they load very fast. Plus, if you want to add animation effects, use GIF. Also great for clip art.

TIFF

PRINT GRAPHICS

TIFF is the best and only choice for professionals when images are intended for print. Its ability to read CMYK and YcbCr color, plus its ability to store such high pixel intensity makes it the only choice for designers, photographers and publishers.

PNG

WEB GRAPHICS / LOGOS & LINE ART

PNGs are great for web graphics. If you want to keep the size small, but still retain the image quality, use PNG. Also if you want to use transparencies, the PNG is the format for you.

BMP

PRINT GRAPHICS

These files are large and uncompressed, but the images are rich in color, high in quality, simple and compatible in all Windows OS and programs. BMP files are also called raster or paint images.





Requirement 3

Design a printed piece (flier, T-shirt, program, form, etc.) and produce it. Explain your decisions for the typeface or typefaces you use and the way you arrange the elements in your design. Explain which printing process is best suited for printing your design. If desktop publishing is available, identify what hardware and software would be appropriate for outputting your design.

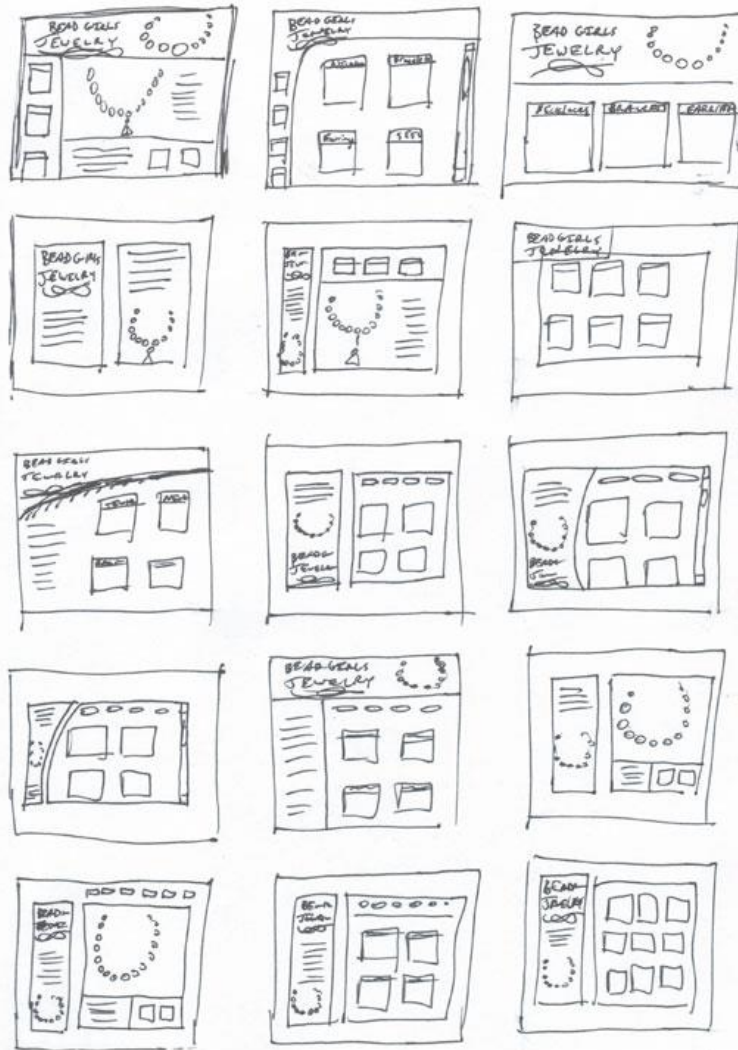
Requirement 3

- Every printing job requires planning
 - What type of job it is and what the finished piece is expected to be.
 - Which printing process is best for the job.
- A printing job can be broken into two parts:
 - The design includes how you will communicate your message and what that message will look like.
 - The design elements are the words and pictures of your design.
 - The layout is when you assemble all of the elements of your design to make a master (completed version) that will be the basis of what you will be printing.
 - The printing process you plan to use and the equipment you have available will determine the way you assemble your layout.

Requirement 3

Step 1 - The Thumbnail

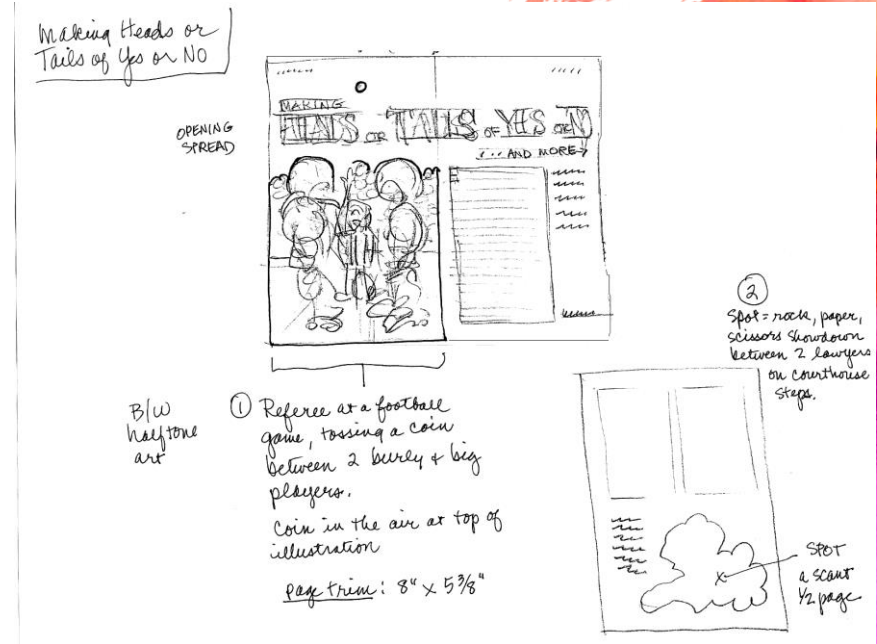
- A thumbnail is a simple pencil drawing of your design idea usually smaller than the size you plan.
- It mainly shows proportion and the shape of the piece with the design elements drawn as basic geometric shapes.
- Make more than one thumbnail sketch inventing different ideas.
- This will give you several ideas to choose from and help you create the best possible design.



Requirement 3

Step 2 – The Rough

- Choose your favorite thumbnail and expand on that design.
- A rough is drawn the actual size of the planned piece and it shows the design elements in greater detail than the thumbnail.
- Draw the larger words in the style and size they will be printed.
- Show long paragraphs as a series of lines.
- Pictures in the design should depict minimum details.
- Write notes off to the side of the rough to indicate the sizes and styles of the type and any picture's format and source.
- Write these notes in a color different from the color you for design elements.



Requirement 3

Choosing Typefaces

- Each type classification is generally suited for a particular purpose.
 - Roman type is usually used for books, newspapers, magazines, or any printing where there is a lot of continuous reading.
 - **Sans serif type is typically found in headlines or titles.**
 - Text type has an “official” look and is often used for important documents such as diplomas, certificates, and legal papers.
 - *Script type usually projects a sense of elegance and formality and is commonly used for wedding invitations or where a carefully crafted human touch is desired.*
 - **NOVELTY TYPE MAY BE DESIGNED TO LOOK POWERFUL, STILY, EXCITING, OR NEARLY ANY MOOD YOU WANT AND SHOULD BE USED SPARINGLY.**

Requirement 3

Making the Layout

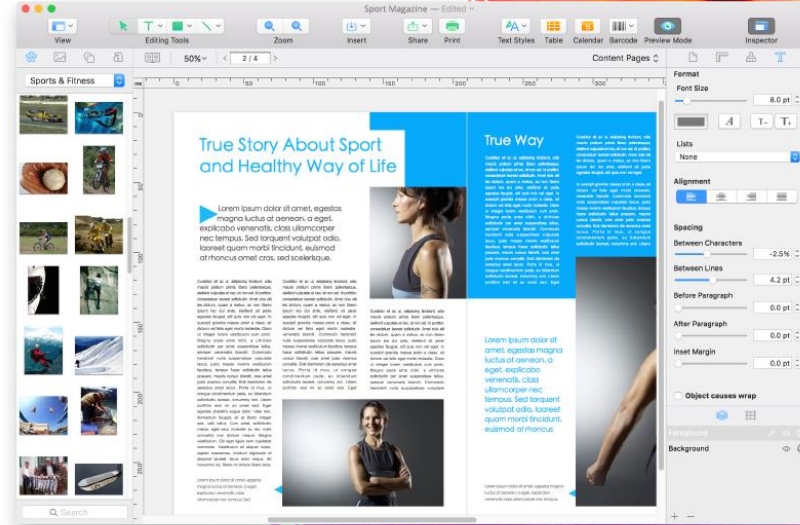
- Paste up
 - The traditional, but outdated, paste up is made on a piece of heavy white paper or illustration board.
 - It is called a paste up because you cut out and paste all the final text and graphics on the board according to the rough design.
 - When all the text and graphics are accurately fixed in position, it is photographed with a stat camera to create a same-size film negative for each *printing* plate required for lithography or the negative is turned into a picture to make a photographic stencil for screen printing.



Requirement 3

Making the Layout

- Most layouts today are done on computer systems using desktop publishing software.
- Some tools you can use when making a layout with a computer:
 - Use word-processing software to set type for text.
 - Create graphics with painting or drawing software.
 - Use computer clip art.
 - Scan your photographs or artwork to a computer.
 - Download text and graphics from the internet.
 - Take photos with a digital camera or your phone and download them to a computer.
- After you have created your layout with a computer, print the digital paste up using a printer.



Requirement 4

Produce the design you created for requirement 3 using one of the following printing processes:

a. Offset lithography

Make a layout and produce a plate using a process approved by your counselor. Run the plate and print at least 50 copies.

b. Screen printing

Make a hand-cut or photographic stencil and attach it to a screen that you have prepared. Mask the screen and print at least 20 copies.

c. Electronic/digital printing

Create a layout in electronic form, download it to the press or printer, and run 50 copies. If no electronic interface to the press or printer is available, you may print and scan a paper copy of the layout.

d. Relief printing

Prepare a layout or set the necessary type. Make a plate or lock up the form. Use this to print 50 copies.

Requirement 4

- You can produce your design for printing with the help of the downloadable instructions in PDF format that were provided with this presentation.
 1. Screen Printing at Home
 2. Relief Printing Woodblock Edition
 3. Relief Printing Linocuts Edition
- You can also use a computer, graphic design software, and a printer to meet this requirement.

Requirement 5

Review the following postpress operations with your counselor:

- a. Discuss the finishing operations of padding, drilling, cutting and trimming.
- b. Collect, describe, or identify examples of the following types of binding: perfect, spiral, plastic comb, saddle stitched, and case.

Requirement 5

Padding Finish

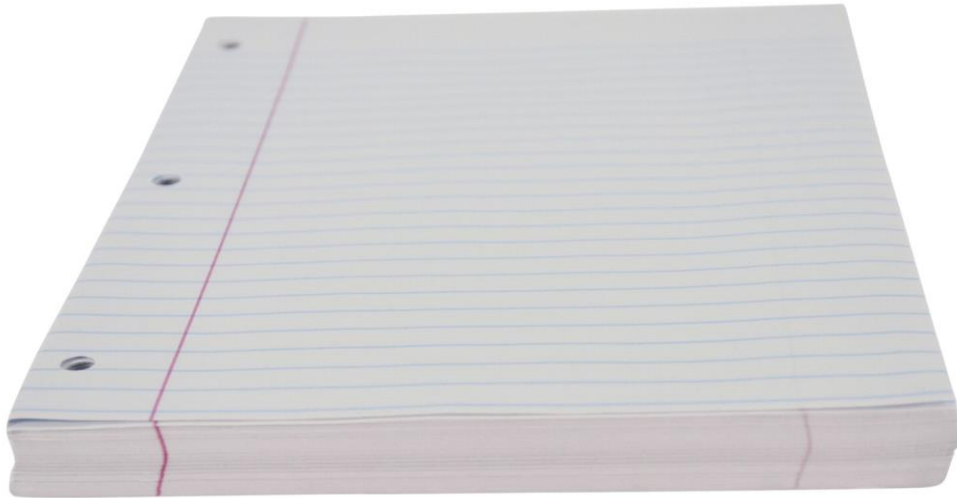
- Refers to the binding of a stack of sheets, by using a flexible adhesive along one edge of a stack of same-sized sheets.
- The adhesive secures the sheets as a unit, but allows the top sheet to be easily removed when needed.
- Notepads are a typical example of padding.



Requirement 5

Drilling

- Refers to the process of creating round holes in paper using a rotating bit, such as the hole patterns needed for sheets and dividers placed into ringed binders.



Requirement 5

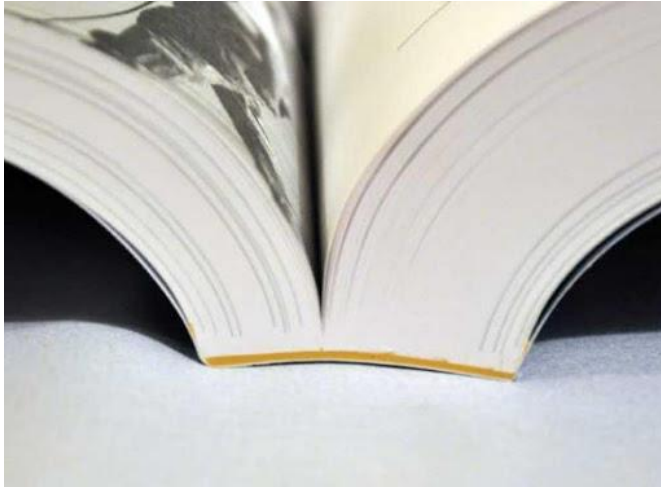
Cutting and trimming

- **Cutting** is often differentiated from **trimming** in that cutting refers to the separation of pages that have been printed together, while **trimming** refers to the process of removing paper from around the edges of a sheet.
- Cutting and trimming are usually done using a **guillotine cutter**. A stack of sheets is placed on the bed of the cutter and the angled stainless steel blade cuts through it at the desired position.



Requirement 5

- **Perfect Binding** is a widely used soft cover book binding method.
- With this binding method, the pages and cover are glued together at the spine with a strong yet flexible thermal glue.
- The other three sides of the book are then trimmed as needed to give them clean “perfect” edges.



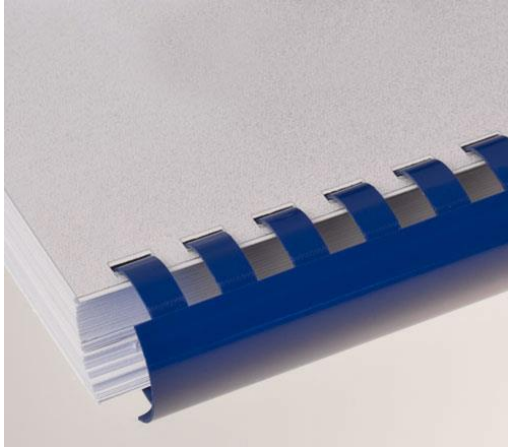
Requirement 5

- **Spiral binding** is the process of binding pages together with a plastic coil that is inserted into holes along the edge of paper pages.
- It is effective for documents up to 300 pages.
- Spiral bound printing is generally used for booklets or catalogs that need to lay flat and referred to often.



Requirement 5

- **Plastic Comb binding:** The teeth of a plastic 'comb' are inserted into a series of slits drilled or punched into a stack of sheets. This process is often used for reports and presentations.



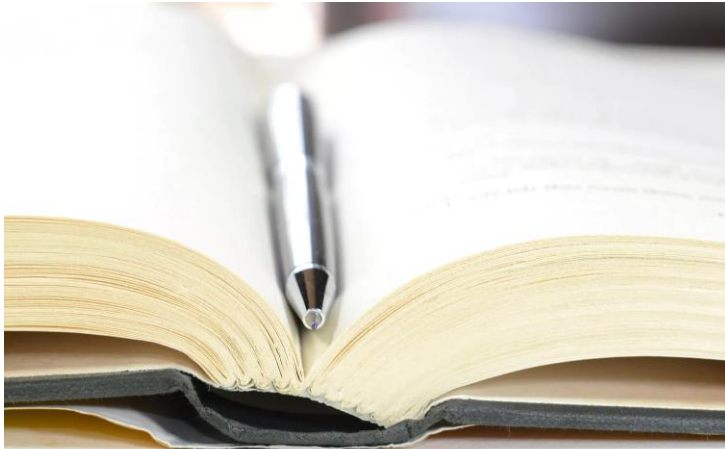
Requirement 5

- **Saddle stitch binding** is when single sheets of paper are printed on both sides, collated in page number order, folded in half and then stapled through the fold by a saddle stitch stapler.
- Saddle stitch binding is one of the most common binding methods for booklet manufacturing, magazines, newsletters, small catalogs, etc., but is limited in the number of pages that can be bound.



Requirement 5

- **Case binding**- The pages of the book are arranged in signatures and sewn or stitched together in the correct page order.
- A **signature** is a group of sheets folded in half, to be worked into the binding as a unit.
- Then, hard covers made of cloth, vinyl, or leather over cardboard are attached to the book using glued-on endpapers.



Requirement 6

Do ONE of the following, then describe the highlights of your visit:

- a. Visit a newspaper printing plant: Follow a story from the editor to the press.
- b. Visit a retail, commercial, or in-plant printing facility: Follow a project from beginning to end.
- c. Visit a school's graphic arts program: Find out what courses are available and what the prerequisites are.
- d. Visit three websites (with your parent's permission) that belong to graphic arts professional organizations and/or printing-related companies (suppliers, manufacturers, printers): With permission from your parent or counselor, print out or download product or service information from two of the sites.

Requirement 6

[American Institute of Graphic Arts \(AIGA\)](#)



[Graphic Artists Guild](#)



[Society of Illustrators](#)



[Bowling Green State University Graphic Design Program](#)





Requirement 7

Find out about three career opportunities in graphic arts. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.

Requirement 7

Graphic Designer Career, Salary and Education Information

What They Do: Graphic designers create visual concepts, using computer software or by hand, to communicate ideas that inspire, inform, and captivate consumers.

Work Environment: Many of these workers are employed in specialized design services, publishing, or advertising, public relations, and related services industries.

How to Become One: Graphic designers usually need a bachelor's degree in graphic design or a related field. Candidates for graphic design positions should have a portfolio that demonstrates their creativity and originality.

Salary: The median annual wage for graphic designers in 2020 is \$50,370.

Job Outlook: Employment of graphic designers is projected to grow 3 percent over the next ten years, slower than the average for all occupations. Graphic designers are expected to face strong competition for available positions.

Requirement 7

Career Opportunities in Graphic Arts

Graphic Designer

The designer plans the piece to be printed and establishes the theme and style of the printed piece. Materials are created utilizing computerized design tools and programs. Designers should have a natural artistic talent as well as an eye for detail and color.

Photographer/Videographer

The photographer produces the images required for a variety of reproduction including websites, catalogs, brochures, billboards, books and advertising materials. Both static and moving video imaging are part of this position. Photographers must have proven creative talent, as well as the ability to get along with others during a photo shoot. Due to the use of digital cameras, photographers must be familiar with digital and computer technologies.

Illustrator

The illustrator creates illustrations, drawings, charts, graphs, or full-color artwork to complement the written word. Most illustrations are now created using computerized software programs. However, an illustrator must still have precise artistic talent as well as a knowledge of composition and proper use of the tools of the craft.



Requirement 7

Career Opportunities in Graphic Arts

Page-layout Artist

The page-layout artist uses a computer workstation to assemble the artwork and the text according to the designer's layout. Since the artist prepares the piece for production, the job requires precision, accuracy, neatness, and the ability to follow directions. With modern software systems in use, one person often performs all the functions of the graphic designer, illustrator, and page-layout artist. Therefore, the person needs a well-rounded knowledge of computer software, in addition to having artistic ability.

Social Media/Web Specialist

Many projects are distributed by a variety of channels and print/mail is often coordinated with web based methods. The specialist may coordinate e-blasts, manage database files, update websites and other tasks related to electronic communications with clients.

