

CHAPTER 19 - OBJECTIVES

LEARNING OBJECTIVES

After completing the reading and assigned activities related to this chapter, students will be able to do the following:

1. Demonstrate an understanding of the terminology related to Lithographic inks.
(by correctly completing the vocabulary, ink movie, and ink question sheet)
 - a. Describe process (CMYK) and spot (PMS) inks.
 - b. Identify process and spot color areas from selected sample print job
 - c. Describe the procedure for mixing and testing custom colored inks
 - d. Describe causes of ink problems and possible solutions
 - e. Review solutions for common ink problems
 - f. Discuss coatings (aqueous, ultraviolet cured, varnish)

CHAPTER 19 - OBJECTIVES

CODE TO RELATE TO OTHER STANDARDS

19. Lithographic Inks

- OPO C. 37) Describe process (CMYK) and spot (PMS) color inks
- OPO C. 38) Identify process and spot color areas from selected sample print job
- OPO C. 39) Describe the procedure for mixing and testing custom colored inks
- OPO C. 40) Describe causes of ink problems and possible solutions
- OPO C. 41) Review solutions for common ink problems
- OPO C. 42) Discuss coatings
 - a. Aqueous
 - b. Ultraviolet cured
 - c. Varnish

CHAPTER 19 - LEARNING ACTIVITIES

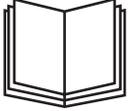
PREREQUISITES:

None

LEARNING ACTIVITIES SHEET

Student Name _____

Place a checkmark in the appropriate box as you complete each of the steps below.



- 1. Do** Read Ch. 19: Lithographic Inks (p.459-491)
- 2. Do** How Ink is Made Questions
- 3. Stop** Have instructor evaluate the completed assignment sheet and if the evaluation is satisfactory, continue to step 4. If the evaluation is not satisfactory, repeat step 2.
- 4. Do** Assignment Sheet 1, Chapter 19 vocabulary.
- 5. Stop** Have instructor evaluate the completed assignment sheet and if the evaluation is satisfactory, continue to step 6. If the evaluation is not satisfactory, repeat step 4.
- 6. Do** Assignment Sheet 2, Ink Questions
- 7. Stop** Have instructor evaluate the completed assignment sheet and if the evaluation is satisfactory, continue to step 8. If the evaluation is not satisfactory, repeat step 6.
- 8. Do** Chapter 19 - Take Pretest Review.
- 9. Stop** Have instructor evaluate your performance. If the evaluation is satisfactory, continue to step 10. If the evaluation is not satisfactory, fill out the study guide.
- 10. Take** Chapter 19 Quiz.

TEACHER NOTES:

(prior to starting Ch. 19, make sure that the movie is set and ready to run)

Have the students get their Ch. 19 packet and go to the Ink Movie Question Sheet.

Today we will watch a movie on how ink is made. Throughout the movie there are questions you need to answer regarding paper.

The ink movie questions are due today.

Name: _____

How Ink Is Made Movie Questions **Key**

Directions: Watch the movie and answer the questions regarding ink.

1. What are the four process color inks? **CYAN, MAGENTA, YELLOW, BLACK**
2. What are the two primary components of ink? **PIGMENT AND VEHICLE**
3. The **VEHICLE** is the fluid part of the ink that determines the ink's stiffness.(referred to as the printing honey)
4. After mixing the two components what is the next step in making ink? **GRINDING**
5. What does QC stand for?
QUALITY CONTROL
6. What is added to the ink to impart rub resistance? **WAX**
7. What is added to allow ink to set to a solid film?
DRYERS
8. What test is used to tell how sticky the ink is? **TACK**
9. What colors are created because the process colors can't reach the gamut needed?
PANTONE
10. Once the ink has been canned, it has been through **3** grinding mills, **2** mixers, **5** QC tests,

TEACHER NOTES:

Have the student's rate their prior knowledge of the vocabulary terms.

Students can either draw pictures or find graphics on the internet for each vocabulary word.

Name: _____ Period: _____

Chapter 19: Lithographic Inks

Instructions:

Step 1: Rate: rate your prior knowledge of the word (1=don't know at all, 2-3 = sort of know it, 4= I know it).

Step 2: Describe: provide a description, explanation, or example of the new term.

Step 3: Restate: restate the description, explanation, or example in your own term.

Step 4: Graphic Representation: represent term using simple pictures or symbols.

Fill- in: Undesirable effect that produces a muddy look in the midtones and shadows; caused by presence of foreign material in the ink.

Rub Off: Ink-adherence problem that allows the ink to rub off the substrate.

ink body: the consistency or degree of softness or hardness of an ink.

Scumming: When ink adheres to the nonimage areas of the plate.

Ink Mileage: Measurement of how much area a specific amount of ink will print over.

Setoff: The unwanted transfer of ink from one sheet to the back of the next.

Ink Opacity: The covering ability of an ink, or how opaque or transparent the ink is.

Tack: The stickiness of an ink, measured by its ability to split between two surfaces.

Mottling: When the solid portions of the dried print appear uneven and speckled.

Tinting: Contamination problem that occurs when ink emulsifies in the dampening solution.

Name: _____ Period: _____

Chapter 19: Lithographic Inks

Instructions:

Step 1: Rate: rate your prior knowledge of the word (1=don't know at all, 2-3 = sort of know it, 4= I know it).

Step 2: Describe: provide a description, explanation, or example of the new term.

Step 3: Restate: restate the description, explanation, or example in your own term.

Step 4: Graphic Representation: represent term using simple pictures or symbols.

Ink Viscosity: the degree to which ink resists flow under applied force.

TEACHER NOTES:

Make sure there are at least 4 printed samples demonstrating process and spot colors.

Read the directions to Assignment 2 - Ink Questions.

The students can use the internet or the Offset Lithography Book to answer the questions.

CH. 19 LITHOGRAPHIC INKS

Assignment Sheet 2 - Ink Questions **KEY**

Student Name _____ Date _____

BASIC SKILLS



TECHNOLOGY



READING



CRITICAL THINKING

Evaluation Criteria

Rating

- Correctly created a printing workflow for an offset print job
- Correctly created a printing workflow for a digital print job

OBJECTIVE

- Describe process (CMYK) and spot (PMS) inks.
- Identify process and spot color areas from selected sample print job
- Describe causes of ink problems and possible solutions
- Review solutions for common ink problems
- Discuss coatings (aqueous, ultraviolet cured, varnish)

DIRECTIONS

Answer the following questions using your past knowledge of colors:

1. What is the four process colors (CMYK)? **they are subtractive colors: cyan, magenta, yellow, and black.**
2. What are spot color inks (PMS)? **Pantone Matching System, which is a standardized color matching system, utilizing the Pantone numbering system for identifying colors. By standardizing the colors, different manufacturers in different locations can all reference a Pantone numbered color, making sure colors match without direct contact with one another.**

Using a printers loop, look at the instructors print samples and circle whether the sample is a spot color or a process color:

3. Print sample #1: process color or spot color
4. Print sample #1: process color or spot color
5. Print sample #1: process color or spot color
6. Print sample #1: process color or spot color

Below is a list of ink problems, explain what caused them.



crystallization

Excessive wax in ink, too much drier.



linting

too much body and tack in the ink, ink drying too fast, poor paper coating, rollers too hard; pressroom, press and ink temperatures too low.



mottling

non absorbent paper, faulty distribution of ink on press, poor wetting, ink too soft, uneven ink absorption.



rub off

insufficient binder in ink, too much penetration of vehicle into paper, ink too soft, paper too absorbent.



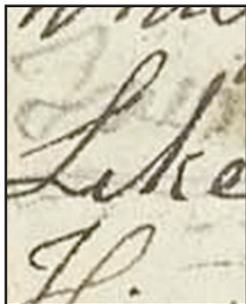
setoff

Ink sets too slow, static electricity in paper, too much ink, too much impression.



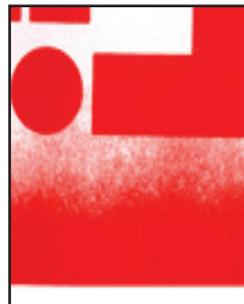
scumming

too much body and tack in the ink, not enough fountain solution, poor acidity in fountain solution.



strike through

Ink too soft or too slow to dry, excessive amount of nondrying oils, ink film too heavy.



tinting

ink emulsifies in the dampening solution.

Using the internet or the Offset Lithography Book, answer the following coating questions:

7. What is Aqueous Coating? **a clear, water-based, fast-drying coating that can be applied over printed materials to improve resistance to scuffing.**
8. What is an Ultraviolet Coating? **is a very glossy, shiny coating applied to the printed paper surface and cured on a special machine using ultraviolet light. These special UV coatings harden, or cure when they receive ultraviolet radiation.**
9. What is a Varnish Coating? **are transparent coatings applied over ink. They are used to protect the printed ink from moisture, abrasion, or other potential sources of damage.**

TEACHER NOTES:

I usually have the students take the pretest on a Thursday.

Unfortunately, review game zone only offers to keep track of the students scores if you pay for it. So if you want to just walk around and observe who is doing well and who isn't. I just write down a list of students that need to do more to understand the material.

Then on Friday, the students that needed more I have them fill out the study guide while watching the video presentation on the chapter.

The students that need enrichment get to play a game to earn candy.

Name _____

CHAPTER 19 - STUDY GUIDE

Directions: Using the book, read Chapter 19 and answer the questions below.

Know your vocabulary terms.

What are the three basic components of ink? know the definition for each.

Pigments: solid particles suspended, not dissolved, within the liquid vehicle, supplies its color.

Vehicle: the fluid part of the ink that carries the pigment and works as a binder to hold the pigment on the printing surface after drying.

Additive: an ingredient such as a drier, lubricant, wax, or starch, added to ink to impart special characteristics, improve desirable properties, or suppress undesirable properties.

What is milling? **a process used to crush and further blend the ink pigment into the vehicle.**

What are the lithographic ink properties:

Ink Body: the consistency or degree of softness or hardness of an ink.

Ink Viscosity: the degree to which ink resists flow under applied force.

Ink Length: the ability of an ink to flow and form threads, or strings, when stretched.

Ink Tack: The stickiness of an ink, measured by its ability to split between two surfaces.

Ink Opacity: The covering ability of an ink, or how opaque or transparent the ink is.

Ink Permanence: the ability of a printing ink to resist changes from exposure to light weather, and time.

Ink Mileage: Measurement of how much area a specific amount of ink will print over.

Define and explain the following coatings:

Aqueous: a clear, water-based, fast-drying coating that can be applied over printed materials to improve resistance to scuffing.

Ultra Violet Coating is a very glossy, shiny coating applied to the printed paper surface and cured on a special machine using ultraviolet light. These special UV coatings harden, or cure when they receive ultra violet radiation.

Varnish are transparent coatings applied over ink. They are used to protect the printed ink from moisture, abrasion, or other potential sources of damage.

CHAPTER 19 - STUDY GUIDE

Define and explain various ink problems and how to fix them.

Crystallization: a problem occurring in multicolor printing when the first ink printed dries too hard and the second ink printed does not adhere to the dried ink surface.

Linting: the result of loosely bonded fibers that break off and are carried by the offset blanket to the ink rollers.

Mottling: a blotchy or cloudy appearance of an image, instead of a smooth, continuous appearance.

Rub Off: an ink-adherence problem that allows the ink to rub off the substrate.

Scumming: when ink adheres to the nonimage areas of the plate.

Setoff: an unwanted transfer of ink from one sheet to the back of the next sheet.

Strike through: show-through resulting from increased ink absorption and penetration through the paper.

Tinting: a contamination problem that occurs when ink emulsifies in the dampening solution, causing a slight tint of ink to appear on the nonimage area of the printed sheet.

CHAPTER 19 - PRETEST

1. Log onto a computer and go to the following website:
 - <http://reviewgamezone.com/index.php>
2. On the right side it has a box that has 'Games by ID#' type in 6152.
3. To get started, select a game from the list below and test your knowledge on 'Lithographic Inks'
4. If you did not do well, you might want to complete the study guide on the other side of this paper.

TEACHER NOTES:

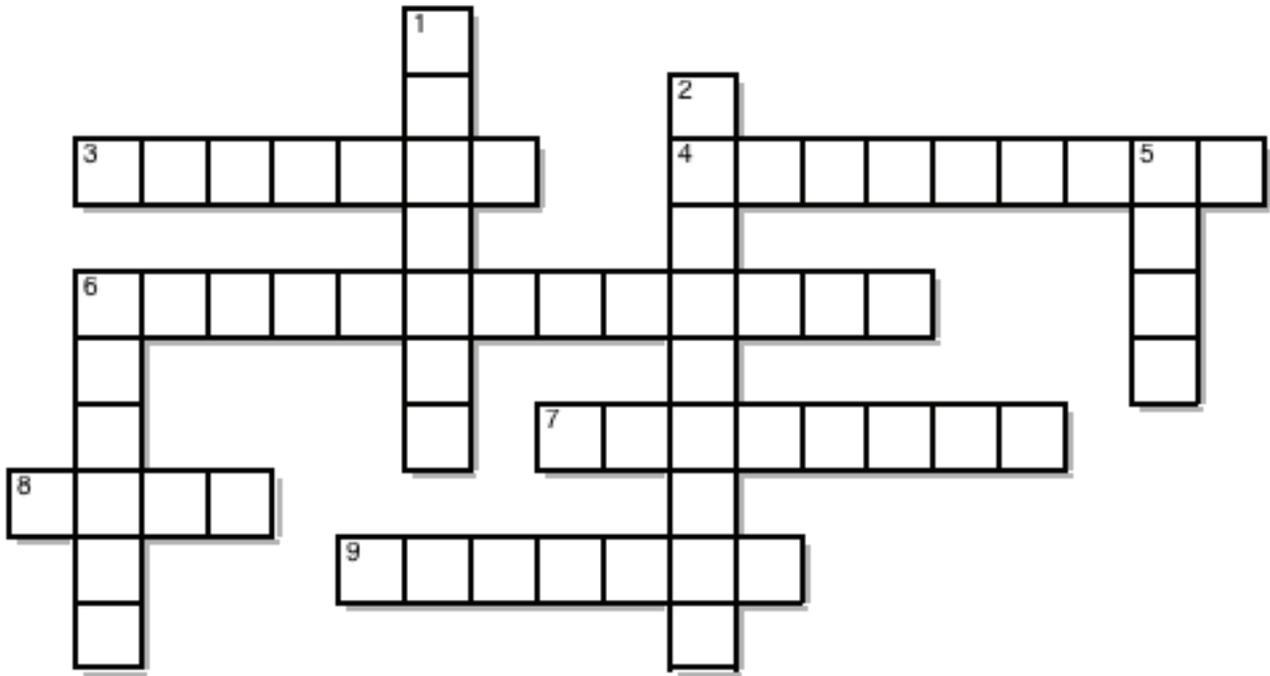
Once the bell rings, the instructor will hand out an Ink Crossword puzzle.

The first 3 people that correctly complete the cross puzzle will get some candy.

After you are finished, turn in your Chapter 19 packet.

LITHOGRAPHIC INK CROSSWORD

NAME: _____



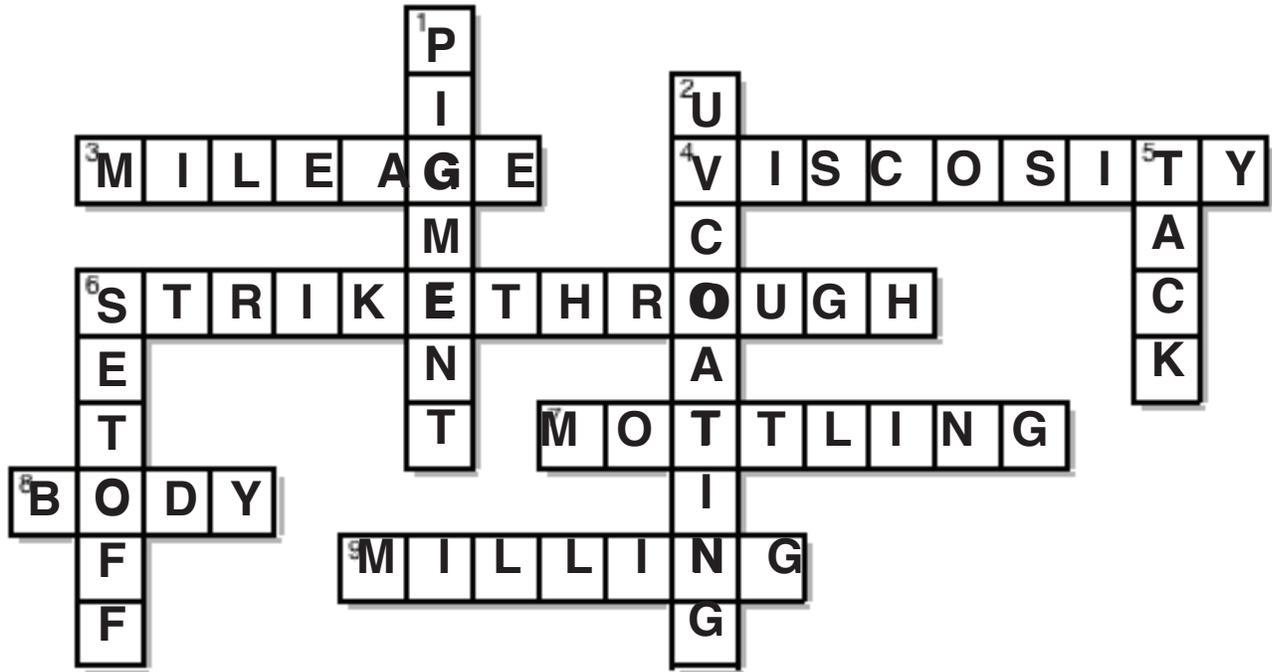
ACROSS

3. Ink _____ is a measurement of how much area a specific amount of ink will print over.
4. Ink _____ is the degree to which it resists flow under applied force.
6. _____ is show-through resulting from increased ink absorption and penetration through the paper.
7. _____ is the blotch or cloudy appearance of an image instead of a smooth, continuous appearance.
8. Ink _____ the consistency or degree of softness or hardness of an ink.
9. The _____ stage of ink manufacture breaks up the pigment clumps and further blends the pigment into the vehicle of lithographic inks.

DOWN

1. The three main components of ink are Additive, _____, and Vehicle.
2. _____ is a very glossy, shiny coating applied to the printed paper surface and cured on a special machine using ultraviolet light. These special UV coatings harden, or cure when they receive ultra violet radiation.
5. _____ the stickiness of an ink, measured by its ability to split between two surfaces.
6. _____ is unwanted transfer of ink from one sheet to the back of the next.

CH. 19 CROSSWORD KEY



ACROSS

- 3. Mileage**/Ink _____ is a measurement of how much area a specific amount of ink will print over.
- 4. Viscosity**/Ink _____ is the degree to which it resists flow under applied force.
- 6. StrikeThrough**/_____ is show-through resulting from increased ink absorption and penetration through the paper.
- 7. Mottling**/_____ is the blotch or cloudy appearance of an image instead of a smooth, continuous appearance.
- 8. Body**/Ink _____ the consistency or degree of softness or hardness of an ink.
- 9. Milling**/The _____ stage of ink manufacture breaks up the pigment clumps and further blends the pigment into the vehicle of lithographic inks.

DOWN

- 1. Pigment**/The three main components of ink are Additive, _____, and Vehicle.
- 2. UV Coating**/_____ is a very glossy, shiny coating applied to the printed paper surface and cured on a special machine using ultraviolet light. These special UV coatings harden, or cure when they receive ultra violet radiation.
- 5. Tack**/_____ the stickiness of an ink, measured by its ability to split between two surfaces.
- 6. Setoff**/_____ is unwanted transfer of ink from one sheet to the back of the next.