Learning Activity Package
Instructor Information

A. System Title: Communications Grade Level: ____

Concept: ~~(3B)~~ Printing Processes 3B

Course Title: _____

B. Activity Title: Offset Printing

C. Length of time to complete the activity; maximum 45 minute class periods 7 ; Minimum 45 minute class periods 5 .

Estimated total amount of time to complete this activity for the average student: 5 days.

D. See student learning activity package for activity objectives, activity procedures, and activity question sheets.

1. Activity Objectives:

The student will be able to:

a. Recognize that technology amplifies, expands, and creates new abilities to receive and send information.

b. Recall that communication systems are defined as graphic, electronic, light, acoustic, and computer technologies.

c. Complete activities that develop understandings of the five communication systems.

d. Develop an awareness of careers in communications technology.

2. Activity Description:

Day One & Two: Read chapter 1, pages 1-7. In Photo Offset Fundamentals, by McKnight Publishing or _____ and answer questions on page 7 and the word list on page 7.

Day Three: Get negative from teacher and strip up the negative.

Day Four: Develop and make plate so it can be run on the press.

Day Five: Put plate on press so it can be run (cut paper if you need some to work with). DO NOT RUN THE PRESS WITHOUT YOUR INSTRUCTOR'S PERMISSION. Let your teacher check all work.

E. Resources

Please list any resources that will be helpful to the instructor to implement this activity. This includes but is not limited to the following:

1. Standard tools and equipment.

   Offset press (model to be determined on site location)

2. Special tools (list possible sources), equipment, and pre-activity set ups.

water rollers	block of wood
metal plate	sheets of cardboard
ink	hand brayer
ink knife	ink slab
fountain solution	sponge and water
swab pads for cleaning	rubber blanket
rollers	stripped-up flat

3. Student materials (what the student will be taking home).

4. Supplies (needed in the classroom to successfully run the activity).

   Consumable - photographic negative (1 per each 2 students); Polychrome win plate (size depends on press) 1 package of 50 each; Polychrome #992 plate developer, 1 gallon ink (variety) Vanson, 1 lb. can.

   Basic paste-up tools: ruling pen; black India ink; print trimmer.

   Proofs of newspaper display advertisements.

5. Reference books, computer software, or materials.

   Text, Photo Offset Fundamentals, 6 copies per building or _____.

Simple Cross-File Forms

   Polk: The Practice of Printing, Chapter 21, "Composition of Tabular Forms.

Market Display Advertisement

   Ballinger: Layout

   Cogoli: Photo-Offset Fundamentals, Page 81.

   Arnold: Ink on Paper. Chapter 15, "Newspaper Typography and Makeup".

6. Audio visual materials (include title, order numbers, and where they can be obtained).

7. Resource people (ie: instructors or other persons in the district that have a certain amount of expertise in the area of this activity).

   Resource people: The instructor should request "in-service" assistance from Mr. DeHart. Tremper High School, if deemed necessary.

8. Worksheet answer keys.

Questions

1. Name eight materials on which printing is commonly done. Are there others?

2. What are the five major printing processes?

3. Describe the process of letterpress printing.

4. Why is screen printing so called?

5. Which of the five major printing processes is commonly used for printing on glass bottles? Why?

6. Which two of the major printing processes employ printing plates which do their printing from lines or dots below the surface of the plates?

7. What is meant by offset printing?

8. Why is the name "offset" used to describe this process?

9. What is the "grease water" theory as applied to offset printing?

10. Why is a greasy (or fatty) ink used in offset printing?

11. With a dry offset plate on the press, which is applied first - water or ink? Why? What would happen if the other

12. Give another name for the image portion of the offset plate.

13. Give at least two names for that portion of the offset plate which carries no image.

14. Suppose the plate image in Figure 3 (see page 6) were reversed, left to right, would the image on the blanket then be readable or wrong reading? Would the resulting image appear on the paper in unreadable or readable form?

Questions (cont.)

15. Define the following terms as they apply to offset printing:

a. water receptive
b. water repellent
c. ink receptive
d. ink repellent
e. image area
f. clear area
g. printing area
h. non-printing area
i. blanket
j. ink fountain
k. water fountain
l. water rollers
m. ink rollers
n. impression cylinder
o. readable image
p. wrong reading image
q. right-reading
r. unreadable
s. mirrored image

Problems and Projects

1. Examine an offset press in the shop. Locate each of the basic parts shown in the schematic drawing in Figure 3.

2. Examine a used offset plate in the shop. Ask if you may touch and rub the image with a finger tip. What can you say about the image?

3. Closely inspect two printed samples - one printed by letterpress, and the other printed by offset. Notice the outlines of the magnified letters of each sample. Describe what you see. Why is it so?

4. Clip and mount on a notebook page five samples of printed matter, each printed by a different major process. Identify and label each according to the printing process used.

Word List

1. adhere
2. aluminum
3. billions
4. characterized
5. characters
6. combination
7. controlled
8. cylinder
9. duplicate
10. economically
11. engraving
12. essentially
13. etching
14. fountain
15. fundamental
16. greasy
17. illustration
18. importance
19. industry
20. letterpress
21. lithographic
22. lithograghy
23. mirrored
24. original
25. pantagraph
26. pressure
27. processes
28. production
29. rotogravure
30. schematic

9. Drawings of jigs and fixtures that have to be made.

10. Indicate the quantity of copies (L.A.P.) required to implement this activity at each school.

    Maximum 30 copies/class. Minimum 6 copies/building;

F. Reference to related activities (text, magazines, video, single concept films)

G. Special safety considerations:

No student is allowed to operate the offset press without the instructors' presence AND permission.

Demonstration:

In addition to a study and discussion of the foregoing text material, the student will gain a deeper and fuller understanding of the theory and practice of fundamental offset principles involved.

Platemaking and Presswork:

The finest demonstration of offset principles would require that platemaking equipment and a simple offset press (such as a duplicator) be available.

Expose and develop a presensitized paper or metal plate, using an available stripped-up flat. Explain each step and the materials used.

Mount the plate on the press (which has been prepared for the printing operation). Show how the plate is dampened and how the plate image picks up a coverage of ink. Stop the press and allow the students to examine the plate.

Transfer the plate image to the blanket, and again stop the press. Point out how the blanket image is a "mirrored image" of the plate image.

Take a few impressions and pass out the printed sheets to the students. Close the demonstration by showing the students how the plate is preserved and stored for future use.

If preparations are made beforehand, the complete demonstration should not take more than twenty minutes, allowing ample time for the lively discussion which is sure to follow.

Plate and Proof Press:

If it is neither desirable or convenient to demonstrate with an offset duplicator or offset press, much of the same principles can be demonstrated with an offset plate and letterpress proof press.

For this demonstration, build up the proof press bed with a block of wood and several sheets of thin cardboard so that the press gives a slight squeeze impression. Also ink up a hand brayer and an ink slab with offset ink.

Demonstrate the exposure and developing of an offset plate (as above) or take from storage a previously used offset plate.

Place the plate, image side up, on the built-up bed of the proof press. Wash the preservative from the plate surface with a sponge and water and roll up the image with the hand brayer. It may require several passes with the brayer to build up the image with sufficient ink. If so, sponge off the plate with water between inkings. If water accumulates on the brayer, remove it by rolling the brayer on clean newsprint.

Place a sheet of printing paper on the inked plate, and pull an impression. Additional impressions may be taken if, before each additional impression, the plate is moistened and then inked.

This demonstration will show the "grease and water" theory and also the "mirror reversal" of the plate image when it prints on the paper.

Conclude by showing how to prepare the plate for storage. Then hold a discussion on what has been demonstrated.

Plate, Blanket, and Proof Press:

A third demonstration which may be made involves the same set-up of offset plate and proof press. In addition, an offset-press blanket, or a portion of one, is needed.

After washing off and rolling up the plate with ink, place the blanket over the plate and pull an impression on the proof press.

Remove the printed upon blanket and show that its image is a "mirror image" of the plate image.

Now, remove the offset plate from the proof press and place the blanket (image side up) on the built-up proof press bed.

Place a sheet of printing paper on the blanket and pull an impression. Show that the impression printed on the paper is a "right-reading" duplicate of the plate image.

In this demonstration, additional sheets may not be printed unless the blanket is washed between impressions. However, the inclusion of the blanket makes this a convincing demonstration.

Conclude, as before, with plate preservation and class discussion.