

Alabama Rivers, Flora & Fauna

Making a cross book using paper engineering techniques

Lesson Designer: Donna Pickens

Grade Level: 7th (adaptable to other grades)

Enduring Understanding: Visual imagery influences understanding of and responses to the natural environment.

Essential Question: How do artists use 3-D paper engineering techniques to create works of art that effectively communicate?

Arts Discipline Standards: Visual Arts

Alabama Anchor Standard 2: Organize & develop artistic ideas & work.

Grade 7: Creating 5 – Apply graphic design strategies (paper engineering techniques) to produce a work of art that clearly communicates information or ideas.

Grade 7: Creating 6 – Reflect on & explain personal artwork in a story about Alabama

Non-Arts Discipline Standards: English Language Arts, Science, Math

English Language Arts:

ELA7.27.3– Gather relevant information from multiple print and digital sources to use as text.

ELA 7.34.2- Include multimedia components and visual displays in presentations to emphasize salient points.

Science:

SCI.7.8.4- Construct an explanation to predict patterns of interactions in different ecosystems in terms of the relationships between and among organisms.

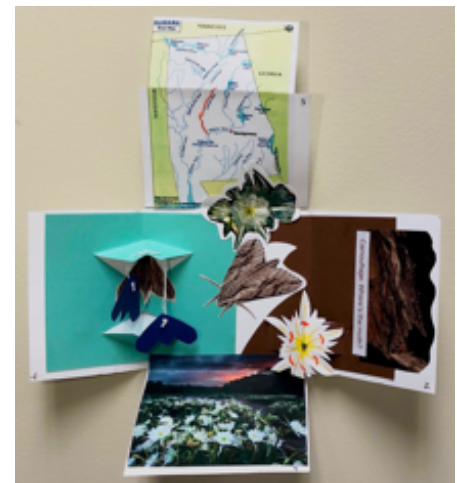
SCI.7.10.- Use evidence to explain how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of both animals and plants.

SCI.7.10.3 & 4 – Use evidence to explain how seeds are dispersed and how plants reproduce.

Mathematics – Geometry:

M.7.12 -Create geometric shapes with given conditions.

M.7.12.2. Draw segments of a given length using a ruler.



M. 7.13 – Describe two dimensional figures that result from slicing three dimensional figures

M.7.13.3. Recognize the relationship between two & three dimensional figures.

M. 7.13.4. Recognize symmetry.

M.7.13.5 & 6. List attributes of two & three dimensional figures.

M.7.15 – Solve real-world and mathematical problems involving angle measure.

M.7.15.5. Discuss parallel, perpendicular, and intersecting lines.

Requirements: Materials & Supplies:

- Previously researched information about Alabama river ecologies, flora & fauna
- Images of plants, animals, insects, and organisms unique to Alabama rivers
- Maps of Alabama rivers & ecosystems
- 8 ½" x 11" cardstock, cut in half length-wise – 2 halves/student
- 4" x 5" colored cardstock or construction paper – 2/student
- Pencils & erasers
- Scissors
- Rulers
- Elmer's Extra Strength glue stick & regular glue sticks
- Colored and patterned paper
- Construction paper crayons or oil pastels
- Watercolors, brushes, water, and paper towels

Requirements: Prerequisite Knowledge - Arts:

- Understand that a collage is made from cutting and assembling different images to create a new whole.
- Understand that an illustration may be expressed in symbols and words, as well as by drawing and coloring.
- Understand basic paper engineering techniques & terms (see vocabulary page)
- Practice making different folded angles with small pieces of copy paper: parallel-folds and V-folds.

Arts vocabulary addressed: line, color, shape, form, space; proportion, pattern, variety; symbol, collage; vertical & horizontal; base, gully or gutter, gluing tab, plane, spine fold, parallel fold, V-fold

Requirements: Prerequisite Knowledge – Non-Arts:

- Show a map of Alabama rivers and discuss the importance of river watersheds in Alabama geology. Choose a river basin of interest to depict in a story.
- List the types of plants and animals found in the river watershed, and find images of these, as well as important geological formations in the area, attributes, and symbolic associations related to the river environment chosen for the story creation and illustration.
- Write a short story about the river ecology chosen, including a title, beginning, middle, and end for the story.

Non-arts vocabulary addressed: Alabama geological formations, river ecology and watersheds, flora & fauna, river pollution



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Procedures: Introductory Activity:

Discuss the importance of Alabama's unique rivers to the health of the state's environment. Help the students research geological features, flora & fauna unique to a river watershed near their location. Show an example of a "cross" book and tell the students that they will be creating mini books and stories about their chosen river ecology.

Procedures: Sequence of Activities:

1. Choose a river environment to depict in the pop-up book.
2. List significant geological & geographical features, flora & fauna unique to the river ecology, and find images of these to use for the story illustration.
3. Write a short story describing the river environment. Make sure the story includes a beginning, middle, and end.
4. To create the base of a simple "cross" book, cut 1 piece of 8 ½" x 11" cardstock in half length-wise (hot dog style).
5. Place one half so that it is tall (vertical) in front of you. Place the second half on top horizontally to form a large plus or cross sign. All four sides of the "cross" should be approximately the same length (3 3/8"). Fold each of the 4 sides as illustrated in ***Instructions for Making a Simple "Cross" Book***.
6. Take the 2 pieces of paper apart. Put glue on the center of the tall, vertical paper. Center the horizontal piece of paper on top of the vertical one, so that the overall shape resembles a cross, with each protruding side approximately equal. Press down the center shape to help the glue adhere. Fold the sides up to form a book.
7. Open the book up again. Draw a river across the center, left and right sides, with a horizon line and tree line above the river. The sky can be placed in the top section of the open book, and the bottom section can include grass or some indication of the river bank.
8. Use the construction paper crayons or oil pastels to create clouds in the sky, ripples in the river, and grass on the riverbank if desired. Color these firmly, so they will resist the watercolors when painted and be clearly visible.
9. Paint the river, trees on the river bank, grass, and sky with watercolors, mixing colors in the watercolor tray. Be sure to wash the brush each time a different color is used. Experiment with using a variety of colors and light and dark values of the colors in the painting. Paint all the sections of the open cross book and let the paint dry before continuing to create the three-dimensional folds.
10. Use the 4"x5" colored cardstock to make 2 different types of pop-up folds: a parallel fold and a V fold (see ***Two Basic Pop-ups***). Glue the 2 different pop-ups inside the cross book, so that one opens on the left side of the center and one on the right side. Make sure that every pop-up spans a gully of the cross book and that each pop-up is balanced on each side of the gully. Before gluing the folds down, cut away any extra paper, so the folds don't cover up much of the painted sections of the book.
11. Cut out images of fish, birds, snails, and other flora and fauna that are found in the river environment, and glue them on the pop-up folds. Make sure that the images fold over correctly when the book is closed.
12. Draw and color images, and collage patterned and colored paper, other cut-out images and symbols from printed information to create interesting variety on the top, bottom, and sides of the book, both inside and outside (when the book is closed).



13. Experiment with adding other pop-up folds and shapes in your book, using smaller strips of colored cardstock (1-1 ½" wide x 2 ½ - 3 ½" long). Glue the tabs of each fold, following the ***Gluing Directions for V-folds and Parallel-folds.***
14. Include some written text on the inside and outside of the book.
15. Punch a hole in the center of the top flap of the book, and add a loop of yarn to display the book, if desired
16. Write a short story about the river environment on one-half sheet of 8 ½" x 11" cardstock (5 ½ " x 8").

Culminating Activity (Performance Task):

Students used basic paper engineering (parallel & V-folds), drawing, and painting techniques to create a 3-dimensional story, with text, about the importance of Alabama river environments.

Culminating Activity: Evaluation:

- Students investigated a selected river environment in Alabama.
- Students gathered relevant information about a particular Alabama river or watershed from print & digital sources to incorporate in their stories and illustrated book.
- Students used 2 & 3 dimensional elements and different drawing and/or painting techniques in their illustrated book.
- Students used parallel and V-shape pop-up folds and glued those correctly in line with the major folds (gullies) of their books.
- Students wrote a short story about their selected river environment, including a title, beginning, middle, and end.

