Connecting Literature and Math

#13: *Mouse Shapes* by Ellen Stoll Walsh & *Color Zoo* by Lois Ehlert

Introduction

This curriculum guide features two books, *Mouse Shapes* by Ellen Stoll Walsh, and *Color Zoo* by Lois Ehlert. Both books focus on the concept of shapes. In *Mouse Shapes*, the author celebrates shapes, colors and creativity with three mice as the main characters, while in *Color Zoo*, shapes and colors are introduced with illustrations of shapes that form animal faces when placed on top of one another.

Teacher Notes about STEM

- *Early Childhood Educators are now linking together science, technology, engineering, and math into what is called STEM curriculum.*
- *CLAM focuses on Math, one of the components of a STEM curriculum.*
- *CLAM was developed to give preschool children foundations of mathematical understanding through concrete experiences; a foundation for life-long learning and school success in math.*

Arkansas Child Development and Early Learning Standards: Birth through 60 Months

Domain of Development and Learning: Mathematical Thinking
Domain Component: Geometry and Spatial Sense

Learning Goals will be included for each activity

Teacher Notes:

- *Refer to 2nd Reading of Color for explanation of the 10 shapes featured in the story.*
- *Refer to Shape and Color Lotto game for examples of each of the 10 shapes.*

Materials to Collect and Make

- Provide pattern blocks and pattern activity cards
- Provide attribute blocks and attribute block activity cards
- Provide geometric shapes (solid forms/three-dimensional): cube, cone, cylinder, sphere
- Provide shape puzzles
- Provide colors and shapes bingo
- Make a Shapes and Colors Lotto game (See Attachment: Shape and Color Lotto) Make two copies of each page on cardstock, laminate and cut out. Use one set as the playing card for each person. Cut the other set into individual cards to use for calling cards.
- Make Lollipop Shapes (See Attachment: Lollipops) Copy on cardstock, laminate and cut out. Attach each lollipop to a craft stick. Make as many sets as needed for your class.
- Make Shape and Color Cube(s) (See Attachment: Lollipops). Carefully fill an empty cube shaped tissue box with crumpled newspapers. Use several sheets of paper because this will make your cube more durable. Cover the cube with colored paper. Copy Lollipops on cardstock, laminate and cut out. Use these circles with shapes to attach to each side of the cube.
- Make shapes templates by using an exacto knife to cut out shapes in a plastic lid from a butter tub, for example. Cut out one shape per lid.
- Collect square and long scarves
- Collect a basket of fabric cut into shapes such as circles, squares, triangles that are 2 to 3 feet in size
- Cut out shapes from different colors of construction paper: circle, square, triangle, rectangle, oval, diamond, heart, star, octagon, hexagon
- Purchase or make a geoboard to use in the Manipulative or Math Center. (See Attachment: Geoboards for directions on how to make a geoboard)

Story Presentations

Learning Goals:

LD1.1 Understands and responds to language (in child's home language) *(vocabulary and language comprehension)*

LD2.1 Uses increasingly complex vocabulary, grammar and sentence structure (in child's home language) *(expressive vocabulary)*

EL1.1 Shows interest in literacy experiences *(engagement in literacy experiences)*

EL1.2 Engages in read-alouds and conversations about books and stories *(story comprehension)*

EL3.1 Responds to features of books and print *(book knowledge)*

MT4.1 Explores and describes shapes and spatial relationships *(shape knowledge)*

Book: *Mouse Shapes* by Ellen Stoll Walsh

First Reading of *Mouse Shapes*

- Be familiar with the book, *Mouse Shapes.*
- Show the cover, give title, author and illustrator. (Explain that the author is the person who writes the words and the illustrator is the person who creates the pictures. In this book, Ellen Stoll Walsh is both the author and illustrator)
- Invite children to look at the cover and describe what they see. If children do not mention that they see shapes, ask them if they see any shapes they know.
- Show the title page and invite children to identify the shapes and colors they see, also the size of the two circles.
- Explain to the children that the story is about three mice named Violet, Martin, and Fred, and how they use shapes to trick a sneaky cat.
- Read the story so all children can see the pictures in the book.
- Pause at the end of the story and allow children's honest reaction to it.
- Follow up the reading by showing the pages where the mice made things with shapes and invite children to identify the objects: house, tree, sun, wagon, fish, cat, 3 mice, and Swiss cheese.

Second Reading of *Mouse Shapes*

- Show the cover, give title, author and illustrator.
- Invite children to recall what the story is about.
- Read the story so all children can see the pictures in the book.
- Follow up the reading by inviting children to look at the pages and recall what is happening. Prompt as needed.
- Involve children in an in-depth discussion about the shapes and number of shapes (by counting how many) the mice used to make the different things in the book. For example:
  1 triangle and 1 square to make a house,
  1 triangle and 1 rectangle to make a tree
  1 circle to make a sun
  2 circles and 1 rectangle to make a wagon
  2 diamonds to make a book
  1 oval, two circles, and 8 triangles to make a fish
  3 circles and 7 triangles to make a cat
- Invite children to only name shapes for 3 mice and for the Swiss cheese.
- Explain to children that there will be opportunities in the art center for them to use shapes to make pictures.

Additional Learning Goal:
MT1.1 Demonstrates number sense and an understanding of quantity *(number names and count sequence)*

Teacher Note: *Consider presenting the second reading of Mouse Shapes with a small group of children (4 or 5) so children can more clearly see the illustrations and be involved in the counting of shapes.*

Book: *Color Zoo* by Lois Ehlert

First Reading of *Color Zoo*

- Show the cover and give title, author and illustrator. Explain to children that Lois Ehlert is both the author and illustrator of this book. She wrote the words and she created the pictures.
- Invite children to look at the cover and describe what they see. Ask them why they think the title of the book is *Color Zoo.* If they do not correctly name the animal on the cover as tiger, ask them what animal they see. Say, "Let's read and find out more about *Color Zoo."*
- Read the rhyming text on the first page.
- Show the next page, name the animal, and remind children that this is the same animal that is on the cover. Show the cover again and ask if they were correct when they named the animal on the cover. Did they say "tiger?"
- Continue showing each page and involve children in trying to name the animal. State the name of the animal if children do not recognize it.
- Follow up by showing the pages and inviting children to name the animals.

Second Reading of *Color Zoo*

- Invite a small group of 3 to 5 children to join you in reading *Color Zoo.*
- Have a set of the 10 shapes featured in the book. The shapes can be made from laminated poster board or card stock.
- Invite children to explore the shapes, discuss with them the characteristics of each and guide them to see how they are alike and different:
    - **circle** is a perfectly rounded shape; it has no sides
    - **square** has 4 sides; all 4 sides are the same length
    - **rectangle** is a shape that is made up of two pairs of parallel lines or sides; a shape in which one pair of lines is longer than the other
    - **triangle** is a shape that has 3 sides
    - **oval** shape is like a flattened circle
    - **diamond or rhombus** is a shape with 4 sides that are the same length, but isn't a square or a rectangle
    - **octagon** is a shape that has 8 sides (count sides with children, starting with the top side and continuing in a clockwise counting)
    - **hexagon** has 6 sides (count sides with children, starting with top side and continue counting in a clockwise counting)
    - **star** is different, it is like no other shape; it is not round and it has no sides (5 points are triangles)
    - **heart** is different, it is like no other shape; it is not round and it has no sides
- Explain to children that the book, Color Zoo, is about all of these shapes and the animals they make.
- Show the cover and invite children to recall the title of the book.
- State that Lois Ehlert is both the author and illustrator because she wrote the words and created the pictures.
- Show the page with the star and the words COLOR ZOO in the middle.
- Read the title and invite children to name the color of the star. (red) Then turn the page and ask children "What color is the star now?" (green)
- Read the rhyming text on the first page.
- Show the next page and invite children to name the animal.
- Invite children to name the shapes that make up the tiger's face.
- Turn the page, call children's attention to the shape on the left-hand page, and ask them to name the shape (circle) and identify the color of the shape.
- Continue with this pattern of naming the animal, the shapes that make up that animal, then turning the page and naming the shape and the color of the shape on the left-hand page.
- Follow up the reading by inviting children to place each shape on the corresponding shape on the page containing all of the white shapes in 3 rows.
- Explain to children that they will be some materials in the Manipulatives Center that have some of the shapes mentioned in the story.

Teacher Notes:

- *In the school setting, the diamond shape will later be referred to as rhombus.*
- *While the star and heart shapes are featured in the book, they are not considered to be geometric shapes*.

Additional Language, Language and Mathematical Activities

Learning Goals:
LD1.1 Understands and responds to language (in child's home language) *(vocabulary and language comprehension, follows directions)*
EL1.1 Shows interest in literacy experiences *(engagement in literacy experiences, variety of interests)*
MT4.1 Explores and describes shapes and spatial relationships *(shape knowledge)*

Activity: Where is the Shape? (Tune of Are You Sleeping?)

Materials: Lollipop Shapes (See Attachment: Lollipops)

Directions:

- Provide each child with a lollipop shape, insuring that at least 4 children in the group have the same shape.
- Ask children to hold their lollipop shapes by their sides until they hear it in the song, then they will hold it up and wave it.
- Have a set of the shapes for yourself.
- Begin to sing the song.

Where Is the Shape?
(Sing to the tune of Are You Sleeping?)

Where is square?
Where is square?
Here I am. Here I am. (You and children hold up square and wave it)
How are you today, square?
Very well, I thank you. (shake square again)
Run away, run away (put square behind back)

- Continue this activity using all of the shapes that children have been given.

Teacher Notes:

- *Do this activity with children at other times; changing the shapes they are given.*
- *Discontinue modeling the correct shape when children are familiar with all of the shapes.*
- *If you have purchased the Totally Math CD by Dr. Jean, use Shape-A-Loo from the CD for this activity.*

Learning Goals:
LD1.1 Understands and responds to language (in child's home language) *(vocabulary and language comprehension, follows directions)*
Mt4.1 Explores and describes shapes and spatial relationships

Activity: Shape and Color Lotto

Materials: Teacher-made Shape and Color Lotto (See Attachment: Shape and Color Lotto)

Directions:

- Invite 4 to 6 children to play this game with you.
- Give each child a lotto card.
- Explain that the game will be continued until all of the shapes on each child's card will be covered.
- Show a shape and color card and ask, "Who has the blue circle?"
- Guide children to respond with a complete sentence. For example, "I have the blue circle."
- Hand the child the blue circle to put over the blue circle on his/her board.
- The game is over when all children cover their board.
- Allow all children to play the game at other times.

Teacher Note: *There are no winners or losers in the game.*

Activity: Feel the Shape

Materials: feely box or bag, star, circle, square and triangle cut from cardstock or poster board

Directions:

- Invite a small group of children, from 4 to 6, to join you for the activity.
- Show the children the 4 shapes and invite them to identify each one and to describe the characteristics of each. For example, the circle is round and has no sides, the square has 4 sides, the triangle has 3 sides, and the star has points.
- Place the 4 shapes in the box or bag and invite a child to reach into the bag, feel one of the shapes, describe it and name it.
- Child brings shape out of the bag and group decides if the child was correct in identifying the shape.
- Return the shape to the bag and invite other children in the group to follow the same procedure.
- Continue this game as long as children remain interested. .

Activity: Shape and Color Cube

Materials: Shape and Color Cube **(**See Materials for directions)

Directions:

- Make a "Shape and Color" cube.
- Help the children name all of the shapes and colors on the cube.
- Ask a child to toss the cube and name the shape and color on the top.
- Continue with each child having a turn to toss the cube.
- Involve children in looking for the shapes around the room.

Learning Environment

Teacher Note*: As children are involved in learning centers listed here, they are engaged in activities that support the following Domains of Child Development and Early Learning:*

- *Emergent Literacy*
- *Mathematical Thinking*
- *Creativity and Aesthetics*

Art Center

- Add shapes cut from different colors of construction paper or textured wall paper and encourage children to create a geometric collage.
- Provide construction paper scraps so that children can create own shapes
- Cut sponges into a variety of shapes. Add a clothespin to each sponge for children to hold as they print shapes. Pour a thin layer of tempera paint into a flat dish, encourage children to dip sponges into the paint and print designs on butcher paper or drawing paper.
- Provide a limited number of large cardboard or textured wallpaper cutout shapes such as a star, diamond, square, triangle, and circle. Encourage children to place the cardboard or wallpaper under a piece of paper and rub a crayon to create a rubbing.
- Cut out large triangles, circles and squares from butcher paper for children to place on the easel for painting. Add tempera paint and brushes.
- Provide plastic lids, coasters, and bottle lids for children to trace around.
- Cut out large triangles, circles or squares from grocery bags, wall paper, or butcher paper. Cut out a number of similar small shapes and invite children to glue the small triangles on the large triangle
- Provide shape cookie cutters for children to use with play dough.
- Add templates for tracing; templates that have been created out of the presence of children.

Manipulatives (or Math Center)

- Add pattern blocks and pattern block cards
- Add parquetry blocks and parquetry block cards
- Add geometric shapes (solid forms)
- Add table top wood blocks
- Add shape puzzles
- Add colors and shapes bingo
- Add shapes and colors lotto
- Add geo boards and rubber bands (boards can either be purchased or made.) (See Attachment: Geoboards for how to make directions)

Teacher Note:

- *Interact with children as they are involved with the different math manipulatives. Make comments about the different shapes they are using, naming the shapes.*
- *Play colors and shapes bingo and lotto with them.*

Block Center

- Provide wood unit blocks of different shapes (solid forms)
- Secure a corresponding shape to storage shelves for each shape of block in the center (this guides children to recognize and store blocks where they belong). Smaller blocks should be placed on the top shelf with larger blocks on the bottom of the shelving unit. Begin placing the smallest blocks on the left side of the self adding larger blocks in sequence of size as you place blocks towards the right of the shelf.
- Add traffic signs
- Add boxes of different sizes. Stuff boxes with newspaper, tape securely, and cover with self-adhesive paper

Dramatic Play Center

- Add square and long rectangular scarves
- Add a basket of fabric cut into different shapes

Music Center

- Add the shapes lollipops
- Add the CD, Totally Math, by Dr. Jean

Food/Nutrition Experiences

- Provide shape crackers for snack and encourage children to identify the shapes of their crackers.

Transition Activities

Shape Transition

- Have lollipop shapes in a container such as plastic icing tub or plastic cup.
- Give each child a lollipop shape and have a set of the same shapes.
- Hold up a shape and ask children with that shape to state the name of the shape, place it the container and transition to the next activity.

Shape and Color Cube for Transition

- Give each child a turn to toss the shape and color cube.
- Ask child to name the color and shape on top of the cube, and go to the next activity.
- Continue with this activity, giving each child a turn.

Family Connection

- Send home a note to families explaining that the children have been learning about shapes and suggest ways they can extend that learning into the home. For example, play "I Spy" with their children. Say to children "I spy something that is a rectangle. We come into the house through it." (door)
- Call attention to the traffic signs as you are driving around and invite children to identify the shape of the sign.
- Send home a list of books about shapes and suggest that families visit their local library and check out some of the books to read with their children.

Teacher Note: *Consider sending home with the children drawings of the different shapes you have been studying. Write the name of each shape under the drawing of that shape.*

Additional Books

Grifalconi, Ann. *The Village of Round and Square Houses*
Hoban, Tana. *Shapes, Shapes, Shapes**
Hutchins, Pat. *Changes, Changes**
Portis, Antoinette. *Not a Box*

Teacher Note:
**These two books support the Strand: Shape Manipulation.*

Assessment Ideas

Refer to page 5 of this guide: Activity – **Shape and Color Lotto** for an activity to assess the following Learning Goals:

Domain Component: Geometry and Spatial Sense

Learning Goal:
MT4.1 Explores and describes shapes and spatial relationships *(shape knowledge)*

To Assess:
- Involve a small group of children in playing Shape and Color Lotto with you.
- Assess children's competence by using a check sheet to note which shapes individual children can identify without assistance.