

Using Literature to Teach Math Concepts in K-2

By Patty Morrison

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Patterning Lessons

These activities can be adapted to any level. By allowing children to create their own patterns teachers can assess where the students are. I have had students create very complex patterns and others who simply create AB patterns. By using an open ended task – “make me a pattern” children can work at many levels with the same introduction. Allowing students to create any pattern they choose shows the complexity of their thinking!

Activities:

The M & M's Brand Color Pattern Book

By Barbara Barbieri McGrath

Materials:

Circle colored stickers

1 Copy of pg. 22 in the story for each child

1. Pull the students to a meeting area (carpet or other place). Read pages 1 – 8 and have the students say the patterns with you. Stop reading when there is addition on the page.
2. Skip to page 22. This is the page with empty circles for the students to create their own pattern. Show the students the empty circles and tell them that they will create their own pattern with stickers.
3. Send the students to their desks and pass out the materials. First have the students sort their stickers by color so they know what they have. Then, have students spend a few minutes creating their own patterns.
4. Have the students record their patterns on the paper.
5. After the story have students share their patterns with the class. Collect them and add them to a center or create a book so students can revisit the patterns at a later time

Pattern Bugs

By Trudy Harris (CRL)

Materials:

Bugs for each student (stickers: dots or bugs, die cuts, etc.)

Paper – (Glue only if using something other than stickers)

1. Read the story. As the story is read have the students finish the pattern orally as a class before the page is turned and the end of the pattern is finished. Check their responses with the answer on the next page.
2. Have students create their own bug pattern. Have them glue or stick their bugs on a paper to create the pattern. The patterns don't need to be very long. Invite students to share their patterns with the class. Collect them to create a class book or display in the classroom. I have them add legs to their circle pattern to make 1 large caterpillar complete with a face and antennae.

Extension:

- The patterns can be placed in a center with extra “bugs” so students can revisit the patterns to practice

Pattern Fish

By Trudy Harris (CRL)

Materials:

Colored Fish Crackers

Paper and Crayons for each child

1. Read the story and as the story is read have the students finish the pattern orally as a class before the page is turned. The first pattern is Yellow-black. Yellow-black. Yellow . . . and before the page is turned the students say "black." Check their response with the answer on the next page.
2. Pass out colored fish crackers. Have students create their own fish pattern and draw a picture to match their pattern. They can simply draw a circle rather than recreate the fish.
3. If time, have students share their pattern with the class. Collect all the pictures to display or create a class book.
4. Students can now eat their pattern!!

Sam Johnson and the Blue Ribbon Quilt

By Lisa Campbell Ernst (CRL)

Materials:

10 Paper squares (or post-its) in at least 2 colors for each child

Scissors and Glue

Paper or Sentence Strip for each child

1. Review the shapes: square and triangle. Show the students pictures of squares and triangles on the quilts as the story is read.
2. Read the story and then have students create their own square and triangle pattern. Show students how to cut the squares in half diagonally to create 2 triangles if they want to use squares and triangles in their pattern.
3. Have students glue down their shapes on sentence strip or paper after they create their pattern.
4. Invite students to share their patterns with the class. Collect them and create class book or display in the room. Sentence strips can be used as a border for a bulletin board.

Mr. Noisy's Book of Patterns

By Rozanne Lanczak Williams (CRL)

Materials:

Chart Paper or White Board & Markers

1. Gather the students on the rug or meeting area. The first time the story is read start the pattern and ask the students to finish it. (The music notes pattern might be hard for them to repeat)
2. The second time the story is read have the students act like Mr. Noisy. Make sure they make the same sounds that Mr. Noisy makes.
3. Get out a chart paper or use a board. Brainstorm with them what noises they think Mrs. Quiet would make when she does the same things: talks, walks, sings, dances, and sleeps. Write the students' ideas on the chart or board.
4. Reread the book as Mrs. Quiet and use the students' ideas – acting it out while reading

Extension:

- Create a Venn Diagram to compare Mr. Noisy with Mrs. Quiet

The Shape of Things

By Dayle Ann Dodds (CRL)

Materials:

Chart paper or White Board & Markers

1. Before the story get a big piece of chart paper or use a white board.

2. As the story is read show students the pattern on the top of the page and read the pattern together. Point out that the shape patterns can be read by color or size. Emphasize the idea of big and small shapes as the patterns are read.
3. After the story draw a pattern on the piece of chart paper or board using big and small squares. Have the students say what shape comes next and draw it into the pattern. Continue for a few squares until the students say the next shape quickly.
4. Start a new pattern with a different shape and repeat step 2. If time, create a third pattern or put it into a center for the children to create patterns.

Application:

Materials:

2 different sizes of fish or square crackers/cereal – be creative!!

Goldfish come in regular, large, and baby sizes

Squares: Saltines, Wheat Thins, Cheez-its, Corn Chex cereal, others?

Paper and Pencil for each child

- ♣ Allow students to arrange the crackers into a pattern
- ♣ Have them draw their pattern on a paper or sentence strip (borders!!)
- ♣ Have students share their pattern with the class
- ♣ Students can eat their pattern!!

Beep, Beep, Vroom, Vroom

By Stuart J. Murphy

Materials:

4 red, blue, yellow color tiles or cubes per student

4 Green and Purple die cut cars or colored cubes for each student

1. Pass out red, blue, and yellow color tiles or cubes before the story starts. Have the students make the pattern of the cars when the pattern changes on each page. Challenge the students to remember the original pattern before showing it on page 25. Show the pattern to check answers and finish the story.
2. Pass out green and purple paper cars or squares of paper. Have children create a pattern for Molly's cars and glue it down on paper. Students can trade patterns and see if they can extend their classmate's pattern. Put all the patterns in a center for students to practice.

Extension

Materials:

Stickers (assorted) and Zipper Bags

Paper or Sentence Strip

- ♣ Give students stickers and 1 paper or sentence strip
- ♣ Have the students create a pattern that extends for the entire paper
- ♣ Cut off the last 6 – 8 stickers individually and put them in the zipper bags
- ♣ Place the new pattern "puzzles" in a center for students to finish as there is extra time or in a center

Nathan Olson has a Patterning series that uses every day objects to show patterns. It is great to blend math into a common core unit by staying within theme or topic. I just found them in a Scholastic Reading Club Order last year so keep your eyes open 😊 The company also has books on solids and sorting things that I love to use in my classroom.

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Graphing Lessons

Where in the Wild

By David Schwartz

Materials Needed:

Whole Group:

Pocket Chart and white board pen
1 set of pictures colored and cut apart

Individual Work:

1 Empty Graph or paper for each child
1 Set of Pictures for each child
Scissors, Glue, Crayons

Whole Class Lesson:

Read Story aloud to the class – this is best on a carpet area where the kids can crowd in close to try and find the hidden animals or using a document camera so the picture is larger for them to find the animals easier. Allow the children time to guess each animal and then try to find the hidden animal in the picture – if time permits read a few of the facts about each animal.

Brainstorm possible ways to graph the animals allow the children to give as many ideas as they can – if children don't have any ideas you can suggest counting the number of legs.

Show the children the pictures of the animals and have the students help you sort them by their choice topic (number of legs as an example). Write at the bottom of the pocket chart (on the plastic pocket) with your white board marker the categories. Then put the pictures in the pocket chart to sort/graph.

Count how many animals are in each row of the graph and ask questions about which group has more, less, or if any are equal. You can also have children create questions and ask them about the graph.

After a discussion, pull the pictures out, erase the bottom, and do it again with another way to group those same animals. This can be done many times with many different sorts of the animals.

**If your students would work better individually then have them sit at their desks and work with their own set of animals while you create a graph in the front on a document camera or pocket chart. If you provide an empty paper they can create any graph they want to as an assessment to show their understanding of graphing and sorting. They can create questions and trade graphs with a partner to answer the new questions.

The Very Hungry Caterpillar

By Eric Carle

1. Get a Pocket Chart and a white board marker.
2. Introduce the vocabulary word graph by telling the students that a graph helps us organize the data we collect.
3. As you read the book write down on a chart or board how many things that the caterpillar eats every day.
4. Send the students to their seats and have them each draw a different picture of 1 thing the caterpillar eats.
5. Make a picture graph, by days of the week, and place the students' pictures onto the pocket chart. Be sure to label the chart with the pen with the days of the week.

6. Have students create questions as they are able. If they get stuck you can ask questions like, "Which day has the fewest pieces of food?" or "Which days have more food than Wednesday?"
7. Extension 1: Graph which food the caterpillar ate are the children's favorites. You can have them stand in rows on the blacktop or in the room to make a human graph. Have students create questions about their new graph.
8. Extension 2: Have the students make their own graph of the foods they eat in a week from the school lunch menu. They can draw each piece of food and create a picture graph in the pocket chart. Have students create questions for the graph to ask the class.
9. Extension 3: Homework – graph the foods the students eat at dinner for a school week and bring the graph to class. They must also write questions about the graph then trade with a classmate and answer their questions.

Addition & Subtraction Lessons

***Ladybug* ("Life Cycles" series)**

by David M. Schwartz

photographs by Dwight Kuhn

Materials Needed:

- 1 Ladybug outline per student
- 1 set of 10 counters per student
- 1 set of 10 stickers (dots) per student

Day 1: Read the Ladybug story at the class meeting area.

1. Show your ladybug to the students. Show the students how to place the 10 counters on either side of the ladybug's back. Slide them off and do one more demonstration. Be sure to tell the students not to put them on the ladybug's head, on the line, or outside the body. All the counters should be on the back on the wings.
2. Pass out the ladybugs and monitor student work. Correct any misconceptions. Allow a lot of time for exploring combinations of 10. Do not record anything today.
3. Watch for students to just do 1 combination and stop. Encourage other ways to make 10 because sometimes students don't want to move beyond their first attempt. (They think they are done with 1 answer)
4. At the end of the time collect the ladybugs and counters. Save the ladybugs until Day 2.

Day 2: Before the lesson be sure that each student has 10 stickers to put on their ladybugs.

1. Pass out the ladybugs again. Tell the students that they will review how to make 2 groups with the counters like yesterday.
2. After the review pass out the stickers. Have students place 10 stickers on their lady bug instead of counters. They can only put them on the ladybug's back – not the head. They also need to use all 10 stickers. They can choose how many to put on either side of the ladybug.
3. Get the demonstration ladybug and model putting some stickers on both sides of the back (example 4 on one side of the line and 6 on the other). Ask for questions.
4. Pass out the ladybugs and the stickers. Monitor that the students are following the directions.
5. After the students are finished bring them back to a meeting area. Create a chart showing all the ways the students created for making 10. For example if there were 3 stickers on one side and 7 on the other write down that $3+7=10$.
6. Write down everyone's sentences even if they are the same. If there are some missing have students work together at the meeting area to find any other missing ways.

7. Extension: Graph the ladybugs so students can see which combination of numbers was most chosen. Students can hold their lady bugs and stand in a human graph on the carpet or the lady bugs can be put on the wall in a graph.
8. Use this with any number family that is appropriate for your grade level. K-2 students need to know different facts at each grade level.

Quack and Count – Number Sense

By Keith Baker

Materials: connecting cubes, paper, pencils

1. Pass out 7 connecting cubes to each student. The students will need room to put the cubes together and pull them apart in a stick.
2. As the story is read have the students break their cube stick into the different arrangements of 7. For example on the first page with 6 and 1 the students should have a stick of 6 and a train of 1. I have them hold 1 train in each hand.
3. Continue through the story and let the students make each combination of 7.
4. After the story, have students use their cube trains to make different combinations of 7 and draw their own pictures (pumpkins, cats, trees, flowers, etc.). They can make a class book of their artwork.
5. Center Idea or Partner Work: Students can play a game with any size stick. One student shows how many cubes are in the stick (ex:15) and then puts it behind their back. The student breaks the stick into 2 pieces (ex 7 and 8) and shows the partner 1 of the sticks (7 cubes). The partner must use their facts to come up with 8 are hiding. Have students use the math facts they are memorizing as the amount in the stick. This varies by grade level.

Domino Addition

By Lynette Long, Ph.D.

Materials: Dominos, Paper, Pencils

1. Bring a set of dominos to class. Document cameras help if you have regular size dominos. If you don't have a document camera you can use sentence strip and dots to create a pocket chart set of dominos.
2. Read the story and count the dots together. Show the students how each square is its own number. An addition problem is created by adding the top square to the bottom square on the domino.
3. Count the dots and show the addition problems for the rest of the story.
4. Pass out a 2 dominos to each pair of students. Have them write the addition problems and count the dots to get the answer. Another option is to have a set of dominos for each pair so they can make many combinations without trading. If there is only one set have the students trade to make multiple problems. Next have students write the fact family that goes with the addition fact they solved.
5. More Advanced students: Instead of each square being a number each domino is the number and students add 2 whole dominos together: $(3 + 4)$ & $(2 + 6)$ make the problem $7 + 8 = 15$; $15 - 8 = 7$ & $15 - 7 = 8$.

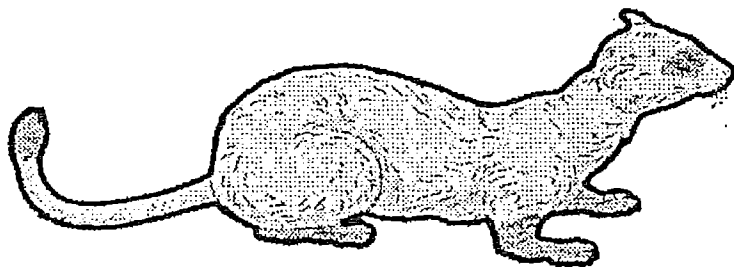
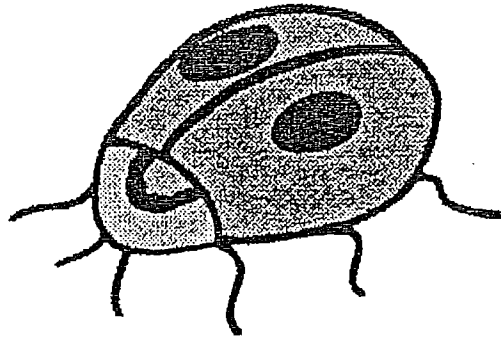
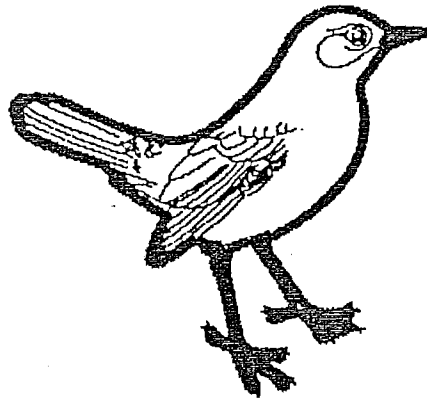
**** By using different options the teacher allows each child to work at their level. Independent work is differentiated based on the student need. Each student can work with any of these levels and be on task during independent time and the teacher can increase difficulty as the student masters each task.**

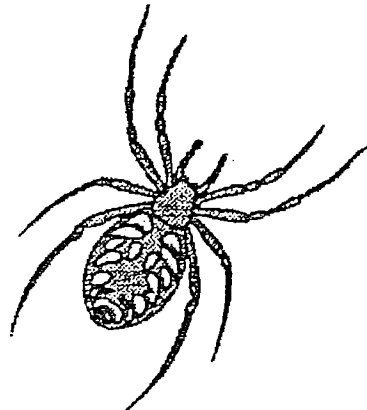
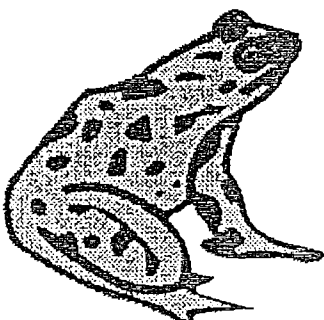
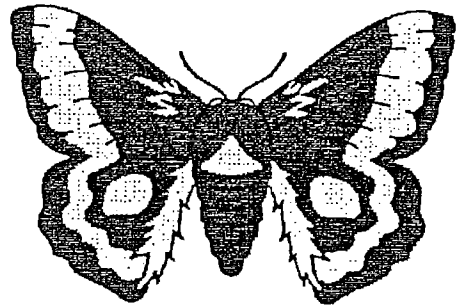
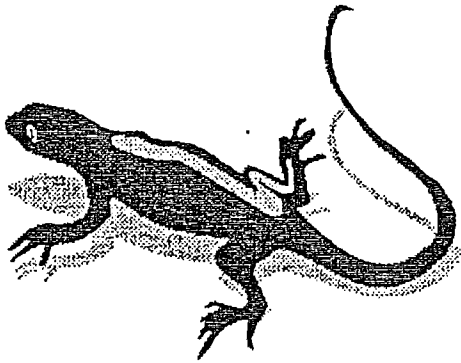
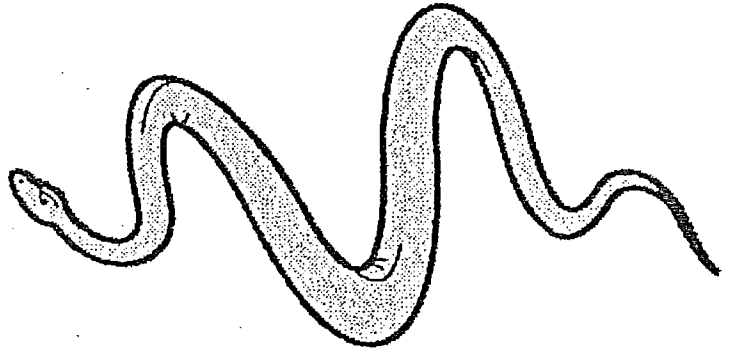
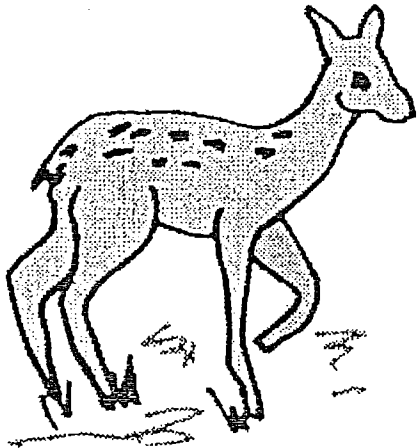
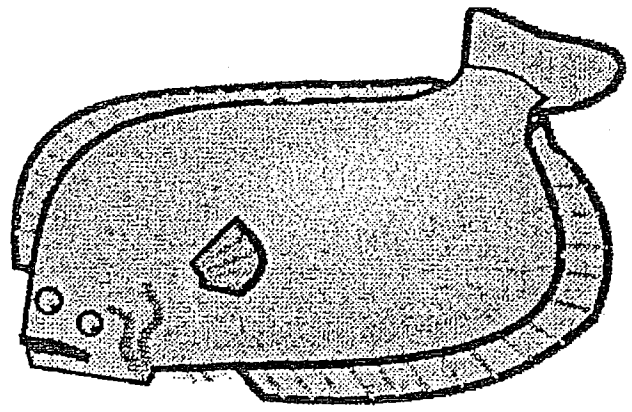
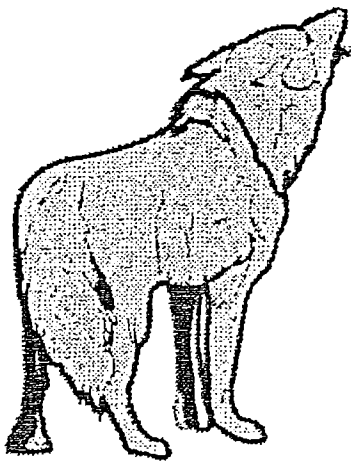
Design your own pattern
For this page in the book.



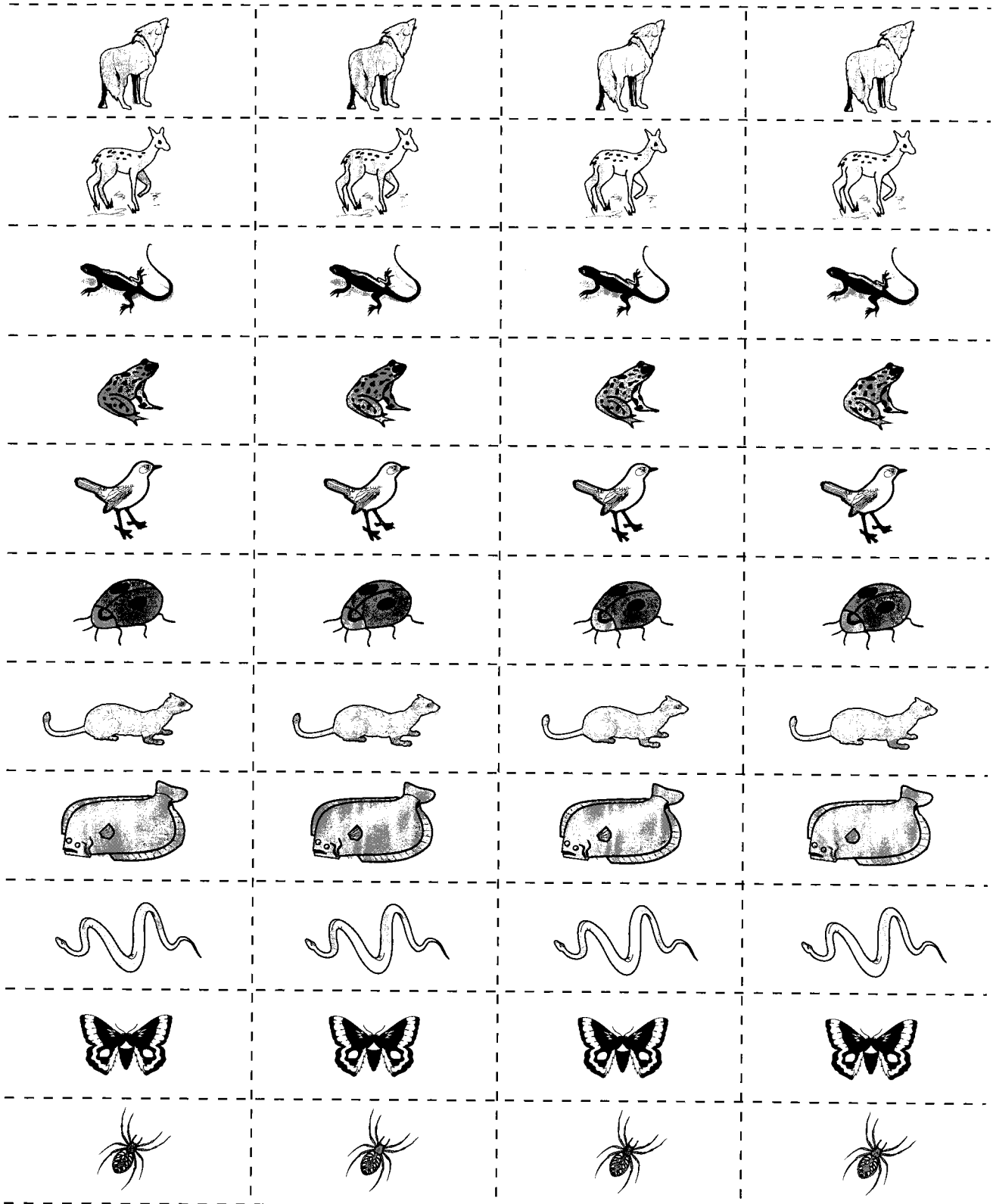


Pocket chart
animals.



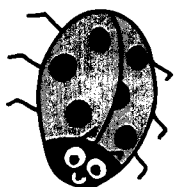
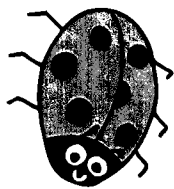


Where in the Wild
by Patty Morrison

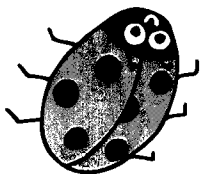
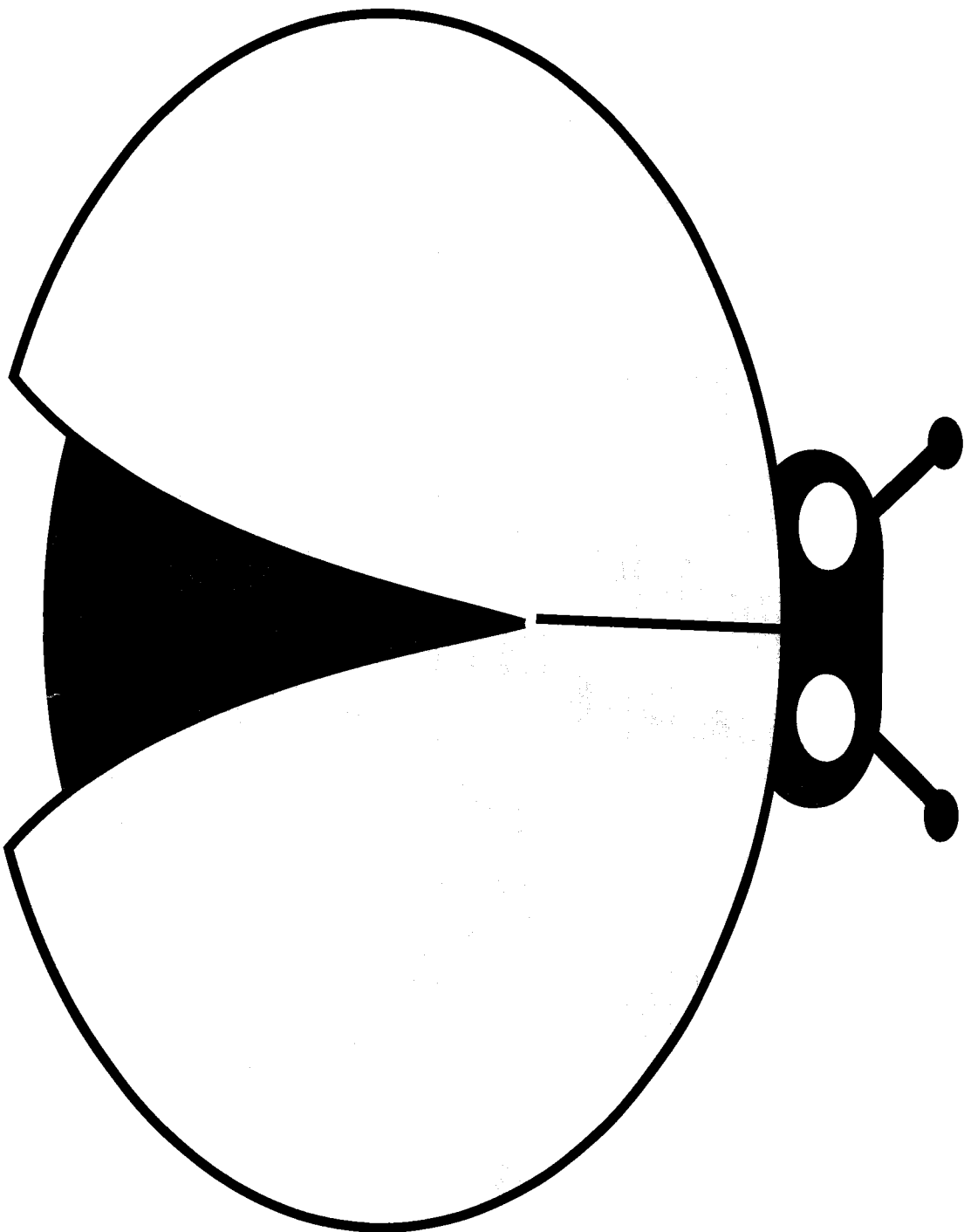
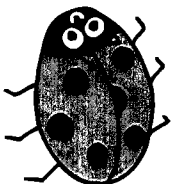
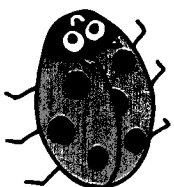
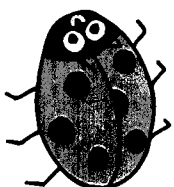


Where in the Wild Graph by Patty Morrison

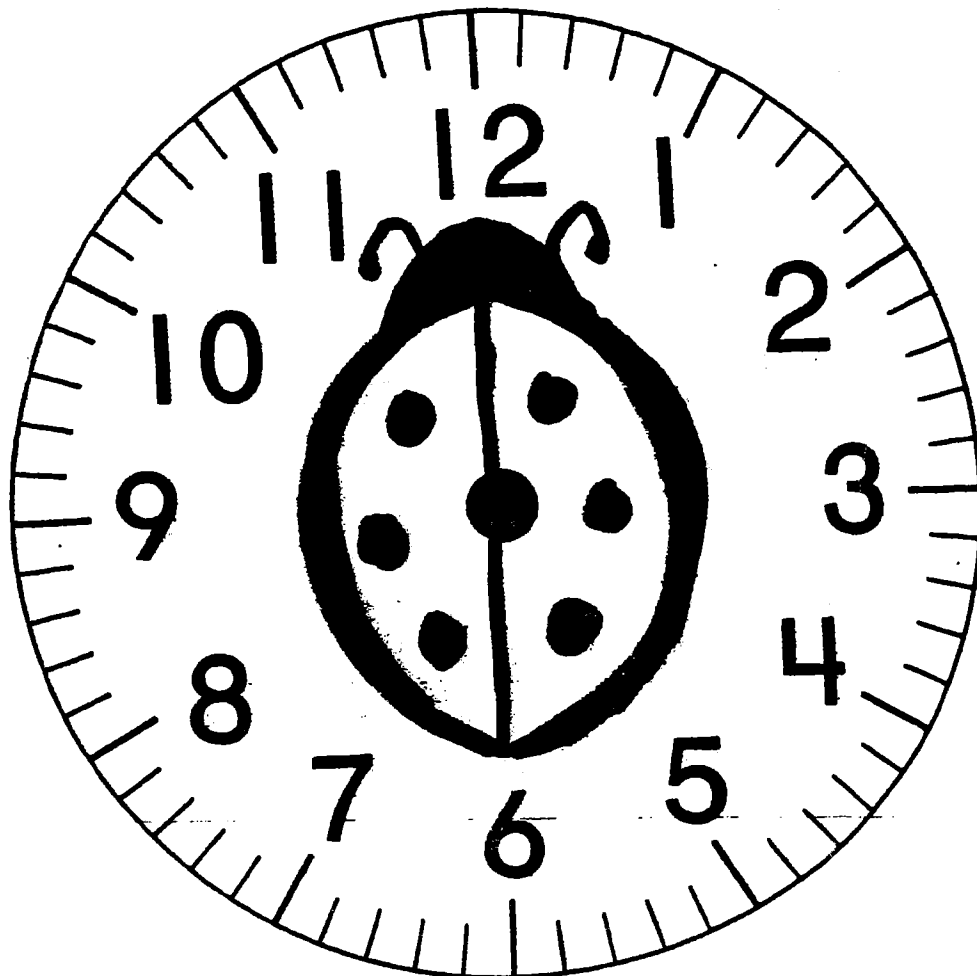
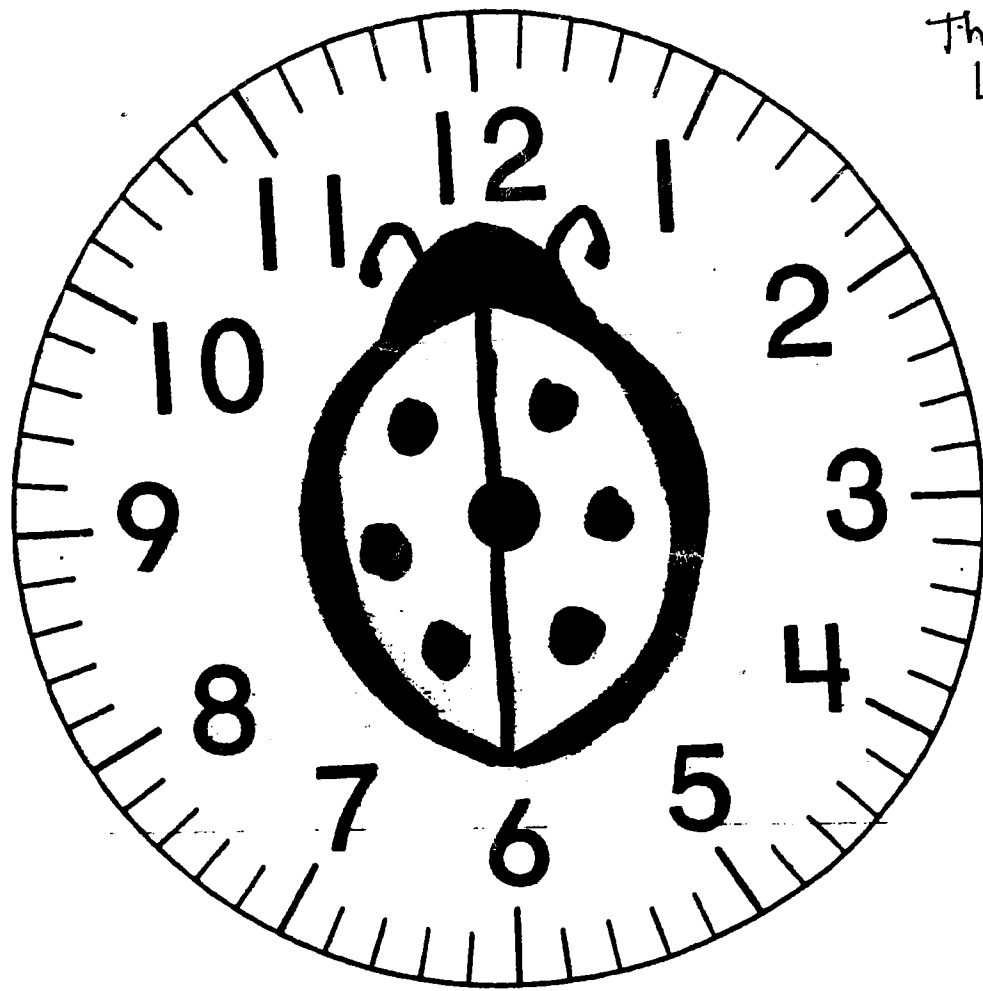
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Ten Spot Ladybug
by Patty Brown



The Grouchy
Ladybug
by
Eric Carle



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DOMINO Math - Fact Families

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