

# Shape Up for Math

**Grade Level or Special Area:** Kindergarten

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**Length of Unit:** Seven lessons (approximately 25-30 minutes each)

## I. ABSTRACT

This unit uses different math manipulatives to teach geometric concepts. Specific skills include identifying shapes, learning terms of orientation, and comparing size of basic objects.

## II. OVERVIEW

### A. Concept Objectives

1. Understand geometric concepts, properties, and relationships in problem solving situations. [**Colorado State Standard Math 4**]
2. Understand shapes and their relationships (for example, symmetry and congruence). [**CSS Math 4.1**]
3. Recognize geometric shapes and spatial reasoning. [**CSS Math 4.4**]

### B. Content from the *Core Knowledge Sequence*

1. **Mathematics:** Know and use terms of orientation and relative position such as: (p. 18)
  - a. closed, open
  - b. on, under, over
  - c. in front, in back (behind)
  - d. between, in the middle of
  - e. next to, beside
  - f. inside, outside
  - g. around
  - h. far from, near
  - i. above, below
  - j. to the right of, to the left of
  - k. here, there
2. **Mathematics:** Identify basic shapes in a variety of common objects and artifacts. (p. 18)
3. **Mathematics:** Make congruent shapes and designs. (p. 18)
4. **Mathematics:** Compare size of basic plane figures (larger, smaller). (p. 18)
5. **Language Arts:** Understand and follow oral directions. (p. 8)

### C. Skill Objectives

1. Students will be able to show understanding of the terms on, over, under, front, back, next to, beside, inside, outside, above, below, right, and left.
2. Students will actively participate in making and using an object to show directional terms.
3. Students will work with a partner to show further understanding of directional terms.
4. Students will identify objects as larger and smaller.
5. Students will sort objects in groups of larger and smaller.
6. Students will search for shapes in everyday objects.
7. Students will keep a checklist and mark for every shape they find.
8. Students will become familiar with shapes and their attributes.
9. Students will use pattern blocks to build an object.
10. Students will use shape cut outs to develop a ship.
11. Students will use the geoboards and geobands to make congruent shapes.

12. Students will demonstrate an understanding of the shapes.
13. Students will be able to make a given shape using the geoboard.
14. Students will be able to tell the difference between similar shapes.
15. Students will be able to show understanding of the terms between, in the middle of, around, far from, near, here, and there.

### III. BACKGROUND KNOWLEDGE

- A. For Teachers
  - None
- B. For Students
  1. Identify left and right hand.
  2. Identify top, bottom, middle.
  3. Identify and sort basic plane figures: square, rectangle, triangle, circle.
  4. Recognize shapes as the same or different.

### IV. RESOURCES

None

### V. LESSONS

#### Lesson One: Where is Scamper?

- A. *Daily Objectives*
  1. Concept Objective(s)
    - a. Recognize geometric shapes and spatial reasoning.
  2. Lesson Content
    - a. Know and use terms of orientation and relative position such as:
      - i. on, over, under
      - ii. in front of, in back of (behind)
      - iii. next to, beside
      - iv. inside, outside
      - v. above, below
      - vi. to the right of, to the left of
    - b. Understand and follow oral directions.
  3. Skill Objective(s)
    - a. Students will be able to show understanding of the terms on, over, under, front, back, next to, beside, inside, outside, above, below, right, and left.
    - b. Students will actively participate in making and using an object to show directional terms.
    - c. Students will work with a partner to show further understanding of directional terms.
- B. *Materials*
  1. One copy of Where is Scamper?, Appendix A, per child
  2. Crayons – one box per child
  3. Scissors – one pair per child
  4. Hole punch
  5. Yarn
- C. *Key Vocabulary*
  1. On – upon; in contact with
  2. Over- above; higher than
  3. Under – beneath; below; lower than
  4. Front – foreword part or surface
  5. Back – part of body opposite the front; rear

6. Next to – beside; nearest to
7. Beside – near; by the side of
8. Inside - within
9. Outside – exterior
10. Above – over; higher than
11. Below – lower than; beneath
12. Right – side opposite left
13. Left – side of body which contains heart

D. *Procedures/Activities*

1. Begin by discussing each of the vocabulary words. Be sure that the students have a firm understanding of each term before moving on to the activity.
2. Pass out one copy of *Where is Scamper?*, Appendix A, one pair of scissors, and one box of crayons to each child.
3. Explain to the students that Scamper is going to help us learn our math terms.
4. Ask the students to color and cut out Scamper and his doghouse.
5. As the students are finishing cutting, begin to punch holes in the dog and the doghouse where indicated.
6. Tie the yarn to connect the dog to the doghouse.
7. Ask the class to listen as you give each direction such as, “Put the dog above the doghouse” or “Put the dog next to the doghouse.”
8. Check the class for understanding then continue to give the group directions using the following directional terms:
  - a. on, over, under
  - b. in front of, in back of (behind)
  - c. next to, beside
  - d. inside, outside
  - e. above, below
  - f. to the right of, to the left of
9. Pair the students and assign one student to be the caller. Direct the caller to stand in front of their partner and give directional commands such as, “Stand beside me” or “Sit in front of me.”
10. Instruct the partner to listen carefully and follow the directions.
11. After several directions, ask the students to switch roles and repeat the activity.

E. *Assessment/Evaluation*

1. Teacher observation
2. Peer directional term activity (as described in numbers 8-10)
3. Ask the children to come to you individually. Using the dog and doghouse made earlier, ask the child to show you the position words.
4. Use checklist from Appendix B, Checklist for Position Words, for position words.

**Lesson Two: Which One Is It?**

A. *Daily Objectives*

1. Concept Objective(s)
  - a. Understand shapes and their relationships (for example, symmetry and congruence).
  - b. Recognize geometric shapes and spatial reasoning.
2. Lesson Content
  - a. Compare size of basic plane figures (larger, smaller).
  - b. Understand and follow oral directions.

3. Skill Objective(s)
  - a. Students will identify objects as larger and smaller.
  - b. Students will sort objects in groups of larger and smaller.
- B. *Materials*
  1. One copy of Appendix C, Larger/Smaller Buckets, per student
  2. A copy of Appendix D, Anecdotal Notes, for the teacher
  3. A collection of different sizes of buttons
- C. *Key Vocabulary*
  1. Larger – of great size
  2. Smaller – littler than
- D. *Procedures/Activities*
  1. Begin by asking the students if they know the meaning of the words larger and smaller. Accept all answers, but also give the correct definition.
  2. Tell the students that you would like them to separate themselves into groups of larger and smaller.
  3. Show the students two separate areas in the room. Tell them that one side is for larger and one side is for smaller.
  4. Instruct the students to place themselves in the proper areas of the classroom.
  5. Observe students, making sure they understand the concept of these terms.
  6. Bring the students back together and show them the variety of buttons you have collected.
  7. Tell the students that they are going to get a handful of buttons to sort into piles of larger and smaller.
  8. Pass out a copy of Appendix C, Larger/Smaller Buckets, and a handful of buttons to each child.
  9. Explain to the students that the larger buttons should be placed on the larger bucket and the smaller buttons placed on the smaller bucket.
  10. Circulate around the classroom, monitoring student’s work.
  11. Use Appendix D, Anecdotal Notes, to evaluate the student’s progress.
  12. After everyone has finished, ask the students to help you clean up. Ask them to first bring you their pile of larger buttons. Then, ask the students to bring you their pile of smaller buttons.
- E. *Assessment/Evaluation*
  1. Teacher observation
  2. Appendix D – Anecdotal Notes

### **Lesson Three: We’re Going On A Shape Hunt!**

- A. *Daily Objectives*
  1. Concept Objective(s)
    - a. Recognize geometric shapes and spatial reasoning.
  2. Lesson Content
    - a. Identify basic shapes in a variety of common objects and artifacts.
    - b. Understand and follow oral directions.
    - c. Compare size of basic plane figures.
  3. Skill Objective(s)
    - a. Students will search for shapes in everyday objects.
    - b. Students will keep a checklist and mark for every shape they find.
    - c. Students will become familiar with shapes and their attributes.
- B. *Materials*
  1. One copy of Appendix E, Shape Hunt Checklist, per student
  2. Pencils – one per student

3. Clipboards or lapboards – one per student
- C. *Key Vocabulary*
1. Circle – closed curved shape having no points
  2. Square – four-sided figure having all equal sides
  3. Rectangle – parallelogram with all right angles
  4. Triangle – figure with three sides and three angles
  5. Diamond – figure with four sides and four points
- D. *Procedures/Activities*
1. Tell the students that today they will be going on a shape hunt.
  2. Explain to the students that they will be walking around the school and searching for shapes in the things they see.
  3. Show the student's that they can find shapes in everyday things. For example, a door is a rectangle, a table is a square, a ball is a circle, etc. Remind the students to look for different size objects as well.
  4. Before leaving the classroom, discuss the standards for walking around the school. Ask the students for suggestions on how they need to act while walking in the hall. (Quiet voices, walk in a line, and stay together.)
  5. Pass out one copy of Appendix E, one lapboard or clipboard, and one pencil to each student.
  6. Explain to the students that they will make a tally mark or check mark next to each shape they find. Be sure to explain that they need to make a mark each time they see one of the shapes on their paper. They need to keep careful track of each shape they see.
  7. Line the students up to go on their shape hunt.
  8. Walk the students around the hallways of the school to look for shapes. Be sure to walk slowly and stop often for students to make marks on the checklists.
  9. After the students have had plenty of time to find their shapes, return to the classroom.
  10. Have the students sit with their shape hunt checklists. Quickly go around and ask the students how many of each shape they found during the shape hunt. Ask if anyone found two different sized shapes. For example, a big circle and a small circle.
  11. Collect the student's checklists to check for understanding.
- E. *Assessment/Evaluation*
1. Teacher observation
  2. Appendix E – Shape Hunt Checklist

### **Lesson Four: Shape Ship**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Recognize geometric shapes and spatial reasoning.
    - b. Understand shapes and their relationships.
  2. Lesson Content
    - a. Make congruent shapes and designs.
    - b. Identify basic shapes in a variety of common objects and artifacts.
    - c. Understand and follow oral directions.
    - d. Compare size of basic plane figures.
  3. Skill Objective(s)
    - a. Students will use pattern blocks to build an object.
    - b. Students will use shape cut outs to develop a ship.
    - c. Students will become familiar with shapes and their attributes.

- B. *Materials*
1. One piece of construction paper per student
  2. One copy of Appendix F, Shapes for Shape Ship, per student
  3. Scissors – one pair per student
  4. Crayons – one box per student
  5. Glue – one bottle per student
  6. Pattern blocks – one handful per student
  7. One copy of Appendix G, Shape Ship Example, to show as an example
- C. *Key Vocabulary*  
Review shape terms from Lesson Three
- D. *Procedures/Activities*
1. Begin class by having the students sit where they can work on a hard surface. Pass out a handful of pattern blocks to each student.
  2. Ask the students what type of things they might be able to build using the pattern blocks. Accept all answers.
  3. Give the students time to build an object using their pattern blocks.
  4. After the students have finished building, ask if there is anyone who would like to share what they have built. Allow time for the students to share.
  5. Pass out a piece of construction paper and one copy of Appendix F, Shapes for Shape Ship, per student.
  6. Have the students color and cut out the shapes on Appendix F, Shapes for Shape Ship.
  7. Direct the students to use the shapes to make a ship. Direct the students' attention to the example of a ship, Appendix G.
  8. Describe one shape at a time (see below) and encourage each child to find that shape.
    - a. Semicircle: "Find the large shape with a curve on one side and a flat edge on the other."
    - b. Rectangles: "Find the shapes that have four corners, two long sides, and two short sides."
    - c. Circles: "Find the round shapes with no corners."
    - d. Squares: "Find the shapes with four corners and four side that are exactly the same."
    - e. Triangle: "Find the shape that has three corners and three sides."
  9. After the students have found the correct shape, give the name of the shape and explain where to glue it on the construction paper.
  10. When the glue is dry, display the seaworthy ships.
- E. *Assessment/Evaluation*
1. Teacher Observation

### **Lesson Five: Geoboard Exploration I**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Understand shapes and their relationships.
    - b. Understand geometric concepts, properties, and relationships in problem solving situations.
  2. Lesson Content
    - a. Make congruent shapes and designs.
    - b. Understand and follow oral directions.
  3. Skill Objective(s)
    - a. Students will use the geoboards and geobands to make congruent shapes.

- b. Students will demonstrate an understanding of the shapes.
- B. *Materials*
  - 1. Geoboards – one per student
  - 2. Geobands – approximately 10 per student
  - 3. One copy of Appendix H, Evaluation for Geoboards, per student
- C. *Key Vocabulary*
  - 1. Geoboard – flat board with spokes; math manipulative
  - 2. Geoband – similar to rubber bands
- D. *Procedures/Activities*
  - 1. Begin by seating the students in a place where they can work on a hard surface.
  - 2. Give each student a handful of geobands and a geoboard.
  - 3. Explain to the students that they are going to use the geoboards and geobands to create shapes.
  - 4. If needed, draw the shapes on the chalkboard for the students.
  - 5. One by one, ask the students to make the shapes on their geoboards.
  - 6. After you have asked the students to make each of the shapes, allow the students to make their own designs on the geoboards.
  - 7. While the students are making their designs, call one student up to you at a time.
  - 8. Individually ask each student to make each of the following shapes using their geobands and geoboard.
  - 9. Evaluate each student’s progress using Appendix H, Evaluation for Geoboards.
- E. *Assessment/Evaluation*
  - 1. Teacher observation
  - 2. Appendix H - Evaluation for Geoboards

**Lesson Six: Geoboard Exploration II**

- A. *Daily Objectives*
  - 1. Concept Objective(s)
    - a. Recognize geometric shapes and spatial reasoning.
    - b. Understand shapes and their relationships.
  - 2. Lesson Content
    - a. Make congruent shapes and designs.
    - b. Compare size of basic plane figures.
    - c. Understand and follow oral directions.
  - 3. Skill Objective(s)
    - a. Students will be able to make a given shape using the geoboard.
    - b. Students will be able to tell the difference between similar shapes.
- B. *Materials*
  - 1. Geoboards – one per student
  - 2. Geobands – one per student
- C. *Key Vocabulary*
  - 1. Geoboards – flat board with spokes; math manipulative
  - 2. Geobands – similar to rubber bands
- D. *Procedures/Activities*
  - 1. Begin by having the students sit on the floor in a semicircle.
  - 2. Pass out a geoboard and a handful of geobands to each student.
  - 3. Ask the students what kind of shapes they can make on the geoboard. *Squares, triangles, rectangles.*
  - 4. *“Do you think you can make a circle or an oval with the geoboard?”* Accept all answers.

5. “Why can’t you make a circle using the geoboard?” Because you cannot make curves with the geobands, you can only make straight lines.
  6. Ask the students to make a shape on their geoboard.
  7. When the students are finished, ask them to put the geoboard on the floor in front of them.
  8. “If you made a triangle, hold it up for us to see. Are all of the triangles the same? What’s different about them?”
  9. “If you made a square, hold it up for us to see. Are all of the squares the same? What’s different about them?”
  10. “Did anyone make a rectangle? Hold it up for us to see. Are they all the same? What makes them different?”
  11. Now ask the students to make a new shape on their geoboard.
  12. When the students are finished, ask them to put the geoboard on the floor in front of them.
  13. “If you made a triangle, hold it up for us to see. “
  14. “If you made a square, hold it up for us to see.”
  15. “If you made a square, hold it up for us to see.”
  16. Repeat the activity one more time to check for comprehension.
  17. “Take your geobands off of your geoboards.”
  18. You may choose to place the geoboards in the math center for further exploration.
- E. *Assessment/Evaluation*
1. Teacher observation

### **Lesson Seven: Lucky the Ladybug**

- A. *Daily Objectives*
1. Concept Objective(s)
    - a. Recognize geometric shapes and spatial reasoning.
  2. Lesson Content
    - a. Know and use terms of orientation and relative position such as:
      - i. between, in the middle of
      - ii. around
      - iii. far from, near
      - iv. here, there
    - b. Understand and follow oral directions.
  3. Skill Objective(s)
    - a. Students will be able to show understanding of the terms between, in the middle of, around, far from, near, here, and there.
    - b. Students will actively participate in making and using an object to show directional terms.
    - c. Students will work with a partner to show further understanding of directional terms.
- B. *Materials*
1. One copy of Appendix I, Ladybug and Flower, per student
  2. One copy of Appendix J, Anecdotal Notes, for the teacher
  3. Crayons – one box per student
  4. Scissors – one pair per student
  5. Glue – one bottle per student
  6. Craft sticks – one per student
- C. *Key Vocabulary*
1. Between – space that separates

2. Middle – equally distant from two points
3. Around – closely surrounding
4. Far – at or to a great distance
5. Near – close; not far
6. Here – in this place
7. There – that place, position, or point

D. *Procedures/Activities*

1. Review previously learned position words with the class (on, over, under, front, back, next to, beside, inside, outside, above, below, right, left).
2. Introduce the remaining position words (between, in the middle of, around, far from, near, here, there).
3. Ask for two volunteers from the class to help demonstrate these position words.
4. Using the volunteers, ask the class to show how to do the following words:
  - a. between, in the middle of
  - b. around
  - c. far from
  - d. near
  - e. here
  - f. there
5. Repeat the activity a few times to insure every child has had a chance to participate.
6. Check for understanding.
7. Have the students sit where they can use a hard surface.
8. Pass out one copy of Appendix I to each student.
9. Ask the students to color the ladybug and the flower, then to cut each of them out.
10. Next, show the students how to glue the ladybug onto a craft stick, back to back.
11. Then, demonstrate how to create a tube with the flower cut out. Show the students how to roll the flower pattern and glue it together where indicated.
12. Ask the students to place the flower tube over their fingers on one hand, and hold the ladybug in the other hand.
13. Describe the following position words while the students follow along using their ladybug and flower.
  - a. Hold the ladybug near the flower.
  - b. Hold the ladybug far from the flower.
  - c. Make yourself stand between the flower and the ladybug.
  - d. Have your ladybug fly around the flower.
  - e. Put your ladybug here (show the students where to hold it) and your flower there (demonstrate for students).
14. When you have finished giving the commands, ask the students to pair with a partner.
15. Write the position words used in the lesson on the board. You may also choose to write the position words from Lesson One, as well.
16. Ask the students to choose a role. One person should give the commands, and the other should act out the commands with the ladybug and the flower.
17. As the students are acting out the position words, begin using Appendix J, Anecdotal Notes, to evaluate the student's progress.
18. After about five to seven minutes, instruct the students to switch roles.
19. Continue to circulate around the classroom and make anecdotal notes.
20. When the students have finished, you may wish to have the whole class again demonstrate all of the position words to check for understanding.

21. Allow students to take their ladybug and flower home to show their parents what they have learned.
- E. *Assessment/Evaluation*
  1. Teacher observation
  2. Appendix J – Anecdotal Notes

## **VI. CULMINATING ACTIVITY**

- A. Appendix K – Parent Letter
- B. Appendix L – Oral Test

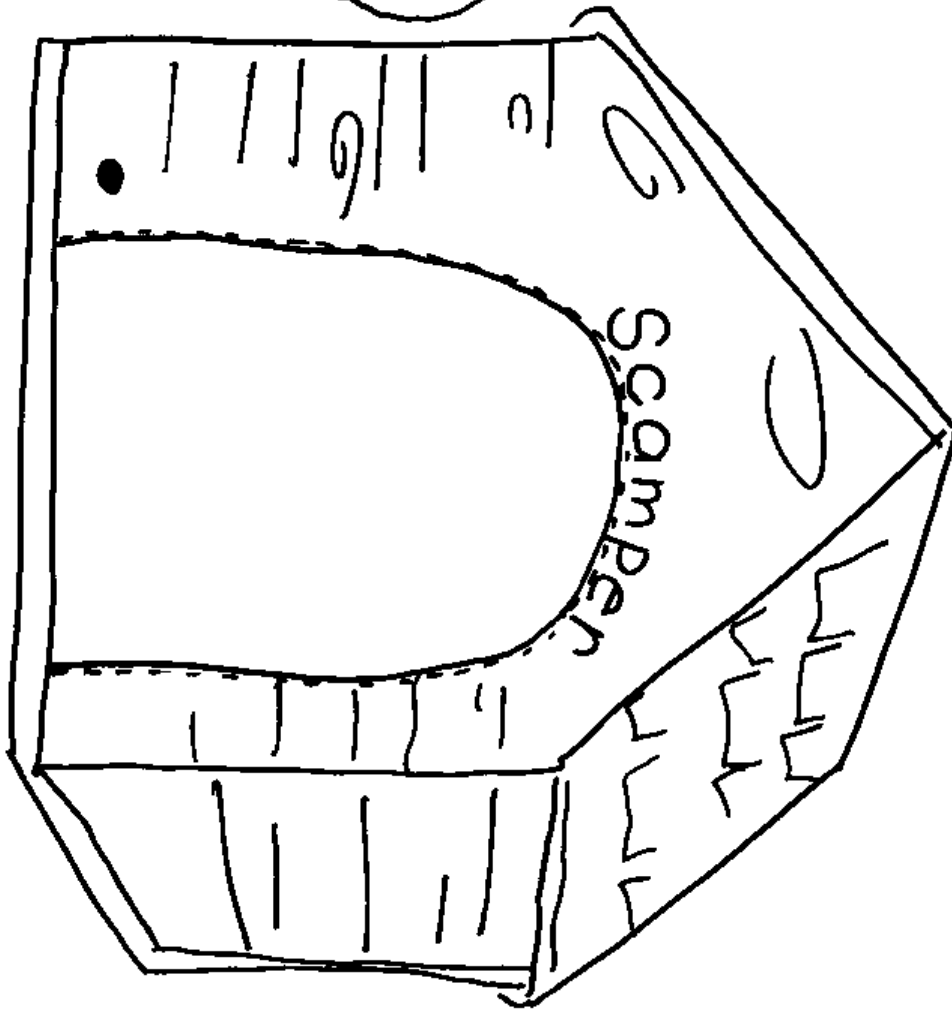
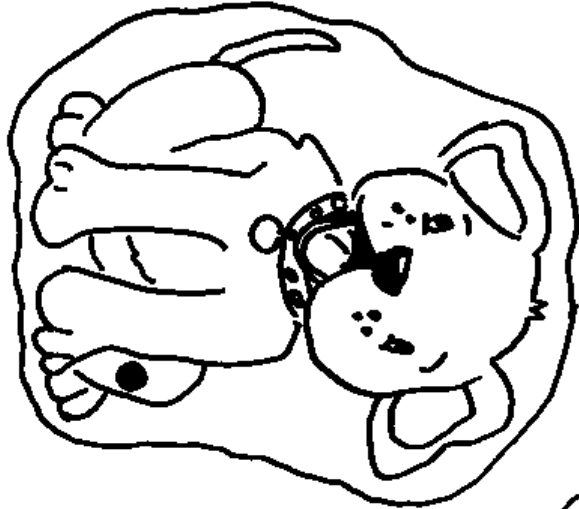
## **VII. HANDOUTS/WORKSHEETS**

- A. Appendix A: Where is Scamper?
- B. Appendix B: Checklist for Position Words
- C. Appendix C: Larger/Smaller Buckets
- D. Appendix D: Anecdotal Notes
- E. Appendix E: Shape Hunt Checklist
- F. Appendix F: Shapes for Shape Ship
- G. Appendix G: Shape Ship Example
- H. Appendix H: Evaluation for Geoboards
- I. Appendix I: Ladybug and Flower
- J. Appendix J: Anecdotal Notes
- K. Appendix K: Parent Letter
- L. Appendix L: Oral Test

## **VIII. BIBLIOGRAPHY**

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- B. McGrath, B. *M&M Counting Book*. Watertown, MA: Charlesbridge, 1994. 0-881-06853-5.

Appendix A  
Where is Scamper?



**Appendix B**  
**Checklist for Position Words**

**Student evaluated:** \_\_\_\_\_

**Date evaluated:** \_\_\_\_\_

Did the student accurately demonstrate the following position words?

**On**                      yes\_\_\_              no\_\_\_

**Over**                    yes\_\_\_              no\_\_\_

**Under**                    yes\_\_\_              no\_\_\_

**In front of**            yes\_\_\_              no\_\_\_

**In back of**             yes\_\_\_              no\_\_\_

**Next to**                yes\_\_\_              no\_\_\_

**Beside**                 yes\_\_\_              no\_\_\_

**Inside**                 yes\_\_\_              no\_\_\_

**Outside**                yes\_\_\_              no\_\_\_

**Above**                 yes\_\_\_              no\_\_\_

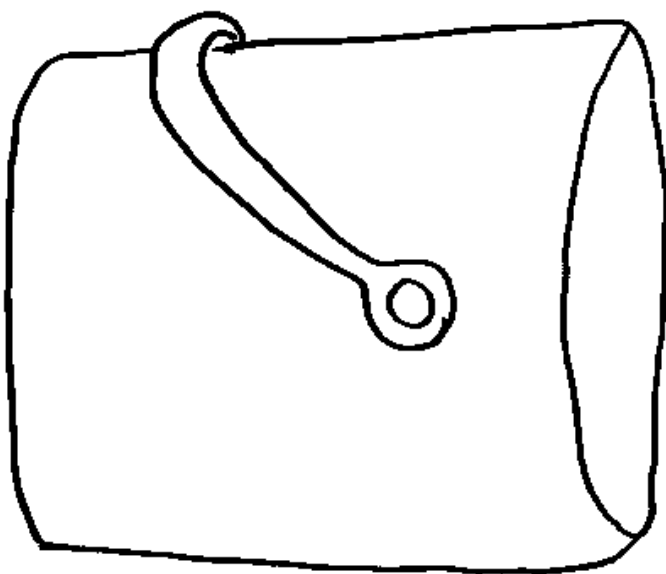
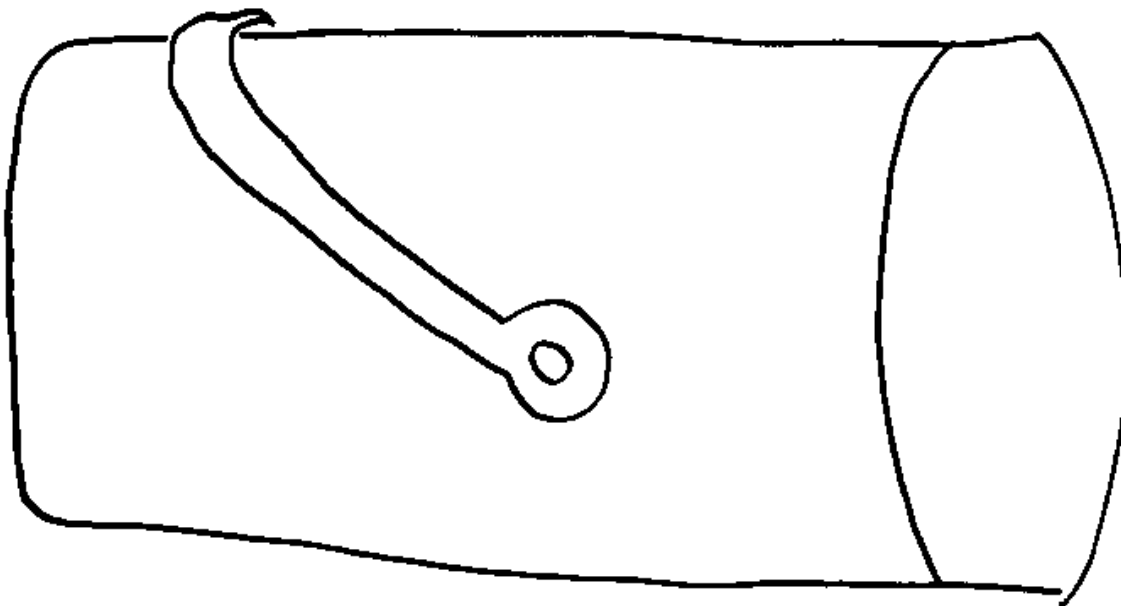
**Below**                 yes\_\_\_              no\_\_\_

**To the right of**        yes\_\_\_              no\_\_\_

**To the left of**         yes\_\_\_              no\_\_\_

**Comments:**

**Appendix C**  
**Larger/Smaller Buckets**



**Appendix D**  
**Anecdotal Notes**

**Larger/Smaller activity**

Date: \_\_\_\_\_

As a class, were the students able to accurately sort the buttons?

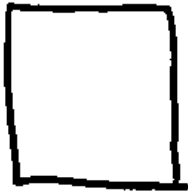
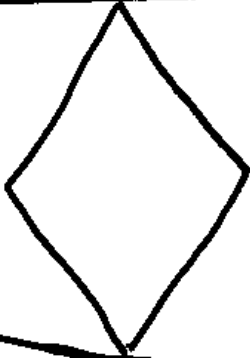
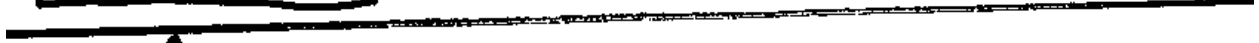
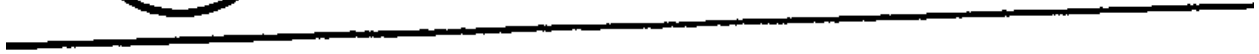
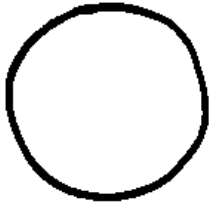
Were there any students that did not understand the concept?

Are there any students who have a strong grasp of the concept and were helping others?

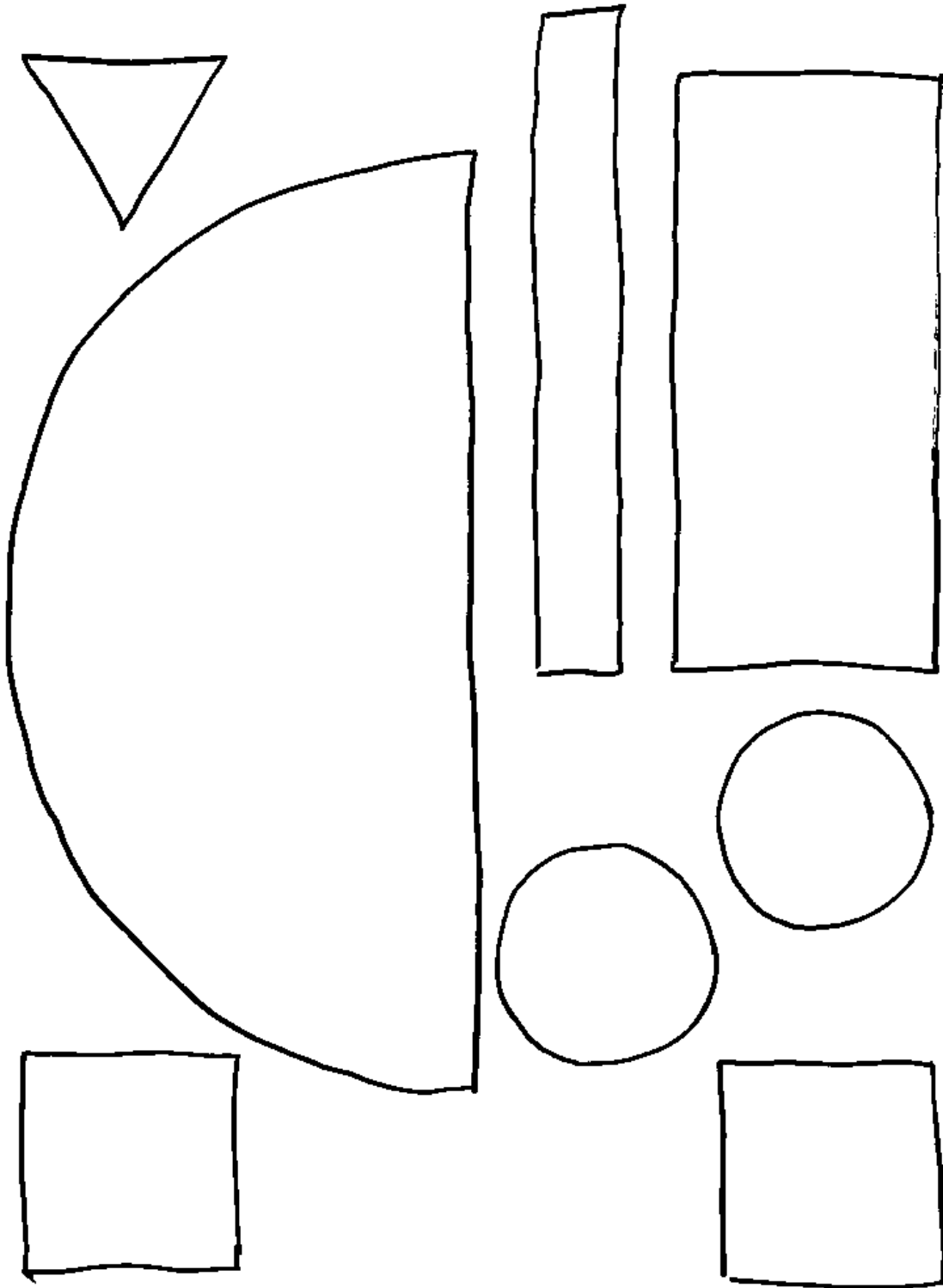
Are there any students who would benefit from having this concept re-taught?

Comments:

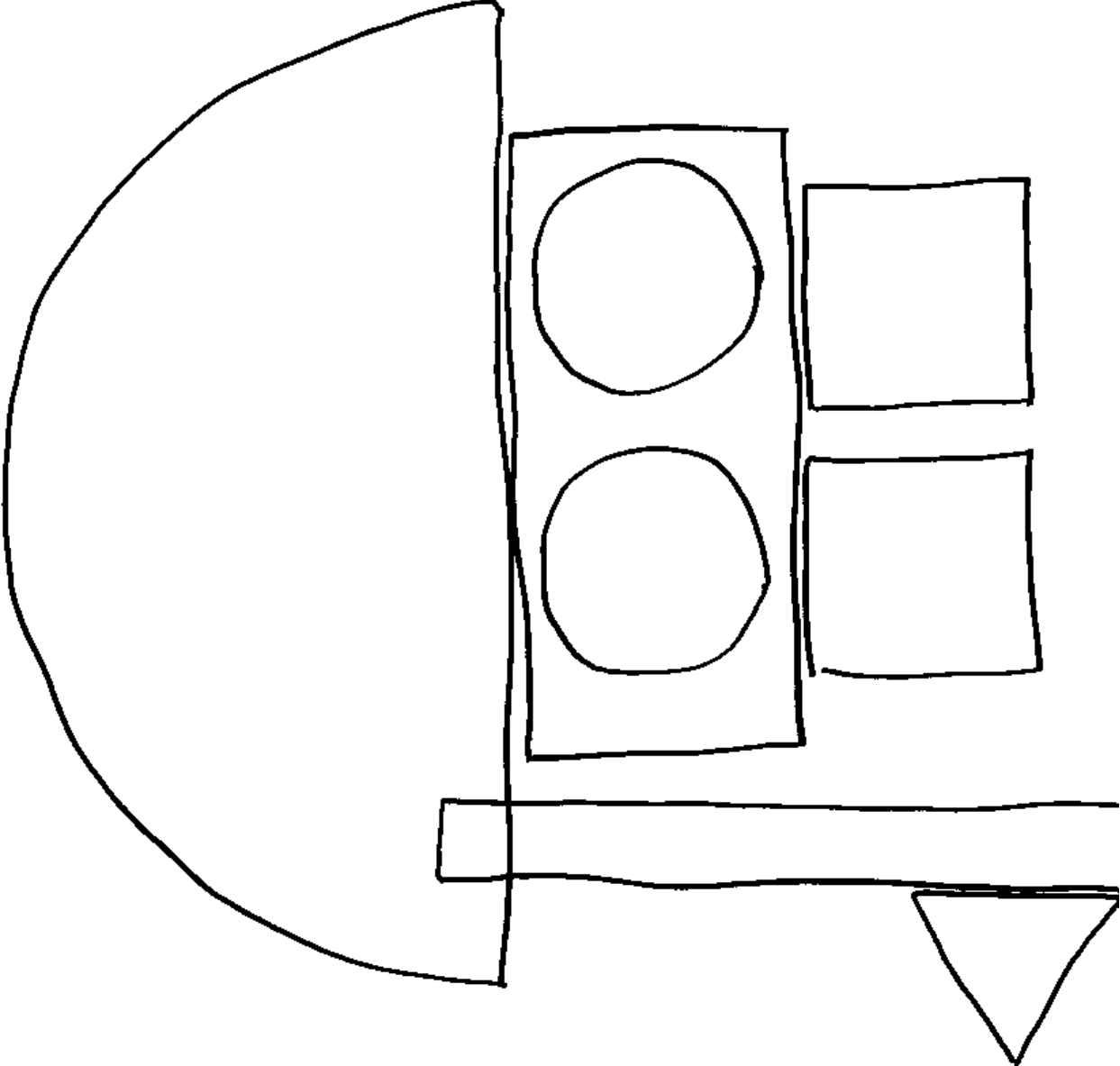
Appendix E  
Shape Hunt Checklist



**Appendix F**  
**Shapes for Shape Ship**



Appendix G  
Shape Ship Example



**Appendix H**  
**Evaluation for Geoboards**

Student evaluated: \_\_\_\_\_

Date evaluated: \_\_\_\_\_

Was the student able to accurately make the following shapes?

Square	yes	no
--------	-----	----

Triangle	yes	no
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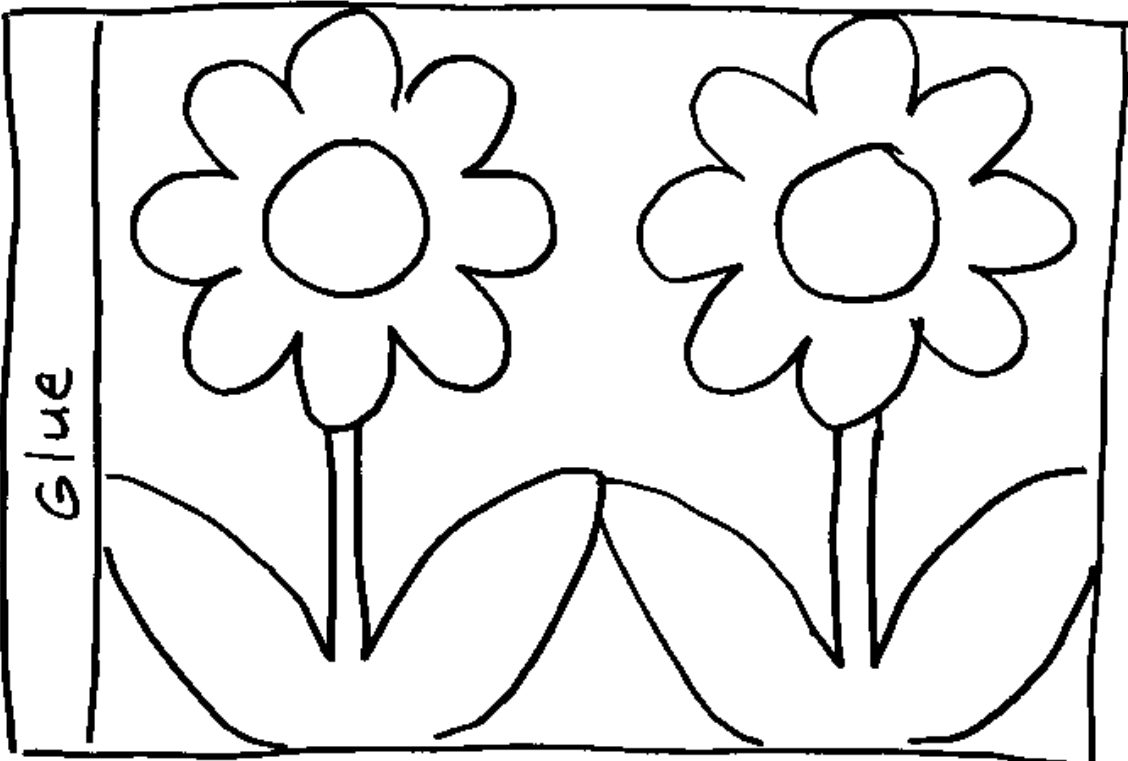
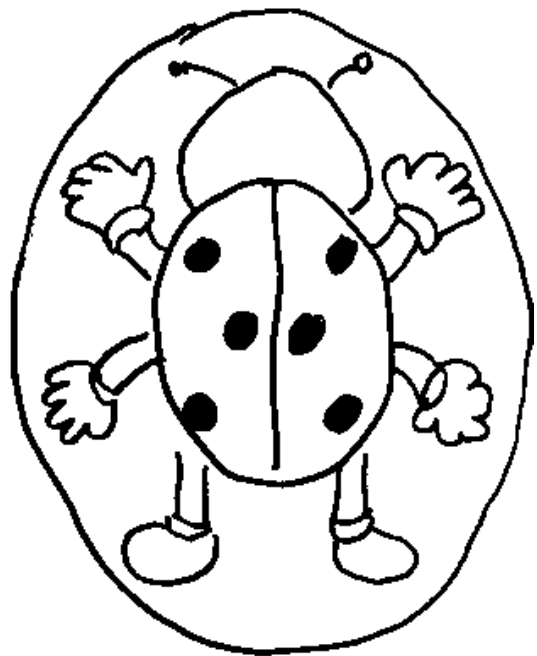
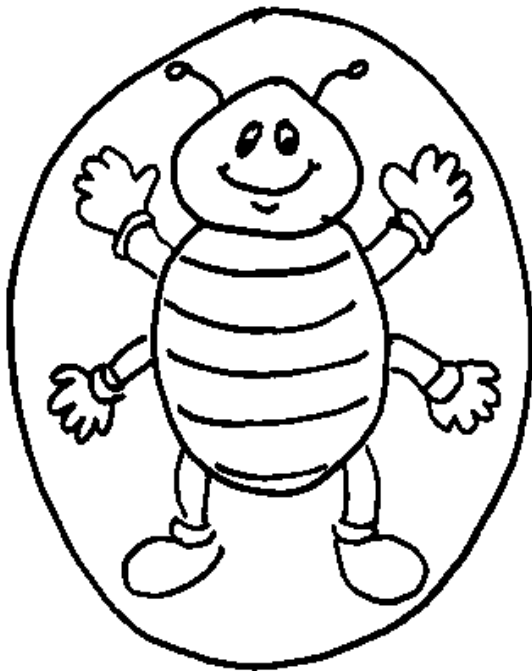
Rectangle	yes	no
-----------	-----	----

Diamond	yes	no
---------	-----	----

\_\_\_\_\_/4pts.

Comments:

Appendix I  
Ladybug and Flower



## Appendix J Anecdotal Notes

### Position Word Activity

Date: \_\_\_\_\_

As a class, were the students able to demonstrate the following position words?

Between –

Middle –

Around –

Far –

Near –

Here –

There –

Were there any terms that were difficult for the students to understand?

Are there any terms that were particularly easy for the students to understand?

Comments:

**Appendix K**  
**Parent Letter**

Dear Parents,

We have been having a lot of fun in math this week. We have been using different math manipulatives that we made to show position words. Today your child is bringing home their manipulatives to share with you. Please take a couple of minutes and have your child demonstrate what he/she has learned this week. You may want to practice the following position words with your child:

On	Above
Over	Below
Under	To the right of
In front of	To the left of
In back of	Between
Next to	Middle
Beside	Around
Inside	Far
Outside	Near
Here	There

Thank you for your support.

## Appendix L Oral Test

\*\*You will need a copy of Appendix E, a few different sized buttons, and one of the position words math manipulatives to administer this test.

Student name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Point to the square.

Yes    No

2. Point to the circle.

Yes    No

3. Point to the rectangle.

Yes    No

4. Point to the diamond.

Yes    No

5. Point to the triangle.

Yes    No

6. Show me the larger button.

Yes    No

7. Show me the smaller button.

Yes    No

8. Using the ladybug/flower or dog/doghouse, show me:

On            Y/N

Over         Y/N

Under        Y/N

In front of   Y/N

In back of    Y/N

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Next to	Y/N
Beside	Y/N
Inside	Y/N
Outside	Y/N
Above	Y/N
Below	Y/N
To the right of	Y/N
To the left of	Y/N
Between	Y/N
Middle	Y/N
Around	Y/N
Far	Y/N
Near	Y/N
Here	Y/N
There	Y/N

Comments: