



Using Manipulative Instruction to Solve Perimeter Problems.

Objective: To teach students to solve geometry problems involving perimeter.

Setting and Materials:

Settings: Special Education Resource Classroom/ one-on-one instruction

Materials:

- Geoboard (5 x 5 pegs)
- Rubber bands
- 25-foot measuring tape
- Paper
- Pencil

Content Taught

Students are taught how to solve problems involving perimeter using modeling, guided practice, and independent practice in conjunction with manipulative training.

Teaching Procedures

1. Introduce to the students what perimeter means. "How far is it around the _____ (e.g. the classroom, your yard, building)
2. Walk around the room to demonstrate the perimeter of the classroom.
3. Give the student a geoboard and rubber bands.
4. Model for the student how to make shapes on the geoboard using rubber bands.
5. Let the student make different shapes on the geoboard.
6. Make a square on your geoboard and instruct the student to do the same.
7. Demonstrate how to determine the perimeter by counting from nail to nail around the perimeter of the square.
8. Have the student place a rubber band at one corner as a marker, then moving their finger from peg to peg as they count with you around the perimeter of the square "One unit, two units, and so on. Then state the total number of unites for the square's perimeter.
9. Correct any errors and have student re-count and restate the answer.
10. Create 5 random shapes one at a time on the geoboard and have the students do the same.
11. Instruct the students to determine the perimeter of each shape by counting from nail to nail. (just as in steps 8 and 9 for the square)
12. Select two perimeter problems from the math book and demonstrate to the students how to solve the problem using the geoboard.

13. Verbally say, "We need to represent the figure in the book on the geoboard," and then create the figure on the board. Tell the students "Yes, they are the same."
14. Determine the perimeter together.
15. Then guide the student to create another shape on the geoboard based on the second problem you selected.
16. Instruct the students to find the perimeter.
17. Select two more perimeter problems from the textbook and instruct the students to solve them.
18. Give each student a 25 foot measuring tape.
19. Ask the students to measure an object in the room (e.g. desktop, section of a rug, or tabletop) and then calculate the perimeter.
20. Select three problems from the textbook that require single digit addition and have the students solve these three problems on the geoboard independently.
21. Then give the students two perimeter problems that involve regrouping to solve independently using paper and pencil.

Evaluation

Use problems the student solves independently in steps 20 and 21 as your evaluation. Record the data of the number of errors the student experiences during independent practice

Common Core Standards:

CCSS.MATH.CONTENT.HSG.GPE.B.7

Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

Lesson Plan Based on:

Cass, M., Cates, D., Smith, M., & Jackson, C. (2003). Effects of manipulative instruction on solving area and perimeter problems by students with learning disabilities.

This Lesson Plan Starter was developed by The National Technical Assistance Center on Transition (NTACT), Charlotte, NC, funded by Cooperative Agreement Number H326E140004 with the U.S. Department of Education, Office of Special Education and Rehabilitative Services (OSERS). This document has been reviewed and approved by the OSERS. Opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Department of Education. OSEP Project Officer: Dr. Selete Avoke. RSA Project Officer: Kristen Rhinehart-Fernandez. This product is public domain. Authorization to reproduce it in whole or in part is granted. While permission to reprint this publication is not necessary, the citation should be: National Technical Assistance Center on Transition (2018). *Using Manipulatives to Solve Perimeter*

