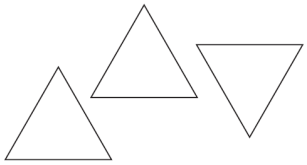
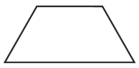
Name _____

CST/Grade 2 MG 2.2

Look at the three triangles. Which of the following shapes can be made from the three triangles?

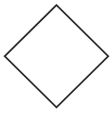


A



B

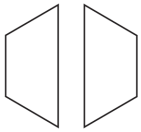
C



D

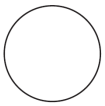
CST/Grade 2 MG 2.2

These two shapes can be put together side by side to make a new shape. Which picture shows this new shape?

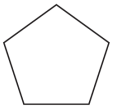


A

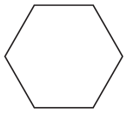
B



C



D



Divide all the answers into two shapes. What smaller shapes can the answers be made of?

CST/Grade 2 MG 2.2

Which of the following shapes can be made with these two squares by taping the edges without any overlap?

A

B

C

D

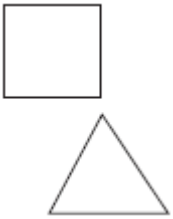
What shapes can be made with four squares?

CST/Grade 2 MG 2.2

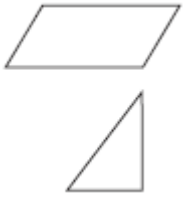
Which two shapes can be put together side by side to make a rectangle?

A

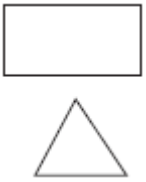
B



C



D



Decomposing and Recomposing Shapes

Objective: Teachers are given multiple strategies for developing student understanding of geometric shapes, their attributes, and how they can be decomposed and recomposed (taken apart and put back together) to form different shapes.

Standards: Kindergarten: Measurement and Geometry 2.1 Identify and describe common geometric objects (e.g., circle, triangle, square, rectangle, cube, sphere, cone).

Kindergarten: Measurement and Geometry 2.2 Compare familiar plane and solid objects by common attributes (e.g., position, shape, size, roundness, number of corners).

1st Grade: Measurement and Geometry 2.2 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects.

1st Grade: Measurement and Geometry 2.3 Give and follow directions about location.

1st Grade: Measurement and Geometry 2.4 Arrange and describe objects in space by proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of)..

2nd Grade: Measurement and Geometry 2.1 Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices.

2nd Grade: Measurement and Geometry 2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).

Activities to develop geometric understanding and visual spatial skills

* What shapes am I made of?
* Guess my design
* Pattern Books
* Creating similar shapes and designs on a geoboard
* Creating new shapes using two or more shapes on a geoboard

What shapes am I made of?

Objectives: Students use pattern blocks to cover a geometric design.

Materials: Pattern Blocks
Designs (on cardstock and preferably laminated, SEE ATTACHMENT)

Vocabulary: square, triangle, hexagon, parallelogram/rhombus, trapezoid, above, below, right, left, next to, angle, side

Introduction: Today we are going to use pattern blocks to cover a design.
(Go over classroom norms for using manipulatives. Pass out pattern blocks and designs after teacher demonstrates with whole class.)

I Do: Teacher models how to use the pattern blocks to cover a design. She/he demonstrates how many different combinations of shapes can be used to cover the same design. The class discusses what shapes made up that design.

We Do: Teacher guides students through the process of covering a pattern design. She/he facilitates a discussion of which blocks were used and their relative position to other blocks.

You try: Students are asked to cover a design on their own. Teacher debriefs this activity with the students prompting them to describe where they paced each pattern block in relative position to the other pattern blocks.

You Do: Students are given designs to cover on their own. The teacher monitors students' progress.

Closing: Teacher debriefs activity with students.

Extensions: 1. Pattern block stickers can be used so that students may record their specific designs.
2. Students may draw their designs or trace the pattern blocks on paper to record their designs.
3. Students can create their own designs for other students to replicate.
4. Students can be partnered to work together in this activity. One student can be the designer and the other student may be the builder. They then switch after each has had a turn.

Guess my design

Objectives: Students use pattern blocks to cover create a design while a partner must reproduce the design solely from their partner's directions .

Materials: Pattern Blocks
Paper
Dividers (opened three ring binders will do)

Vocabulary: square, triangle, hexagon, parallelogram/rhombus, trapezoid, above, below, right, left, next to, angle, side

Introduction: Today you will be working with a partner to create a design. We are going to use pattern blocks to create this design. Only you will be able to see the design. You will then have to describe to your partner the design using the greatest amount of detail and your partner will recreate the design.
(Go over classroom norms for using manipulatives. Pass out pattern blocks, dividers, and paper after teacher demonstrates with whole class.)
Create a list of words that students may want to use when describing their design to their partner.
Have the students sit across from one another at a desk. Place a divider between them so they can't see each other's designs. At first, limit the number of pattern blocks they can use to five or less.

I Do: Teacher models how to create a design (should be very simple, use only three pattern blocks). She/he describes the design in great detail to a student volunteer. They check the design when they are finished describing and building it. They debrief the activity suggesting improvements.

We Do: Teacher creates a design and describes it to all the students. The description is very detailed. The class then checks the design with the teacher's original design. They debrief the activity suggesting improvements.

You try: Students are paired up with one student creating a design and describes it to another student. The description is very detailed. The two students then check their designs with the each other. They debrief the activity suggesting improvements.

You Do: Students switch roles and try again with a new design. The teacher monitors students' progress.

Closing: Teacher debriefs activity with students.

Pattern Books

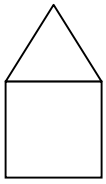
Objectives: Students use pattern blocks to design representations of common objects and record they designs in a book.

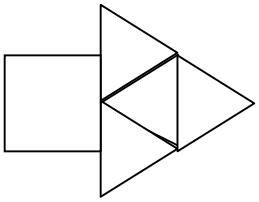
Materials: Pattern Blocks
Paper (folded and stapled into a book form)
Crayons or markers

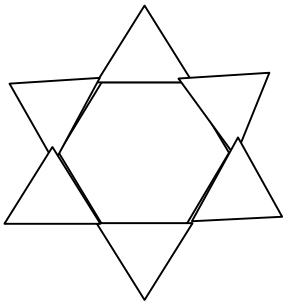
Vocabulary: square, triangle, hexagon, parallelogram/rhombus, trapezoid, angle, side

Introduction: Today you will create a book of designs using pattern blocks.
(Go over classroom norms for using manipulatives. Pass out pattern blocks, paper, and crayons/markers after teacher demonstrates with whole class.)

I Do: Teacher models how to create very simple common items using pattern blocks, i.e. a house, an arrow, a star. Teacher demonstrates how to trace the design on paper (overhead) to record that design.







We Do: Teacher describes to the class how to build other common items using the pattern blocks. The class builds those designs and traces them on paper.

You try: Teacher provides students a few minutes to explore with the pattern blocks, creating their own designs of common item. Several student volunteers describe to the class how to build their common item using the pattern blocks. The class builds those designs. (Try to pick designs that use a few pattern blocks. These designs can become elaborate).

You Do: Students create designs and record them in their pattern book. They can record the number of each shape they used in their design. They can also write a sentence about their design.

Closing: Teacher debriefs activity with students.

Creating similar shapes and designs on a geoboard

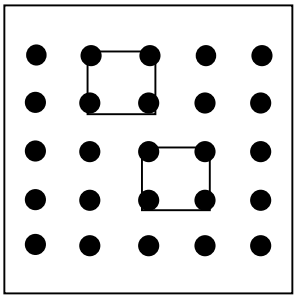
Objectives: Students use geoboards and geobands to create similar shapes and designs.

Materials: Geoboards
Geobands

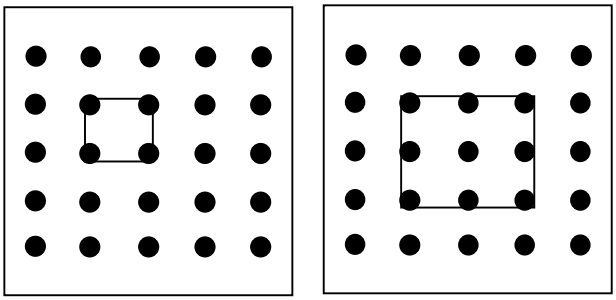
Vocabulary: square, triangle, hexagon, parallelogram/rhombus, trapezoid, above, below, right, left, next to, angle, side, similar, congruent

Introduction: Today you will be working with geoboard and geobands to create shapes that are congruent, the same size and the same shape, and shapes that are similar, the same shape and proportions. (Go over classroom norms for using manipulatives. Pass out geoboards and geobands after teacher demonstrates with whole class.)

I Do: Teacher models how to create a 1 x 1 square on the geoboard. She/he then creates another 1 x 1 square. She/he explains how these two shapes are congruent. They have the same shape and the same size. The teacher than creates a larger square, 2 x 2, and explains how this shape has the same proportions, it has 4 equal sides, so it is the same shape, but it is not the same size. This shape can be classified as similar.

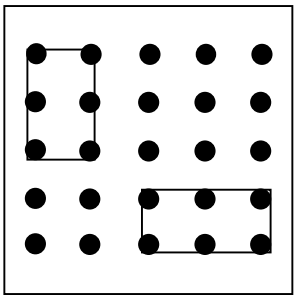


Congruent

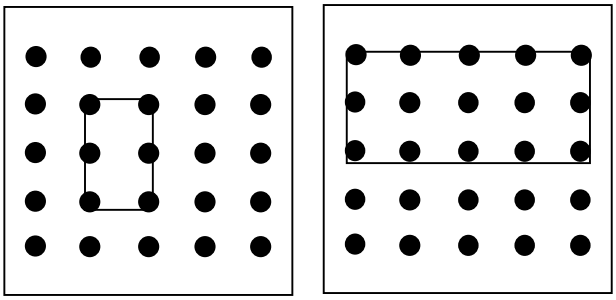


Similar

We Do: Teacher models how to create a rectangle, 2 X 1. Students do the same. She/he then creates a congruent rectangle. Students do the same. Class discusses why these rectangles are congruent. Teacher than models how to create a similar rectangle and the students do the same. Teacher facilitates a discussion on why this new rectangle is similar to the original rectangle.

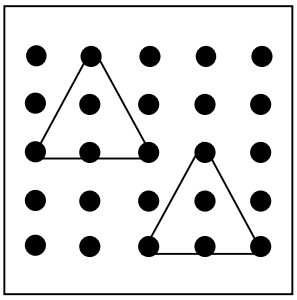


Congruent

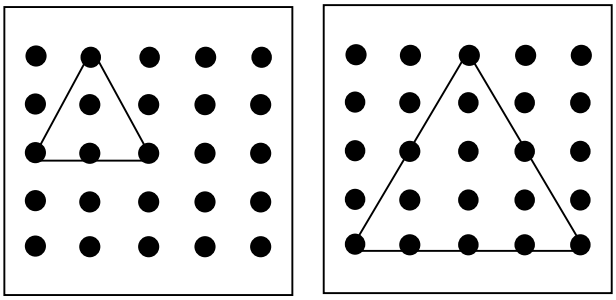


Similar

You try: Students are paired up with one student creating an isosceles triangle and the second creating a congruent triangle. The second student then creates a similar triangle. They switch roles and do it again. Teacher monitors student work. The whole class debriefs the activity.



Congruent



Similar

You Do: Students are paired together. One creates a shape on the geoboard and the partner creates a congruent then similar shape.

Closing: Teacher debriefs activity with students.

Creating new shapes using two or more shapes on a geoboard

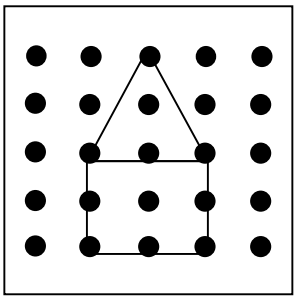
Objectives: Students use geoboards and geobands to create new shapes out of two or more shapes.

Materials: Geoboards
Geobands

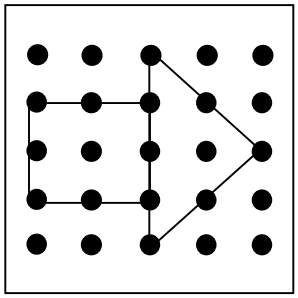
Vocabulary: square, triangle, hexagon, parallelogram/rhombus, trapezoid, above, below, right, left, next to, angle, side

Introduction: Today you will be working with geoboard and geobands to create new shapes using two other shapes. (Go over classroom norms for using manipulatives. Pass out geoboards and geobands after teacher demonstrates with whole class.)

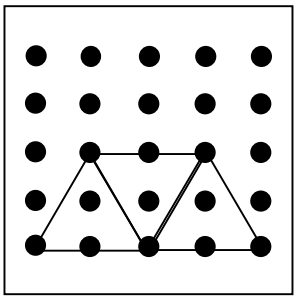
I Do: Teacher models how to create a new shape using two shapes.



House



Arrow



trapezoid

We Do: Teacher guides students in creating another shape using two or more shapes (see example above).

You try: Students are paired up and asked to create a trapezoid using more than one shape. The teacher leads a debrief of this task.

You Do: Students are provided time to explore and share other shapes that can be made by using two or more shapes.

Closing: Teacher debriefs activity with students.

What Shapes Am I Made Of?