Pattern Blocks

Free Exploration
All students need time to become familiar with new materials such as Pattern Blocks. They can explore and discover relationships between the blocks before being asked to focus on teacher-directed tasks. During this time, it is acceptable for the teacher to ask open-ended questions about what they notice about the blocks. Some students will be receptive to teacher-posed questions which encourage more structured exploration.

Copy Partner’s Design
Each student creates a design using 10-20 blocks.
(Option: Create a shape with no holes left in it.)
Trade places with a partner and build an exact copy of your partner’s design.
Take blocks out of your shape and replace them to keep the same shape using different blocks.

Hexagon Shape Covering
Each student receives a paper with the hexagon shape outline. Students are instructed to fill the hexagon with pattern blocks without holes and without hanging outside the lines. Check their work for accuracy. (Suggest to students experiencing difficulty to start with the outer edges and build toward the middle like a jigsaw puzzle.)

After building have students scan one another’s solutions. This enlightens them that there are multiple ways to solve this puzzle. Discuss how many blocks they each used to fill the hexagon shape? Students can pile their pieces to the side and challenge a friend to cover the hexagon using their blocks.

Challenge students to find how many different solutions there are for covering the hexagon. Use record sheet to record how many of each shape is used to make sure solutions are unique.

Shape Covering
Students cover various shapes (sheets A-F) with blocks and record their solutions on a chart. Challenge them to find and record at least two or three solutions for each shape.

Create Your Own Puzzle Cards
Students build a shape (with no holes) on a piece of tag board. Then trace around the outside of the shape. They will need help holding the blocks and tracing. They record how many of each shape they used to create their design. These cards then become a classroom set of puzzle cards for their classmates to solve.

Create a chart for their folders so they can keep track of which puzzles they have solved.
Pattern Block Puzzle

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<thead>
<tr>
<th>Block</th>
<th>Number</th>
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Total number of blocks _____

Pattern Block Puzzle

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Total number of blocks _____

Created by ______________________  # _____

Created by ______________________  # _____
Did you pick up the right shape?

- triangle
- Square
- blue rhombus
- white rhombus
- trapezoid
- hexagon
**FREE EXPLORATION**

(ALL GRADE LEVELS)

All students, regardless of grade level, need time to become familiar with the Pattern Blocks before being asked to focus on specific problems. This exploration time helps students discover relationships among the blocks. They learn that two red trapezoids can be arranged to make a yellow hexagon, for example, or that two green triangles are equivalent in area to a blue parallelogram. Along with unstructured free exploration, it is possible to provide structure for students’ initial explorations. The fourth graders on the videotape were given the activity of Covering Desktops.

Also appropriate is Building Roads. For this, students make a straight road using all one color block. They try this for each of the colors, investigating if they can make their roads turn corners.

Another activity is Designing Puzzle Shapes. Students make a design with the blocks and trace around the outside of it. Younger children will need to work with a partner who holds the blocks still as they make their tracing. Then they record how many blocks they used for their design on their paper. This produces a class set of puzzle cards. Students try and fit the indicated number of pieces into each other’s designs.

**SCOOP and SORT**

(GRADE 1-2)

This activity appears in the book *Pattern Blocks Activities* by Barbara Bayha and Katherine Burke. Having the grid drawn for the children helps them organize the blocks into columns that can be compared. From a small group activity such as this, a teacher can learn about children’s understanding of number.

The activity can be extended in several ways. Children can make records of their concrete graphs by drawing on smaller grid paper. For a learning station activity, students scoop and sort, and then answer a series of questions about their graphs such as the following:

1. Which block is there most of?
2. Which block is there least of?
3. How many blocks did you scoop in all?
4. How many blocks with four sides did you scoop?
5. Did you scoop more triangles or squares? How many more?
6. Did you scoop more hexagons or triangles? How many more?
How many of each did you scoop up?
HEXAGON SHAPE COVERING

(GRADES 1-3)

It's a good idea for children to have partners check that their solution works before handing in their papers. This increases the chance that children will be successful and also gives them a first glimpse that there are different solutions.

Have the children post their papers. Discuss with the class how many different solutions they found. Extend this activity into a graphing experience. Each child colors in a square to indicate how many blocks were used to fill in the hexagon shape.

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This activity can be done by younger children as it requires only that they cover the shape and count the blocks. It also prepares them for another type of challenge. For example, a follow-up problem for students to solve with a partner might be the following: "I have a shape that I know I can cover with six blue blocks. How many green blocks do you think it will take?" This kind of problem provides young students experience with ratio and proportion.
This activity provides more of a challenge than does Cover with One Color. To choose other numbers of blocks suitable for a particular shape, merely cover the shape with an assortment of blocks, note that number, and then sweep off the blocks. This guarantees that there will be at least one solution.

To extend this activity, interested students can see if they can solve one of the problems using a different assortment of the same number of blocks.
Hexagon Puzzle

Name________________

I used ___ green triangles. △

I used ___ blue parallelograms. □

I used ___ red trapezoids. △

I used ___ yellow hexagons.
Pattern Block Shapes

Name _____________________ Shape ____________________

Yellow Hexagons
☐ Yes I used ____ blocks.
☐ No

Red Trapezoids
☐ Yes I used ____ blocks.
☐ No

Blue Parallelograms
☐ Yes I used ____ blocks.
☐ No

Green Triangles
☐ Yes I used ____ blocks.
☐ No
Pattern Block Puzzles

Name

Cover shape A with 10 blocks.
I used ___ green triangles.
___ blue parallelograms.
___ red trapezoids.
___ yellow hexagons.

Cover shape B with 8 blocks.
I used ___ green triangles.
___ blue parallelograms.
___ red trapezoids.
___ yellow hexagons.

Cover shape C with 9 blocks.
I used ___ green triangles.
___ blue parallelograms.
___ red trapezoids.
___ yellow hexagons.

Cover shape D with 8 blocks.
I used ___ green triangles.
___ blue parallelograms.
___ red trapezoids.
___ yellow hexagons.

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