

**DENNY'S HEXAGON**

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The only pattern blocks your group is allowed to use in the problem are trapezoids, triangles, and diamonds.

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Denny's hexagon is made from a total of 9 pattern blocks, 3 of which are diamonds.

**Build Denny's Hexagon!**

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Denny's hexagon uses twice as many triangles as it does trapezoids.

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Denny's hexagon is equilateral, but it is NOT equiangular.

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In Denny's hexagon, the diamonds are all arranged to form a hexagon, and so are the trapezoids.

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In this pattern, each triangle shares a side with another triangle. Triangles are allowed to share a side with non-triangles.

**Denny's Hexagon** is a lovely little cooperative logic puzzle. Recall that these are played by having each player receive a clue which they can only share by reading it. (People can't look at it, or transcribe it.) Each group needs to construct a shape that satisfies all the clues.

In set-up, be sure to say that the "diamond" is the fat rhombus (not the skinny one or the square). When I do it, I have people take out the right shapes at the start. Some people make kits with just the right pieces. If you give the clues in an envelope, you can start with the three or four clue version and let groups self-differentiate by letting them add clues as they finish.

There are lots of solutions. Don't give too many hints. (Maybe ask groups if they want a hint.) If everyone has solved some version, it's fun to share answers using overhead pattern blocks or a document camera (or just taking a field trip around the classroom).

### **Differentiation**

Easiest: use the three unmarked clues (no + or o in the top right). These can be solved with squat hexagons that look like (wait for it) the Denny's Restaurant sign.

- Hint: Hexagons don't have to be regular.
- (three clue version ONLY) Hint: Hexagons don't have to be equilateral.

Medium: add the o clue ("equilateral") to the unmarked clues. These need chevrons.

- Hint: Hexagons don't have to be convex.
- Hint: Try drawing some possible concave hexagons.

Hard: add a fifth clue (one of the + clues).

- (triangle clue added) Hint: triangles don't have to ALL touch each other.
- (two internal hexagon clue) Hint: The internal hexagons don't have to be regular (or concave).

Hardest: all clues together.

Extension: find multiple solutions to the Hardest.

### **Source**

Eric Hsu adapted an activity by David Masunaga.