Houses: Task Card

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**Objectives**

* Learning group roles and practicing group norms
* Engaging in problem solving and generating multiple strategies
* Taking on students’ perspectives
* Making mathematical connections
* Experiencing rich mathematical tasks

## Part 1

1. The Facilitator reads (or chooses someone to read) all of Part 1 and makes sure everyone understands before beginning the task.
2. Work individually for 3 minutes on the task below. It is okay if you do not finish.

Below is a picture of three houses in a row. This has a total of 11 outside edges. Imagine a row of 86 of these houses. Without drawing out all the houses and without counting the sides one by one, figure out how many outside edges there would be.

1. Each person shares their thinking about the task. Each person speaks without interruption the first time. After everyone has had a chance to share their thinking, the group tries to reach consensus about which strategies will work, how to represent them, and what the answer is.
2. As a group you must come up with at least two different strategies for solving this problem. You must be able to explain how these strategies connect to the figures. The Reporter is responsible for ensuring that everyone records information about these strategies *and* the similarities and differences between them.
3. You have 15 minutes to complete Part 1. Check in with the instructor before continuing.

## Part 2

1. Facilitator or someone else reads all of Part 2 and makes sure everyone understands before beginning the task.
2. Imagine that you have a row of 35 houses. How would each of your strategies apply to this situation?
3. Imagine that you have *any number* of houses in a row. Imagine you are in middle school and have not yet learned about variables: Using words (no variables), use one of your strategies to write directions for how someone could find the number of outside edges for any number of houses.
4. Shorten your rule by using one or more variables. Be sure to define your variable(s).
5. You have 15 minutes to complete Part 2. Check in with the instructor before continuing.

## Part 3

1. The Resource Manager gets chart paper and markers from the instructor. Facilitator or someone else reads all of Part 2 and makes sure everyone understands before beginning the task.
2. Create a poster that
   1. explains two different strategies and how they connect to the figures, and
   2. ***discusses the similarities and differences between these strategies***.
3. I will choose which team member will present the information, so make sure your entire team is prepared to present the information to the whole class.
4. You have 10 minutes to complete Part 3. Check in with the instructor before continuing.

## Extension

1. Consider some of the ideas in the list below and either (i) complete the explanation (for instance filling in missing details and/or drawing pictures to clarify their method) and then shorten it with variables, or (ii) add an accompanying written explanation and pictures that connects the algebraic rule to the figure.
   1. The first house has 5 sides. Each new house adds 3 more sides.
   2. 3*x* + 8
   3. Every house has 5 outside edges. But then I have to subtract 2 sides for each of the middle houses, and 1 side for each of the end houses.
   4. 5*n* – 2(*n* – 1)
   5. There are always 5 set sides: Four from the leftmost house plus the one side on the far right end of the picture. Every other house adds 3 more sides.
   6. 3(*n* – 2) + 8
   7. 2*n* + *n* + 2