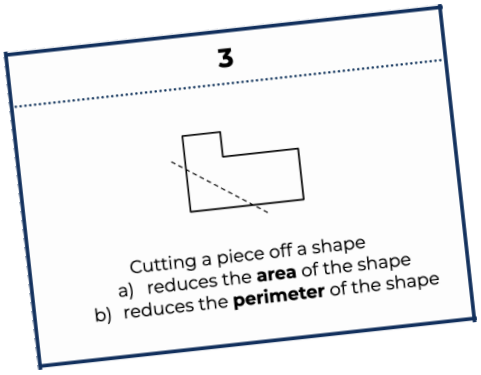
ALWAYS, SOMETIMES, NEVER

What is it and why would I use it?

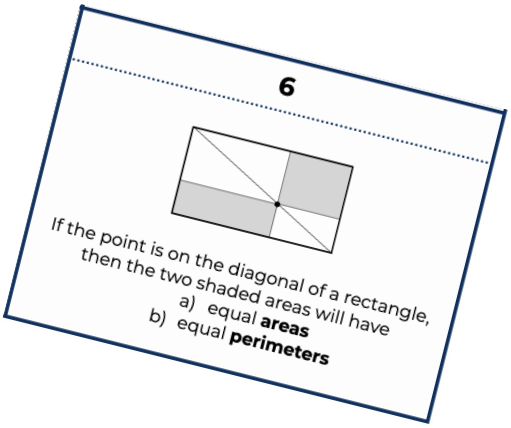
Always, Sometimes, Never is a great task structure for developing students' understanding and proficiency with creating convincing arguments (a.k.a. 'proof'). They are given a series of statements and, for each, need to decide if the statement is always true, sometimes true, or never true. This leads to many productive habits of mind related to proof - looking for counterexamples, investigating extreme cases, and identifying that several examples do not constitute 'proof.'



For these reasons, this task structure is great for developing Math Practice Standards #3 (constructing viable arguments) and #6 (attend to precision). Always, Sometimes, Never is especially useful in geometry, but can be used across many other domains of mathematics as well.

What are some helpful tips for using this task structure?

- Have students form three different columns or groups on their desk - one for always, one for sometimes, and one for never. They can put a card in the appropriate group once they have decided where it belongs. This will help you visually assess student understanding and progress.



- If you are having students work collaboratively on these activities, emphasize that *everyone in the group* should be able to justify the group's decision. They shouldn't place a card until this qualification is met.
- As you circulate, you can help hold students accountable for this by selecting a card and *randomly* selecting a student to explain why they decided to place the card in this category. Use a visibly random selection method so that students know you aren't 'picking on' any particular student.
- You might consider requiring students to produce visuals or explanations for each of their card placements.

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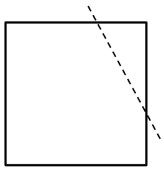
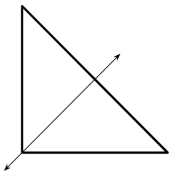
Decide if each statement below is **always true**, **sometimes true**, or **never true**. If you decide the statement is always true or never true, you must be able to prove this to a skeptic. If you decide the statement is sometimes true, you must specify the conditions that would make it true.

1



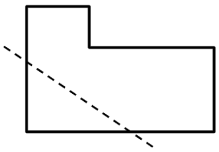
Cutting a corner off a square turns it into a pentagon.

2



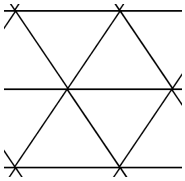
Triangles have a line of symmetry

3



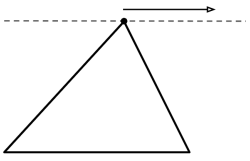
Cutting a piece off a shape
a) reduces the **area** of the shape
b) reduces the **perimeter** of the shape

4



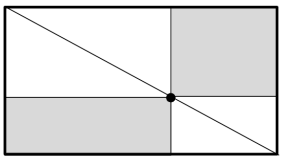
Triangles tessellate

5



If you slide the vertex of a triangle from left to right,
a) the **area** stays the same
b) the **perimeter** stays the same

6



If the point is on the diagonal of a rectangle, then the two shaded areas will have
a) equal **areas**
b) equal **perimeters**

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1	2
If you add two odd numbers together, the sum will be even.	When you multiply two numbers, you will get a bigger number.
3	**4**
If you add three consecutive whole numbers, the sum will be divisible by three.	If you add four consecutive whole numbers, the sum will be divisible by four.
5	**6**
$\sqrt{3x} = \sqrt{3} \cdot \sqrt{x}$	$\sqrt{3 + x} = \sqrt{3} + \sqrt{x}$

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1	2
Half of the students who took a test will get a score below average	In a class of 27 students, nobody will score exactly average
3	**4**
If the teacher gives everyone in the class 3 extra points on the test, the class average will also increase by 3 points	If the teacher gives everyone in the class 3 extra points on the test, the standard deviation will also increase by 3 points
5	**6**
If the teacher gives doubles everyone's score on the test, the class average will also double	If the teacher doubles everyone's score on the test, the standard deviation will also double