

# What's My Pattern (or, the 2-4-6 Puzzle)

**Math concepts:** logic and deduction, scientific reasoning

**Equipment:** Paper or White Board

**Duration:** 5 - 15 minutes per lesson, for 1 - 5 lessons.

2, 4, 6 fits the rule. What's your next guess?

## Why we love the 2-4-6 Puzzle

The 2-4-6 Puzzle comes from an experiment by Peter Watson done in 1960 on confirmation bias. It makes a remarkably good activity for a classroom, and one that can help set a very positive tone.

In particular, the 2-4-6 Puzzle reveals confirmation bias, and shows how making mistaken conjectures is the critical way to find out what's really going on. Generalization to other patterns (What's My Pattern) makes the game replayable.

## How to Play

The teacher challenges the class to guess a rule that she knows. To find it, they can offer triples of numbers and she'll tell them whether they fit the rule or not. To start, she puts forward the triple 2, 4, 6, and announces that it fits the rule. The class guesses for as long as they want. When everyone is convinced that they're sure what the rule is, they can guess. However, they're only allowed one guess per day, so if they're wrong, they have to wait until tomorrow to have another shot at finding out what the rule is.

What's the rule? The numbers have to be in ascending order. So 8, 10, 12 follows the rule, but so does -1, 121, 130.5. On the other hand, 2, 2, 3 and 3, 2, 1 fail. Sometimes students will guess the rule in 10 minutes, sometimes it will take much longer, and sometimes people will be convinced that there's a much more complicated rule that explains their data. But once students get the idea to guess sequences that will break their theories rather than support them, forward progress becomes inevitable!

## The Wrap

When students are ready to make their guess, let them. If it's right, tell them. If it's wrong, stop the game for the day, and say they can come back to it later. This will teach them to take their guess seriously.

What this game shows is that we all have a tendency to avoid "wrong" guesses, and favor safe guesses, which will follow the rule. Having a discussion about which guesses were most useful can be fascinating. Often, it was the guess that seemed ludicrous at the time that actually proved the most helpful. Being willing to be wrong, and taking feedback as data rather than as judgment, in other words, lets us learn faster. This lesson is so valuable in a math class that it can be worth doing this game early to set a positive tone.

## Tips for the Classroom

1. Record every guess. Have a board set up for guesses that work, and another set up for guesses that don't.
2. Don't give hints.