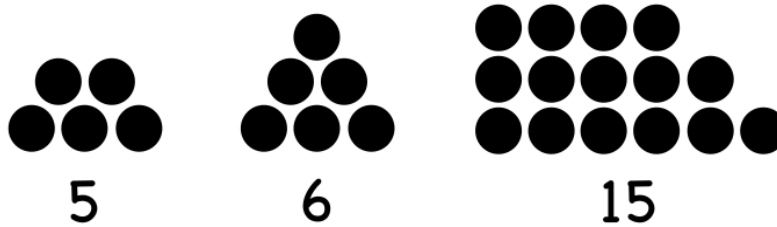


# Puzzle of the Week

## *Trapezoidal Numbers – 1*

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**Trapezoidal Numbers** are the sum of two or more consecutive numbers. They deserve their name because you can make a trapezoid with that many dots, as pictured in the examples below. Note that having 1 dot on the top row is stretching the idea of being a trapezoid a bit, but it is allowed for these numbers.



**THE CHALLENGE:** Show that every odd number is a Trapezoidal Number.



**EXPLORATION:** Can you find some even numbers that are Trapezoidal Numbers? Can you find some that aren't?

# Puzzle of the Week

## *Trapezoidal Numbers – 1 – Notes*

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**THE CHALLENGE:** Every odd number is of the form  $2n + 1$ . Because  $2n + 1 = n + (n + 1)$ , that shows every odd number, larger than 1, is a Trapezoidal number..

**EXPLORATION:** Among the first few even numbers, we have the following:

- 2: Not trapezoidal
- 4: Not trapezoidal
- 6:  $6 = 1 + 2 + 3$
- 8: Not trapezoidal
- 10:  $10 = 1 + 2 + 3 + 4$
- 12:  $12 = 3 + 4 + 5$
- 14:  $14 = 2 + 3 + 4 + 5$
- 16: Not trapezoidal

It looks like powers of 2 are never trapezoidal. Will follow that up in a later Puzzle of the Week.