Lesson: An Average Sidetrack

Tell Students:

1. I'm going to have each of you roll 10 standard die and add up your total score.
2. Before doing this I want each of you to make a guess at what your total will be, AND I want you to guess what the total for the whole class added together will be.
3. Go ahead. Write your guesses down on a piece of paper and start rolling!

Tally the Class Results:

Ask: Does anyone notice any connection between the class total and the numbers on the die?

Discussion Prompts:

1. What was the smallest possible the class total could have been?
   [Answer: $1\times$ the number of students]
2. What is the biggest possible the class total could have been?
   [Answer: $6\times$ the number of students]
3. Roughly where did we end up?
   [Answer: roughly in the middle]
4. Suppose we had used the 333333 die? What would you expect?
   [Answer: $3\times$ the number of students]
5. How about the 222266 die?
   [Answer: closer to 2 than 6]

Define the Average Roll

$$\text{average roll} = \frac{\text{sum of all possible rolls}}{\text{number of possible rolls}}$$

So for a standard six-sided die

$$\begin{aligned}\text{average roll} &= \frac{1+2+3+4+5+6}{6} \\ &= \frac{21}{6} \\ &= 3\frac{1}{2}\end{aligned}$$

Discussion Prompts:

1. Is it possible to roll the average roll?

   [Answer: NO!]

2. What happens the more rolls you make?

   [Answer: as a general rule, you'll end up close to about $3\frac{1}{2}\times$ your number of rolls. Encourage them to try it!]