Chain Reaction

The Big Idea:

It's always cool to see a row of dominos topple each other in a ripple. But it turns out a domino can knock over a bigger object. If you keep going with that, one teeny piece can knock over a giant one!

You Will Need:

- ★ Thin rectangular objects that can stand on end, e.g. books, cereal boxes, pieces of wood
- ★ Measuring tape or ruler

The Math Behind the Scenes:

When objects balance on end, it doesn't take much to knock them over. This video shows that an object can knock over one that weighs 1 1/2 times as much. Do that over and over, and you see the effects of "compounding" – the same math we use to figure out how interest makes a bank account grow.

Ripple Effect

Here's how you can create your own line of objects that will fall in a chain reaction.

1. Place your objects in order from shortest to tallest.
2. Test each object's ability to knock over the one that would be next in line. Each object needs to weigh at least half of the next one – if an item is too lightweight, it won't knock over the next.
3. Pick a spot on the floor where you can stand them up in a line.
4. Stand the first object on end and measure its height. Then place the next object at a distance smaller than that height so it can reach. Use your measuring tape or ruler to guide you.
5. Repeat the process to add each new object to the line.
6. Once everything is in place, tip over the first, smallest object, and watch everything fall!

Math Teasers

Try as many questions as you can! Answers upside-down below.

PreK: How many things did you collect for your chain reaction? Count them up!

Kindergarteners: As your objects fall, how would you count down from the total number down to 1? Count down to 1!

1ˢᵗ- graders: Each object has to reach the next one, so they have to be close enough together. If a 10-inch book tips over and the next one is just 4 inches away, how much less is that than the height of the book?

2ⁿᵈ-graders: If you have 5 objects in a row and they're all spaced 10 inches apart, how far apart is the 1ˢᵗ object from the 5ᵗʰ?

3ʳᵈ-graders: If you have 6 objects in a row and they're all spaced 13 inches apart, how far is the farthest from the closest?

4ᵗʰ-graders: If you start with a 10-inch-tall book, and each knocks over a book that is 4 inches taller, how tall would the 15ᵗʰ book be?

5ᵗʰ-graders: If you have 8 dominos and the last is 112 inches from the first, how far is each domino from the next if they're evenly spaced?