

A MATHEMATICIAN AT PLAY

# The power of saying "I don't know"

Have you ever been in a position where saying "I don't know" eventually lets you know the information you are seeking? **Daniel Finkel** gives you four meta-puzzles that illustrate the power of saying "I don't know". By just saying that, the characters in these puzzles reveal information that leads us to the answers. Get cracking now...

One of my favourite class of logic puzzles are meta-puzzles. These are puzzles that require a kind of mathematical empathy. The information you need may be out of reach, but the characters in the story know enough that you can imagine yourself in their minds, and somehow solve the puzzle based on their reactions.

I made up these meta-puzzles to see how powerful it could be when someone says *I don't know*. Let's try a few!

## PUZZLE 1

Abby and Bill each secretly choose a whole number between 1 and 9.

**Abby** I don't know if the sum of our numbers is a 2-digit number. Do you know?

I don't know. **Bill**

**Abby** I wasn't sure before, but now I know the sum is a 2-digit number.

What is Abby's number?

## PUZZLE 2

Abby and Bill each secretly choose a whole number between 1 and 30.

**Abby** Is your number twice my number?

I don't know. Is your number twice my number? **Bill**

**Abby** I don't know. Did we pick the same number?

We did. **Bill**

What number did Abby and Bill pick?

## PUZZLE 3

Abby and Bill pick numbers from 1 to 40.

**Abby** Is your number half mine?

I don't know. Is your number half mine? **Bill**

**Abby** I don't know. Is your number half mine?

Yep. **Bill**

What numbers did Abby and Bill pick?

## PUZZLE 4

Abby chose five distinct numbers from the set  $\{1, 2, 3, 4, 5, 6, 7\}$ .

If she told Bill what the product of the chosen numbers was, that would not be enough information for Bill to figure out whether the sum of the chosen numbers was even or odd. What is the product of the chosen numbers?

Dan Finkel is the founder of Math for Love, an organisation devoted to transforming how math is taught and learned. He is the creator of mathematical puzzles, curriculum, and games, including the best-selling Prime Climb and Tiny Polka Dot.