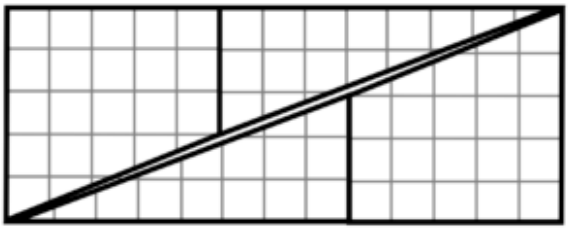
The Magic Checkerboard – Solution

go figure

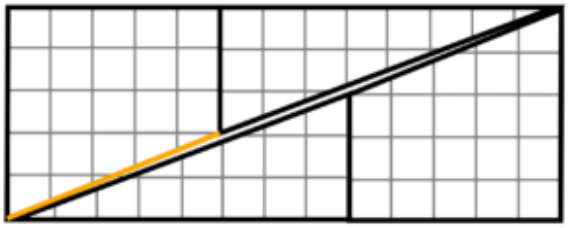
"Ohhh, I see," Janelle said, after a long pause staring at the rectangle. "It doesn't line up all the way!"

"What do you mean?" Terrence asked his big sister.

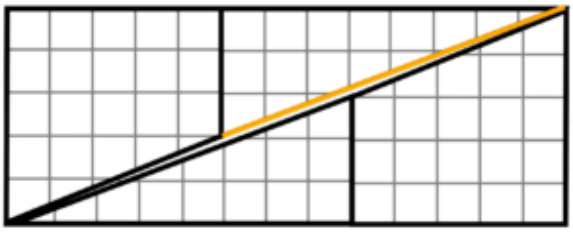
"There's a really thin slit on the diagonal that's not covered with paper," Janelle explained, and she pulled apart the pieces of paper just slightly so the slit was more visible.



"Look at the slope of the diagonal cuts," she continued. "This short one has a slope of 2/5…"



"… and this long one has a slope of 3/8, which is smaller."



Terrence frowned. "How do you know 3/8 is smaller, and why does that explain it?"

Amy reached for a pencil. "You can put them over the same denominator," she said, and wrote it out:

$$\frac{2}{5} = \frac{16}{40}$$

$$\frac{3}{5} = \frac{18}{40}$$

Janelle finished the explanation. "A smaller slope means the 3/8 doesn't go up as fast as the 2/5 does. That's what makes a little space for the slit."

"Oh, I get it now," said Terrence after staring at the rectangle one more time. "Nice one, Sarah!"