

# Comparing Products

## Task

Leo and Silvia are looking at the following problem:

How does the product of  $60 \times 225$  compare to the product of  $30 \times 225$ ?

Silvia says she can compare these products without multiplying the numbers out. Explain how she might do this. Draw pictures to illustrate your explanation.



## Commentary

The purpose of this task is to generate a classroom discussion that helps students synthesize what they have learned about multiplication in previous grades. It builds on

Apply properties of operations as strategies to multiply and divide.

and

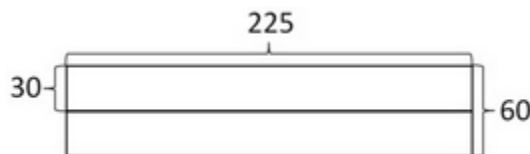
Interpret a multiplication equation as a comparison.

## Solution

Since 60 is twice 30, the product  $60 \times 225$  is twice the product  $30 \times 225$ . We can write this as an equation:

$$60 \times 225 = (2 \times 30) \times 225 = 2 \times (30 \times 225).$$

The above explanation corresponds to the following picture.



The area of a 225 by 60 rectangle ( $60 \times 225$ ) is double that of a 225 by 30 rectangle ( $30 \times 225$ ). If we scale the width of the rectangle by a factor of 2, then the area of the resulting rectangle doubles. In other words, if one of the factors of the product  $30 \times 225$  is scaled by a factor of 2 then the product is scaled by a factor of 2.