



[Video Link](#)

## Halving

### Summary

Students create pictorial representations of multiplication using Grasplify to investigate the mathematical strategy of halving, which is more multiplicative in nature than repeated addition.

### Tasks

1. Project  $4 \times 5 = 20$  for students to see. Explain that the product is twenty. Ask students to halve the product by only changing the pips. Once done, halve the product again to make five.



### TEACHER TIP

Instead of starting from the left, you can make  $20 = 5 \times 4$  by starting on the right side of the screen. It's a good idea to use both directions to help students see that the equal sign does not always have to be on the right. This also provides an opportunity to discuss the meaning of the equal sign with students.

2. As pairs successfully complete the given task, Challenge them to find other ways to halve the product.

### What to Watch For

- Ensure that pairs have halved the product by changing the pips, which is multiplicative rather than repeated addition. When first given this task, many pairs halve the product by dragging pods to the trash.
- Students will have to shift from adding more pip-fingers to removing half their pip-fingers each time.
- Pay attention to the "choreography" students are using. For example, if a student places 3 fingers from her left hand as well as 3 fingers from her right hand on the pip-side, she can halve the product by lifting one hand. Similarly, if two students each have four fingers on the pip-side, they can halve the product if one of the students takes her fingers off.

### Questions to Ask

- *What do you have to do next in order to halve the product so that it becomes ten?*
- *Which side do you need to lift your fingers?*
- *How is doubling different than halving?*
- *Did you notice anything about halving that is similar to doubling?*

### Extending Student Learning

- Early finishers can be challenged to try halving the product of  $8 \times 5 = 40$  by only changing the pips. Prompt them to try halving  $40 = 5 \times 8$ .
- Students can also be challenged to halve  $10 \times 5 = 50$  which would quickly produce a problem (halving 25).
- Be sure to try an challenging question like  $3 \times 7$ , and ask about halving.
- In a move towards the more general, ask students if they had an unknown number of pips and 4 pods, what would they do to halve?

### Assessment

1. Rekha has made  $32 = 4 \times 8$  in Grasplify. Show or explain two different ways she could halve that product to get 16.
2. Draw a picture or explain in words why halving is the opposite of doubling.