Maximising the Product – Part B

Video Link

Summary

Students continue to create square numbers. This task is an arithmetic version of what students will later see in algebra, when they work with the product of binomials.

Task

1. Have students place two fingers along the left side and two fingers along the bottom to produce four and then increase each factor by one. Have them draw a sketch of what they see. Then use Zaplify again to make 3 x 3 and increase each factor by one. Have them draw another sketch of what they see. Have them predict how many new points will appear if they increase each factor by one in 4 x 4? Then have them draw a picture showing this prediction.

What to Watch For

- Prompt students to work as a pair by taking turns. While one student holds their fingers and increases the product, the other student draws a sketch. Prompt students to use pencil crayons to depict the intersection points.
- Some students might add lines to an existing sketch. If that happens, prompt them to make a separate sketch for each situation and compare all of them at the end. They can make their drawing on the iPad, using the built-in drawing app—they might even want to start with a screen image of, say, 3 x 3, and simply add on the required elements.

Questions to Ask

- *When you added a finger, how many more intersection points did this create?*
- *Do you see a relationship between the number of points that are created by each finger?*
- *The second finger creates one more point than the first finger does. What do you think caused this additional point?* Draw students' attention to the intersections between the lines.

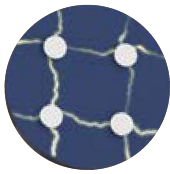
Extending Student Learning

- Early finishers can be asked to add more than one finger to the factors and to predict what would happen by making a quick sketch.

TEACHER TIP

We want students to notice that there's an extra orange point that must be counted, in addition to the horizontal and vertical lines, which is the result of the covarying of the factors.

Maximising the Product – Part C



Video Link

Summary

Students continue to maximise the product. This task poses a restriction on the number of fingers to direct students' attention to the covarying relationship between the factors and the product.

Task

1. Have students find out if it is possible to make a product larger than twenty-five using exactly ten fingers.

What to Watch For

- Some students might have difficulty starting the task. If this happens, prompt them to make a product they are familiar with (perhaps 3 x 4 = 12) and then change the factors to try to get a bigger product. Ask them to try different combinations by changing the locations of their fingers.
- Some students might use less than ten fingers. If that happens, prompt them to press exactly ten fingers down.
- Some students might aim to produce 10 by using less than ten fingers. If that happens, explain that the total number of fingers should be 10, not the product.

Questions to Ask

- *What is the smallest product? With which factors did you produce it?*
- *What is the largest product? Which factors did you use?*
- *Do you see any connection between the factors and the size of the product?*
- *How does the difference between the factors change as the product increases?*

Extending Student Learning

- Early finishers can be asked to make the largest product using only 11 or 12 fingers. They might also try to predict the largest products for larger numbers, without using Zaplify.