Maximising the Product – Part A

Summary

Students investigate the covarying relationship between each factor and the product by changing the factors and observing how each factor changes the product differently. By comparing how the factors interact to increase or decrease the product, students try to determine how to maximise the product.

Task

1. Have students make a product of six using the factors two and three and then predict where to place one more finger on the screen to maximise the product. Encourage them to predict what the new product will be. Then students try it out. If their prediction was incorrect, encourage them to figure out why. If their prediction was right, how did it work?

2. While projecting 3 x 3 on the screen, ask students where to place one finger to maximise the product. Ensure that students understand that for square numbers it doesn't matter whether they increase the horizontal lines or the vertical lines by one to maximise the product.

| A Square Number | 1 More Vertical Lightning Bolt | 1 More Horizontal Lightning Bolt |

What to Watch For

*   Remind pairs to make their predictions first and then try it out on Zaplify.

*   Some students may lift their fingers as soon as they place them on the screen. Prompt them to hold their fingers on the screen until the end of the task.

*   Once students have created 2 x 3 = 6, if they add multiple fingers to maximise the product, prompt them to start over, reminding them that they can only use only one finger in this task.

Questions to Ask

*   *What happened when you made a horizontal line? How many new points appeared on each vertical line? How many new points in total appeared? Is there another horizontal line with the same number of points?* In order to draw attention to the multi-plying aspects of multiplication, ensure that children explain what happened on the vertical lines when another horizontal line was created.

*   *Do you notice anything about the three-ples?* Draw attention to the number of points on each horizontal line and the relationship between the points and the number of vertical lines.

*   *When you increased this factor (point to the horizontal lines) to maximise the product, what was happening that caused the product to increase more?*

Extending Student Learning

*   Early finishers can be challenged with a more open task, *Place as many fingers as you want on one side of the screen. Your partner will place as many fingers as they want on the other side of the screen. Which factor should you increase by one to maximise the product?* Students can continue to play this game by taking turns.

*   You can extend this task by asking students, *Place two fingers along the side and three along the bottom to produce six. Your partner can put two more fingers on the screen. Where should they be placed to maximise the product? Where should they be placed to minimise the product?*

*   Ask students to find as many products as they can and to record these products.

Assessment

1. How will the product change if you increase the first factor from 13 to 14?

2. How will the product change if you increase the second factor from 11 to 12?

Explain your answers by drawing on the picture of 13 x 11= 143 above.