

Using the Array Model to Develop Prospective Teachers' Understanding of Multiplication and its Properties



Dana Olanoff Widener University dolanoff@widener.edu Neet Priya Bajwa Illinois State University nbajwa@ilstu.edu **Ziv Feldman**Boston University
zfeld@bu.edu

Eva Thanheiser
Portland State University
evat@psu.edu

Rachael M. Welder
Western Washington University
rachael.welder@wwu.edu

Jennifer M. Tobias Illinois State University jtobias@ilstu.edu

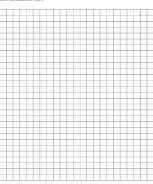
Task Goals: For prospective teachers to:

- Recognize that a product can be found by summing, or combining, partial products, and that this procedure can be modeled by decomposing a rectangular array into different regions.
- Use a rectangular array model to make sense of the distributive property of multiplication over addition as a driving force behind the partial products (by place value) and the standard algorithms.

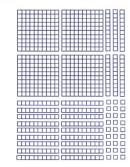


Name

Any has a fiver that the wants to distribute to everyone in her college. She walks into the campus until room and sees the town of mailbours. She has to determine how many mailbours have a see to his lown how many copies not they when seeds to make Help Jump figures out how many mailbours there are uning the picture below. See if you can do this in at least 3 different ways. Use on his picture below to represent only one way. For each strategy, explain why it makes mathematical seems.



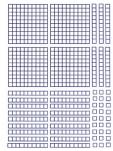
2. Does this model represent the mailbox problem? If so, how? Please provide your reasoning.



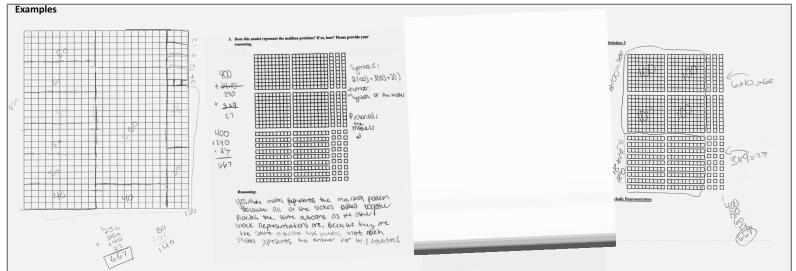
Reatoning:

Use the base ten block model in 3 different ways to find how many mailboxes there
are total. Write a symbolic representation that matches what you did with the





Symbolic Representation



Key Findings:

- Most PTs recognized that a product can be found by summing, or combining partial products by breaking the rectangular array into different regions.
- 2) While some PTs were successful in making the connection between the factors and their representation using the base-ten blocks, many struggled to make this connection and instead focused on the total number of squares represented in the array model.