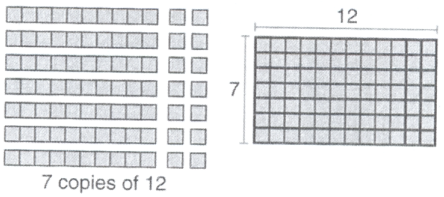
Activity Set 3.3: Multiplying with Base-Ten Pieces MAT 221

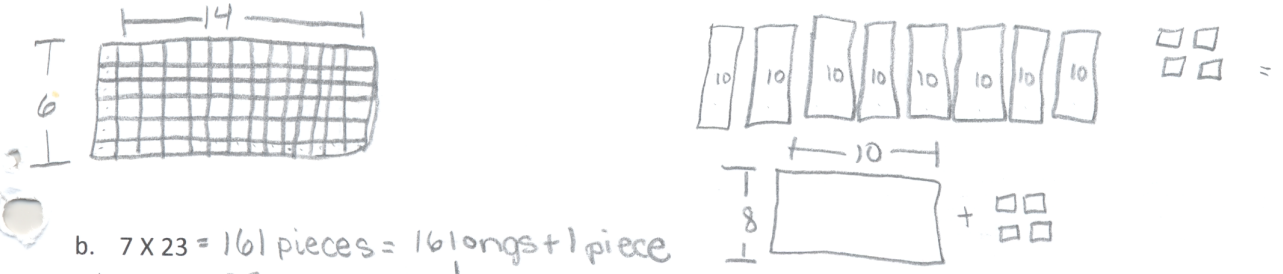
Purpose: To use base-ten pieces to build visual models for multiplication.

1. The product 7 X 12 can be represented with base-ten pieces as 7 copies of 12. When the pieces are pushed together, they form a rectangle with dimensions 7 X 12. By regrouping the base pieces to form a minimal collection of 8 longs and 4 units, we can determine that the product is 84.

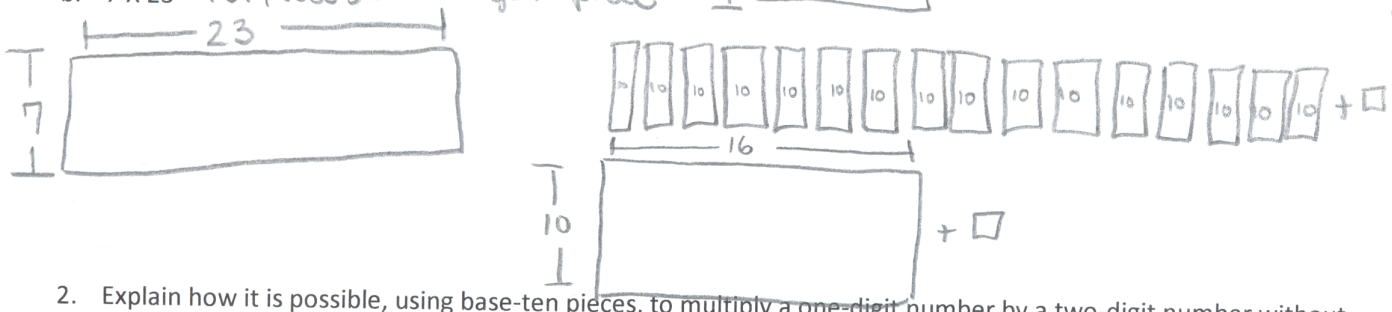


Determine the following products by forming rectangles with your base-ten pieces and then regrouping to obtain the minimal collection. Sketch each rectangle of base-ten pieces, and write the numeral representing the minimal collection beneath it.

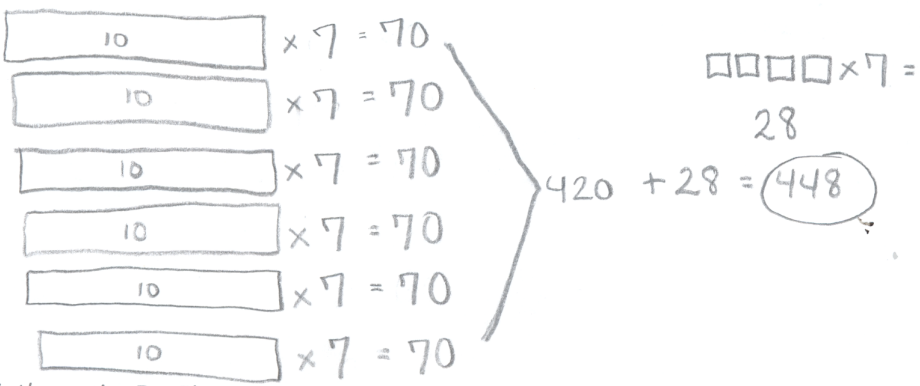
a. 6 X 14 = 84 pieces = 8 longs + 4 pieces



b. 7 X 23 = 161 pieces = 16 longs + 1 piece

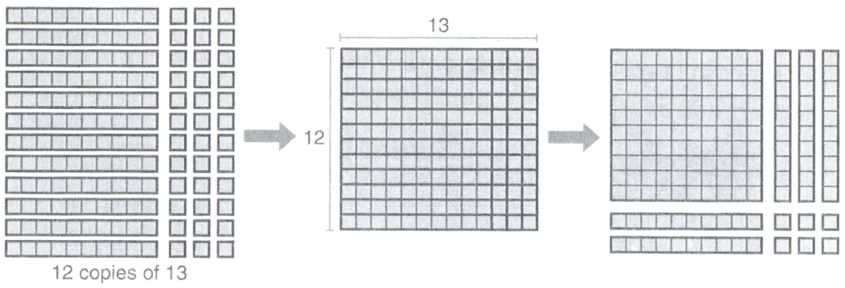


2. Explain how it is possible, using base-ten pieces, to multiply a one-digit number by a two-digit number without using any multiplication facts. For example, think of representing 7 X 64 with your base-ten pieces. Draw a diagram to illustrate your explanation.



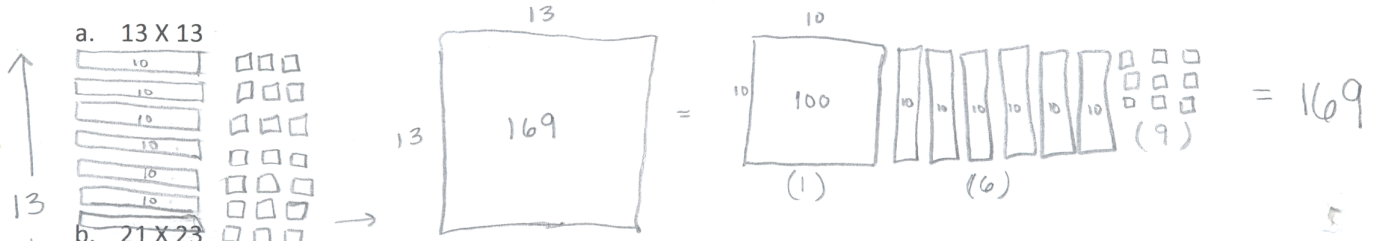
1. Draw out base ten
2. Explain breaking into longs and pieces
3. Show, draw, or multiply to show each part times seven
4. Add up all products

3. The product 12 X 13 is represented below with base-ten pieces as 12 copies of 13. When pushed together, the pieces form a rectangle with dimensions 12 X 13. Several exchanges can be made without affecting the dimensions of the rectangle. Ten longs can be exchanged for 1 flat, and groups of 10 adjacent units can be exchanged for longs. The resulting rectangle is composed of 1 flat, 5 longs, and 6 units, so the product of 12 and 13 is 156.

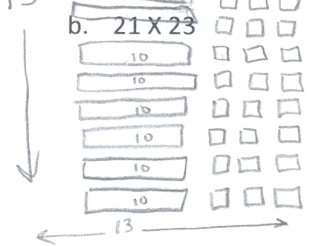


Use your base-ten pieces to determine the following products. Make exchanges when possible, and use as few base pieces as you can when building your rectangle. Sketch each rectangle, regroup to show the minimal set of base-ten pieces, and record the numeral for this collection.

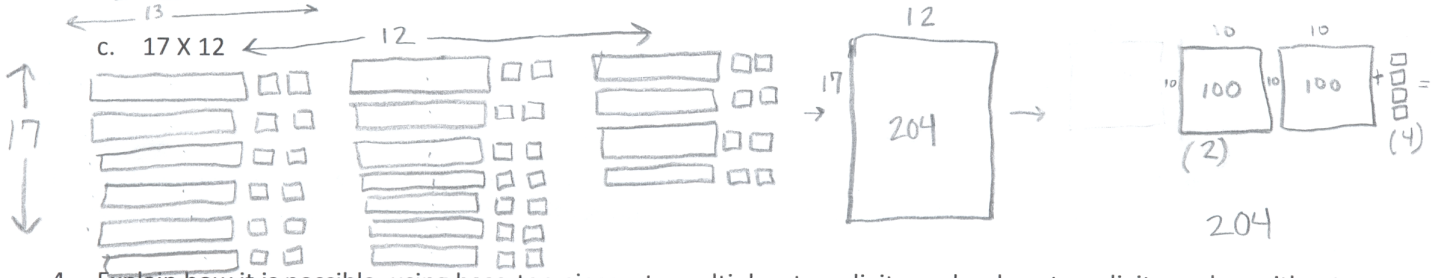
a. 13 X 13



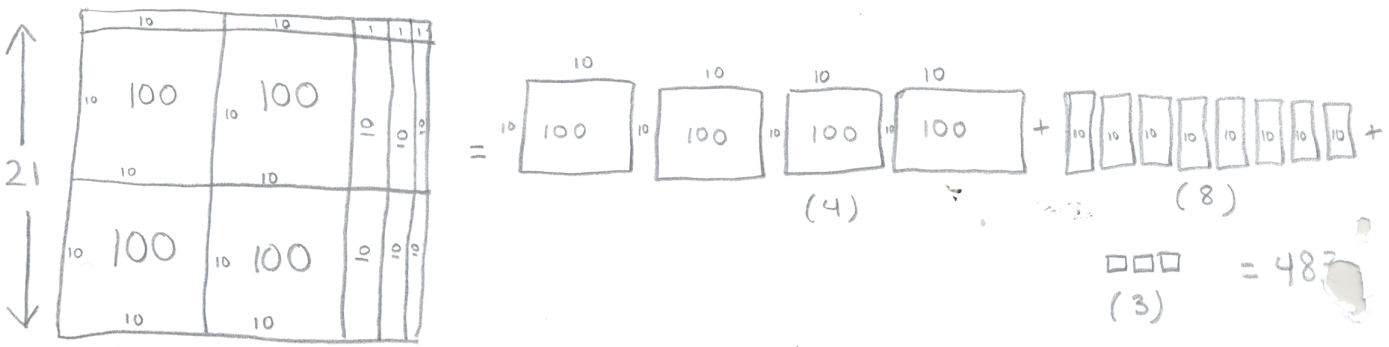
b. 21 X 23



c. 17 X 12



4. Explain how it is possible, using base-ten pieces, to multiply a two-digit number by a two-digit number without using any multiplication facts. Draw a diagram to illustrate our explanation for 21 X 23.



← 23 →

Activity 3.3 #2