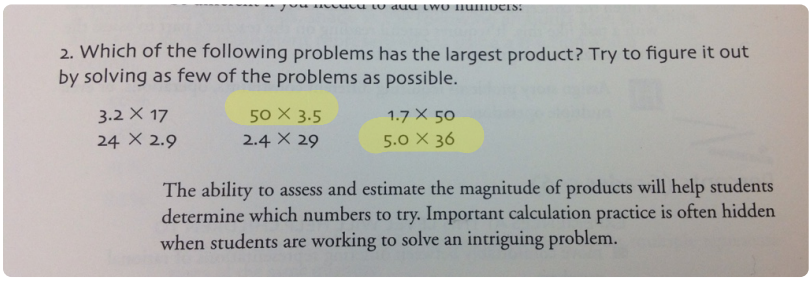
Learning Goal
We are learning how to multiply whole numbers by tenths, and that the strategies we use for multiplying whole numbers are the same as the ones for multiplying decimal numbers.



2. Which of the following problems has the largest product? Try to figure it out by solving as few of the problems as possible.

3.2 × 17 50 × 3.5 1.7 × 50
24 × 2.9 2.4 × 29 5.0 × 36

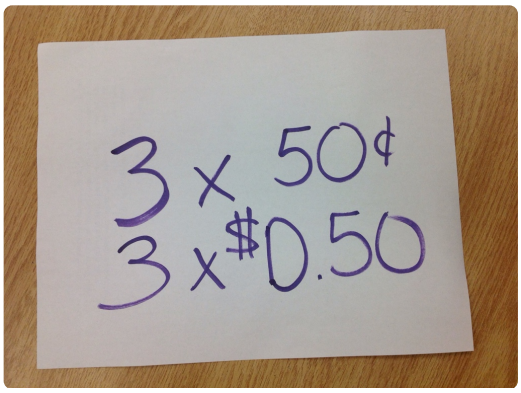
The ability to assess and estimate the magnitude of products will help students determine which numbers to try. Important calculation practice is often hidden when students are working to solve an intriguing problem.

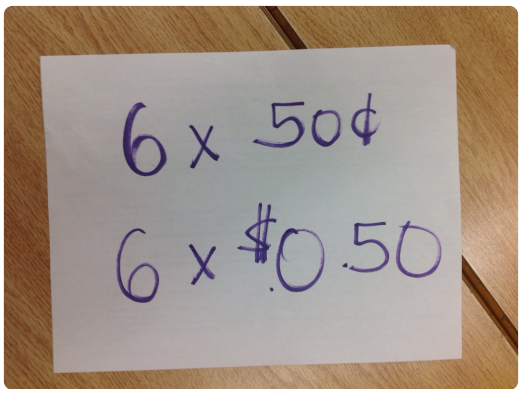
Minds On
Which of these has the largest product? Using estimation, decide which one.

50 x 3.5 has more value than 50 X 1.7....

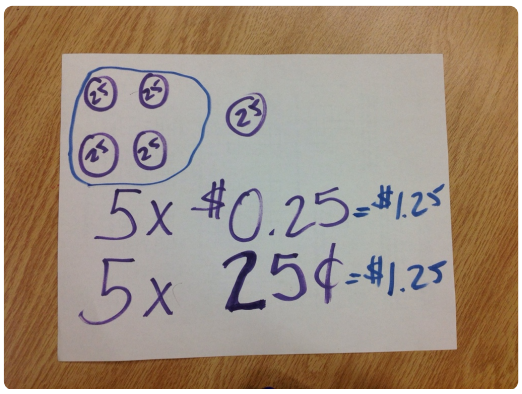
5.0 x 36, rounding up to 40
Students having difficulty understanding the magnitude or quantity being represented by a decimal number, think that estimating means rounding, but rounding too far from the original number.

Rethinking our Minds On





Can you give me an amount of money between 0.28-0.53?



And in another class we tried a string, with base ten

$10 \times 2.35 =$

Student-I just moved a place value, and then I got 235
-I used the same strategy, but I got 23.5
-I broke it up

$2 \times 10 = 20$

$10 \times 0.3 = 3$

$0.05 \times 10 = 0.5$

$20 + 3 + 0.5 = 23.5$

Next string

$0.1 \times 4 =$

I got 0.4 $4 \times 1 = 4$

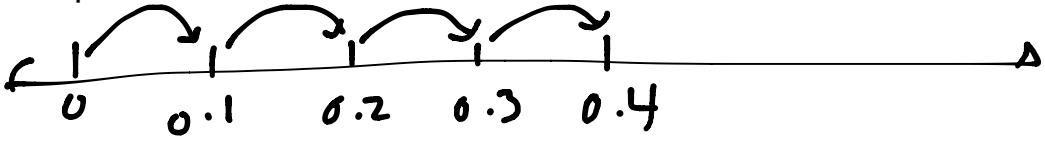
How does the 4 become 0.4?

$0.1 \times 10 \times 4 = 4$

$4 \div 10 = 0.4$

If you x by 10, then you have to divide by 10

I did an open number line and added 0.1 four times



Next string

$0.3 \times 4 =$

I did $\frac{3}{10} \times 4 = \frac{12}{10}$ (Divide 12 by 10)

$= 1.2$

I did $0.3 \times 2 = 0.6$

$0.3 \times 2 = 0.6$

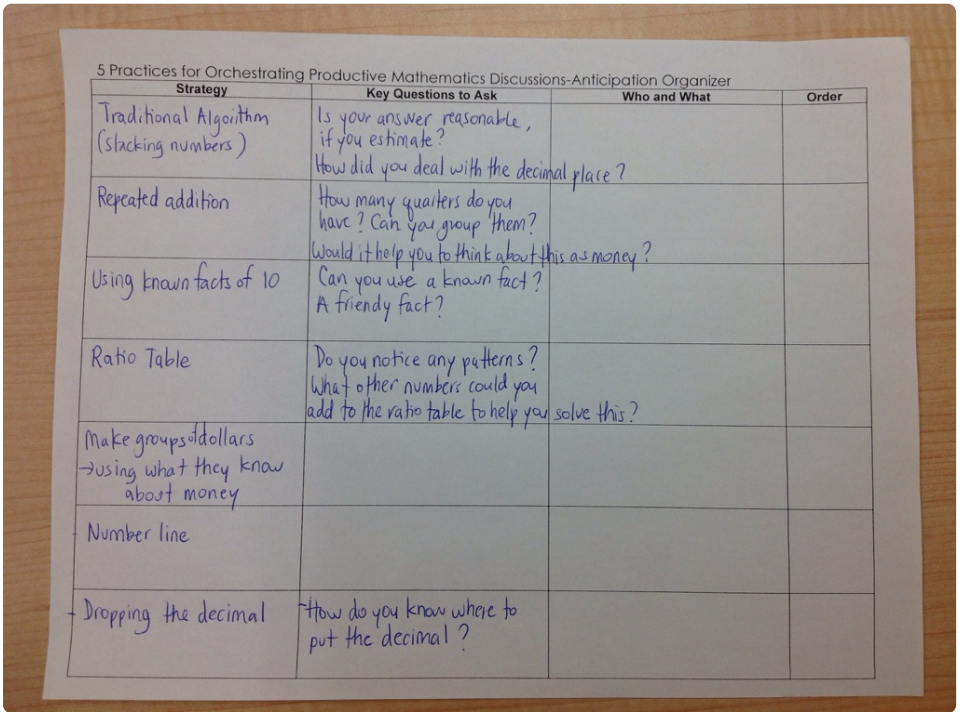
$0.6 + 0.6 = 1.2$

Teacher-take out the base ten, the rod is the whole, represent 0.3 x 4

Does everyone see where the 1.2 come from?
Student- I thought the answer was in the question...
Teacher- when can we just move the place value?
S-when we are multiplying by 10

Show 0.05x4

Most students counted out 5 units, and made four groups, found that it was 20 hundredths, or two tenths, and were able to show both as decimals

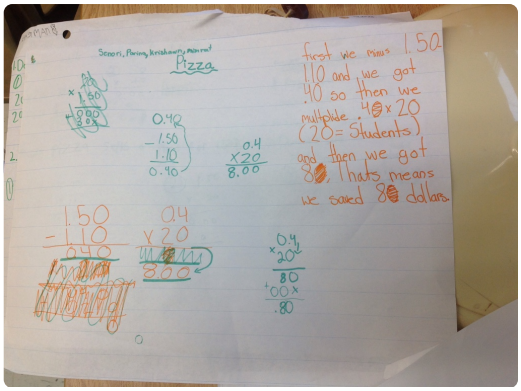


5 Practices for Orchestrating Productive Mathematics Discussions-Anticipation Organizer

Strategy	Key Questions to Ask	Who and What	Order
Traditional Algorithm (stacking numbers)	Is your answer reasonable, if you estimate? How did you deal with the decimal place?		
Repeated addition	How many quarters do you have? Can you group them? Would it help you to think about this as money?		
Using known facts of 10	Can you use a known fact? A friendly fact?		
Ratio Table	Do you notice any patterns? What other numbers could you add to the ratio table to help you solve this?		
Make groups of dollars → using what they know about money			
Number line			
Dropping the decimal	How do you know where to put the decimal?		

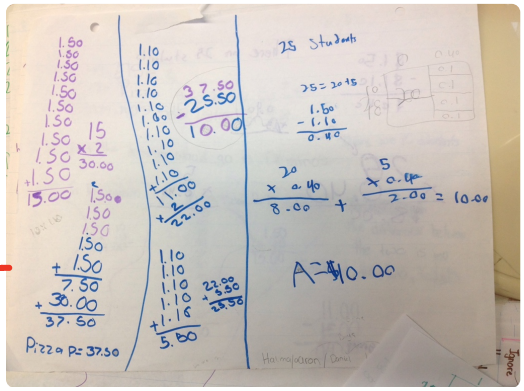
The problem-Working on it
You are planning for a class party and Pizza Pizza is selling slices for $1.50 and Dominos is selling slices for $1.10. How much money would you save if you order from Dominos?

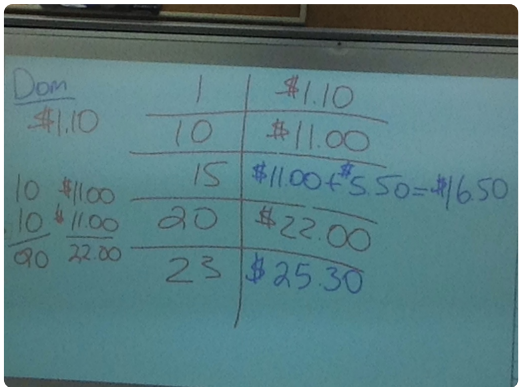
-students are given different class sizes to investigate, based on their entry point (10, 15, 20, 25)

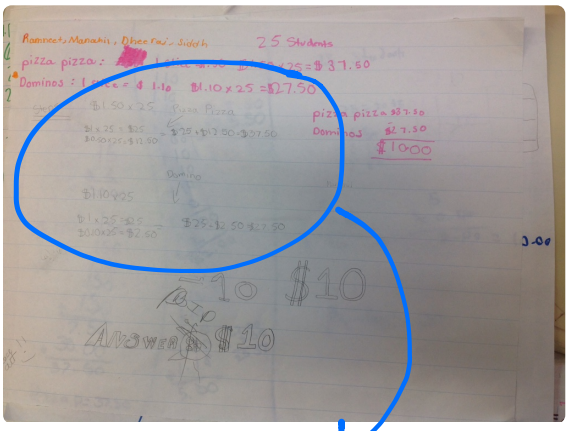


Most students used the traditional algorithm

Some used repeated addition, and found ten, and then added on from there Debrief-use this to model an ordered ratio table after the students share their work with the class





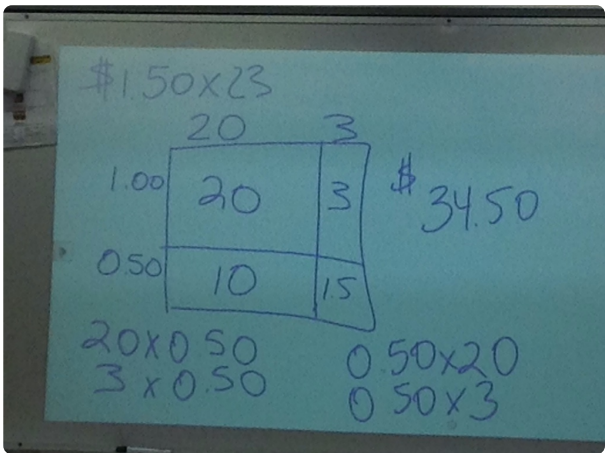


Some multiplied in parts and then added partial products
Debrief-use this to model an open array after this group shares their work with the class

– without decimals

	20	3
100	2000	300
50	1000	150

– with decimals



$3350 → we multiplied $1.50 x 100, so now we need to divide

335.0 ÷ 10 = 335.0

335.0 ÷ 10 = $33.50