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CORWIN

Please enjoy this complimentary excerpt from Figuring Out Fluency - Multiplication and Division With Fractions and Decimals.

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ACTIVITY 2.6

BREAK APART TO MULTIPLY (BY ADDENDS) WORKED EXAMPLES

Worked examples are problems that have been solved. They can be used as a warmup, as a focus of a lesson, at a learning center, or on an assessment. Here we share examples and ideas for preparing worked examples to support student understanding of the Break Apart and other strategies. There are different ways to pose worked examples, and they each serve a different fluency use.

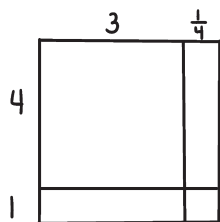
TYPE OF WORKED EXAMPLE	PURPOSES: COMPONENT (FLUENCY ACTIONS)	QUESTIONS FOR DISCUSSIONS OR FOR WRITING RESPONSE
Correctly Worked Example	Efficiency (selects an appropriate strategy) and flexibility (applies a strategy to a new problem type)	What did _____ do? Why does it work? Is this a good method for this problem?
Partially Worked Example	Efficiency (selects an appropriate strategy; solves in a reasonable amount of time) and accuracy (completes steps accurately; gets correct answer)	Why did _____ start the problem this way? What does _____ need to do to finish the problem?
Incorrectly Worked Example	Accuracy (completes steps accurately; gets correct answer)	What did _____ do? What mistake does _____ make? How can this mistake be fixed?

Another excellent practice is to ask students to compare two correctly worked examples (How are they alike? How are they different? How do they compare in terms of efficiency? When would you use each method?). Incorrect examples highlight common errors (as well as successful steps). A common error for the Break Apart strategy with fractions and decimals is to multiply the whole numbers and then multiply the fractions (missing the other two partial products).

CORRECTLY WORKED EXAMPLES																	
FRACTION EXAMPLES	DECIMAL EXAMPLES																
<p>How are these two examples alike and how are they different?</p> <p>Problem: $5 \times 2\frac{1}{4}$</p> <p>Sara's work:</p> $\begin{aligned} &5 \times 2\frac{1}{4} \\ &(4+1) \times 2\frac{1}{4} \\ &(4 \times 2\frac{1}{4}) + (1 \times 2\frac{1}{4}) \\ &9 + 2\frac{1}{4} \\ &11\frac{1}{4} \end{aligned}$ <p>Imani's work:</p> <table style="display: inline-table; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">2</td> <td style="text-align: center;">$\frac{1}{4}$</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">4</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">8</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="padding-left: 5px;">9</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">1</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$\frac{1}{4}$</td> <td style="padding-left: 5px;">$2\frac{1}{4}$</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="padding-left: 5px;">$11\frac{1}{4}$</td> </tr> </table>		2	$\frac{1}{4}$		4	8	1	9	1	2	$\frac{1}{4}$	$2\frac{1}{4}$				$11\frac{1}{4}$	<p>Paul solved 14×4.25 like this:</p> $\begin{array}{r} 14 \times 4.25 \\ \hline 12 \times 4.25 + 2 \times 4.25 \\ \hline 48 + 3 + 8.5 \\ \hline 59.5 \end{array}$
	2	$\frac{1}{4}$															
4	8	1	9														
1	2	$\frac{1}{4}$	$2\frac{1}{4}$														
			$11\frac{1}{4}$														

PARTIALLY WORKED EXAMPLES

Brian chose to use an area model to solve $5 \times 3\frac{1}{4}$.
What should he do next?

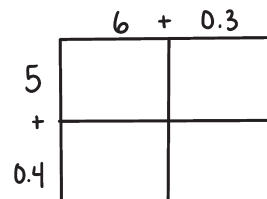


To solve $5 \times 3\frac{1}{4}$, Lara chose to break apart 5. What does she need to do next? Why is this a good method?

$$5 \times 3\frac{1}{4}$$

$$(4 + 1) \times 3\frac{1}{4}$$

To solve 6.3×5.4 , Louise chose to use an area model. Here is how she started:



Georgina chose to use Partial Products. Here is how she started:

$$\begin{array}{r} 6.3 \\ \times 5.4 \\ \hline 30. \\ 1.5 \end{array}$$

How are these two methods alike? Different? Pick the option you like best and complete the work.

INCORRECTLY WORKED EXAMPLES

Carter's work:

$$4\frac{1}{5} \times 6$$

$$4 + \frac{1}{5} \times 6$$

$$(4 \times 6) + (\frac{1}{5} \times 6)$$

$$24 + \frac{6}{5}$$

$$\frac{30}{5} = 6$$

Justin's work:

$$6.7 \times 8.4$$

$$6 \times 8 + 0.7 \times 0.4$$

$$48 + 0.28 = 48.28$$