

Activity 9 Assessment

Mental Math Strategies

Developing Fluency with Whole Number Operations

Understands number relationships and properties and applies them to whole number operations.

$$\begin{array}{ll} ? - 240 = 720 & 50 \times ? = 2000 \\ 720 + 240 = 960 & 2000 \div 50 = 40 \end{array}$$

"I solved each equation using an operation I am comfortable with."

Uses estimation to check reasonableness of solutions.

A forklift can carry 2000 kg. An operator is unloading boxes of shoes weighing 78 kg. How many boxes can the forklift safely carry at one time?
 $78 \times ? = 2000$

"78 is close to 80. I know $80 \times 20 = 1600$ and $80 \times 5 = 400$. $1600 + 400 = 2000$. An estimate of 25 boxes seems reasonable."

Uses mental math strategies to solve single-step equations with larger numbers.

$$\begin{aligned} 78 \times 25 &= (70 + 8) \times (20 + 5) \\ &= (70 \times 20) + (8 \times 20) + (70 \times 5) + (8 \times 5) \\ &= 1400 + 160 + 350 + 40 \\ &= 1950 \end{aligned}$$

$\begin{array}{r} 78 \\ \times 25 \\ \hline 1400 \\ 160 \\ 350 \\ + 40 \\ \hline 1950 \end{array}$	(70 × 20)	<table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td style="padding: 2px 5px;">20</td><td style="padding: 2px 5px;">70</td><td style="padding: 2px 5px;">8</td></tr><tr><td style="padding: 2px 5px;">5</td><td style="padding: 2px 5px;">1400</td><td style="padding: 2px 5px;">160</td></tr><tr><td style="padding: 2px 5px;"></td><td style="padding: 2px 5px;">350</td><td style="padding: 2px 5px;">40</td></tr></table>	20	70	8	5	1400	160		350	40
20	70	8									
5	1400	160									
	350	40									
	(20 × 8)										
	(70 × 5)										
	(8 × 5)										

"I decomposed the numbers to make multiplying easier."

Observations/Documentation

Activity 9 Assessment

Mental Math Strategies

Developing Fluency with Whole Number Operations (cont'd)

Solves multi-step equations using mental math strategies and properties of operations.

$$1560 + 1682 - 440 - 602 = ?$$

$$1560 - 440 = 1120$$

$$1682 - 602 = 1080$$

$$1120 + 1080 = 2200$$

Uses order of operations to solve equations and explains the effect when order is not followed.

$$9 \times 8 - 3 + 16 \div 4 = 72 - 3 + 4$$

$$= 73$$

"I have to do multiplication and division first. If the order isn't followed and I perform the operations in the order in which they appear, I get 21 R1."

Flexibly selects mental math strategies and applies order of operations to solve multi-step equations/problems.

To claim the prize in a contest, you must answer this skill-testing question:

$$19 + 11 \times 6 - 4 = ?$$

$$19 + 11 \times 6 - 4 = 19 + 66 - 4$$

$$= 20 - 1 + 66 - 4$$

$$= 20 + 66 - 1 - 4$$

$$= 86 - 5$$

$$= 81$$

Observations/Documentation