Merit Tutoring

WORKSHEET 11

Multiplication (2-Digit) - Area Models

Year 5 Mathematics — Operations Strand

Australian Curriculum v9.0 — AC9M5N06

Name: _____ **Date:** _____

Section 1: Fluency - Multiplying by Tens

Question 1: Calculate 45×10

Answer: _____

Question 2: Calculate 45×20

Answer: _____

Question 3: What is 12×30?

Answer: _____

Question 4: Calculate 23×40

Answer: _____

Question 5: What is 18×50?

Answer: _____

Question 6: Calculate 67×10

Answer: _____

Question 7: What is 25×30?

Answer: _____

Product Panda Says:

"You're a Multiplication Magician!"

Joke Time: Why was the multiplication sign so popular? Because it always made things grow!

Section 2: Reasoning - The Area Model

Question 8: Use the area model below to calculate 23×14. Fill in the missing products.

	20	3
10	_____	_____
4	_____	_____

Total Product: _____

Question 9: Complete the area model for 32×15.

	30	2
10	_____	_____
5	_____	_____

Total Product: _____

Question 10: Use an area model to calculate 41×12. Draw your own model below.

Answer: _____

Question 11: Break down 26×13 using the distributive property:
$26 \times 13 = (20 + 6) \times (10 + 3)$
Calculate each part:

$20 \times 10 =$ _____
$20 \times 3 =$ _____
$6 \times 10 =$ _____
$6 \times 3 =$ _____

Total: _____

Question 12: What is 18×22 using the area model method?

Answer: _____

Question 13: Calculate 35×16 by breaking it into parts.

Answer: _____

Question 14: Look at this partial area model. What multiplication does it represent?

100	50
20	10

Answer: _____

Area Model Owl Says:

"You're an Area Model Ace!"

Joke Time: Why did the rectangle go to the gym?
To work on its area!

Section 3: Challenge - Estimation

Question 15: Estimate the answer to 32×19 by rounding both numbers.

Round to: ____ × ____

Estimate: _____

Question 16: Is your estimate for Question 15 higher or lower than the real answer? Calculate the exact answer to check.

Exact answer: _____ Your estimate was: _____

Question 17: Estimate 48×21 by rounding to the nearest ten.

Answer: _____

Question 18: Round and estimate: 37×18

Rounded calculation: _____
Estimate: _____

Question 19: A student calculated $25 \times 19 = 375$. Use estimation to check if this answer is reasonable.

Your estimate: _____ Is 375 reasonable? _____

Question 20: Estimate 63×22 using rounding.

Answer: _____

Question 21: Calculate the exact answer for 63×22 and compare with your estimate.

Exact answer: _____

Question 22: Which gives a closer estimate for 44×18: rounding both numbers up, or rounding both down? Explain.

Answer: _____

Estimation Eagle Says:

"You're Soaring with Estimates!"

Joke Time: Why are estimates like birds?
They both need to be in the right ballpark!

Excellent work! Check your answers on the next page.

WORKSHEET 11
ANSWER KEY

Section 1: Fluency - Multiplying by Tens

1. 450
2. 900
3. 360
4. 920
5. 900
6. 670
7. 750

Section 2: Reasoning - The Area Model

8. Area model: $20 \times 10 = 200$, $3 \times 10 = 30$, $20 \times 4 = 80$, $3 \times 4 = 12$; Total: 322
9. Area model: $30 \times 10 = 300$, $2 \times 10 = 20$, $30 \times 5 = 150$, $2 \times 5 = 10$; Total: 480
10. $41 \times 12 = (40 + 1) \times (10 + 2) = 400 + 80 + 10 + 2 = 492$
11. $20 \times 10 = 200$, $20 \times 3 = 60$, $6 \times 10 = 60$, $6 \times 3 = 18$; Total: 338
12. 396
13. 560
14. This represents $15 \times 12 = 180$ (or similar: 10×12 and 5×12)

Section 3: Challenge - Estimation

15. $32 \times 19 \approx 30 \times 20 = 600$
16. Exact answer: 608; Estimate of 600 was slightly lower
17. $48 \times 21 \approx 50 \times 20 = 1000$
18. $37 \times 18 \approx 40 \times 20 = 800$ (actual: 666)
19. $25 \times 19 \approx 25 \times 20 = 500$; 375 seems too low (actual answer is 475)
20. $63 \times 22 \approx 60 \times 20 = 1200$
21. Exact answer: 1386
22. 44×18: Rounding down $(40 \times 10 = 400)$ is too low; rounding up $(50 \times 20 = 1000)$ is too high; mixed rounding $(40 \times 20 = 800)$ is closer to actual (792)

Merit Tutoring

WORKSHEET 12

Multiplication (2-Digit) - Vertical Algorithm

Year 5 Mathematics — Operations Strand

Australian Curriculum v9.0 — AC9M5N06

Name: _____ **Date:** _____

Section 1: Fluency - Standard Algorithm

Question 1: Solve 56×12 using the vertical method.

$$\begin{array}{r} 5\ 6 \\ \times\ 1\ 2 \\ \hline \\ \hline \end{array}$$

Answer: _____

Question 2: Calculate 34×21 using the standard algorithm.

$$\begin{array}{r} 3\ 4 \\ \times\ 2\ 1 \\ \hline \\ \hline \end{array}$$

Answer: _____

Question 3: Multiply 48×15 using the vertical method.

Answer: _____

Question 4: Calculate 72×13

Answer: _____

Question 5: What is 63×24?

Answer: _____

Question 6: Solve 85×16 using the standard algorithm.

Answer: _____

Question 7: Calculate 29×32

Answer: _____

Calculation Cat Says:

"You're a Column Calculation Champion!"

Joke Time: Why did the cat love multiplication?
Because it was purr-fect at it!

Section 2: Reasoning - Error Hunt

Question 8: Look at this calculation: $25 \times 11 = 250$. What step did the

student forget?

$$\begin{array}{r} 25 \\ \times\ 11 \\ \hline 25 \\ 250 \\ \hline 250 \end{array}$$

Error explanation: _____
Correct answer: _____

Question 9: Find the mistake in this multiplication:

$$\begin{array}{r} 32 \\ \times\ 14 \\ \hline 128 \\ 320 \\ \hline 448 \end{array}$$

What's wrong? _____
Correct answer: _____

Question 10: A student calculated $43 \times 12 = 516$. Check this answer using estimation. Is it correct?

Estimate: _____ Is 516 correct?
_____

Question 11: Complete the missing partial products:

$$\begin{array}{r} \ 5\ 7 \\ \times\quad 2\ 3 \\ \hline \ \_\ \_\ \_ \\ \_\ \_\ \_\ 0 \\ \hline \end{array}$$

Final answer: _____

Question 12: Why is it important to line up the place values correctly when using the vertical algorithm?

Answer: _____

Question 13: Look at these two methods for 24×15. Both should give the same answer. Fill in the missing numbers.

Method 1 (Vertical):

$$\begin{array}{r} \ 2\ 4 \\ \times\quad 1\ 5 \\ \hline \end{array}$$

_____

Method 2 (Area Model): $(20 + 4) \times (10 + 5) =$

_____

Question 14: A student wrote ”23” when multiplying 46×5 (just the ones). What did they calculate incorrectly?

Answer: _____

Detective Dog Says:

"You're an Error-Finding Expert!"

Joke Time: Why did the detective love maths?
Because he was always solving for X!

Section 3: Challenge - Practical Problems

Question 15: A school buys 24 boxes of pencils. Each box has 12 pencils. How many pencils are there in total?

Answer: _____

Question 16: A farmer has 18 rows of apple trees. Each row has 25 trees. How many apple trees does the farmer have?

Answer: _____

Question 17: A bakery makes 36 trays of cookies each day. Each tray holds 24 cookies. How many cookies are made in one day?

Answer: _____

Question 18: A library has 15 shelves. Each shelf holds 48 books. How many books can the library hold?

Answer: _____

Question 19: Tickets to a concert cost $32 each. If 45 people buy tickets, how much money is collected?

Answer: _____

Question 20: A shop sells 28 boxes of chocolates each week. Each box contains 16 chocolates. How many chocolates are sold in a week?

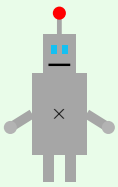
Answer: _____

Question 21: A parking lot has 22 rows with 35 parking spaces in each row. What is the total number of parking spaces?

Answer: _____

Question 22: A factory produces 52 items per hour. How many items are produced in a 16-hour workday?

Answer: _____



Problem-Solving Robot Says:

"You're a Real-World Problem Solver!"

Joke Time: Why do robots love multiplication? Because they compute at lightning speed!

Fantastic work! Check your answers on the next page.

WORKSHEET 12
ANSWER KEY

Section 1: Fluency - Standard Algorithm

1. 672
2. 714
3. 720
4. 936
5. 1512
6. 1360
7. 928

Section 2: Reasoning - Error Hunt

8. The student didn't add the two partial products correctly. They forgot to add 25 + 250. Correct answer: 275
9. In the first line, $32 \times 4 = 128$, but the student didn't carry the tens properly. The "1" should be carried. Correct answer: 448
10. Estimate: $43 \times 12 \approx 40 \times 10 = 400$; 516 is correct (or very close to estimate of 480 if using 40×12)
11. First line: 171 (from 57×3); Second line: 1140 (from 57×20); Final: 1311
12. Lining up place values ensures we add hundreds to hundreds, tens to tens, etc., giving the correct total
13. Method 1: $24 \times 5 = 120$ and $24 \times 10 = 240$, total = 360; Method 2: $200 + 100 + 40 + 20 = 360$
14. $46 \times 5 = 230$, not 23. They forgot to include the carried value or didn't calculate $6 \times 5 = 30$ correctly

Section 3: Challenge - Practical Problems

15. 288 pencils
16. 450 apple trees
17. 864 cookies
18. 720 books
19. $1440
20. 448 chocolates
21. 770 parking spaces

22. 832 items

Superb!

You've mastered 2-Digit Multiplication!
Keep up the outstanding work in Year 5 Maths!