Grade 3 Everyday Math: Unit Operations Study Guide EDM Version 4
Thank you!

Catherine Wiist @ Abc123is4me
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Graphics From the Pond http://frompond.blogspot.com
Grade 3

Everyday Math: Unit 3

Operations

Study Guide

Name: ________________________________ Test Date: ___ - ___ - ___

Unit Vocabulary:

adding a group, area, close-but-easier numbers, column addition, counting up, equivalent, estimate, expand-and-trade subtraction, expanded form, expression, factors, facts table, function machine, helper fact, input, key, Multiplication/Division Facts Table, multiplication squares, name-collection box, open number line, output, partial-sums addition, partition, picture graph, precisely, reasonable, rubric, rule, scaled bar graph, scaled picture graph, square product, square units, subtracting a group, tile, turn-around rule, “What’s My Rule?”
Lesson 3.1:
How do you find missing numbers and rules in “What’s My Rule?” tables?

<table>
<thead>
<tr>
<th>Rule</th>
<th>in</th>
<th>out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add 7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

Lesson 3.2:
How do you use mental math to make reasonable estimates?

Use rounding to estimate and then solve. Then, use your estimates to check if your answers make sense. Show your work.

1. Estimate: _________________________
   
   174
   + 37
   ————
   211

   Does your answer make sense? Explain below.

2. Estimate: _________________
   
   282
   - 75
   ————
   207

   Does your answer make sense? Explain below.
Lesson 3.3:
How do you use the partial-sums addition algorithm to add 2-digit and 3-digit numbers?

Solve both addition problems using partial sums. Use your estimates to make sure your answers make sense.

1. Estimate: _________________________

2 3 7
+ 9 1
_____

2. Estimate: _________________________

2 7 7
+ 3 0 4
_____

Lesson 3.4:
How do you use the column addition algorithm to find sums?

Solve using column addition. Use your estimate to make sure your answer makes sense.

Estimate: _________________________

98 + 36 = _______
Lesson 3.5:
How do you solve subtraction problems using the counting-up strategy?

Solve the problem. Use an open number line or a number sentence to show your work. Use your estimate to check your work.

742 – 537 = ?

Estimate: _______________________

742 - 537 = _____

Lesson 3.6:
How do you use the expand-and-trade subtraction algorithm to subtract 2- and 3-digit numbers?

The expand-and-trade subtraction algorithm was used to find the exact answer; however, the exact answer doesn’t match up with the estimate! Explain why.

116 - 37 = ?

Estimate: 120 – 40 = 80

Explain: __________________________________
________________________________________
________________________________________

 1 1 6
- 3 7
---
 1 6

1 1 6
1 0 0 + 1 6

- 3 7
---
 3 0 + 7

1 0 0 + 7 0 + 9 = 179
Lesson 3.7:
Exploration A: How do you create a scaled bar graph?

Favorite Ice Cream Flavors of 3rd Graders

<table>
<thead>
<tr>
<th>Flavor</th>
<th>Number of 3rd Graders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td>55</td>
</tr>
<tr>
<td>Vanilla</td>
<td>45</td>
</tr>
<tr>
<td>Strawberry</td>
<td>20</td>
</tr>
<tr>
<td>Other</td>
<td>35</td>
</tr>
</tbody>
</table>

Use the chart to fill in the scale of the bar graph.

Exploration B: How do you measure area?

Fill in the blanks:
- The amount of surface inside a 2-dimensional shape is called the _________________.
- The number of squares that cover the surface is a measurement of the area in ___________ ___________

Exploration C: How do you partition rectangles into equal parts to find the area?

Partition the rectangle into 2 rows with 3 same sized squares in each row.
Lesson 3.8:
How do you create a scaled picture graph?

Use the tally chart and the key to complete the picture graph.

Ways 3rd Graders Get to School

<table>
<thead>
<tr>
<th>Ways to School</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>□ □ □ □ □ □ □ □</td>
</tr>
<tr>
<td>Bus</td>
<td>□ □ □ □ □ □ □ □</td>
</tr>
<tr>
<td>Walk</td>
<td>□ □ □</td>
</tr>
</tbody>
</table>

Lesson 3.9:
How do you find the products of multiplication squares?

Write a number sentence to match the array.

Number sentence: ______________________

Does the problem show a multiplication square? _________ Why or why not? _________
Lesson 3.10:
How does knowing one multiplication fact help with knowing its turn-around fact?

1. Use the turn-around rule to solve and draw arrays for each fact.

\[ 4 \times 7 = \_\_\_\_ \quad 7 \times 4 = \_\_\_\_ \]

______________ True or False?
The number of dots are the same in each array. So, the array just turned but the product is the same.

Lesson 3.11:
How does the adding-a-group strategy help to solve unknown multiplication facts?

Fred does not know the answer to \( 3 \times 7 \).
He does know that \( 2 \times 7 = 14 \), so he uses it as a helper fact.
Fred starts by drawing this array for \( 2 \times 7 = 14 \).

Show on the array and explain how Fred can use the array to help him figure out \( 3 \times 7 \).
**Lesson 3.12:**

How do you use the subtracting-a-group strategy to help solve unknown multiplication facts?

Tina uses the subtracting-a-group strategy with $10 \times 4$ to help her figure out $8 \times 4$. Use numbers, pictures, or words to explain what Tina did.

$8 \times 4 = \_\_\_\_$

**Lesson 3.13:** *(CC.2.1.3.B.1, CC.2.2.3.A.3)*

How do you generate equivalent names for numbers using all four operations?

Two of the names do not belong in this box. Cross them out. Then write the name of the box on the tag.

10 X 10

2 quarters

fifty

100 ÷ 2

25 x 2

QDDN

(The minutes)
ANSWER KEY
Grade 3

Everyday Math: Unit Operations

Study Guide

Unit Vocabulary:
adding a group, area, close-but-easier numbers, column addition, counting up, equivalent, estimate, expand-and-trade subtraction, expanded form, expression, factors, facts table, function machine, helper fact, input, key, Multiplication/Division Facts Table, multiplication squares, name-collection box, open number line, output, partial-sums addition, partition, picture graph, precisely, reasonable, rubric, rule, scaled bar graph, scaled picture graph, square product, square units, subtracting a group, tile, turn-around rule, “What’s My Rule?”
Lesson 3.1:
How do you find missing numbers and rules in “What’s My Rule?” tables?

![Rule tables example]

Lesson 3.2:
How do you use mental math to make reasonable estimates?

Use rounding to estimate and then solve. Then, use your estimates to check if your answers make sense. Show your work.

1. Estimate: _________________________

   \[
   \begin{array}{c}
   174 \\
   \hline
   37 \\
   \hline
   211
   \end{array}
   \]

Does your answer make sense? Explain below.

Sample answer: Yes, because my estimate is 170 + 40 = 210, which is close to 211.

2. Estimate: _______________

   \[
   \begin{array}{c}
   282 \\
   \hline
   75 \\
   \hline
   207
   \end{array}
   \]

Does your answer make sense? Explain below.

Sample answer: Yes, because my estimate is 280 - 75 = 205, which is close to 207.
Lesson 3.3:
How do you use the partial-sums addition algorithm to add 2-digit and 3-digit numbers?

Solve both addition problems using partial sums. Use your estimates to make sure your answers make sense.

1. Estimate: \(240 + 90 = 330\)  
2. Estimate: \(280 + 305 = 585\)

\[
\begin{array}{c}
237 \\
+ 91 \\
\hline
200 \\
+ 120 \\
+ 8 \\
\hline
328
\end{array}
\]

\[
\begin{array}{c}
277 \\
+ 304 \\
\hline
500 \\
+ 70 \\
\hline
588
\end{array}
\]

Lesson 3.4:
How do you use the column addition algorithm to find sums?

Solve using column addition. Use your estimate to make sure your answer makes sense.

Estimate: \(100 + 35 = 135\)

\[
\begin{array}{c}
98 \\
+ 36 \\
\hline
134
\end{array}
\]

Sample answer: \(100 + 35 = 135\)
Lesson 3.5:
How do you solve subtraction problems using the counting-up strategy?

Solve the problem. Use an open number line or a number sentence to show your work. Use your estimate to check your work.

742 – 537 = ?

Estimate: Sample answer: 740 - 540 = 200

742 - 537 = 205

Lesson 3.6:
How do you use the expand-and-trade subtraction algorithm to subtract 2- and 3- digit numbers?

The expand-and-trade subtraction algorithm was used to find the exact answer; however, the exact answer doesn’t match up with the estimate! Explain why.

116 - 37 = ?

Estimate: 120 – 40 = 80

1 1 6
- 3 7
1 0 0 + 1 0 + 1 6
3 0 + 7
1 0 0 + 7 0 + 9 = 179

Explain: Sample answer: The kid needed to cross off 100 and write 0 because she/he took away a hundred and put it in the tens spot to change 0 to 100.
Lesson 3.7:

Exploration A: How do you create a scaled bar graph?

Favorite Ice Cream Flavors of 3rd Graders

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Use the chart to fill in the scale of the bar graph.

Exploration B: How do you measure area?

Fill in the blanks:

The amount of surface inside a 2-dimensional shape is called the **area**.

The number of squares that cover the surface is a measurement of the area in **square units**

Exploration C: How do you partition rectangles into equal parts to find the area?

Partition the rectangle into 2 rows with 3 same sized squares in each row.
Lesson 3.8:
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<td>Walk</td>
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</table>

Lesson 3.9:
How do you find the products of multiplication squares?

Write a number sentence to match the array.

Number sentence: \(4 \times 3 = 12\)

Does the problem show a multiplication square? **NO** Why or why not? _________

The two factors are not the same.
Lesson 3.10:
How does knowing one multiplication fact help with knowing its turn-around fact?

1. Use the turn-around rule to solve and draw arrays for each fact.

\[ 4 \times 7 = \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \]
\[ 7 \times 4 = \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \]

**True**

True or False?
The number of dots are the same in each array. So, the array just turned but the product is the same.

---

Lesson 3.11:
How does the adding-a-group strategy help to solve unknown multiplication facts?

Fred does not know the answer to \( 3 \times 7 \).
He does know that \( 2 \times 7 = 14 \), so he uses it as a helper fact.
Fred starts by drawing this array for \( 2 \times 7 = 14 \).

Show on the array and explain how Fred can use the array to help him figure out \( 3 \times 7 \).

**Sample answer:** He drew an array for \( 2 \times 7 \) and knew it was 14. To figure out \( 3 \times 7 \), he can add one more row of 7 dots. \( 14 + 7 = 21 \).
Lesson 3.12:
How do you use the subtracting-a-group strategy to help solve unknown multiplication facts?

Tina uses the subtracting-a-group strategy with $10 \times 4$ to help her figure out $8 \times 4$. Use numbers, pictures, or words to explain what Tina did.

Sample answers:

\[ 8 \times 4 = \underline{32} \]

Since 8 groups of 4 is two fewer than 10 groups of 4, Tina can start from 40 and take away 2 groups of 4. 

\[ 40 - 8 = 32. \]

Lesson 3.13:
How do you generate equivalent names for numbers using all four operations?

Two of the names do not belong in this box. Cross them out. Then write the name of the box on the tag.

Sample answers:

Since 8 groups of 4 is two fewer than 10 groups of 4, Tina can start from 40 and take away 2 groups of 4. 

\[ 40 - 8 = 32. \]