

## Sixth Grade Summer Review Sheet

### Multiplying Whole Numbers

#### Multiplying by a 1-Digit Number

If you know how to multiply 1-digit numbers such as  $7 \times 5$ , you can also multiply larger numbers such as  $7 \times 582$ . That's because multiplying multi-digit numbers is done one digit at a time. Each product is called a **partial product**. First, multiply the value of each digit from one factor by the value of each digit from the other factor. Then, add up the partial products.

Method 1: Multiplying by listing all the partial products

#### Example:

Find  $582 \times 7$ .

582		
$\times 7$		
<hr/>		
14	$\leftarrow$ Multiply the ones.	$7 \times 2 \text{ ones} = 14 \text{ ones}$
560	$\leftarrow$ Multiply the tens.	$7 \times 8 \text{ tens} = 56 \text{ tens} = 560$
+3500	$\leftarrow$ Multiply the hundreds	$7 \times 5 \text{ hundreds} = 35 \text{ hundreds} = 3500$
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4074	$\leftarrow$ Add the partial products	

Method 2: You can also multiply without listing the partial products.

#### Example:

Find  $582 \times 7$ .

$$\begin{array}{r} 51 \\ 582 \\ \times 7 \\ \hline 4074 \end{array}$$

Multiply the ones. Since 14 ones is 1 ten and 4 ones, write **4** in the ones place. Write **1** above the tens so you don't forget it.

Multiply the tens. Since 56 tens is 5 hundreds and 6 tens, add the 6 tens to the 1 ten you already have. Write **7** in the tens place. Write **5** above the hundreds so you don't forget it.

Multiply the hundreds. Since 35 hundreds is 3 thousands and 5 hundreds, add the 5 hundreds to the 5 hundreds you already have. Write 0 in the hundreds place. Write 4 in the thousands place.

## Multiplying by a 2-Digit Number

### Example:

Multiply  $24 \times 674$ .

Method 1: Multiplying by listing all the partial products

Hundreds	Tens	Ones	
6	7	4	
×	2	4	
	1	6	Multiply by the ones.
	2	8	$4 \times 4 = 16$
	2	4	$4 \times 70 = 280$
	2	4	$4 \times 600 = 2400$
	8	0	Multiply by the tens.
	1	4	$20 \times 4 = 80$
	2	0	$20 \times 70 = 1400$
	2	0	$20 \times 600 = 12,000$
1	6	1	7
6	7	4	Add the partial products.

Method 2: You can also multiply without listing the partial products.

Hundreds	Tens	Ones	
2	1	4	
×	2	4	
2	6	9	Multiply by the ones: $4 \times 674 = ?$
2	6	9	$4 \times 4 = 16$ → 6 ones with 1 ten to regroup
	2	6	$4 \times 70 = 280$ → 8 tens + 1 ten with 2 hundreds to regroup
	2	6	$4 \times 600 = 2400$ → 24 hundreds + 2 hundreds
	1	3	Multiply by the tens: $20 \times 674 = ?$
	2	1	$20 \times 4 = 80$ → 8 tens and 0 ones
	2	1	$20 \times 70 = 1400$ → 4 hundreds with 1 thousand to regroup
	2	1	$20 \times 600 = 12,000$ → 12 thousands + 1 thousand
1	6	1	7
6	7	4	Add the partial products.

## Dividing Whole Numbers

Remember, there are three symbols for division:  $\div$ ,  $\overline{)$ , and the fraction bar.

### Example:

272 divided by 8 can be written as  $272 \div 8$ ,  $8 \overline{)272}$ , or  $\frac{272}{8}$ .

The basic steps in division are:

**Step 1: Multiply to estimate.** Look at the dividend (the number being divided; in the example above, 272 is the dividend). Find the first place that the divisor (the number doing the dividing; in the example above, 8 is the divisor). Use mental multiplication to get close to the dividend without going over.

**Step 2: Subtract and compare.** Subtract the product you found in **Step 1** from the dividend to see what remains to be divided.

**Step 3: Repeat Steps 1 and 2** until there's not enough or nothing left to divide.

### Example:

1. Find  $272 \div 8$ .

$$\begin{array}{r} 34 \\ 8 \overline{)272} \\ - 240 \\ \hline 32 \\ - 32 \\ \hline 0 \end{array}$$

**Remember:**  $272 = 2$  hundreds(200) + 7 tens (70) + 2 ones(2).

Start with the hundreds.  $200 \div 8 = ?$ . *Multiply to estimate.*  
 $8 \times 100 = 800$ . That's too much. So, don't write anything in the hundreds place.

Divide the **tens**.  $270 \div 8 = ?$ . *Multiply to estimate.*

$$8 \times 3 \text{ tens} = 24 \text{ tens} = 240$$

$$8 \times ? \text{ tens} = 270$$

$$8 \times 4 \text{ tens} = 32 \text{ tens} = 320$$

So, the quotient is between 30(3 tens) and 40(4 tens). Write a **3** in the tens place and **240** under the dividend. *Subtract and compare.*  
 $272 - 240 = 32$ . Since  $32 > 8$ , we can keep dividing.

Divide the **ones**. *Multiply to estimate.* In this case, there is no need to estimate. We know that  $8 \times 4 = 32$ . Write a **4** in the ones place and place a **32** under the dividend.

*Subtract and compare.*  $32 - 32 = 0$ . We can't divide any more, so we are done.

2.  $5,504 \div 32 =$

$$\begin{array}{r} 172 \\ 32 \overline{)5504} \\ -3200 \\ \hline 2304 \\ -2240 \\ \hline 64 \\ -64 \\ \hline 0 \end{array}$$

OR

$$\begin{array}{r} 172 \\ 32 \overline{)5504} \\ -32 \downarrow \\ \hline 230 \downarrow \\ -224 \downarrow \\ \hline 64 \\ -64 \\ \hline 0 \end{array}$$