Greek Orthodox Patriarchate School
International - Hanina

**Unit 7**

**Name: _____** **Lesson 7.4** **Grade 7A**

**Date: _____** **Multiplying integers by mixed numbers** **Study sheet**

Our next topic combines your knowledge of integers and fractions. This sheet will help you understand how to estimate and accurately multiply an integer by a mixed number. Let's break it down!

## Part 1: Key Concepts Review

1. What is a Mixed Number?

A mixed number has a whole number and a fraction (e.g., $2\frac{3}{4}$, $5\frac{1}{2}$).

2. What is an Integer?

An integer is a positive or negative whole number (e.g., -4, 7, 0, 12).

## Part 2: The Power of Estimation

Estimating helps you predict the answer and check if your final calculation is reasonable.

How to Estimate:

1. Round the mixed number to the nearest whole number.
2. Multiply the integer by this whole number.

### Example 1: Positive Integer

- Problem: $4 \times 3\frac{7}{8}$
- Step 1: $3\frac{7}{8}$ is close to 4.
- Step 2: 4×4=16

- Estimate: The answer should be close to 16.

### Example 2: Negative Integer

- Problem: $-5 \times 2\frac{1}{10}$
- Step 1: $2\frac{1}{10}$ is close to 2.
- Step 2: $-5 \times 2 = -10$
- Estimate: The answer should be close to -10.

## Part 3: The Exact Calculation Method (Decomposing the Mixed Number)

### The Secret Trick: Break the mixed number into its whole part and its fraction part!

#### Step 1: Decompose

Rewrite the mixed number as a whole number plus a fraction.

- $3\frac{1}{2} = 3 + \frac{1}{2}$

#### Step 2: Distribute

Multiply the integer by both the whole number AND the fraction separately.

- $5 \times 3\frac{1}{2} = 5 \times (3 + \frac{1}{2}) = (5 \times 3) + (5 \times \frac{1}{2})$

#### Step 3: Calculate & Combine

Do the two simpler multiplications and add the results together.

Circle the best estimate for each problem.

1. $8 \times 4\frac{9}{10}$

   a) 32
   b) 40
   c) 35

2. $-6 \times 3\frac{1}{8}$

   a) -18
   b) -24
   c) -20

Solve these problems using the decomposition method. Show your work!

3. $5 \times 2\frac{1}{5}$

4. $-3 \times 4\frac{1}{3}$

5. $2 \times 6\frac{3}{4}$

*Read carefully, estimate first, then solve.*

6. A bag of apples weighs $3\frac{1}{4}$ kg. What is the total weight of 4 such bags?
   - **Estimate:** _____ × _____ = _____
   - **Calculate:** _____

7. A submarine descends at a rate of $2\frac{1}{5}$ meters per second. What is its total change in depth after 5 seconds? (Use a negative number for descent.)
   - **Estimate:** _____ × _____ = _____
   - **Calculate:** _____