Thanks, Grandma! – Lesson 1

Objective:
1. Students will be able to multiply a decimal number by a whole number.

Overview:
In this lesson, students will be given a real-world scenario using money to demonstrate how to multiply a decimal number by a whole number. This particular lesson refers only to Part A of the task **Gifts from Grandma**.

Key Content Standard(s):

6.NS.3

Key Practice Standard(s):

2, 4

Lesson Plan:

1. Begin by telling students about a (real or fictional) grandmother who treats all of her grandchildren equally.   Say to students, "If grandma has six grandchildren, and gives each of them $24, how much money did she give altogether?" Allow students time to solve. Call on a student to give the answer ($144). Ask another student how they found the answer (multiplying 24 and 6). Ask a third student how they could model that multiplication (e.g. writing $24 six times).
2. Now tell students that you were being imprecise – she actually gave each child $24.50. All students a few moments to revise their answer ($147). Ask students for how they answered it, ideally eliciting several strategies (e.g. "I did $.50 x 6, and added that to the total;" "I counted up by $.50 until I got to $147). Congratulate students on correct reasoning, and demonstrate the algorithm for multiplying a decimal by a whole number, including instruction on how to determine the number of decimal places in your product.
3. Demonstrate that $24.50 x 6 generates the same product as 24.5 x 6, and have students explain why this is (e.g. because 24.50 = 24.5; because the numbers are the same except 24.50 says that there are zero hundredths, which we already know is true about 24.5).
4. Give students another example to practice (e.g. $82.25 for each of the six grandchildren). Insist that they use an algorithm for multiplying a decimal and a whole number, although welcome them to check their answers with other strategies (e.g. 82 x 6, added to the value of six quarters).

Assessment:

Ask students to write and solve their own "grandma" situation, involving a grandmother giving a non-whole number amount of money to her grandchildren.

Differentiation:

Although the distributive property is found in the sixth grade standards, this example could be an effective introduction or reinforcement. Students can "break apart" the dollar and cent portions of the money gift, and "distribute" the number of children to each. Thus, 24.50 x 6 could be $24 x 6 + $.50 x 6, or even 20 x 6 + 4 x 6 + .5 x 6.

Commentary:

This lesson is framed as a first introduction to multiplying and dividing decimals. Using money as an introduction is sensible because it is familiar to students. However, teachers should ensure to give students practice multiplying non-money decimals – even if these are not real-world mathematical calculations (e.g. 8.7 x 9). This avoids the student misconception that decimal answers **must** have two places.

If applicable, include worksheets, diagrams, student work etc. at end