

Thanks, Grandma! – Lesson 2

Objective:

1. Students will be able to divide a decimal number by a one-digit whole number.

Overview:

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

Key Content Standard(s):

6.NS.3

Key Practice Standard(s):

2, 4

Lesson Plan:

1. If “Thanks, Grandma! – Lesson 1” has been conducted, remind students of it. If not, tell students about a (real or fictional) grandmother who has 7 grandchildren, and treats them all equally.
2. Ask students what you would do to find out how much each grandchild received, if you knew that she gave a total of \$227.50. Have a student answer (A: divide), and another student explain how they knew (e.g. “we knew the total and how many kids she had in all, so the money is split equally between them”).
3. Have students write the division problem as they think it should be written, e.g.:

$$7\overline{)227.50}$$

4. Ask students what is different about this long division problem than they usually see (A: the dividend has a decimal). Tell students that these kinds of problems are exactly like the long division problems they’ve done, with one difference that they will soon discover.
5. Have students treat this like a “normal” long division problem, preferably as a whole class exercise with students writing along in their notebooks. As students divide, insist that students precisely align the digits in their quotient.
6. What students have calculated their quotient (without the decimal), ensure that students have 3250 as the quotient. Now ask students for their ideas as to where the decimal should go. Encourage students to think about what would be a reasonable answer for each of the seven grandchildren to get, if the total was \$227.50. Students should converge around putting the decimal between the 2 and 5. Have students check that answer with multiplication (i.e. 32.50×7 , which equals 227.50).
7. Having confirmed 32.50, have students insert the decimal in their quotient. Ask students what they notice about the decimal in the quotient and the decimal in the dividend (A: they are right on top of the other). Tell students that this is correct, and that from now on, when they are

dividing a decimal number by a whole number, they should remember to always put the decimal in the quotient as the first thing they do. Tell them to also remember to review their answers for reasonableness, as they just did.

8. Give students several other division problems to practice. Some examples:

$$8.12 \div 4$$

$$7.25 \div 5$$

$$.87 \div 3$$

Assessment:

1. "One of the grandchildren earned a total of \$133.84 doing odd jobs for her grandmother. Since she worked for 8 weeks, how much did she generally earn each week?"
2. Have students write and solve their own division with decimals question. Insist that they use a one-digit divisor.

Differentiation:

When using money as a dividend, a teacher could challenge students by giving a dividend and divisor that do not make a terminating decimal in the quotient. For example:

"Three friends go out for lunch, and the bill total comes to \$15.50. How much does each person pay?" Most students will get to \$5.16 relatively easily, but may become confused when the decimal doesn't "stop". If students answer \$5.16, ask them to multiply that by 3, and see if it will cover the bill, or if they will be short. Here most students will realize that they are \$.02 short, and that a reasonable solution is for someone to kick in an extra two cents. Alternatively, the teacher could have them continue to the thousandths place, and ask students if we ever use the thousandths place when dealing with money (A: no, at least not in everyday circumstances). Tell students that rounding up to the nearest hundredth will ensure that the three friends cover their bill in full.

Commentary:

This lesson is part of a mini-unit on multiplying and dividing decimals. As an introduction to dividing with decimals, monetary units are used as the dividend. This helps demonstrate the logic behind the long division algorithm (specifically, where the decimal should go in the quotient). This particular lesson should not be considered to be sufficient for teaching the division of decimals.

Teaching students the general rule that the decimal in the quotient goes directly above the decimal in the dividend will help reduce student error. However, this rule only holds when the divisor is a whole

number. If the divisor is also a decimal, a different algorithm is used. It is unlikely that students will be required to calculate such operations without the use of technology.

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