

How AND Why

By Christopher Yn

After doing his homework, Hero showed it to his mom to check his answers.

“Hero, look at this. It says here in the direction that final answers have to be rounded to the hundredths place,” said Mom.

Hero looked at his notes and realized that he overshot the place values to the right of the decimal point.

| | | | | | | |
|------|------|---|--------|------------|-------------|-----------------|
| Tens | Ones | • | Tenths | Hundredths | Thousandths | Ten thousandths |
|------|------|---|--------|------------|-------------|-----------------|

“I am sorry, Mom. I was careless. I thought that there’s also a ones place to the right of the decimal point. I will redo all my answers,” said Hero.

Hero looked at one of his answers prior to rounding off: 15.3507. He thought out loud, “First, I have to identify the rounding place. In this case I have to round off my answer to the nearest hundredth.”

Hero underlined the digit in the hundredths place (15.3507). He checked the digit to its right. “It’s zero and it’s less than five, so I retain the digit I underlined and turn every digit to its right to zero. Had it been five or more, I would have to add one to the underlined digit before turning the other digits to its right to zero. My final answer would be 15.35,” he said.

“That sounded like you were just mouthing the steps without really understanding what you are doing,” commented Mom.





“Isn’t that the rule for rounding off?” asked Hero.

“Yes, it is. But you also have to understand what really happens when you perform the steps to the rule. Don’t just memorize the rule. Understand how and why it works,” said Mom.

“When asked to round off 15.3507 to the hundredths place, you are really asked for ‘which hundredths’ the number is closer to. 15.3507 is between 15.35 and 15.36, right?”

“And it is closer to 15.35,” continued Hero.

“That’s why it rounded off to this nearest hundredth,” finished Mom.

“I get it. So when 15.3075 is to be rounded off to the nearest hundredth, I think of two numbers where this number falls between—15.30 and 15.31. The number is definitely closer to 15.31 on the number line. Cool!” said Hero.

“That’s how to you do it!” said Mom.

“You’re right, Mom. Knowing why something works is real learning,” agreed Hero.



Try This!

I. Round off the numbers below. Which two numbers do you check when asked to round off the numbers to the specified place value?

a. tenths

1. 2.0637 _____

2. 4.519 _____

3. 0.3108 _____

4. 0.14560 _____

5. 7.2839 _____

b. hundredths

1. 0.00842 _____

2. 16.0791 _____

3. 12.5536 _____

4. 1.03901 _____

5. 4.9986 _____

c. thousandths

1. 0.76123 _____

2. 2.48715 _____

3. 0.004762 _____

4. 52.70943 _____

5. 2.510096 _____

II. Round off the following numbers to the specified place value.

1. 49.3547 to the nearest hundredth _____
2. 81.4659 to the nearest ones _____

3. 765.8989 to the nearest tenth _____
4. 301.01925 to the nearest thousandth _____
5. 456.8032 to the nearest tenth _____
6. 0.012345 to the nearest ten thousandth _____
7. 71.203684 to the nearest millionth _____
8. 34.01248 to the nearest whole _____
9. 9.1347530 to the nearest hundredth _____
10. 2.9997 to the nearest thousandth _____
11. 5.58513 to the nearest ten thousandth _____
12. 183.1397 to the nearest tens _____
13. 930.56213 to the nearest whole _____
14. 78.2010358 to the nearest ten thousandth _____
15. 0.903324 to the nearest hundredth _____

III. Identify the rounding place.

1. 5.2634 rounds to 5.3 _____
2. 1.00567 rounds to 1.0057 _____
3. 10.948 rounds to 11 _____
4. 75.86001 rounds to 75.87 _____
5. 93.1247301 rounds to 93.125 _____
6. 22.31643 rounds to 22.32 _____
7. 161.4015639 rounds to 161.4016 _____
8. 0.0377521 rounds to 0.03775 _____
9. 14.009293 rounds to 14.01 _____
10. 2.993989 rounds to 2.994 _____

ANSWERS:

I.

- a. 2.0 and 2.1
4.5 and 4.6
0.3 and 0.4
0.4 and 0.5
7.2 and 7.3
- b. 0.00 and 0.01
16.07 and 16.08
12.55 and 12.56
1.03 and 1.04
4.99 and 5.00
- c. 0.761 and 0.762
2.487 and 2.488
0.004 and 0.005
52.709 and 52.710
2.510 and 2.511

II.

1. 49.35
2. 81
3. 765.9
4. 301.019
5. 456.8
6. 0.0123
7. 71.203684
8. 34
9. 9.13
10. 3.000
11. 5.5851
12. 180
13. 931
14. 78.2010
15. 0.9

III.

1. tenths
2. ten thousandths
3. whole, ones
4. hundredths
5. thousandths
6. hundredths
7. ten thousandths
8. hundred thousandths
9. hundredths
10. thousandths