Grade Level/Course: 5
Lesson/Unit Plan Name: Adding Whole Numbers and Decimals- Multiple Algorithms Reference Sheet
Rationale/Lesson Abstract: Use the methods already learned with whole numbers to build a bridge to decimals. The emphasis is on place value understanding.
Timeframe: This is a reference sheet, not a lesson, so the time frame depends on the amount of time in your unit.
Common Core Standard(s): 5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Instructional Resources/Materials: Pencil and Paper

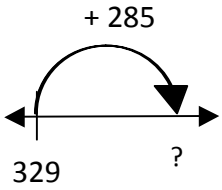
Activity/Lesson: (Reference Sheet)

Adding Whole Numbers and Decimals: Multiple Methods

Find the sum: 285 + 329 = _____

Road Map:

285	329
?	



Estimate: $285 \approx 300$ and $329 \approx 300$

$300 + 300 = 600$

The sum should be around 600.

Models:

□ = 100 | = 10 • = 1

hundreds	tens	ones	
□ □ □ □ □ □	| | | | |	• • • • • • • • • • • •	11 285 + 329
600	10	4	614

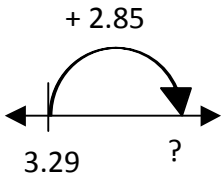
Partial Sums:

285
+329
500 ← 200 + 300
100 ← 80 + 20
+14 ← 5 + 9
614

Find the sum: 2.85 + 3.29 = _____

Road Map:

2.85	3.29
?	



Estimate: $2.85 \approx 3$ and $3.29 \approx 3$

$3 + 3 = 6$.

The sum should be around 6.

Models:

□ = 1 | = 0.1 • = 0.01

ones	tenths	hundredths	
□ □ □ □ □ □	| | | | |	• • • • • • • • • • • •	1 1 2.85 + 3.29
6	1	4	6.14

OR

6	.1	.04	6.14

Partial Sums:

2.85
+3.29
5. ← 2 + 3
1. ← .8 + .2
+.14 ← .05 +. 09
6.14

Decomposition:

$$285 + 329$$
$$= (200 + 80 + 5) + (300 + 20 + 9)$$
$$= (200 + 300) + (80 + 20) + (5 + 9)$$
$$= 500 + 100 + 14$$
$$= 600 + 14$$
$$= 614$$

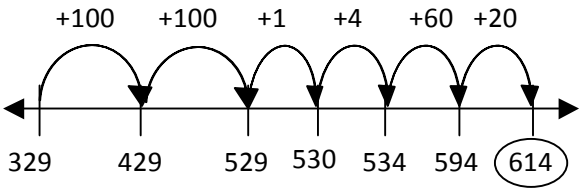
***Decomposition:**

$$2.85 + 3.29$$
$$= (2 + .8 + .05) + (3 + .2 + .09)$$
$$= (2 + 3) + (.8 + .2) + (.05 + .09)$$
$$= 5 + 1 + .14$$
$$= 6 + .14$$
$$= 6.14$$

*Decomposition with Fractions is on the last page.

Number Line:

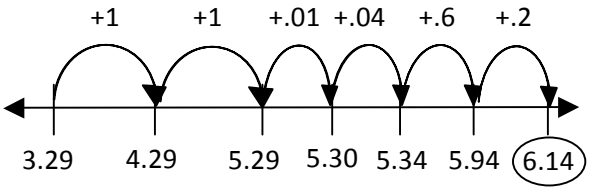
$$329 + 285$$
$$= 329 + (200 + 80 + 5)$$



Check: Did I add 200? Yes, 100 + 100 = 200
Did I add 80? Yes, 60 + 20 = 80
Did I add 5? Yes, 1 + 4 = 5

Number Line:

$$3.29 + 2.85$$
$$= 3.29 + (2 + .8 + .05)$$



Check: Did I add 2? Yes, 1 + 1 = 2
Did I add .8? Yes, .6 + .2 = .8
Did I add .05? Yes, .01 + .04 = .05

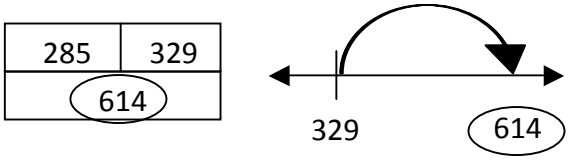
Traditional:

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 285 \\ +\,329 \\ \hline 614 \end{array}$$

Traditional:

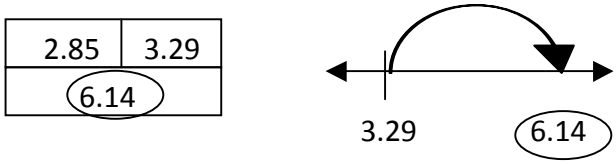
$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 2.85 \\ +\,3.29 \\ \hline 6.14 \end{array}$$

Does it Make Sense?



Estimate: The sum is 614, which is around 600. It makes sense.

Does it Make Sense?



Estimate: The sum is 6.14, which is around 6. It makes sense.

Adding Decimals: Decomposition with Fractions

One Way:

$$= 2.85 + 3.29$$
$$= \left(2 + \frac{8}{10} + \frac{5}{100}\right) + \left(3 + \frac{2}{10} + \frac{9}{100}\right)$$
$$= (2+3) + \left(\frac{8}{10} + \frac{2}{10}\right) + \left(\frac{5}{100} + \frac{9}{100}\right)$$
$$= 5 + \boxed{\frac{10}{10}} + \frac{14}{100}$$
$$= 5 + 1 + \frac{14}{100}$$
$$= 6 + .14$$
$$= \textcircled{6.14}$$

Another Way:

$$= 2.85 + 3.29$$
$$= \left(2 + \frac{85}{100}\right) + \left(3 + \frac{29}{100}\right)$$
$$= (2+3) + \left(\frac{85+29}{100}\right)$$
$$= 5 + \frac{114}{100}$$
$$= 5 + \frac{100+14}{100}$$
$$= 5 + \boxed{\frac{100}{100}} + \frac{14}{100}$$
$$= 5 + 1 + \frac{14}{100}$$
$$= 6 + .14$$
$$= \textcircled{6.14}$$