Lesson 19: Division With and Without Remainders

- Let's find quotients and remainders using an algorithm that uses partial quotients.

Warm-up: Notice and Wonder: Equations with Hundreds

What do you notice? What do you wonder?

$$100 = 33 \times 3 + 1$$

$$200 = 66 \times 3 + 2$$

$$300 = 100 \times 3$$

$$400 = 133 \times 3 + 1$$

$$500 = 166 \times 3 + 2$$

$$600 = 200 \times 3$$

19.1: A Stack of Partial Quotients

Jada used partial quotients to find out how many groups of 7 are in 389.

Analyze Jada's steps in the algorithm.

```
  55
   8
   7
  40
7 )389
 − 280
  109
 −  49
   60
 −  56
    4
```

1. a. Look at the three numbers above 389. What do they represent?

   b. Look at the three subtractions below 389. What do they represent?

   c. What is another way you can decompose 389 to divide by 7?

2. Is 389 a multiple of 7? Explain your reasoning.

3. Use an algorithm that uses partial quotients to find out how many groups of 3 are in 702.

4. Is 702 a multiple of 3? Explain your reasoning.

19.2: Andre and Elena's Work

Andre and Elena are dividing 2,316 by 5. Before they begin, Andre says, "I can already tell that there will be a remainder."

1. Without doing any calculations, decide if you agree with Andre. Explain your reasoning.

2. Here is Andre and Elena's work. Each student made one or more errors. Identify the errors each student made. Then, show a correct computation.

Andre's Work

```
  103
    3
   60
   40
5 )2,316
 −2,000
    316
  − 300
     16
  −  15
      1
```

Elena's Work

```
  400
   60
  100
  300
5 )2,316
 −1,500
    816
  − 500
    316
  − 300
     16
```

19.3: Incomplete Calculations

Here are four calculations to find the value of $3{,}294 \div 3$, but each one is unfinished.

Complete at least two of the unfinished calculations. Be prepared to explain why you chose them.

A

90	
1,000	
3) 3,294	
−3,000	$3 \times 1{,}000$
294	
− 270	3×90

B

80	
200	
400	
400	
3) 3,294	
−1,200	3×400
2,094	
−1,200	3×400
894	
− 600	3×200
294	
− 240	3×80

C

$600 \div 3 =$
$600 \div 3 =$
$600 \div 3 =$
$600 \div 3 =$
$600 \div 3 =$
$270 \div 3 =$

D

$3{,}300 \div 3 = 1{,}100$
$- \quad 6 \div 3 = \quad 2$