Unit 5 Lesson 4: Understanding Decay

1 Notice and Wonder: Two Tables (Warm up)

Student Task Statement

What do you notice? What do you wonder?

Table A

x	y
0	2
1	$3\frac{1}{2}$
2	5
3	$6\frac{1}{2}$
4	8

Table B

x	y
0	2
1	3
2	$\frac{9}{2}$
3	$\frac{27}{4}$
4	$\frac{81}{8}$

2 What's Left?

Student Task Statement

1. Here is one way to think about how much Diego has left after spending $\frac{1}{4}$ of $100. Explain each step.
    - Step 1: $100 - \frac{1}{4} \cdot 100$
    - Step 2: $100 \left(1 - \frac{1}{4}\right)$
    - Step 3: $100 \cdot \frac{3}{4}$
    - Step 4: $\frac{3}{4} \cdot 100$

2. A person makes $1,800 per month, but $\frac{1}{3}$ of that amount goes to her rent. What two numbers can you multiply to find out how much she has after paying her rent?

3. Write an expression that only uses multiplication and that is equivalent to x reduced by $\frac{1}{8}$ of x.

3 Value of a Vehicle

Student Task Statement

Every year after a new car is purchased, it loses $\frac{1}{3}$ of its value. Let's say that a new car costs $18,000.

1. A buyer worries that the car will be worth nothing in three years. Do you agree? Explain your reasoning.

2. Write an expression to show how to find the value of the car for each year listed in the table.

year	value of car (dollars)
0	18,000
1	
2	
3	
6	
t	

3. Write an equation relating the value of the car in dollars, v, to the number of years, t.

4. Use your equation to find v when t is 0. What does this value of v mean in this situation?

5. A different car loses value at a different rate. The value of this different car in dollars, d, after t years can be represented by the equation $d = 10{,}000 \cdot \left(\frac{4}{5}\right)^t$. Explain what the numbers 10,000 and $\frac{4}{5}$ mean in this situation.