Unit 4, Lesson 8

The Birds

Let's solve multiplication problems.

Warm-up

Notice and Wonder: For the Birds

What do you notice? What do you wonder?

Activity 1

Home Is Where the Bird Lives

Different types of birds use different types of houses. The table gives you the recommended side lengths for birdhouses of various species.

type of bird	side lengths of floor	height	volume estimate
chickadee	4 in by 4 in	6 to 10 in	
wood duck	10 in by 18 in	10 to 24 in	
barn owl	10 in by 18 in	15 to 18 in	
red-headed woodpecker	6 in by 6 in	12 to 15 in	
bluebird	5 in by 5 in	6 to 12 in	
swallow	6 in by 6 in	6 to 8 in	

Estimate a possible volume for each birdhouse.

Activity 2

What is the Volume?

Use the information from the table. Find the recommended range of volumes for each type of birdhouse.

type of bird	side lengths of floor	height	range of volume
chickadee	4 in by 4 in	6 to 10 in	
wood duck	10 in by 18 in	10 to 24 in	
barn owl	10 in by 18 in	15 to 18 in	
red-headed woodpecker	6 in by 6 in	12 to 15 in	
bluebird	5 in by 5 in	6 to 12 in	
swallow	6 in by 6 in	6 to 8 in	

Section A Summary

We learned how to find the product of a three-digit number and a two-digit number. We first represented the products with diagrams. The diagrams help us break the product into parts by place value.

Example:

This diagram breaks apart the product 412×32 by place value. To find the product of 412×32, we multiply and then add all the partial products.

	400	10	2
30	12,000	300	60
2	800	20	4

$$12,000 + 300 + 60 + 800 + 20 + 4 = 13,184$$

Then we learned a new **algorithm** to multiply numbers, the **standard algorithm for multiplication**.

Example:

$$\begin{array}{rrrrrr} & & & 4 & 1 & 2 \\ & & \times & & 3 & 2 \\ \hline & & 1 & & & \\ & & & 8 & 2 & 4 \\ + & 1 & 2, & 3 & 6 & 0 \\ \hline & 1 & 3, & 1 & 8 & 4 \end{array}$$

Partial products are organized in a different way. 824 represents the partial product for 2×412, and 12,360 represents the partial product for 30×412.

We noticed that sometimes we need to compose a new unit when we use the standard algorithm. We represent that unit with a number over the place value to the left of the digit we are multiplying. We may have to compose more than one new unit.

$$\begin{array}{rrrrr} & & & 2 & \\ & & & 1 & \\ & & 2 & 1 & 6 \\ & \times & & 4 & 3 \\ \hline & 1 & & & \\ & & 6 & 4 & 8 \\ + & 8, & 6 & 4 & 0 \\ \hline & 9, & 2 & 8 & 8 \end{array}$$

The 1 above the 1 in 216 represents the ten from the product 3×6. The 2 represents 2 hundreds from the product 40×6.