## Lesson 12: Solve Problems Involving Multiplication

* Let’s solve problems using what we learned about multiplication of whole numbers.

### Warm-up: What Do You Know About 1 Year?

What do you know about 1 year?

### 12.1: Time Flies When We Leap Years

1. A baby elephant was born exactly 48 weeks ago. How many days old is she?
2. A leap year has 366 days. A non-leap year (or a common year) has 365 days. How many days are in 3 leap years?
3. In our calendar system, some months are 31 days long, some are 30 days long, and one month (February) is either 28 or 29 days long.
* What if the calendar system changed so that each month has 31 days? How many more days would there be in a year?
* 

### 12.2: Coin Collection

1. Lin’s family has collected 2,074 nickels over the years. How many pennies are worth the same amount?
2. If Lin’s family saved 2,074 nickels each year for 4 years, how many nickels would her family have?
3. Create a situation that involves a problem that can be solved by finding the value of $8×1,​049$. Solve the problem and show your reasoning.

### Section Summary

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In this section, we learned to multiply factors whose products are greater than 100, using different representations and strategies to do so.

When working with multi-digit factors, it helps to decompose them by place value before multiplying. For example, to find the value of $4×5,​342$, we can decompose the 5,342 into its expanded form, $5,​000+300+40+2$, and then use a diagram or an algorithm to help us multiply.





In both the diagram and the algorithm, the 20,000, 1,200, 160, and 8 are called the partial products. They are the result of multiplying each decomposed part of 5,342 by 4.

We can do the same to multiply a two-digit number by another two-digit number.

For example, here are two ways to find the value of $31×15$. The 31 is decomposed into $30+1$ and 15 is decomposed into $10+5$.







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