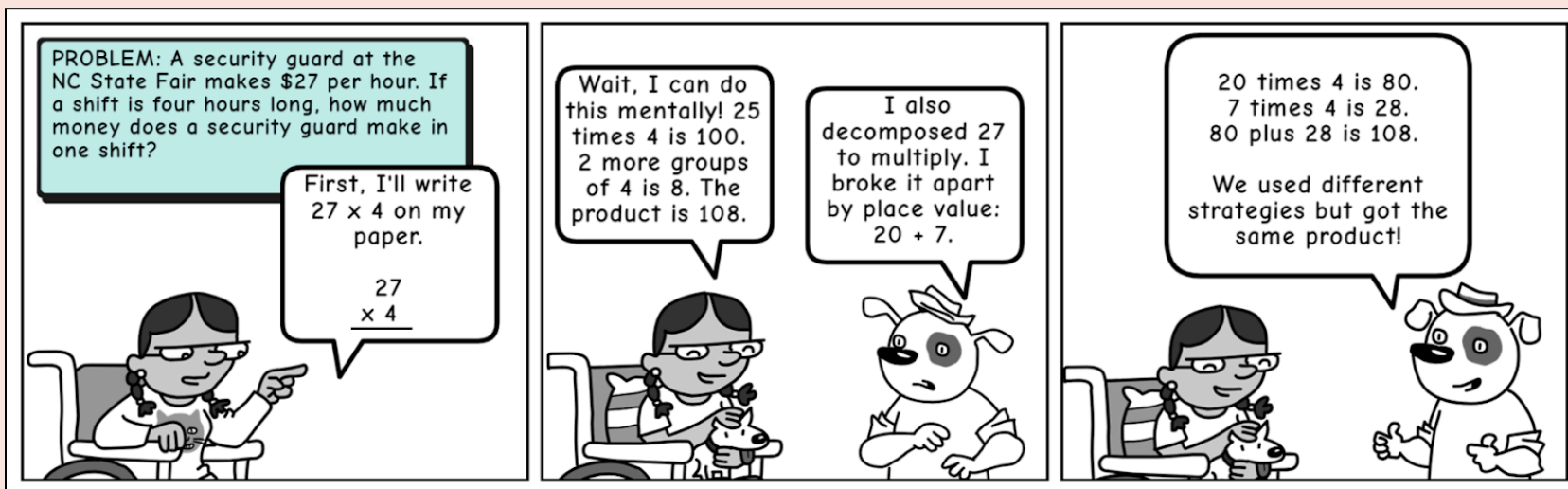




## What is the relationship between conceptual understanding and procedural fluency?

Procedural fluency and conceptual understanding are often seen as separate parts of mathematics, but the two are interwoven. As students engage in problem solving, they build conceptual understanding and establish procedures to multiply and divide. Students flourish in mathematics when opportunities for developing conceptual understanding precede and coincide with learning procedures. By learning through problem solving experiences, students become flexible thinkers and develop efficient strategies for multiplying and dividing. Read [NCTM's Position Statement on Procedural Fluency](#) to learn more.

## What does this look like?



The chart on the next page outlines the procedural fluency goals for whole number multiplication and division as well as underlying conceptual understandings. Notice the bolded verbs at the beginning of each statement. These verbs help distinguish between conceptual understanding and procedural fluency.

Click on each grade level to access additional resources.



# Developing Proficiency with Whole Number Multiplication & Division



	Building Conceptual Understanding	Procedural Fluency Goals
2	<p><b>Determine</b> if a group of objects is odd or even.</p> <p><b>Add</b> repeatedly or <b>count</b> to find the number of objects in an array.</p> <p><b>Skip-count</b> by 5, 10, and 100.</p>	
3	<p><b>Interpret</b> factors as representing the number of equal groups and the number of objects in each group.</p> <p><b>Represent and solve</b> multiplication and division problems within 100.</p> <p><b>Illustrate and explain</b> strategies including equal group drawings, arrays, repeated addition, decomposing a factor, and the properties of operations.</p> <p><b>Identify</b> patterns on a hundreds chart or multiplication table.</p>	<p><b>Multiply and divide</b> within 100 using strategies. Know from memory multiplication facts within 100.</p>
4	<p><b>Find</b> all factor pairs for whole numbers up to and including 50.</p> <p><b>Interpret</b> a multiplication equation as a comparison.</p> <p><b>Represent and solve</b> multiplicative comparison problems.</p>	<p><b>Multiply and divide</b> up to a 3-digit number by 1-digit number or two 2-digit numbers with place value understanding using area models, partial products, and the properties of operations.</p>
5	<p><b>Extend</b> strategies based on place value understanding and the properties of operations to a broader range of numbers.</p>	<p><b>Multiply</b> up to a 3-digit number by 2-digit numbers using a standard algorithm.</p> <p><b>Divide</b> multi-digit numbers using strategies.</p>
6	<p><b>Extend</b> strategies based on place value understanding, the properties of operations, and standard algorithms to a broader range of numbers.</p>	<p><b>Divide</b> multi-digit numbers using a standard algorithm.</p>

**\*Procedural fluency is achieved by doing all three of the following:**

- **Efficiently** select and use strategies. This means students select and use the easiest strategy for the situation.
- **Flexibly** adopt and adapt strategies. This means students know more than one strategy, and can modify strategies as needed.
- **Accurately** solve problems. This means students get the correct answer.