Examples are a great way to deepen your understanding of the arithmetic mean. Let's break down some real-world scenarios where the arithmetic mean would come into play.

Example 1: Shopping for Groceries

Suppose you're buying apples, and there are three types available:

- Type A costs $1.50 per pound
- Type B costs $2.00 per pound
- Type C costs $1.20 per pound

To find the average cost per pound of these apples, you'd add all the prices together and then divide by the number of types:

$$\text{Arithmetic Mean} = \frac{(1.50 + 2.00 + 1.20)}{3} = \frac{4.70}{3} = 1.57$$

So, the average cost per pound of apples is $1.57.

Example 2: Sports Stats

Imagine you want to evaluate a basketball player's performance over five games, where the player scored 12, 15, 20, 25, and 28 points.

$$\text{Arithmetic Mean} = \frac{(12 + 15 + 20 + 25 + 28)}{5} = \frac{100}{5} = 20$$

The player's average score is 20 points per game.

Example 3: Education

Let's say you've received grades in five subjects: 90 in Math, 85 in Science, 80 in History, 88 in Language Arts, and 92 in Physical Education.

$$\text{Arithmetic Mean} = \frac{(90 + 85 + 80 + 88 + 92)}{5} = \frac{435}{5} = 87$$

Your average grade is 87.

Example 4: Finance

You're an investor tracking the yearly returns on three different stocks over the past year. The stocks had returns of 8%, 12%, and 6%.

$$\text{Arithmetic Mean} = \frac{(8 + 12 + 6)}{3} = \frac{26}{3} \approx 8.67\%$$

The average return on your investment portfolio is approximately 8.67%.

Example 5: Medicine

In a medical study evaluating the effectiveness of a new medication, the reduction in symptom severity was recorded for 5 patients as follows: 15%, 20%, 22%, 18%, 16%.

$$\text{Arithmetic Mean} = \frac{(15 + 20 + 22 + 18 + 16)}{5} = \frac{91}{5} = 18.2\%$$

The average reduction in symptom severity due to the medication is 18.2%.

Example 6: Weighted Arithmetic Mean in Course Grading

Imagine a course where your grades are divided as follows: Homework 20%, Midterm 30%, and Final Exam 50%. Your scores are 85 for Homework, 90 for the Midterm, and 92 for the Final Exam.

$$\text{Weighted Mean} = (0.2 \times 85) + (0.3 \times 90) + (0.5 \times 92) = 17 + 27 + 46 = 90$$

Your weighted average grade for the course is 90.

I hope these examples provide a more thorough understanding of how to calculate and interpret the arithmetic mean in various contexts!