



The Parent Sessions:
Mathematical Methods
Year 4

An explanation of ARE (Appropriate, Reliable, Efficient)

- ▶ The ARE framework (Appropriate, Reliable, Efficient) in math helps choose the best problem-solving strategy:
 1. **Appropriate:** Select a method suited to the problem (e.g., mental math for simple sums, algorithms for complex ones).
 2. **Reliable:** Ensure the method consistently gives correct results (e.g., standard algorithms for accuracy).
 3. **Efficient:** Solve the problem quickly without sacrificing accuracy (e.g., using shortcuts like compensation).
- ▶ It promotes accuracy, practicality, and flexibility in solving math problems.

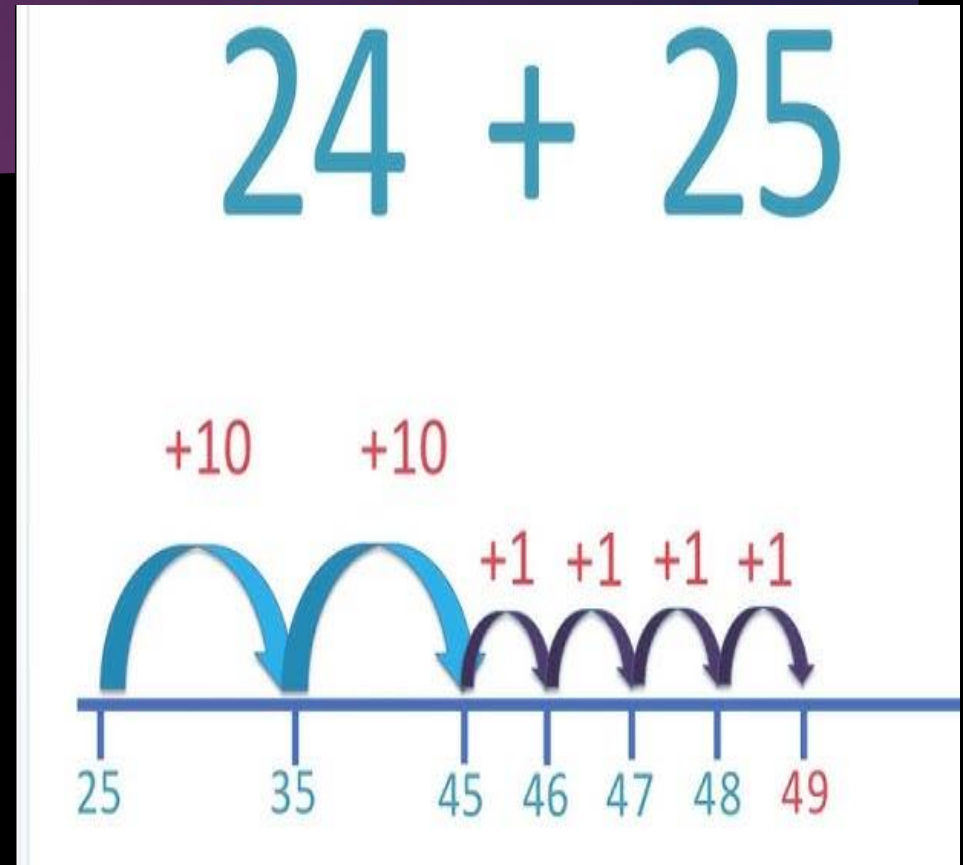
Question: $5400 - 79 =$

- ▶ To use column method to answer this question might not be the most efficient way. A different approach could be to use the compensation strategy ($5400 - 80 + 1$)

The Rationale Behind:

Compensation on a number line

- ▶ Compensation is when you adjust one of the numbers in the problem by a small amount (either adding or subtracting), solve the problem with that adjustment, and then correct it by reversing the adjustment.
- ▶ This strategy helps you make calculations easier by working with friendly numbers (like multiples of 10) and then making small adjustments to get the correct answer.
- ▶ **Faster and Easier:** It's quicker and simpler to add or subtract round numbers like 50 or 40.
- ▶ **Flexible Thinking:** It encourages flexible thinking, as students learn to adjust numbers to make the math easier and then correct their answer.
- ▶ **Confidence Building:** This method helps students feel more confident in solving problems by breaking down complex calculations into easier steps.



Example Questions: Compensation with addition

Let's say the problem is: **$28 + 47$**

- ▶ **Step 1:** Start by looking for a round number close to one of the numbers.

Here, 47 is close to 50, which is a friendly number. So, we "compensate" by adding 3 to 47 to make it 50.

- ▶ **Step 2:** Add the numbers with the adjusted value.

Now, it's easier to add:

$$28 + 50 = 78$$

- ▶ **Step 3:** Don't forget to "undo" the compensation.

Since we added 3 to 47, we need to subtract 3 from 78 to adjust the result:

$$78 - 3 = 75$$

So, **$28 + 47 = 75$** .

Example Questions: Compensation on a number line

Let's say the problem is: **62 - 38**

- ▶ **Step 1:** Find a round number near one of the numbers.

Here, 38 is close to 40, so we compensate by adding 2 to 38, making it 40.

- ▶ **Step 2:** Subtract with the adjusted number.

Now, we subtract:

$$62 - 40 = 22$$

- ▶ **Step 3:** Undo the compensation by adding back the 2 that was taken away.

Since we added 2 to 38, we need to add 2 to 22:

$$22 + 2 = 24$$

So, **62 - 38 = 24.**

Tips for Parents!

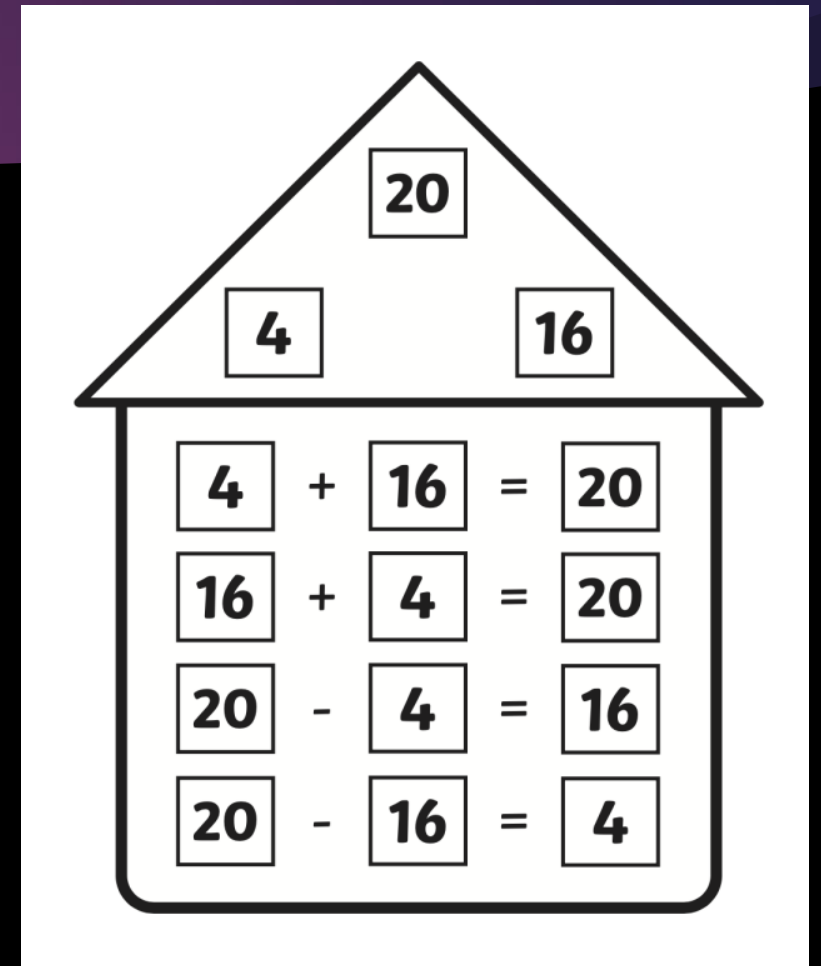
Tips for Parents:

- ▶ **Practice with Simple Examples:** Start with simple numbers and gradually increase difficulty as your child gets more comfortable with the method.
- ▶ **Use a Number Line:** Show your child how to use a number line, moving forward and backward in easy steps to visualize the process.
- ▶ **Encourage Estimation:** Ask your child to estimate the answer first, then use compensation to see if it's close.

The Rationale Behind:

Related Number Facts

- ▶ Related number facts are math facts that are connected or linked in some way. For example, the numbers in **multiplication and division** are related, and so are the numbers in **addition and subtraction**. When we understand how numbers are related, it becomes easier to solve more difficult problems by recalling the simpler ones.
- ▶ **Builds Confidence:** It encourages your child to build on the math facts they already know, so they feel more confident when tackling harder problems.
- ▶ **Simplifies Math:** By connecting facts they've already learned, your child can solve problems more efficiently without having to memorize every single fact.
- ▶ **Strengthens Number Sense:** It helps your child understand how numbers relate to each other, building a deeper understanding of math that they can apply to many different problems.



Example Questions: Using Addition & Subtraction facts

Question 1a:

- ▶ Let's say you need to solve a problem like $8 + 7$. If your child already knows the addition fact for $8 + 7 = 15$, they can use that to solve a related subtraction problem as well.
- ▶ If your child knows that $8 + 7 = 15$, then they also know that $15 - 7 = 8$ and $15 - 8 = 7$.
- ▶ By understanding this relationship, your child can easily switch between addition and subtraction problems.

Question 1b:

Let's say the problem is $14 + 9$.

- ▶ **Step 1:** Break it into easier related facts.

We know that $10 + 9 = 19$.

Then, $14 + 9$ is just $10 + 9$ (which is 19) plus **4 more**.

So, $14 + 9 = 23$.

Example Questions: Using Division & Multiplication facts

Question 2a :

If your child knows that $6 \times 4 = 24$, they can also easily use this information to solve division problems, like:

- ▶ $24 \div 6 = 4$
- ▶ $24 \div 4 = 6$

Knowing multiplication facts also helps with division, and vice versa. If your child can recall the multiplication fact quickly, they can use it to help them solve division problems with the same numbers.

Question 2b:

Let's take the multiplication problem 7×6 .

- ▶ **Step 1:** Start with a related fact you already know.

If your child knows that $6 \times 6 = 36$, then they can use this fact to help with 7×6 .

- ▶ **Step 2:** Add one more group of 6 to 36.

So, $7 \times 6 = 36 + 6 = 42$.

Tips for Parents

- ▶ **Practice Basic Facts Regularly:** Help your child practice basic addition, subtraction, multiplication, and division facts so they can quickly recall related facts when needed.
- ▶ **Encourage Looking for Patterns:** Teach your child to look for patterns in numbers. For example, if they know $6 \times 7 = 42$, then they should also be able to work out $42 \div 7 = 6$.
- ▶ **Make Connections:** Show them how addition and subtraction are related, and how multiplication and division work together. For example, if they know $5 \times 8 = 40$, they should know $40 \div 8 = 5$.
- ▶ **Use Real-Life Examples:** Use real-world situations to show how related number facts apply. For example, if you're shopping and buying several items, point out how multiplying or dividing the total price involves related facts.