

Lesson Title: *Addition Facts (Sums to Twenty), the Corresponding Subtraction Facts and Using Addition and Subtraction as Inverse Operations*

Objectives: Students will be able to commit to memory their addition facts (sums to twenty) and the corresponding subtraction facts. Students will be able to use the concept that addition and subtraction are inverse operations to each other to help them solve problems.

Language to Learn:

Sum, total, difference, inverse operation

The students have already learned how to add numbers. If the students did not know their number facts, then they either drew diagrams or used some type of counters to help them find the sum. The same technique was used with subtraction. This lesson is going to help the students learn their number facts, sums up to 20, and then use the concept that addition and subtraction are inverse operations to confirm their answers.

We will begin this lesson with the assumption that the students are familiar with their addition facts whose sums are ten. We will begin with sums up to eleven.

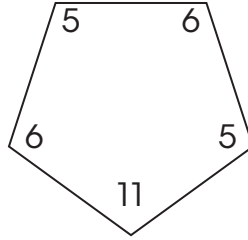
- Ask the students: What is $6 + 5$?
- Ask the students: What is $5 + 6$?
- Ask the students: What is $11 - 6$?
- Ask the students: What is $11 - 5$?
- Show the students the vertical addition:

$$\begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array} \quad \begin{array}{r} 11 \\ - 6 \\ \hline 5 \end{array} \quad \begin{array}{r} 5 \\ + 6 \\ \hline 11 \end{array} \quad \begin{array}{r} 11 \\ - 5 \\ \hline 6 \end{array}$$

- Ask the students: How can the addition facts help with the subtraction facts?

To help the students learn the addition and subtraction facts, have the student create pentagon cards. The students can fill in the numbers and use the cards as flash cards.

Below is an example of a pentagon card.



- If the students add the numbers in the corners on the left side, they see that:

$$5 + 6 = 11$$

- If the students add the numbers in the corners on the right side, they see that:

$$6 + 5 = 11$$

- If the students add the numbers going horizontally across, they see that:

$$5 + 6 = 11 \quad \text{and} \quad 6 + 5 = 11$$

(11 is the number in the bottom)

- If the students start at the bottom and subtract, bottom number minus the left hand corner number, they see that:

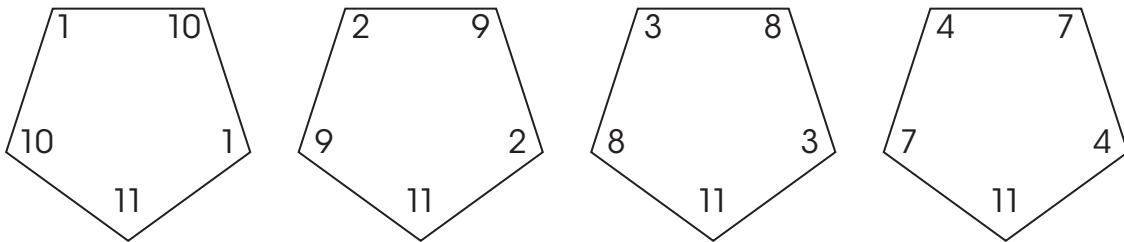
$$11 - 6 = 5$$

- If the students start at the bottom and subtract, bottom number minus the right hand corner number, they see that:

$$11 - 5 = 6$$

The pentagon card will assist the students to remember their addition and subtraction facts. The card visually demonstrates the addition and subtraction.

Have the students create other pentagon cards for 11.



- Show the students the different ways they can add on the pentagon card.

Have the students create pentagon cards for the numbers 12 through 20.

English Language Learner (ELL): & Intensive Level Student:

The ELL and Intensive Level student should create the pentagon cards and use them on a daily basis to help them remember their addition and subtraction facts. In order to be successful in mathematics, it is important for the students to know these facts by heart. The pentagon cards are a tool to help the students visualize and see the addition on paper. It is not sufficient for the students to create the cards and refer to them, or to use counters to arrive at an addition or subtraction answer. The students must eventually have these facts memorized. If need be, the students should have additional drill at home in the form of worksheets, with assessment tests to check their skills. When the worksheets are created, make sure that the students see the addition and subtraction problems written vertically as well as horizontally. They need to be exposed to the two visual forms.

Strategic Level Student:

The Strategic Level Student should go through the same process as the ELL and Intensive Level Student. They too should create pentagon cards to help them learn their addition and subtraction facts. They also must have the facts memorized. Additional work at home will help reinforce these facts.

The Strategic Level student can use these facts to solve verbal problems. For example:

- I had 12 balloons and 3 popped. How many balloons did I have left?
- My mother baked 20 cookies and I ate 4. How many cookies were left for my family?
- I had 8 toy cars and received 4 more toy cars for my birthday. How many toy cars do I have now?
- I had 7 cents in my pocket and found 6 cents in my desk. How much money do I have?
- I had 15 cents and bought a lollypop for 6 cents. How much money do I have left?

With these questions, not only are the students practicing their basic facts, but they also practicing their reading and problem solving techniques that they learned earlier on.

At-Grade Level Student: & Advanced Level Student:

The At-Grade Level and Advanced Level Student should also have their addition and subtraction facts memorized. They also have the option of creating the pentagon cards to help them memorize their facts.

As an interesting activity, the students could work in pairs and pick 2 cards from the number index cards they created. Have them create a math sentence using the index cards. Have their partner find the solution.

An additional activity may include 1 index card. Have one student pick a card, and both students must write down two addition and subtraction problems to yield that number. They should check each others work.

The At-Grade and Advanced Level students should have more challenging verbal problems. For instance:

- I had 12 balloons and 3 popped. My mother bought me 5 more. How many balloons do I have now?
- I had 7 cents in my pocket and found 6 cents in my desk. How much money do I have now? What are the possibilities of the different types of coins I could have? Explain your answer.

The last question is very sophisticated. Although the total amount of money is 13 cents, we would like the student to realize that he could only have either:

- 2 nickels and 3 pennies or
- 13 pennies or
- 1 nickel and 8 pennies

The students might be very excited to say one dime and three pennies. Ask them: Why is that not possible?

As long as the students know their basic facts up to 20, they will be able to see the relationship between addition and subtraction. They will see that they are opposite or inverse operations. Use these facts to help challenge the students with verbal problems. Remember, that in the end, the students must know these facts by heart.