

Core Content

Cluster Title: Use place value understanding and properties of operations to add and subtract.

Standard : 4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

MASTERY Patterns of Reasoning:

Conceptual:

Understand that numbers can be decomposed in many ways to simplify the process of addition.

Understand that the process of adding one-digit numbers transfers over to adding two-digit numbers.

Understand that the value of the tens place can be seen as “2 tens” or “20” (for example).

The inverse relationship between addition and subtraction in one-digit numbers transfers over to two-digit numbers.

Procedural:

Manipulate numbers in the tens or ones place individually.

Manipulate both the tens and ones place in the same problem.

Make (compose) a ten when the situation of making (composing) a ten occurs.

Solve a two-digit addition problem with paper and pencil using many strategies.

Explain through journal writing how to add two-digit numbers.

Representational:

Organize manipulatives to help explain the process of solving the problem.

Supports for Teachers

Critical Background Knowledge

Conceptual:

- Understand that a two-digit number is made of tens and ones.
- Understand the basic skill of addition and subtraction.
- Understand basic addition and subtraction facts.
- Understand the value of the number in the tens place.
- Understand the inverse relationship between addition and subtraction in one-digit numbers.

Procedural:

- Read a two-digit number.
- Circle the number in the tens place.
- Circle the number in the ones place.
- Write a two-digit number.
- Answer addition problems presented in vertical and horizontal formats.

Representational:

- Represent a two-digit number pictorially.
- Represent a two-digit number with manipulatives.

Academic Vocabulary and Notation

Add, Addend, Compose, Equation, Making (Composing) Tens, Ones, Place Value, Sum

Instructional Strategies Used	Resources Used
<p>Using base ten manipulatives such as base ten blocks, Unifix Cubes, or abacuses to manipulate the tens place. Students write a number between 1 and 9 and show it with manipulatives. Each student rolls a number cube and adds that many tens to the original number. Students then write the new number on their recording sheet and roll again until they pass 100. Students then begin again with a new number.</p> <p>Students will pick two cards that each have a two digit number on them. Provide numbers on the cards that don't require regrouping. Students will draw one card, represent it with manipulatives, draw a second card, represent it and finally combine the manipulatives to identify the sum.</p> <p>Provide an activity using expanded form to solve a two-digit addition problem. Students will write numbers in expanded form first. Then add the tens and ones separately, finishing with combining the tens and ones as follows.</p> $ \begin{array}{r} 35 \text{ — } 30+5 \\ +21 \text{ — } 20+1 \\ \hline 50+6=56 \end{array} $ <p>Use the following diagram to show the value of the tens and ones to solve the problem.</p>	<p><u>Teaching Student-Centered Mathematics</u>, Grades K-3, John A. Van de Walle, LouAnn H. Lovin</p> <p>Coolmath4kids.com</p> <p>http://gamequarium.com/addition3.html</p> <p>www.dositey.com/addsub/add5a.html</p>

$$\begin{array}{r} 35 \\ + 21 \\ \hline 50 \\ + 6 \\ \hline 56 \end{array}$$

Students roll a number cube with low numbers to create two two-digit numbers. Students write down the numbers, demonstrate solving with pictures or manipulatives, then write the answer.

Assessment Tasks Used

Skill-based Task:

Problem Task:

Students will demonstrate mastery of the concept by adding two two-digit numbers with and without manipulatives and writing the sum.

In John's rock collection he counted thirty-two rocks. His father came home from a vacation and gave him three rocks and a bag filled with twenty. How can John figure out how many rocks are in his collection now?

On Saturday Cindy jumped thirty-six times without stopping. On Sunday she was tired and only jumped twenty six times without stopping. What would you do to find the difference of how many times Cindy jumped?