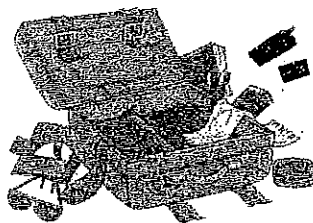


Unpack the Problem

- * Who is the problem about?
- * What are they doing?
- * Are they doing the activity with someone? How many?
- * What do they have? How many?



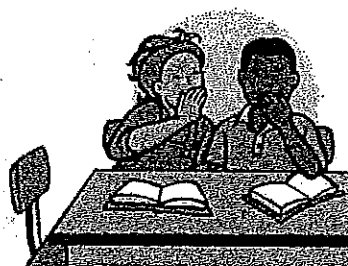
Begin to Solve

- * Work independently to solve
- * Be prepared to explain why you picked the operation
- * Be prepared to explain how you came to your answer (defend it)



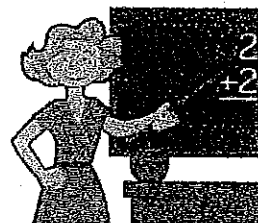
Work with Group or Partner

- * Explain what you did
- * Listen and ask questions
- * Clarify any misunderstandings

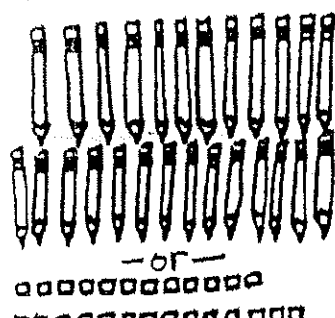
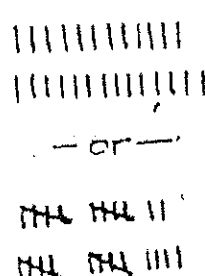
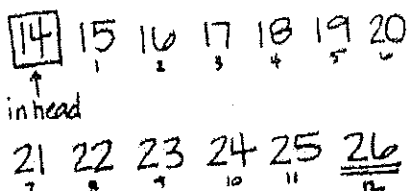
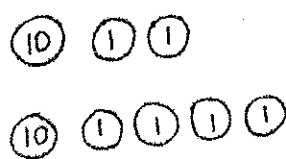
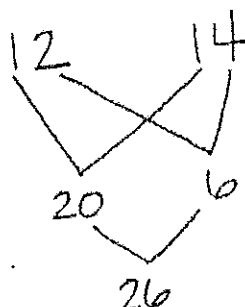
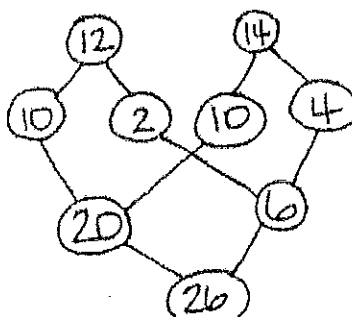
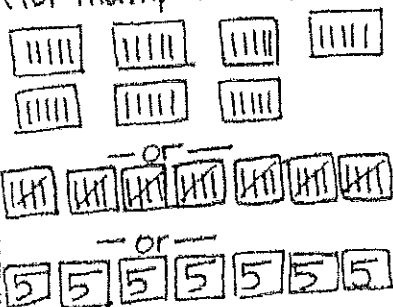


Explain to the Class

- * Walk the class through it
- * Restate what speaker said in your own words
- * Ask meaningful questions



Math Strategies Reference Sheet

<p>Pictures</p>  <p>— or —</p>	<p>Tallies</p>  <p>— or —</p>	<p>Counting</p>  <p>• "counting on" • "counting back" • "skip counting" (for multiplication)</p>									
<p>Number Disks</p> 	<p>Break Down</p> <table><tr><th>Hundreds</th><th>Tens</th><th>ones</th></tr><tr><td></td><td>10</td><td>1</td></tr><tr><td></td><td>10</td><td>1</td></tr></table>	Hundreds	Tens	ones		10	1		10	1	<p>Expanded Form</p> $12 + 14 =$ $10 + 2 + 10 + 4 =$ $20 + 6 =$ 26
Hundreds	Tens	ones									
	10	1									
	10	1									
<p>Place Value</p> <table><tr><td>12</td><td>14</td></tr><tr><td><u>1</u> tens</td><td><u>1</u> tens</td></tr><tr><td><u>2</u> ones</td><td><u>4</u> ones</td></tr></table> $\begin{array}{r} 2 \text{ tens} \\ 6 \text{ ones} \end{array}$	12	14	<u>1</u> tens	<u>1</u> tens	<u>2</u> ones	<u>4</u> ones	<p>Pull Down</p> 	<p>Number Bonds</p> 			
12	14										
<u>1</u> tens	<u>1</u> tens										
<u>2</u> ones	<u>4</u> ones										
<p>Repeated Addition (for multiplication)</p> $5 + 5 + 5 + 5 + 5 + 5 + 5$	<p>Grouping (for multiplication)</p>  <p>— or —</p>	<p>Algorithm*</p> $\begin{array}{r} 12 \\ + 14 \\ \hline 26 \end{array}$									

*Students need to demonstrate proficiency before using the algorithm

Multiplication Table

(Drawing is to scale...)

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

THE ART OF QUESTIONING IN MATHEMATICS

From The NCTM Professional Teaching Standards

HELP STUDENTS WORK TOGETHER TO MAKE SENSE OF MATH

- "What do others think about what _____ said?"
- "Do you agree? Disagree? Why or why not?"
- "Does anyone have the same answer but a different way to explain it?"
- "Would you ask the rest of the class that question?"
- "Do you understand what they are saying?"
- "Can you convince the rest of us that that makes sense?"

HELP STUDENTS TO RELY MORE ON THEMSELVES TO DETERMINE WHETHER SOMETHING IS MATHEMATICALLY CORRECT

- "Why do you think that?"
- "Why is that true?"
- "How did you reach that conclusion?"
- "Does that make sense?"
- "Can you make a model and show that?"

HELP STUDENTS TO LEARN TO REASON MATHEMATICALLY

- "Does that always work? Why or why not?"
- "Is that true for all cases? Explain?"
- "Can you think of a counter example?"
- "How could you prove that?"
- "What assumptions are you making?"

HELP STUDENTS LEARN TO ANALYZE, INVENT, AND SOLVE PROBLEMS

- "What would happen if _____? What if not?"
- "Do you see a pattern? Explain?"
- "What are some possibilities here?"
- "Can you predict the next one? What about the last one?"
- "How did you think about the problem?"
- "What decision do you think he/she should make?"
- "What is alike and what is different about your method of solution and his/hers?"

HELP STUDENT CONNECT MATHEMATICAL IDEAS AND APPLICATIONS

- "How does this relate to _____?"
- "What ideas that we have learned before were useful in solving this problem?"
- "Have we ever solved a problem like this one before?"
- "What uses of mathematics did you find in the newspaper last night?"
- "Can you give me an example of _____?"

CGI – How Can I Show My Thinking and Demonstrate My Understanding?

Name: _____ Date: _____

Problem:

What information do I have?	What am I being asked to find out?
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Strategies

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Explanation (words):

Number Sentence (symbols):

annotating text!

Use the following marks & symbols to show how you are connecting to what you're reading!



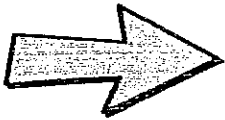
This is a key word or idea.



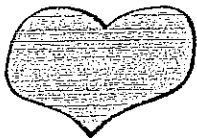
I have a question about this or I don't understand.



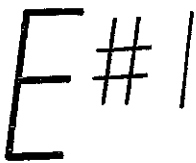
This is interesting or surprising.



I have a connection to this.



This is my favorite part.



This is my evidence. (If answering questions, put the question # that you are showing evidence for.)

S.M.A.R.T. Goal Planner

S pecific	What <u>EXACTLY</u> do I want to happen?	
M easurable	I will know I have reached my goal when...	
A ttainable	With hard work, is it possible to reach this goal by the deadline?	
R ealistic and R elevant	My goal is important enough for me to put a plan into action. I will follow this specific plan to reach my goal:	
T ime-Bound	I will reach my goal by:	