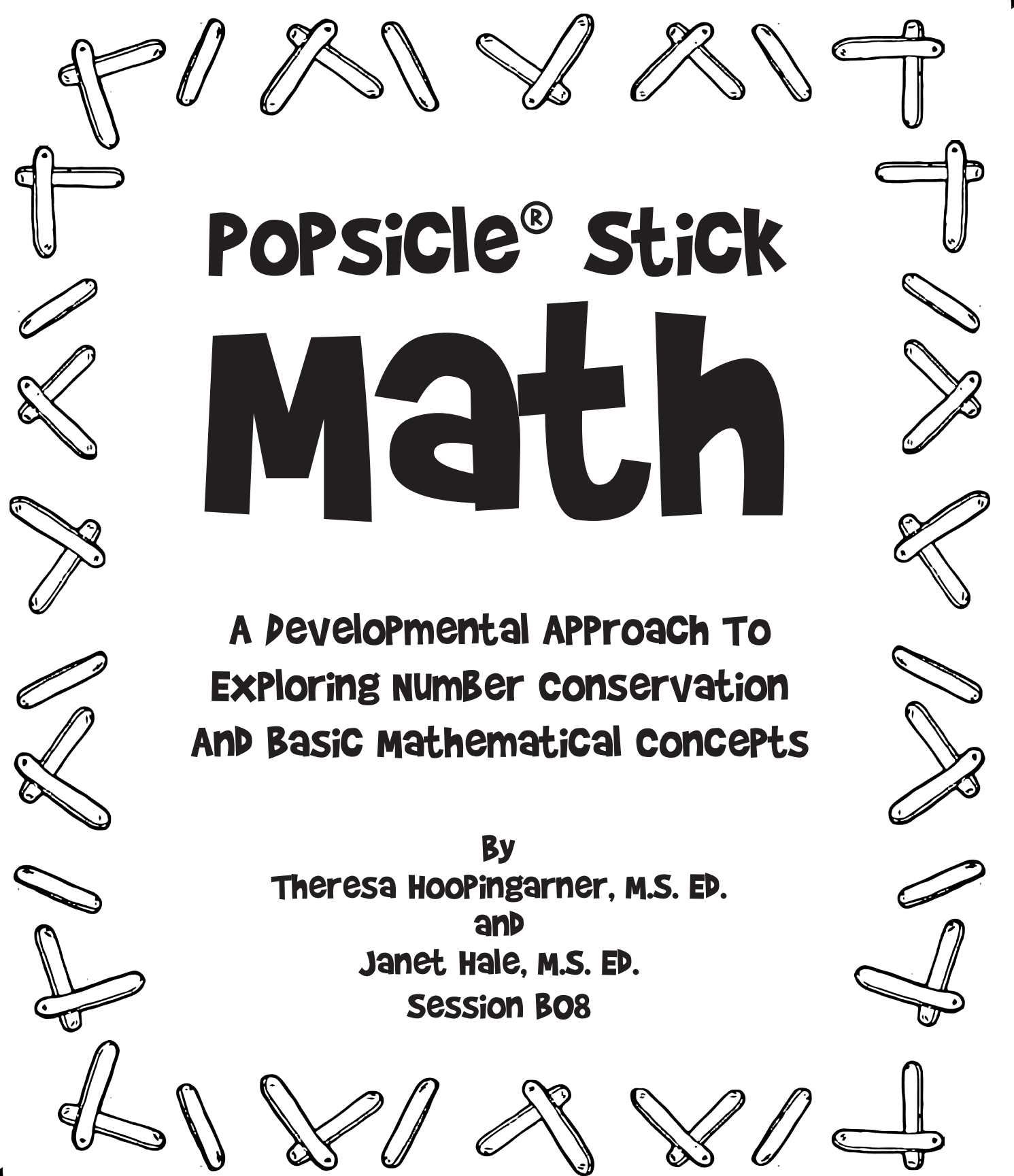




POPSICLE® Stick Math

**A Developmental Approach To
Exploring Number Conservation
And Basic Mathematical Concepts**

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Session B08**

Introduction

The world of mathematics in the classroom can be divided into two categories: *concrete* and *abstract*. Concrete math includes number conservation (number sense) and basic number concepts (which is the basis of *Popsicle Stick Math* and addressed in detail in this packet), while abstract math embraces relationship-oriented math concepts such as time, money, measurement, fractions, and complex graphing.

Concrete math is the basic foundation of mathematics, not unlike the concrete foundation of a house. Unless it is solid and in place, the house built upon it will crack and be in constant need of repair. Using this analogy, think of your children. How often do they struggle with abstract math? Aren't they usually in need of math repair? The reason for this phenomena is based on the fact that most teachers have not been trained in the essential need for concentrating on math foundation. Too often, based on math books and the school year's timeline of we need to cover it all, teachers often times take children quickly through the critical stages of number conservation.

Popsicle Stick Math is designed to make certain that the math foundations are solidly in place. This is not to say children should not be exposed to abstract math concepts, but more for exposure and those who are truly ready, than expected mastery. Once you have tested children (see Placement Testing, page 2) for Popsicle Stick Math, you will discover (and may even be a bit surprised) that many of your children are not as foundationally math-conservation sound as you may have thought.

It is recommended that you divide math instruction into two separate teaching times. One entitled Popsicle Stick Math Time, the other Group Math Time. Popsicle Stick Math Time is detailed in this packet. Group Math Time is designed to introduce and explore abstract math areas appropriate to your grade level.

Placement Testing

You will need:

1 set of cardstock number cards 0-10
1 set of 10 popsicle sticks
1 set of cardstock number cards 0-5
1 set of 5 popsicle sticks
Flat table surface

Note: It is highly recommended that you test one child at a time. This allows you to concentrate on what degree of number sense and number conservation the child has, as well as safeguarding the child from inhibitions he or she might feel with other children watching.

1. Sit at a table with number cards randomly mixed and placed face down on table directly in front you. Ask child to be tested to sit directly opposite of you. Place more than ten popsicle sticks in front of him/her. Tell child that the two of you are going to play a math game. Have child select 10 popsicle sticks from pile. Move remaining pile away. Share that you are going to show him/her a number on a card and that you want him/her to put down the same number of popsicle sticks on the table or match mat.

2. Tilt pile of number cards vertically so child can see first number (as well as you being able to simultaneously look downward and see number upside down.) Say the number and ask child to show you that number with popsicle sticks using specific wording. Example: Number card is five. Say, "You have 10 sticks. Show me a set of five on the table." Observe as child proceeds to lay down popsicle sticks. When child has placed popsicle sticks on table and signifies he/she is finished, do a quick mental count. If number of popsicle sticks on table correct, proceed to next number card. If incorrect, say, "The number is five. You may want to check the number of sticks you have on the table." Wait while child checks/corrects what he/she has done.

3. When number of popsicle sticks on table matches number card, re-state number on card using specific wording (see example on page 3) and place that number card on the table. Immediately state new number using specific wording. Observe child closely to see what strategies the child uses to change the number of popsicle sticks on table. This is

CRUCIAL. The child may use a mental inventory for adjusting number of popsicle sticks and simply pick up or put down appropriate number of popsicle sticks, or the child may not! Read the following example to see what may take place:

Teacher: "You have a set of five on the table set (Place number 5 card on table. Now number 3 appears.)... Now show me a set of three."

Child: He/she smiles at you and immediately places three popsicle sticks from those still held in his/her hand on the table right next to the five already there. He/She looks at you as if to say, "I'm done."

Teacher: "You need to show me a set of three. You may want to check how many sticks you have on the table."

Child: He/she looks puzzled. The child places a finger on each popsicle stick resting on table while counting outloud: "One, two, three, four, five, six, seven, eight." Child giggles and picks up all the sticks and begins to lay them down again saying, "One, two, three," as he/she places each popsicle stick on table.

Teacher: Makes mental note of what child did to correct number of popsicle sticks on table. If child has difficulty on next round, teacher gets second pile of number cards 0-5 and gives child a new pile of five popsicle sticks (completely removing the ten popsicle stick pile). They continue playing the game using only 0-5 number cards.

4. Entire game is played in same manner as outlined above. Here is an example of specific wording for a series of number cards:

"You have a set of five (flipping to new number card), now show me a set of eight. (Pause for child to complete task.) You have a set of eight (flipping to new number card), now show me a set of one. (Pause for child to complete task.) You have a set of one (flipping to new number card), now show me a set of nine. (Pause for child to complete task.)"

This process continues until you have gone through the deck of number cards twice (mix number cards up between first and second round to create random order once again).

5. Share that you are going to remove sticks and play game again, but this time asking child to use his/her fingers instead of sticks (see Finger Flash, page 6). When finished with Finger Flash, thank child for playing and excuse child. Before calling up next child, write down anecdotal notes pertaining to just-tested child's number conservation and number sense abilities.

POPSICLE Math Time Initial Group Placement

- A.** Numbers 0-5, doesn't have a clue concerning number conservation (sense)
- B.** Numbers 0-5, have a small inclination of number conservation (sense)
- C.** Numbers 0-10, with a little practice will have good number conservation (sense) concept
- D.** Numbers 0-10, mastery or just about to master, number conservation (sense) concept and is ready to explore next step in basic mathematical number sense concepts

After testing class, create four popsicle Stick Math groups for Popsicle Stick Math Time based on initial placement finding. Be aware group members may change as school year progresses. Some children begin to build number conservation quickly, while others do not, because they are not maturationally ready.

POPSICLE Stick Math Hour – Four Stations

Teacher Time: Children are with teacher completing specific number conservation (sense) and number concept activities given group's placement. Note: Other hands-on manipulatives can be used instead of popsicle sticks to create variety and continued interest in Popsicle Stick Teacher Time. Also, a variety of manipulatives will be used in exploring later number concept steps.

Journal Writing: Before journal writing begins, children individually complete two to three practice sheets based on number sense/number concept abilities. When practice sheets have been completed and placed in teacher's check file, children follow verbal directions or written directions wherein they write in individual journals showing the process used for "a mathematical conclusion" for a given math situation.

Games: In a specific area of room, math-oriented games are available. Be aware that you will need to provide for wide variety of math number sense and concept levels, as well as variety of learning styles, and must stay in 0-5 and 0-10 range appropriately.

Focused Exploration: Baskets or buckets of manipulatives and measuring devices (you name it, include it!) are available so children can discover the wonderful mathematical world in which we live.

Progress Steps For Popsicle Stick Math

(Important Note: Do not skip any steps! Follow as sequenced Below.)

A. Sets 0–5	I. Addition (Sums To 10)
B. Sets 0–10	J. Additional Addition Lessons
C. Greater Than	K. Subtraction (0–10)
D. Less Than	L. Place Value (General Knowledge)
E. One More	M. Place Value (10–20)
F. Math Equations	N. Place Value (20–100)
G. Addition (Sums To 5)	O. Double-Digit Addition (No Regroup)
H. Write Addition Equations	P. Double-Digit Subtraction (No Regroup)

POPSICLE STICK MATH Teacher Time

Sets 0-5 and Sets 0-10

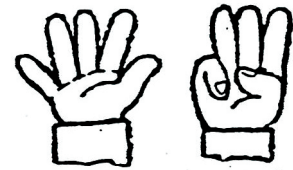
Note: Steps 1-2 are completed during each meeting time; Step 3 is optional.

1. POPSICLE STICK MATH WITH NUMBERS CARDS

Follows same procedure used during initial testing of children (see page 2-3). The only difference now is you will be having more than one child to observe at a time! As rapidly as possible, train eyes to quickly "scan count" number of popsicle sticks each child has placed on table, as well as still held in his/her hands, before showing next number card.

2. Fingers Flash

Finger Flash is played exactly like popsicle stick math, except children use fingers to "flash" appropriate number (based on number card shown). When getting ready to play, ask children to place elbows on tables, forearms vertical. As number card is shown, children "flash" appropriate number of fingers. Using same math language as in popsicle stick math game, children flash fingers for two rounds of number cards. (Don't forget to mix up cards after first round so numbers become random once again.)



3. NUMBER WRITING

This is optional and doesn't have to be a part of each teacher time, although young children particularly enjoy it. Children place popsicle sticks (Sets 0-5 or 0-10) in front of them, just above a mini-dry erase or chalkboard (you can also use scrap paper). Teacher mixes up appropriate number cards. DO NOT SHOW CARDS, AS YOU WOULD USUALLY DO. Announce the number. Example: "The number is four. Please write the number four." Children write number. When all have completed task, show number card to each child by placing card above each child's written number. If the two numbers match (child's written number and number card number), child gives you one popsicle stick. If numbers do not match, ask child to compare his/her written number to number card and make changes (no stick is taken.) Children erase boards between numbers (if using paper, "x" out written numbers). When a child "loses" all popsicle sticks, he/she gets a sticker or stamp on a "Teacher Time Math Card," and may be excused, or watch as others continue to write numbers. Continue playing until all children have lost popsicle sticks or allotted teacher time has expired.

Steps Beyond Number Conservation 0-10

Greater Than

First Lesson

1. Explore term verbally, "Greater than means 'larger' than," using examples/non examples.
2. Explore terminology with popsicle sticks; first with teacher placing a number set of popsicle sticks on table and making set "greater" by adding any number of sticks desired. Continue modeling with children observing; show examples/non-examples.
3. Children takes turns creating "greater than" examples for others to observe (based on teacher's modeling).

Second Lesson

1. Review what was done in initial lesson.
2. (Note: For this activity, teacher uses randomly mixed number cards and a set of ten popsicle sticks. Each child uses a set of ten popsicle sticks.) Show a card and ask children to show a set that is "greater than - (shown number on number card)." As children are laying down sets of popsicle sticks, teacher also lays down a set representing the number card. The reason for this is so children can visually compare their chosen "greater than" number sets to number card set to verify their sets are indeed greater (larger). Be aware: There can be a diverse number of responses depending on number card shown. As long as number of popsicle sticks each child created is a greater set, it is correct. Ask each child to tell you verbally how many greater the number on table is than number on number card. Example: A child says, "A set of seven sticks is two greater than a set of five (number card) sticks." This is an important step, so please do not skip statement process (it is the basis of addition)!
3. Continue part one and part two of second lesson until you feel children truly understand meaning of "greater than," then let them play a partners game similar to part two of second lesson. One partner verbally asks other partner to show a number that is greater than a verbally announced number (randomly chosen, not to exceed ten). Partner lays out sticks, then states how much greater set he/she made is than announced number.

Third or Fourth Lesson

1. Teacher introduces "greater than" symbol concept and uses sets of objects to conceptualize greater amount with larger set.

Less Than

Same process as Greater Than, as outlined on page 7.

One More

First Lesson

1. Explore terminology verbally, "One more" means one greater than," using examples/ non-examples.
2. Explore terminology using popsicle sticks. First teacher places a set of sticks on table and demonstrates making a set have "one more" by adding one popsicle stick and verbalizing process as this is being done. "Five is one more than four." Continue modeling with children observing, use examples/non-examples.
3. Children takes turns creating "one more" examples for others to observe (based on teacher modeling) and verbalize the total amount (e.g., "Eight is one more than seven.")

Second Lesson

1. Review first lesson's terminology and concepts.
2. Teacher uses randomly mixed number cards (leave out number ten card) while each child uses a set of ten popsicle sticks. Teacher shows number card and asks each child to show a set that is "one more" than shown number.
3. Continue parts one and two of this lesson until children truly understand meaning of "one more." Then let them play in teams of two, one child verbally asks partner to show a number that is one more than verbally announced number (remind them that the announced number is not to exceed "nine").

Third Lesson

1. Review first and second lesson concepts.
2. Have children complete three experiences utilizing randomly mixed number cards (do not include number ten): a.) Play Finger flash showing "one more"; b.) have children verbally state the "one more" number; and c.) have children write the "one more" number.
3. Allow each child to choose which of the three ways just practiced to play "one more" games with a partner.

Math Equations

This step introduces the addition symbol and learning how to mathematically read equations.

First Lesson

1. Teacher introduces addition symbol (+) by showing symbol on a card. Children practice recognizing symbol using example/non-example cards. Now share that the addition symbol (or adding sign) has a name: plus. Children say "action word" using examples/non-examples mathematical symbols.

2. Teacher writes a vertical math equation (with a "one more" concept only), such as $5+1$, and shares that the long line has a name: equals.

$$\begin{array}{r} 5 \\ +1 \\ \hline \end{array}$$

Teacher then reads math equation, "Five plus one more equals....."

Children respond as teacher writes sum. Continue modeling, eventually having children write down (and answer) vertical math equations.

Second Lesson

1. Review previous lesson's concepts.

2. Provide each child with a small slip of paper with a row of vertical math equations. A math practice sheet cut into strips works fine, but all vertical math equations at this time are to be adding "one more" only, so you may have to make your own. Each child verbally reads a math equation to group and states the sum.

3. Complete a round of Finger Flash, verbalizing math equations based on number card. Example: Teacher shows number card 7. Children say, "Seven plus one more equals... eight," (flashing seven fingers, then flashing one more finger for a total of eight fingers).

Third Lesson

Basically, a repeat of second lesson, but drop word "more" for all steps. Example: When playing Finger Flash number card is 8, children say, "Eight plus one equals... nine."

ADDITION (Sums To 5)

First Lesson

1. Review concept of "a set" (the amount of objects in a group). Teacher places random number of popsicle sticks on table (not to exceed 10) and states number set amount, "This is a set of five popsicle sticks." Teacher continues with example/non example. Children then, working in teams of two, take turns creating random sets on table and having partner state what number set is represented.

2. Review terminology/symbols: greater than, less than, plus, one more, equals. Review reading written math equations, emphasizing words "set of."

($<$, $>$, $+$, $=$)

second Lesson

Each child will need: 2 small bowls / 1 larger bowl / 5 tokens or beads

1. Introduce concept that "one set plus another set usually equals a third greater set." Teacher vertically places two small bowls above a third larger bowl and demonstrates: Place one token in first small bowl and two tokens in second small bowl. Say, "A set of one plus a set of two equals...(lift two smaller bowls up and tilt bowls so tokens fall into third, larger bowl). Demonstrate concept again using different math equation. Allow children to try a few examples (using their own bowls) as you tell a math problem. (Let children share what problem "equals" after they have transferred tokens from smaller bowls to large bowl) Reminder: Do not allow sums to exceed "five" at this time.

2. Share that, just for fun, they can make up "story problem" math equations with the tokens. Model by placing three tokens in first small bowl while saying, "There was a set of three children playing outside by the swings." Next, place one token in second small bowl while saying, "One more child came to the swing set area. How many children were by the swing set now?" Model lifting of small bowls and spilling tokens into third, larger bowl, simultaneously saying, "A set of two plus a set of one equals a set of three...There were three children now playing by the swing set." Note: Make a strong emphasis during the entire modeling process. that when we add sets together, the answer will usually be a bigger (greater) number. Model another story problem.

3. Have each child, while rest of children listen and observe, model a story problem using three bowls and tokens that teacher verbally shares. Repeat process until everyone has had a turn. Form teams of two and have one partner tell other partner a story problem. Partner uses bowls and tokens as story is being told, then shares answer (sum) of problem. (Note: Do not be surprised if a child tries to create a story wherein the sum exceeds five. Don't panic. The children will work out the situation because of only having five tokens. Usually child modeling what partner is telling will inform "telling" partner, "You can't say that, we don't have enough tokens.")

Third Lesson

1. Review parts two and three from previous lesson, sharing the fact that we can tell story problems without having to use the words "set, plus, or equals". Model this for children by placing three tokens in first small bowl and say, "Three bees were buzzing near a flower." Place two tokens in second small bowl and say, "Two more bees came to the flower. How many bees were buzzing by the flower now?" Manipulate the two small bowls so tokens fall into the third larger bowl and say, "There are five bees buzzing by the flower now."

2. Provide each child with a paper strip of prepared vertical number equations. Ask each child to read equations without using the word set and using animals or objects as descriptions for what each number sets numeral represents. Example:

3
+ 1 "Three marbles plus one marble equals... 4 marbles."

Child records sum for each addition equation as he/she reads equation..

Fourth Lesson

Continue steps in second and third lesson, but now introduce horizontal addition equations, such as $3 + 1 = \underline{\hspace{2cm}}$.

ADDITION (Sums To 10)

Same process/format as Addition (Sums to 5) (Pages 10-11).

ADDITIONAL ADDITION LESSONS

Be certain to integrate "equation solving" each day by having children tell story problems, such as the bees and flowers example. This is the time to include exploration of number conservation via problem solving in which children are encouraged to represent a variety of solutions given a specific sum (number bonds). Still use manipulatives for these experiences.

Also, this is the time to explore number fact "families" Example: Give every two children a piece of yellow paper and ask them to cut out two "lily pads." Give every two children 10 green beads to share (better yet, little plastic frogs). Ask teams to first show with manipulatives, then record addition equations that represent a sum of 8 frogs. Children place various number set combinations using eight of the ten beads/plastic frogs. Their final recording sheet should provide data that somehow reveals the following addition equations (equations may be listed randomly, not necessarily sequentially):

$$0 + 8; 8 + 0; 1 + 7; 7 + 1; 2 + 6; 6 + 2; 3 + 5; 5 + 3; 4 + 4$$

SUBTRACTION (0-10)

First Lesson

1. Teacher introduces subtraction symbol by showing symbol on a card. Children practice identification using example/non-example cards. Teacher shares that the subtraction sign is sometimes called the "take away" sign because it tells us to take a certain number (set) away from the beginning (greater/larger) number set, but we will say "minus". Model this concept by using a pile of popsicle sticks. Place seven sticks on table. Subtract three popsicle sticks by literally taking them away. Simultaneously state math equation, "Seven take away, or minus, three equals... four." Allow children to try subtraction concept with their own set of popsicle sticks. Remind them that the subtraction symbol is an "action word" for minus while gesturing a "take away" action.

2. Teacher writes vertical subtraction equation

$$\begin{array}{r} 7 \\ - 3 \\ \hline \end{array}$$

and reminds the children that the long line is an equal sign.

Teacher reads math equation, "Seven minus three equals..." Children verbally share answer to math equation as teacher writes difference. Continue modeling using this method. Eventually

allow children to write down vertical equations based on verbalizing the equations. Children complete math equations by writing differences and reading back completed math equations to teacher and/or other children.

second Lesson

1. Review previous lesson's concepts.
2. Provide small strip of paper (math practice sheets cut into strips works well) with row of vertical subtraction equations. Have each child read his/her math equations to rest of group and complete equations by writing difference.
3. Complete a round of Finger Flash, verbalizing equations based on displayed number card. For example: The number card is a 7. Teacher says, "Seven minus three equals..." Children first hold up seven fingers and then flash four fingers to show numeral that represents the difference.

Third Lesson

1. Model a subtraction story problem. Place six tokens or popsicle sticks on table. Say, "Six horses were in a corral." Take away three popsicle sticks while saying, "Three horses ran away. "How many horses are still in the corral? There are three horses left in the corral." Complete a second demonstration with a different scenario. Allow children to work in teams of two to make up and complete their own subtraction story problems (not to exceed 10 for a minuend).
2. Provide a paper strip of prepared vertical equations and ask children to read equations using animals or object as descriptions for what each number set represents. Example:

$$\begin{array}{r} 9 \\ - 4 \\ \hline \end{array} \quad \text{"Nine dogs minus four dogs equals... five dogs."}$$

Have children record the difference for each vertical subtraction equation as they read each equation.

Additional SUBtraction Lessons

Same concept as for Additional Addition lessons (page 12). Remember to use both vertical and horizontal math equations and incorporate visual manipulatives, when necessary.

Place Value (General Knowledge)

First Lesson

1. Allow children to literally play (e.g., building houses and towers; making trails) with place value manipulatives: 1s units, 10s rods, 100s flats. As children play, ask them what they notice about the different blocks.
2. Put aside all place value manipulatives, except 1s units. Give each child ten 1s units. Ask each child to create an addition or subtraction story problem (equation) using the ten units (or a portion thereof). Ask them to share their subtraction story problems.

Second Lesson

1. Give each child a set of ten popsicle sticks and ten 1s units. Spend time helping children "discover" correlation: ten sticks equal one set of ten; ten units equal one set of ten. When they appear to understand correlation, remove popsicle sticks. Ask each child to line up his/her own ten units in a vertical line (units should be one-above-the-other in a straight column). Display 10s rods and 100s flats. Have each child select between a rod or a flat as to which shape matches the line of 10 units he/she just made (the rod.) Share that the one rod represents one set of ten 1s units.
2. In teams of two, have each team count out 100 1s units. (As they do this, stress the time it takes them.) When done, have each team arrange the 100 1s units into vertical line sets of 10. In front of you, place ten 10s rods on table while saying, "10, 20, 30, 40, 50, 60, 70, 80, 90, 100." Have children react verbally to these questions: "Do we both have the same number of lines? Which method was fastest? Why?" Explain that since the rods are sets of ten, we can count them quickly "by tens". Allow children to try this by utilizing various number sets of 10 using just the rods.
3. Allow children to work in teams; arranging various sets of 10s rods on table for partner to practice counting by tens.

Place value (10–20)

First Lesson

1. Review general knowledge from previous 0-10 place value lessons. Now its time to introduce place value chart.
2. Using a large ones and tens place value chart (large enough for children to actually place 1s blocks and 10s rods onto chart), begin to explore concept of ones and tens "place" by first identifying these two places. Put one 1s unit in ones column. Ask children if it belongs there. Discuss why. Place the same 1s unit in tens column and ask if it belongs there. Why not? Proceed until you have placed ten 1s units onto ones column of chart. Ask if these ten units belong there and wait for reactions children need more focused questioning, but eventually they will realize that ten 1s are the same as 1 set of ten (a rod) and belong in the tens place.
3. Play simple place value game of laying out ones or tens numbers (do not use combinations such as 2 tens and 3 ones today. Only use base-10 numbers (i.e., 10 or 20) for 10 place, and number sets for 0 through 9.

second Lesson

1. Review last lesson's place value information.
2. Begin process of placing 10s rods and 1s units on ones and tens place value chart and having children (with teacher assistance) "decode" the place values. Continue until you feel children have grasped basic understanding.
3. Place a set representation for a numeral using the 10s rods and 1s blocks on the place value chart. Each child writes the numeral that he/she believes the chart "values." Discuss after each example.
4. Allow children to work in teams of two with place value chart, rods, and units to create number value as just modeled in step three where one child shows number set on chart with 10s rods and 1s units; partner writes appropriate numeral actual number.

Place Value (20–100)

As children show mastery of place value 10-20, continue in increments of ten until they have explored 0-100, which means you will need to introduce the 100s place on a place value chart and use 1 flat.

Double-Digit addition (No Regrouping)

Note: When introducing this concept, begin by using the term "two-place" addition. The term "double-digit" may be introduced in later lessons.

First Lesson

1. Place ones and tens chart in front of children. Represent first number using units and rods near top of chart area (example: 43) and have children figure out first number's value. Represent second number using units and rods directly under first number's units and rods (example: 21) and have children figure out second number's value. Place a ruler or other flat-line object under second number to represent the equals line, as well as add a paper or plastic addition symbol to left of second number. Have children read entire math equation. Share how we add these two numbers together; first add 10s rods together, then 1s units together. (While sharing, simultaneously demonstrate by actually picking up 10s rods and placing them below the equals line on tens side; repeating process with 1s units on ones side.) Discuss process. Model again.

2. Provide teams of two children a ones and tens chart, 1s units, 10s rods, equals line, and addition symbol. Teacher states two-place (no regrouping) addition equations while teams "build" and solve the equations.

Second Lesson

1. Review first lesson concepts.

2. Create an addition equation on ones and tens chart with rods and units. Before solving equation, write out the represented addition equation on paper. Manipulate 10s rods first; write tens place only of sum for paper equation. Repeat process with 1s units; writing ones place of sum for paper equation. Re-read entire equation; discuss procedure for why you began with 10s place value. Allow children to complete task of what was just modeled.

3. Provide each child with a paper strip of two-place addition equations (no regrouping). Solve equations together, focusing on, "add tens place numbers first." Note: Some children may ask why they can't add ones place first, and this is a good question. Explain that later in their learning they will be exploring more about solving two-place equations where they will work with the ones place first.

DOUBLE-Digit ADDition ADDitional Lessons

Repeat concepts from both first and second lessons until children can easily add two numbers together (no regrouping) without manipulatives. If you feel children are ready, and it will not confuse learning process, you may introduce term "double-digit." "Digit" is a term used to identify the numeral that the value is representing.

DOUBLE-Digit SUBtraction (No Regrouping)

Follows same format as Double-Digit Addition, except when demonstrating with units and rods, do not place both first and second numbers on chart. Begin by displaying a written vertical subtraction equation, for example:

$$\begin{array}{r} 64 \\ -21 \\ \hline \end{array}$$

Then represent first number only using rods on a ones and tens chart. Leave some space below this number and place an equals line and paper plastic subtraction symbol in the appropriate area on chart. Read written equation. Move appropriate rods and units away from first number representation to where second number space on chart is located. Read written equation again, this time using made-up objects that can represent the two numbers. (example: "64 pieces of candy minus 21 pieces of candy equals...How many pieces of candy are left?) State you have already subtracted the 21 pieces by relocating them to the space where second number, or set, is placed on the chart. Children will begin to discover/realize that the difference is simply the amount that remains in the top number set (which originally represented the first number). Move remaining pieces (rods/units) appropriately under equals line on chart. Finish subtraction equation by writing difference, making a correlation between 10s rods and 1s units representation and the written difference.

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Number cards

0	1	2
3	4	5
6	7	8
9	10	ReProduce cards on tagBoard.