Kindergarten Mid to End of Year Math Assessment – Number Sense

WHAT IS IT?

The primary mid to end of year math assessment can be used to answer the question, "Did we get there?" In the fall, we determined a starting point for individual students and our class as a whole. After instruction, we want to know where each student presently sits in their learning. From the assessment results, we can see trends within the class and for each student. We learn quickly about their math knowledge and can fill any gaps before the end of the year, celebrate learning and be reflective about our math instruction.

The key understandings from the number sense strand covered in the primary math assessment are: subitizing, the 5 counting principles, partitioning, add/ subtract (operations) and problem solving.

HOW IS IT DELIVERED?

We like to administer this assessment as a team (class teachers, LST, CST, administrators, EA) and will spend 1 TO 2 hours in each classroom. One teacher will present the book, Fish Eyes by Lois Ehlert, engaging the students in the context and play some number games orally (counting, number naming, partitioning…) as they read the book. The Surrey Math problem is then read and explained to the students. Each student returns to their desk with the problem on a piece of paper to start solving it. During this quiet work time, each student is asked to conference with a teacher to play the math assessment games. Teachers follow the questions on the math assessment page, recording student answers, comments and noting their observations and judgments on the table on right side of the assessment page. A class profile can also be created to assist data analysis.

THE ASSESSMENT IN YOUR CLASSROOM

In order to prepare for the assessment, please:

- Have a class list printed off
- Star the students on the class list that you would like assessed by a certain teacher (yourself, your CST, or LST…)
- Have a "busy" activity that is easy to organize for the EA to lead during the hour assessment so that you are free to assess as well
- Provide a small table and chairs and hopefully a quieter spot (for each adult assessing)
- Make sure all students have a pencil

Student Name:_____ Kindergarten Mid to End of Year Math Assessment -Number Sense

Assessment ideas: The book Fish Eyes by Lois Ehlert can be read to the entire class and the context of fish eyes or spots can be used as a basis for manipulatives and questions. Please note that some questions have 2 parts. Do not hesitate to adjust the numbers, or the quantity of tasks completed to suit the student. The Surrey math problem solving assessment might also be used as it uses this same book to assess problem solving and partitioning 10. (Question 6 below)

Questions for the Assessment - Check off the correct answers that students make.

***1a*.** Place the number cards in front of the student and say," Find the number card that matches the number of spots on the fish." (Show the spotted fish cards one at a time and note if the student counts or subitizes to determine their answer).

2 5 7 0 10 Subitizes to #_____

1b. Show the number cards one at a time and say," Please say the number on each card aloud." ***1c***. Then ask which number comes before and then after each number.

3 8 6 9

1d. Place _5_ counters on the table in front of the student and ask," About how many spots am I placing on the table in front of you**?"** ***2.*** " Can you now check your estimate by counting outloud?"

5 9

Estimates: _____, _____
-one to one correspondence _____ trusts the count_____

3. If you were looking in the ocean and saw _4_ fish and then one fish at a time joined in, how would you continue to count how many fish you were seeing? (count forwards)

4, ___, ___, ____, ____, ___, ___,…. to #_____

4. If you were looking in the ocean and saw _7_ fish and then one fish at a time swam away, how would you continue to count how many fish you were seeing? (count backwards) 7, ___, ___, ___, ___, ___,___,___

5. Place the picture of the large fish and counters in front of the student and say, Can you show me _4_ spots on this fish? ***5b.*** Next, ask the student to show a fish that has more spots. How do you know which is more? _____

Teacher Observations Comments / Next Steps:

_____
_____
_____
_____
_____

Key: NP – Needs time, practice and /or support
DA – Developing appropriately
CI – Confidently and independently
Na- not assessed at this time

Task	NP	DA	CI	na
1a. Matches numerals 1-10 with a quantity				
1a. Subitizes to age				
1b. Reads numerals				
1c. Numbers before and after				
1d. Estimates and checks				
2. Counting principles				
3. Counts forward from a number 1-10				
4. Counts back from a number 10-1				
5a. Constructs a set				
5b. Compares sets				
6. Problem Solving				

Cheryl.Adebar, Nora Harwijne, Tracy Pederson SD71

*See Surrey Fish Eyes Problem – for question 6.

Student Name: Student A

April to June (formative or summative)

Kindergarten Mid to End of Year Math Assessment -Number Sense

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Questions for the Assessment - Check off the correct answers that students make.

1a. Place the number cards in front of the student and say," Find the number card that matches the number of spots on the fish." (Show the spotted fish cards one at a time and note if the student counts or subitizes to determine their answer).

2 ✓ 5 ✓ 7 ✓ 0 ✗ none 10 ✓ **Subitizes to #** 2

1b. Show the number cards one at a time and say," Please say the number on each card aloud." ***1c.*** Then ask which number comes before and then after each number.

2, 3 ✓, 4 | 7, 8 ✓, 9 | 5, 6 ✓, 7 | 8, 9 ✓, ?

1d. Place 5 counters on the table in front of the student and ask," About how many spots am I placing on the table in front of you?" ***2.*** " Can you now check your estimate by counting outloud?"

5 ✓ 9 ✓

Estimates: 3, 10
-one to one correspondence ✓ trusts the count ✓

3. If a baby fish had 4 spots and then you noticed the fish had more spots, how would you continue to count the spots? (Then ask the question with 4, 9).

4, 5, 6, 7, 8, 9, 10,.... **to #** 15

4. If you were looking in the ocean and saw 7 fish and then one fish at a time swam away, how would you continue to count how many fish you were seeing? (count backwards) 7, 6, 5, 4, 3, 2, 1, 0

5. Place the picture of the large fish and counters in front of the student and say, Can you show me 4 spots on this fish? ***5b.*** Next, ask the student to show a fish that has more spots. How do you know which is more? There was 4 spots and I added 3 more, so there's more now.

Teacher Observations Comments / Next Steps:

- zero (meaning), match 9
- subitize 5, 6, 7
- counting from 9

Key: NP – Needs time, practice and /or support
DA – Developing appropriately
CI – Confidently and independently
Na- not assessed at this time

Task	NP	DA	CI	na
1a. Matches numerals 1-10 with a quantity		✓		
1a. Subitizes to age	✓			
1b. Reads numerals			✓	
1c. Numbers before and after		✓ (10)		
1d. Estimates and checks			✓	
2. Counting principles			✓	
3. Counts forward from a number 1-10			✓	
4. Counts back from a number 10-1			✓	
5a. Constructs a set			✓	
5b. Compares sets			✓	
6. Problem Solving				

Cheryl.Adebar, Nora Harwijne, Tracy Pederson SD71

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Materials required and find many below:

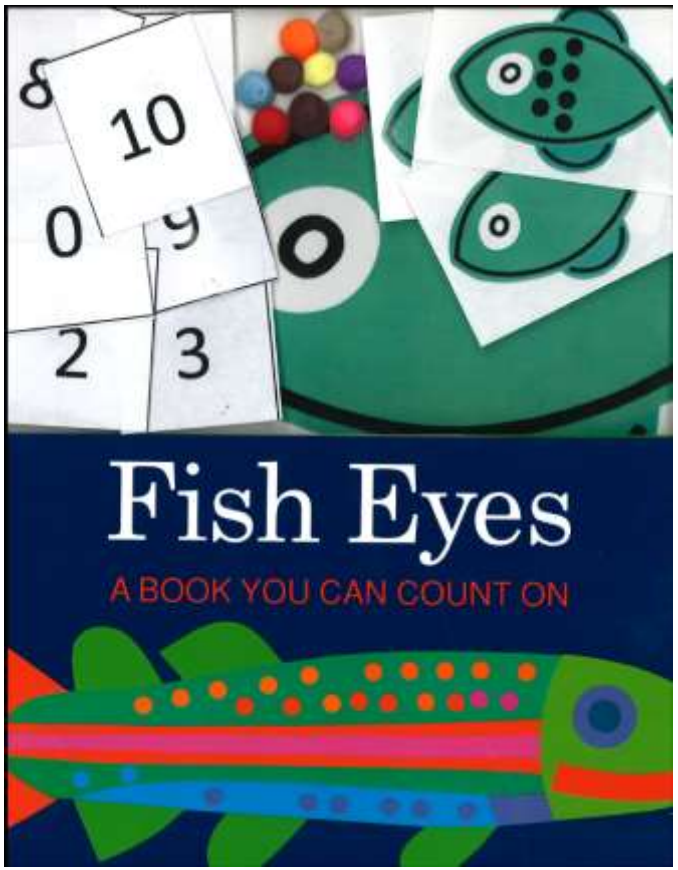
Fish Eyes by Lois Ehlert

Digit cards: 0,2,3,5,6,7,8,9,10

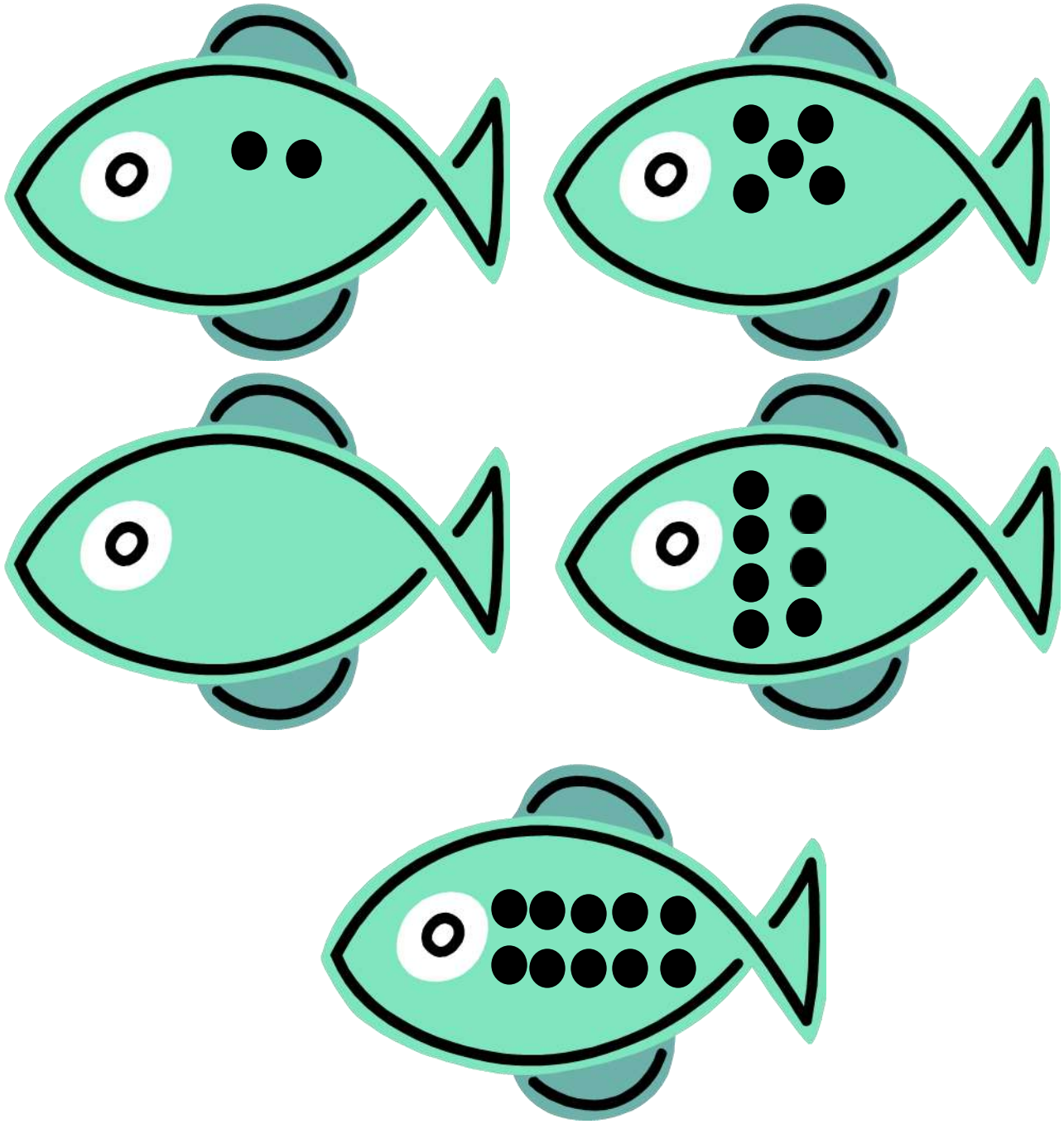
Spotted fish cards

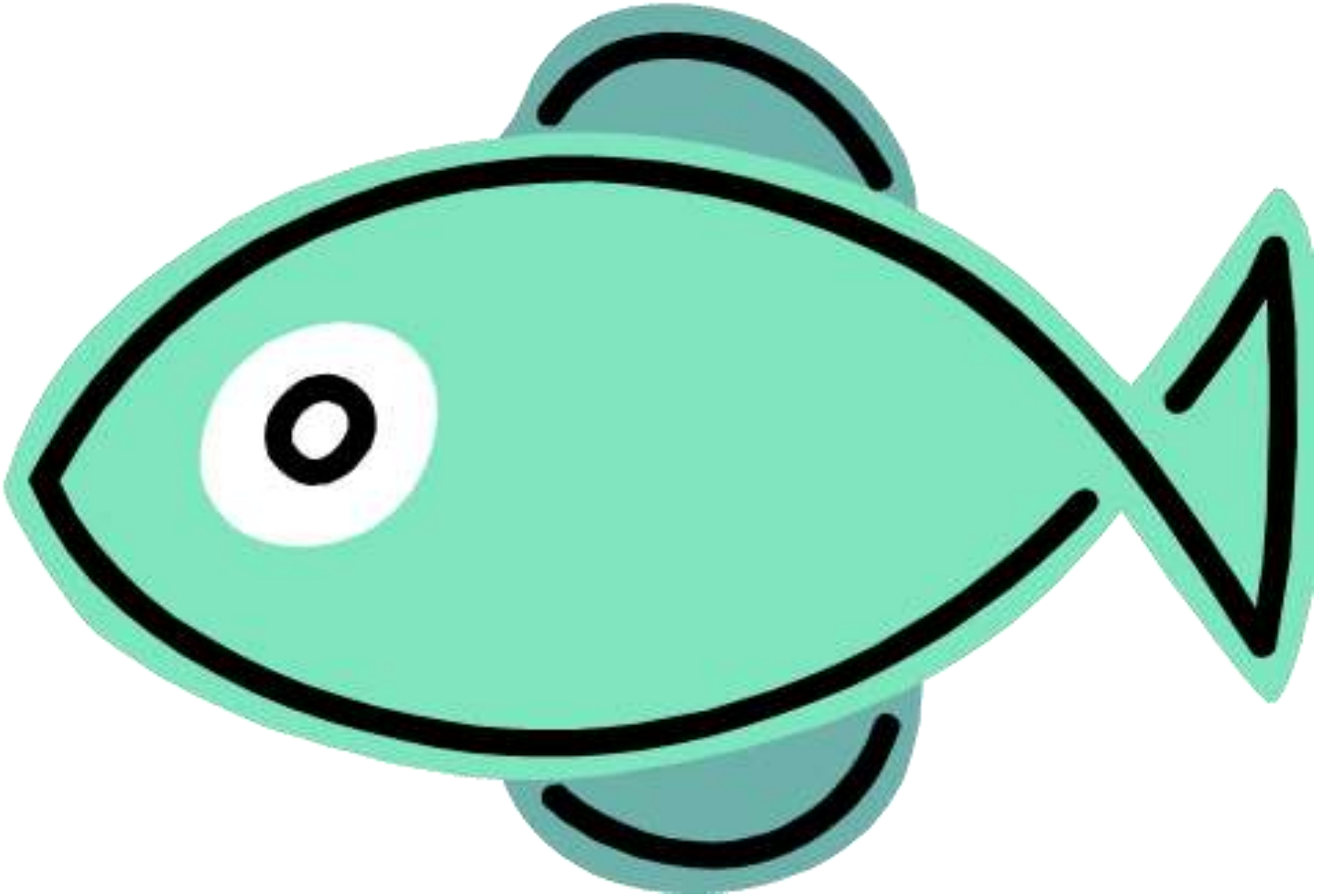
Large fish picture

9 counters



0	2	3	5	6
7	8	9	10	





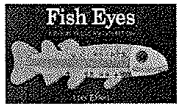
From the Surrey K-7 Problem Solving Assessment (2010) S. Ball, S. Millar, M. Garneau

Kindergarten Problem Solving Assessment – Final

(Teacher Instructions)

Materials:

- various manipulatives
- pencils
- blank ten frames
- Book – *Fish Eyes*



Problem:

When I was at the beach I saw some fish swimming in the ocean. Some swam near the pier, while the rest swam closer to the shore. I counted a total of ten fish.
How might the 10 fish be swimming, with some near the pier and some near the shore?

BEFORE:

- Read to the students a book about the quantity of ten (i.e. Fish Eyes – A Book You Can Count On by Lois Ehlert).

- Discuss the book focussing on the different parts of various quantities that are represented on each page (i.e. There are 6 fish on the page. 4 are small and 2 are large.)
- Have the students use manipulatives to represent different quantities to 9 into 2 parts (some being large fish and some small fish).
- Ask the students to explain how they know that the 2 parts they created equal the total quantity.
- Have the students record their solutions pictorially.
- Ask for volunteers to share their strategy used to reach their solution.

DURING:

NOTE: Teachers may find it beneficial to administer the assessment task to small group of students, rather than the whole class at one time.

- Present the problem to the students:

  "When I was at the beach I saw some fish swimming in the ocean. Some swam near the pier, while the rest swam closer to the shore. I counted a total of ten fish. How might the 10 fish be swimming, with some near the pier and some near the shore?"

- Ask the students if they have any questions about the problem or need help to understand the vocabulary (i.e. they may need to have help understanding the word 'pier').
- Tell the students that they may use any materials room to solve the problem. Make sure that the students have easy access to the materials (i.e. manipulatives, ten frames, pencils, paper).

- Remind the students that they may use manipulatives, pictures, numbers or words to explain their thinking.
- NOTE: Some students may have difficulty transferring their solutions from concrete to pictorially on paper. Taking digital pictures of their work will help you to undercover the student's thinking.
- **If the students find one combination, ask them to think of other combinations of the ten fish swimming near the pier and near the shore.**
- Ask the students to discover many different ways.
- As the students finish, have them explain their thinking to you. Conference with the student and scribe what the student says.
- Refer to the 'Assessment Rubric' to guide your inquiries.
- You may need to ask the students prompting questions/statements to help uncover their strategies and thinking processes.

1. How do you know?
2. How did you start solving this problem?
3. Tell me what you are thinking.
4. Show me what you know.
5. What do you see in your head?
6. What questions did you ask yourself?
7. Why do you think that?
8. Could there be a different answer?
9. What strategies did you use to …?
10. How does your strategy make sense to you?
11. What tools help you?

AFTER:

- **Conduct a 'SHOW AND SHARE' sessions, encouraging the students to share their strategies/thinking and to explain their reasoning to complete the task.**
- Refer to the 'Assessment Rubric' to guide your inquiries.
- Consider about the following questions before recording information on the Assessment Rubric:
    1. How well did the student understand the question?
    2. What strategies did the student use to solve the problem?
    3. How much support did the student require?
    4. How did the student represent and communicate their thinking?
    5. How well did the students reason or justify the solution?
    6. In what way/s did the student make connections to other mathematical concepts or real life situations?

WHERE'S THE MATH?

The "How Many of Each" problem helps to reveal the students' understanding of part-part-whole relationships. Thinking about a number in terms of its parts is an important milestone in the development of early number sense. Part-part-whole relationships are also an important bridge to addition, subtraction and fraction concepts. This type of problem requires that the students use strategies for generating, recording, and organizing part-part combinations for the whole number. Some of the students may generate possibilities through trial and error, whereas some students will begin to notice patterns and relationships.

EXPECTATIONS:

The students will be able to . . .

- Demonstrate a sense of whole numbers and represent and use them in flexible ways.
- Including relating, composing and decomposing whole numbers.
- Understand the effects of adding and subtracting whole numbers.
- Develop and use strategies for whole-number computations.
- Communicate and represent their mathematical thinking.
- Justify their reasoning.
- Make connections with other mathematical concepts and the real world.

EXTENSIONS AND ADAPTATIONS:

- Provide the students with the choice of just a blank piece of paper to record their thinking. Some students may be distracted by the graphics on the student recording page.
- Change the context of the problem to help them make connections to their prior experiences.
- Take digital pictures of the students' solutions.
- Decrease the quantity the students are working with (i.e. focus on the quantity of 8.)
- Increase the quantity (i.e. focus on a quantity larger than 10.)

Kindergarten Problem Solving Assessment – Final

Name _____ Date: _____

"When I was at the beach I saw some fish swimming in the ocean. Some swam near the pier, while the rest swam closer to the shore. I counted a total of ten fish. How might the 10 fish be swimming, with some near the pier and some near the shore?"

My Class – Trends – Data Spreadsheet **Teacher's Name _____ Grade _____**

To create a class "photo" from the assessment, place **NP** (Needs time, practice and/or support), **DA** (Developping Appropriately), **CI** (Confidently and independently) or **Na** (Not assessed at this time) in the appropriate grid for each student.

Class and individual trends may then be seen easily.

Student Name	1a Matches numerals	1a Subitizes	1b Reads numerals	1c Numbers before/after	1d Estimates / Checks	2. Counting Principles	3 Count forwards	4 Counts backwards	5a / 5b Compares /Constructs sets	6 Problem Solving
1										
2										
3										
4										
5										
6										
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Class Trends **From the data from the formative assessment, I notice:**

Class strengths:

_____

_____

_____

_____

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_____

Next steps:

_____

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_____

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Comments: