Island Numeracy Assessment

Computational Fluency A Grade 3+

Collaborative Task

1. Create two different stories that the equation 5 + ☐ = 9 could describe and tell how you would solve the equation. (Marion Small, Good Questions, p. 99)

I have $5 in my pocket. I need $9 to buy a book. How much more do I need?

I have 5 baseball cards. John gives me some, now I have 9 baseball cards.

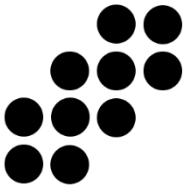
How many baseball cards did he give me?

The equation can describe candies, baseball cards, people, or money in a situation that there was initially 5 of something and ultimately 9 of something (join change unknown). Asking students to create different stories for the same equation emphasizes the underlying structure we want them to see. Offer a context to students that makes sense for your learners (i.e candies, baseball cards, people, or money)

2. Show (project or display) dot image. Whole group conversation. Gather and post students responses:

   Seeing 10 composed and decomposed in many ways. This is for students who are comfortable with "Dot Image Number Talks". For teachers trying this routine for the first time see: **** summary *****
   Students new to Number Talks would follow the number talk protocol with the teacher drawing/modeling student thinking.
   ***photograph *** representing students communicating their thinking in such a way that the teacher can listen deeply and record…. Connections to others learning will occur naturally as learners learn strategies from one another.

   "How many dots do you notice?" "How do you see them?"



Island Numeracy Assessment

Computational Fluency A (addition and subtraction) Grade 3+

Assessment Question:	**Answer Key:**
1. Barnyard Legs I counted 18 legs in the barnyard. Some belonged to horses and some belonged to chickens. How many horses and chickens might have been in the barnyard? Show different ways to solve and explain your thinking. 	Look for flexible decomposing and composing. For example: students may draw 4 horses and 1 chicken. Prompt students to show understanding with pictures, numbers and words. Representing with models in more than one way.
2. What is the best way to estimate 88 + 61? Circle and describe why you chose that equation. 80 + 60 = ____ 80 + 70 = _____ 90 + 60 = ____ 90 + 70=_____ What equation would help you estimate 67 – 29 = _____ ?	*90 + 60 is the closest estimate because 88 is close to 90 and 61 is close to 60* *I would use 70 – 30 to help me estimate the difference.*
3. Solve the following question using two different strategies: 12 - 7 = Explain your strategies using pictures, words, and/or numbers and symbols. One way I solved the question: A second way I solved the question:	Drawing ten frames, using tally marks, dot images, adding up from the number being subtracted (subtrahend) to the whole (minuend), subtraction by removal, subtraction by comparison

4. Solve the following questions: Explain your strategies using pictures, words, and/or numbers and symbols. 26 + 37 Make a reasonable estimate: Now solve and show your thinking below. 126 + 237 Make a reasonable estimate: Now solve and show your thinking below.	Possible representations could include: Friendly numbers, compensate, place value addition, etc. 25+35 = 60 60 +1+2 = 63 100 + 200 20 + 30 6 + 7
5. Solve the following questions: Explain your strategies using pictures, words, and/or numbers and symbols. 62 - 23 Make a reasonable estimate: Now solve and show your thinking below. 62-22 = 40 40- 1 = 39 562 - 423 Make a reasonable estimate: Now solve and show your thinking below. 562- 400 = 162 162 - 23 = 139	Possible representations could include using a number line to add on, subtraction by removal. Reference for further strategies Number Talks K-3 Resource Sherry Parrish
6. Do you think it is easier to add 43 + 47 or 34 + 47? Why?	Possible responses: 43 +47 *(I use friendly numbers to make 10 3+7 and then add to 40 +40)* 34 + 47 *(I add 34 + 44 +3)*

Island Numeracy Assessment

Computational Fluency A (addition and subtraction) Grade 3+ (Answer Key)

Performance Task:

1. Use manipulatives to create and act out a subtraction problem/story.
   In the space below draw a picture to show your subtraction problem/story. Use pictures, numbers and words to represent your thinking.

   Consider this a diagnostic task and an opportunity to have a conversation with each student. Drawing a picture of subtraction will demonstrate understanding of part/part/ whole relationships rather than only 'approaching the operations symbolically or asking students to look for key words'. Good Questions, Marian Small, 2017. p. 99.

   Things to note: Does the student represent 'take-away' in their drawing? Does their work with manipulatives demonstrate subtraction by comparison or subtraction by removal?

   Numbers have deliberately not been offered in this task, prompting students to choose, communicate and represent quantities they are comfortable with. Some students will answer their own story problem and others will leave the story as a situation to be solved.

   Students may be familiar with a four quadrants approach to representing subtraction stories (story, equations, manipulatives and drawing). Alternatively, an open format offers space to encourage multiple, creative visual representations.

Story	Manipulatives
Picture	Equation

2. Make up **three** addition and **three** subtraction equations where there is a 2, a 3, and a 4, somewhere in the question or the answer.

   2 + 3 + 4 =9

   23 = 4 +19

   23 + 40 =63

   23 + 22 =45

   43 – 41 = 2

   4 = 23 - 19

   9 = 234 – 225

   123 – 4 = 119

   Choose one of your equations and write a story problem. (Answers will vary)

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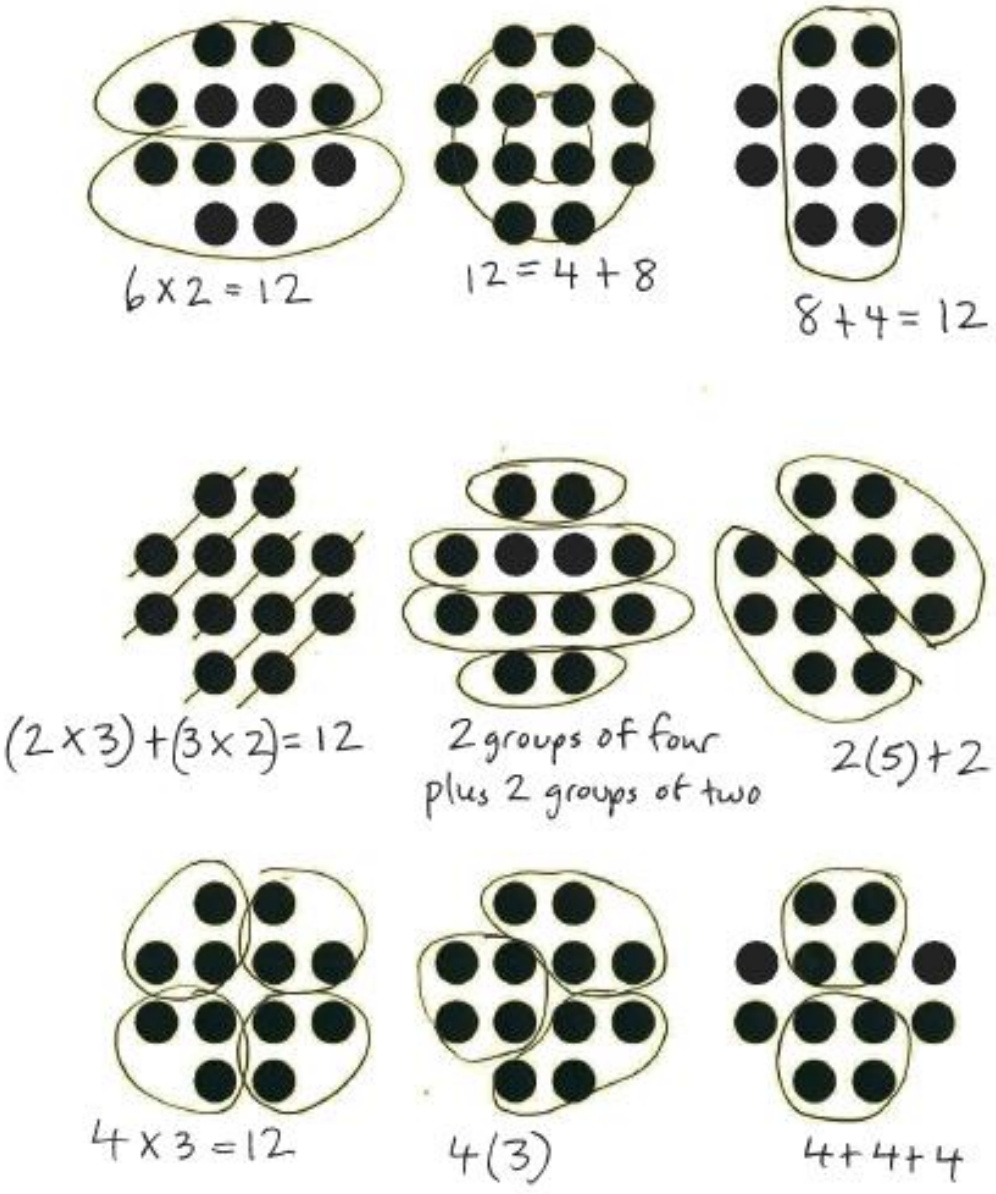
Computational Fluency A Grade 3+

Performance task for students who are familiar with dot image number talks.

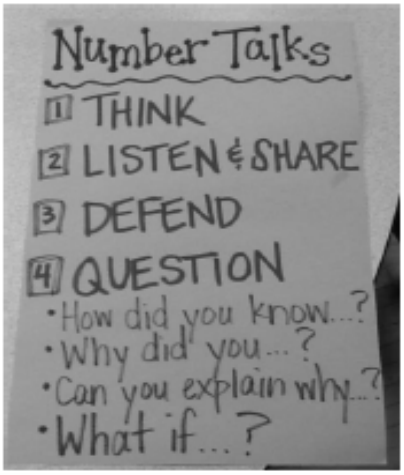
How many dots do you notice? Draw and share your thinking. Include a number sentence (equation) to match your thinking. (Answer Key: Watch for students sharing additive and multiplicative thinking. Shared solutions might include:
(2X2) + (2X4) or 2 (4) +4. A common error is students recording their equation 4+4 = 8 +2+2 =12 (parts of equation are not balanced) rather than 4+4 = 8, 8 +2 =10, 10+ 2 = 12.

Sample Student Response:



NUMBER TALKS AT-A-GLANCE

1. THINK
   - → Say and write the expression on board (horizontally)
   - → Wait until most students have a thumb up (a total)
2. LISTEN/SHARE
   - → Call on 4-5 students to share **answers only**; write answers on the board
   - → Students use "same" signal if they had the same total
   - → Accept all answers (even incorrect ones) without saying if they are correct
   - → Ask: can both/all these answers be correct? *(this isn't an everyday step, just once in awhile as a reminder that there can only be one correct answer for each equation)*
3. EXPLAIN/DEFEND
   - → Select a student to share his/her solution to the equation
   - → Chart student thinking on board—try to chart exactly what students say, even if they are incorrect; give them opportunities to correct/clarify their own thinking before jumping in to "save" them
   - → Take time to name the strategy used (i.e. counting on, making a ten, using friendly numbers)
   - → Students use "same" signal if they had the same total
   - → Repeat the process with another student's strategy
4. QUESTION *[this may come later with younger students, after they have grown more comfortable with the Number Talks routine]*
   - → Allow students to question each other about their thinking or the strategy they chose
   - → Have students identify similarities/differences between strategies



Silent Signals

- READY → closed fist on chest
- I HAVE AN ANSWER → put thumb up
- I HAVE ANOTHER STRATEGY → put out a finger for each additional strategy
- SAME THINKING → move hand back and forth to show agreement