Island Numeracy Assessment
Grade 5+: Computational Fluency

Collaborative Task

Question posed as a whole class number talk: (See *appendix* for description of Number Talk Routine)

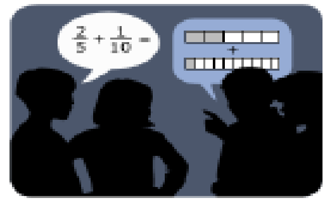
Find the product of 14 and 8.

After individual thinking time invite students to share their solutions with a partner.

Share back to whole group as teacher represents responses visually on the white board. It is helpful to have many different ways of representing students' thinking. Number lines are very useful, as well as providing horizontal and vertical representations. Pictures should be included whenever possible.

See *appendix below* for a summary description of the Number Talk Routine.

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

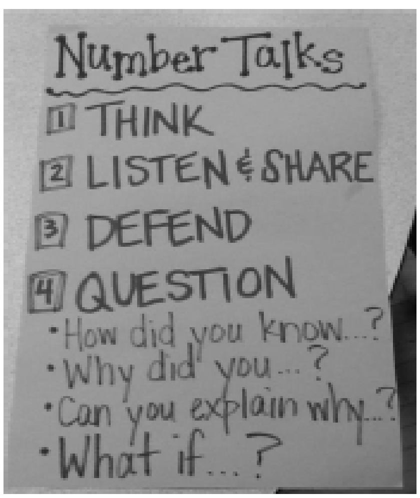
- → Call on 4-5 students to share **answers only**; write answers on the board
- → Students use "same" signal if they had the same total
- → Accept all answers (even incorrect ones) without saying if they are correct
- → Ask: can both/all these answers be correct? *(this isn't an everyday step, just 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

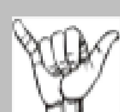
4. Question *[this may come later with younger students, after they have grown more comfortable with the Number Talks routine]*

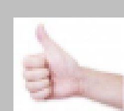
- → Allow students to question each other about their thinking or the strategy they chose
- → Have students identify similarities/differences between strategies



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





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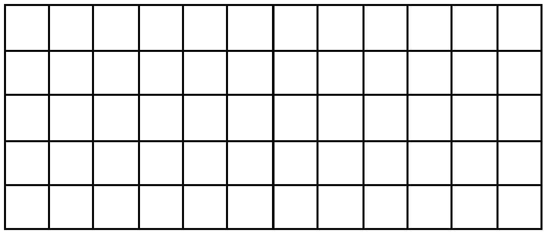
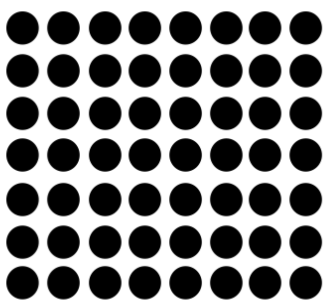
Assessment Question	**Answer Key**
1. Write 2 **multiplication** equations that match this array:  ____________________ ____________________	**Answer**: 12 x 5 = 60 5 x 12 = 60 (Also accept: 12 x 5 and 5 x 12) **Note**: Be open to flexible thinking such as 2 x 6 x 5 = 60 3 x 4 x 5 = 60 A student who only writes one correct answer may not recognize the commutative property of multiplication.
2. Write 2 **division** equations that match this array:  ____________________ ____________________	**Answer**: 56 ÷ 7 = 8 56 ÷ 8 = 7 (Also accept: 56 ÷ 7 and 56 ÷ 8, expressions) **Note**: Be open to flexible thinking such as 56 ÷ 2 = 28

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3. There are 328 students in the school. Each student sold 41 packets of seeds. ***About*** how many packets were sold?

Provide a reasonable but **too low estimate**

and

a reasonab**le but too high estimate.**

Explain your reasoning for your estimates.

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Answer:

Reasonable but too low:
12 000 (I thought of friendly numbers 300 x 40)
or 12 300 (I did 40 groups of 300 and one more group)

Reasonable but too high:
13 000 (I know 300x40 is 12 000 so I believe 13 000 will be too many packets) or
15 000 (I multiplied 300 by 50 and knew that would be too much)

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4. James has 37 trading cards. Mei-Ling gives him some of her cards so he now has 54 cards in his collection.

Without solving, show what you would enter into a calculator to find out how many trading cards Mei-Ling gave James?

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<td>

Answer: 54 - 37

Note: student who uses addition may not understand inverse operations. Student may see this as join – change unknown and be unable to enter it in a calculator 37 + □ = 54

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5. Sami makes 5 piles of candies with 8 candies in each. There is one pile for each of his friends.

Three more friends came so he must remake the piles.

If each friend gets the same amount, how many candies will each one get?

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Answer:

Multi-step

At first 5 X 8 = 40 candies

40 ÷ 8 =5 candies

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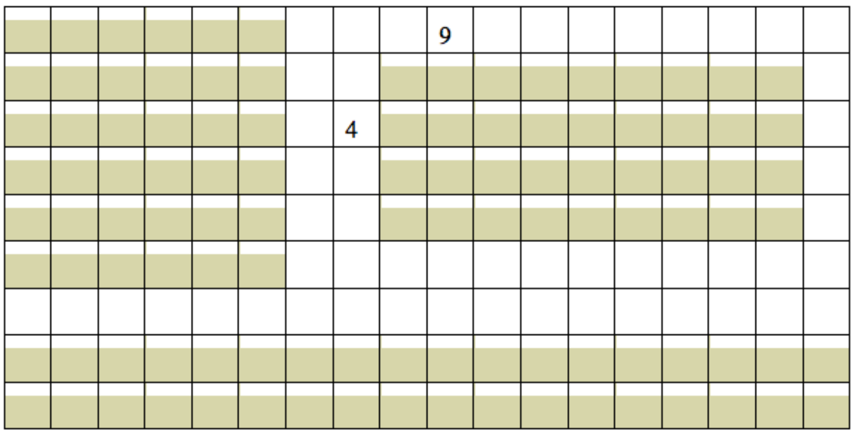
<tr><td>6. What is a reasonable estimate for 6 402 + 127 307 ?</td><td>Answers: (will vary)

135 000 , 134 000,
136 000</td></tr>
<tr><td>7. Write the missing numeral:

17 + 23 = 20 + ☐</td><td>Answer: 20

Does student have an understanding of equivalence? Or do they think the equals sign means ‘find the answer’?</td></tr>
<tr><td>8. Design and label two different rectangles with an area of 36 cm².
</td><td>Answers will vary.
Possible answers:

12cm x 3cm
6cm x 6cm
4cm x 9cm
2cm x 18cm

The student response page has grid to scale.</td></tr>
<tr><td>9. Think of a number that is a multiple of 9 is also a multiple of 6. Explain how you know.
To be a multiple of 6 the number must be even. I thought of all the multiples of 9 that I know are even and then check to see that I could divide them evenly by 6. I noticed that all the even multiples of 9 are also a multiple of 6 (18,36,54,72).
Students may answer: “I multiplied 9x6=54 and I know that both are multiples.”. During reflection time post-assessment students could be encouraged to expand and offer other responses.</td><td>Answer: 18

6 X 3 = 18
9 X 2 = 18

36

9X4 = 36
6X6 = 36</td></tr>
<tr><td>10. Reanna is training for a swim meet. She goes to the pool for 27 days and swims 58 laps each day. In her training log, Reanna needs to record the total number of laps she has completed.

How many laps had Reanna completed at the end of 27 days?
Show two ways that you can solve this problem.

One way I solved the question:

A second way I solved the question:</td><td>Answer: 1 566
Similar to a number talk. Students may represent with pictures, numbers and words.
Possibilities:
60 laps per day would be 1620 laps minus 54 = 1566
Or
I used the algorithm.
Or
(50x27) +(8x27)</td></tr>
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Performance Task

Part A

Place any digit 1 through 9 in the boxes to create the **smallest** possible difference. Use each digit only once.

☐☐☐ — ☐☐☐

How do you know you have found the **smallest** difference without subtracting? Describe the strategy used to solve.

Answer:

Part A
612 – 598 or
712 – 698 or
512 – 498 or
412 – 398 or
-I chose two numbers that were as close together as possible
-I guess and tested my ideas

Part B

Now try the question again with digits 0-9, using each digit only once.

☐☐☐ — ☐☐☐

How do you know you have found the **smallest** difference without subtracting? Describe the strategy used to solve.

Answer:

Part B

301-298

401-398

501-498

601-598

701-698

With 0 in the tens column of the first number the difference will be the smallest possible. 3

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Performance Task

Part A

Using the digits **2, 4, 6, 7** and **9**, make a 3-digit number and a 2-digit number that would give the greatest product. Use each digit only once.

□ □ □ X □ □

Answer: Part A
~~942 x 76~~

962 x 74

How do you know you have found the greatest product without multiplying? Show the strategy used you used to solve.

Possible responses – *you want to put the biggest digit in the hundreds place and put the next biggest digits in the other number so you get the most hundreds possible.*

-I guessed and then tested.

-I wanted to have the most hundreds and then tens in the first columns but needed a large digit in the tens column of the second factor

Part B is offered only as an extension as the product increases greatly but does invite good reasoning and reflection.

Using these digits **0, 2, 4, 6, 7** and **9,** describe how would you apply your strategy above, to solve an expression with more digits.

□ □ □ X □ □ □

Answer: Part B
~~964 x 720~~

962 x 740

How do you know you have found the greatest product without multiplying? Show the strategy used you used to solve.

Possible responses – *With zero added to the choices I know that it must be in the ones place to create the largest product. If I put 0 anywhere else it would make a smaller answer.*

-I guessed and then tested. The products were all much larger than the first question.

-I wanted to have the most hundreds and then tens in the first columns so put 9 in the hundreds of the first factor and 7 in the hundreds of the second factor. I figure that the next biggest digit should be in the tens place of the 1st factor. The place value matters so I alternated the digits until I used zero.

This product is 10 times as big as Part A because we used 0 as one digit.