



■ The Power of Individual Assessment

Why, How, and Finding Time!

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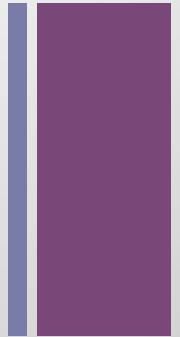
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This is Jonah's math paper. Make some notes about what you know about Jonah's understanding of multiplication from this paper.



$$2 \times 3 = 6$$

$$4 \times 5 = 20$$

$$1 \times 2 = 2$$

$$5 \times 5 = 25$$

$$6 \times 1 = 6$$

$$2 \times 7 = 14$$

$$2 \times 6 = 12$$

$$8 \times 2 = 14$$

$$3 \times 4 = 12$$

$$4 \times 4 = 12$$

$$6 \times 4 = 22$$

$$1 \times 8 = 8$$

$$7 \times 1 = 7$$

$$2 \times 2 = 4$$

$$5 \times 2 = 10$$

$$7 \times 3 = 21$$

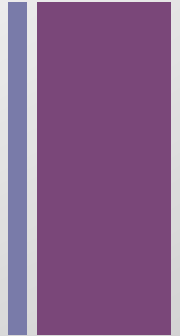
$$5 \times 3 = 8$$

$$1 \times 5 = 6$$



“We often make assumptions about children’s understanding of number concepts based on their ability to give right answers. [Individual interviews can] reveal children’s thinking and thus help us look more closely at what they really understand or do not understand.”

(Richardson, p. 4)



+ Why do we do individual interviews?

- They're a teacher's research tool – We gain deeper understanding of how our students think and what form their concepts and beliefs take.
- We can assess a particular student to plan for targeted instruction.
- We can figure out just how a misconception impacts a student's ability to arrive at a correct answer.
- It's a time to develop a stronger mathematics-based relationship with our students.
- We always find out something we didn't know!

+ After teaching a unit on place value, we wanted to find out:

- Can the student read and write numbers through 99,999 (third grade) or 999,9999 (fourth grade)?
- Can the student identify the place and value of each digit in a multi-digit number?
- Can the student use an understanding of place value to easily increase or decrease a number by multiples of 10?

+ Place Value Interview Protocol

Place Value Individual Interview Recording Sheet

Tell the student: Write the biggest number you think you can read and read it.

Number: _____ Could read correctly? Yes No

Have the student roll 5 ten-sided dice and make the largest possible five-digit number with the digits rolled.

Number: _____

Knows place to ten-thousands? _____ If not, which places known?

Knows value to ten-thousands? _____ If not, which values known?

Have the student write the number in:

expanded notation: Yes No

word form: Yes No

Give the student a calculator.

Ask him/her to use the calculator to:

Notes

253 change the tens place to an 8

4305 change the tens place to a 9

7199 make it have 3 hundreds

For further practice:

2720 make it have 8 hundreds

6900 change the thousands place to an 8

32,520 change the ten-thousands place to a 6

For more challenge:

76,322 change the hundreds place to an even number

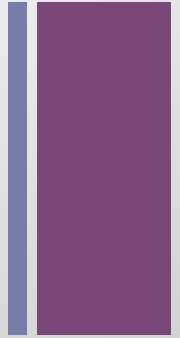
407,961 change the ten thousands place to 5

5,321,910 change the hundred thousands place to 0

Notes: _____



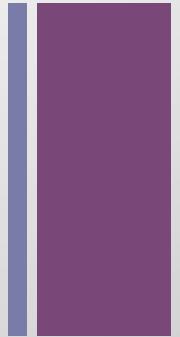
Focus Questions for Videotapes



- What have you learned about the child?
- What does he/she know? Not know yet?
- What follow-up support should be given to this child to increase his understanding?

+ After teaching a unit on basic multiplication, we wanted to find out:

- Does the student have an understanding of multiplication as:
 - Repeated addition
 - Equal groups
 - Skip counting
 - An array
 - Through pictures or illustrations?
- Because we teach both third and fourth graders, we expected age-appropriate variation in students' responses.



+ Multiplication Interview Protocol

Multiplication Task 1

Ask student to give you the answer to **one** of the simple fact problems below.

$$4 \times 7 = \underline{\quad}$$

$$6 \times 8 = \underline{\quad}$$

Whether the answer is right or wrong follow up with the questions below.

- How could you use addition to find your answer?
- How could you skip count (ex: by 4s or by 7s) to find the answer?
- Does your answer help us to find any other related facts? How does your answer help us to find the answer to 7×4 or 8×6 ?
- Show with tiles or blocks a rectangle that shows the product of 4×7 or 6×8 . How can you use the rectangle to show the product of 7×4 or 8×6 ? Explain why this is so.
- Are there other ways to make a picture of multiplication?
- What three other facts are in the family of 4×7 or 6×8 ?
- Explain how you find the other facts in a fact family.
- Which facts (in the 4s table or the 6s table) are the most difficult for you to remember? Why are they so difficult? What could you do to make them easier for you?

Multiplication Task #2

Problem 1: 2 children each have a bag of chocolate bars. There are 4 bars in each bag. How many bars are there altogether?

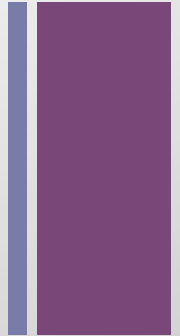
Problem 2: 4 children each have a bag of chocolate bars. There are 2 bars in each bag. How many bars are there altogether?

- In what ways are the two problems alike? How are they different?
- Do both problems have the same answer? Why do they (or do they not) have the same answer?
- Explain how you got your answer to the first problem. Then explain how you got your answer to the second problem. Did you solve them both in the same way? Why or why not?



Brief Guidelines

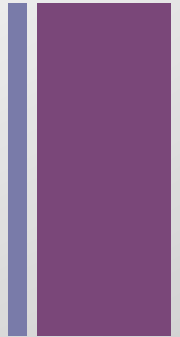
- Decide the purpose and possible tasks
- Design a recording sheet
- Assemble materials
- Set up time and place
- Make student comfortable
- Present tasks and record notes
- Ask questions whether the student is right or wrong
- Record comments right away





Make notes on:

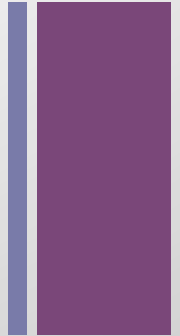
- which tasks are presented
- student's responses
- codes for strategies used
- prompts or hints given
- circumstances such as health, fatigue, noise, interruptions





Sources for Tasks

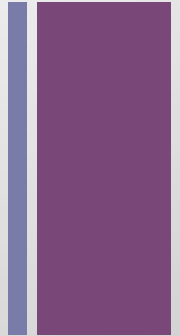
- Teacher-made test questions
- Problems worked in class
- Textbook problems
- State/district-mandated assessment items
- Comments and questions from students
- Problems that arise from meaningful situations shared by students





How do we find the time?

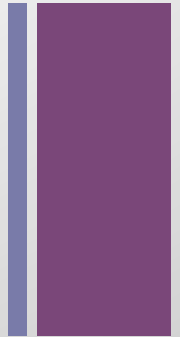
- Interview 2 or 3 students a day
- Use teacher assistant (if you have one!) or ask for parent or community volunteers for rest of class
- Do while students are working independently, perhaps at centers
- Use bits of time that work for you – before or after school, lunch, recess
- Always be thinking about how you can create opportunities to observe/interact with your kids





“It is important to make clear that the process is of greatest importance to the teacher. The process reveals thinking strategies. The product does not tell the teacher very much about the student’s understanding. Getting the right answer does not always imply understanding. In fact, it often is informative for the teacher to explore the thinking that underlies correct answers.”

(Ginsburg et al., p. 62)



+ Resources

- Ginsburg, H.P., Jacobs, S.F., & Lopez, L.S. (1998). *The Teacher's Guide to Flexible Interviewing in the Classroom: Learning What Children Know About Math*. Boston: Allyn & Bacon.

