Virginia Mathematics Institutes

Process Standards

K-2

Handouts

Fall 2011

Sept. 27 – Abingdon

Sept. 28 – Roanoke

Oct. 18 – Richmond

Oct. 19 - Fredericksburg

Strategies for _____

Strategies for _____

Productive Talk Moves

Talk Move/ Example	Purpose	Evidence of use in sample video
Revoicing e.g. "So you're saying that it's an odd number?" "You used the 100s chart and counted on?"	Restating the statement as a question in order to clarify, apply appropriate language, and to involve more students. Important strategy for English Language Learners to reinforce language and enhance comprehension.	
Rephrasing e.g. "Who can share what Ricardo just said, but using your own words?"	Asking students to restate someone else's ideas in their own words in order to ensure ideas are stated in a variety of ways and to encourage students to listen to each other.	
Reasoning e.g. "Do you agree or disagree with Johanna? Why?"	Rather than restate, as in #2, this move asks the student what they think of the idea proposed by another student.	
Elaborating - "Can you give an example?" "Do you see a connection between Julio's idea and Rhonda's idea?" "What if …"	This is a request for students to challenge, add on, elaborate, or give an example. It is intended to get more participation from students, deepen student understanding, and provide extensions.	
Waiting e.g. "Take your time…we'll wait." "This question is important. Let's take some time to think about it."	Ironically, one "talk move" is not to talk. Quiet time should not feel uncomfortable, but should feel like thinking time. If it gets awkward, ask students to pair-share and then try again.	

Adapted from:
Chapin, S., O'Connor, C. & Anderson, N. (2009). *Classroom Discussions: Using Math Talk to Help Students Learn, Grades 1-6.* Sausalito, CA: Math Solutions Publications.

Productive Talk Moves
(16 + 15)

Talk Move/ Example	Purpose	Evidence of use in sample video
Revoicing e.g. "So you're saying that it's an odd number?" "You used the 100s chart and counted on?"	Restating the statement as a question in order to clarify, apply appropriate language, and to involve more students. Important strategy for English Language Learners to reinforce language and enhance comprehension.	• So, if I heard you right these are tens…. • So, you took one away from here…. • So, you took 5 of this and gave it to the 15?
Rephrasing e.g. "Who can share what Ricardo just said, but using your own words?"	Asking students to restate someone else's ideas in their own words in order to ensure ideas are stated in a variety of ways and to encourage students to listen to each other.	
Reasoning e.g. "Do you agree or disagree with Johanna? Why?"	Rather than restate, as in #2, this move asks the student what they think of the idea proposed by another student.	• *Students are indicating their agreement (but there is no further explanation of reasoning or why)* • And that's the same jump that Nate just showed us?
Elaborating - "Can you give an example?" "Do you see a connection between Julio's idea and Rhonda's idea?" "What if …"	This is a request for students to challenge, add on, elaborate, or give an example. It is intended to get more participation from students, deepen student understanding, and provide extensions.	• Can anyone defend it? • Can you prove that makes 30? • So who has a different way of thinking about it? • Can you show me that jump on the hundreds chart? • Can you show me +20? • Is there any other quicker way? Another way? • Plus ten would lead you where…?
Waiting e.g. "Take your time…we'll wait." "This question is important. Let's take some time to think about it."	Ironically, one "talk move" is not to talk. Quiet time should not feel uncomfortable, but should feel like thinking time. If it gets awkward, ask students to pair-share and then try again.	

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Children need to experience mathematics as problem solving: investigating, seeing what happens if..., and using mathematics to find out things for themselves that they don't already know. Rather than trying to figure out what the teacher wants them to do, children need to understand that mathematics is about reasoning: making conjectures about why something is the way it is and then checking out those conjectures; thinking for oneself rather than trying to figure out what the teacher wants. Rather than being a task done quietly by a child at her desk, mathematics is about communication: clarifying her thinking by talking to her friends, by listening to what they have to say, by finding ways to write down her experiences and her thinking with words, with diagrams and pictures, and with mathematical symbols. Rather than being a set of isolated skills and procedures to be practiced and drilled until they are mastered, mathematics is about connections: seeing the relationship between mathematical ideas, seeing mathematics everywhere one looks.

Richardson, Kathy. (1999). *Developing Number Concepts Planning Guide*. Parsippany, NJ: Dale Seymour Publications.

Teacher Version - Frogs in the Pond

There were 57 frogs in the pond. Some were swimming and some were sunning themselves on a log. There were about twice as many frogs swimming as were sunning. How many frogs were swimming and how many frogs were sunning? Use pictures, numbers, and/or words to prove that your answer makes sense.

Grade 1 - Frogs in the Pond

There were 12 frogs at the pond. Some were swimming and some were sunning themselves on a log. There were more frogs swimming than sunning. How many frogs were swimming and how many were sunning? Use pictures, words and numbers to prove that your answer makes sense. Can you find more than one way to do this?

Looking at Student Work – Frog Problem (First Grade)

Student	What representations are used?	What appears to be understood (or not understood)?	Next steps for instruction
D			
I			
F			
B			

Student	What representations are used?	What appears to be understood (or not understood)?	Next steps for instruction
G			
H			
E			

Looking at Student Work – Frog Problem (First Grade)

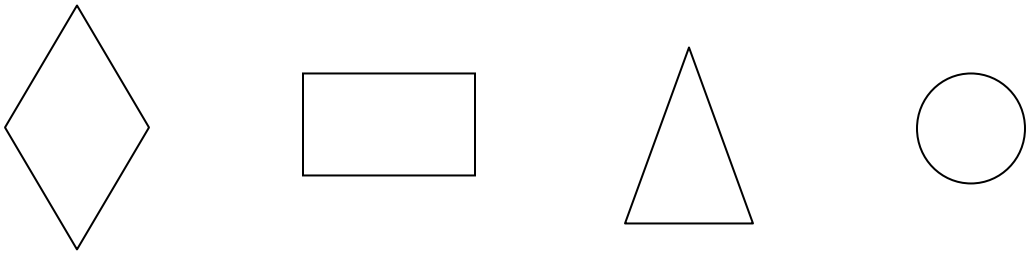
Student	What representations are used?	What appears to be understood (or not understood)?	Next steps for instruction
D	Detailed pictures Number sentences Numbers labeled with words	Understands 12 as a quantity Finds some parts of 12 Understands the more/less relationship between the parts Knows how to write number sentences Does he understand there are more combinations for 12?	Encourage student to show us as many combinations of 12 as he can. Provide opportunities for student to see and use simpler pictures/mathematical representations. Provide opportunities for student to develop perseverance in finding multiple solutions.
I	Detailed picture Number sentence The number sentence written in words	Understands there are two parts Understands the more/less relationship between the parts Finds a combination for 15 Loses track of the total quantity	Help student become aware of paying attention to all conditions of the problem. Encourage student to show us as many combinations of 12 as he can.
F	Detailed picture Number sentences Sentences describing the situation using story problem structure	Understands 12 as a quantity Knows 7 and 5 make 12 Understands the more/less relationship between the parts Knows how to write a number sentence Knows there are more solutions, but doesn't show them	Encourage student to show us as many combinations of 12 as he can. Provide opportunities for student to develop perseverance in finding multiple solutions.
B	Ten Frame Number Line Part-Part-Whole Mat Number Sentences Picture of unifix cubes? Numbers labeled with words Color Coding to connect different representations for each combination	Understands 12 as a quantity Finds several combinations for 12 Understands the more/less relationship between the parts Knows how to write a number sentence Uses multiple concrete/ pictorial representations Does he understand there are more combinations for 12?	Encourage student to find all the combinations of 12 and develop a strategy for being sure all the combinations have been found.

G	Detailed pictures	Seems to understand 12 as a quantity, but loses track of 12 on one solution Understands there are multiple combinations for 12 Understands the more/less relationship between the parts Does not connect words or numbers to his picture (Can he write number sentences?)	Ask student to use numbers (number sentences) to describe the pictures. Help student realize the importance of checking work for accuracy. Provide opportunities for him to see and use simpler pictures/mathematical representations.
H	Detailed picture Number sentence Sentences describing the situation	Understands there are two parts Understands the more/less relationship between the parts Words and picture do not match number sentence	Encourage student to show us as many combinations of 12 as he can. Help student realize the importance of checking work for accuracy.
E	Pictures Number sentences Numbers labeled with words	Understands 12 as a quantity Finds some parts of 12 Knows how to write number sentences Loses sight of the more/less relationship between the parts Understands that there are multiple ways to make 12, but has misconceptions about how many there might be.	Help student become aware of paying attention to all conditions of the problem. Help student refine ideas about the number of combinations for 12. Provide opportunities for student to develop perseverance in finding multiple solutions.

Task Sort

1. Draw a shape. Show how to cut the shape into 2 halves.

2. How many vertices does each shape have?



3. If the difference between two numbers is 5, what could the 2 numbers be?

4. Explain this statement using pictures, numbers, and words: 5 + 5 = 7 + 3.

5. There are 13 pigs and 22 chickens in the barn yard. How many animals are there? Use words, pictures, and numbers to explain your thinking.

6. Write the 4 number sentences for the **fact family** 4, 8, 12 .

_____ _____

_____ _____

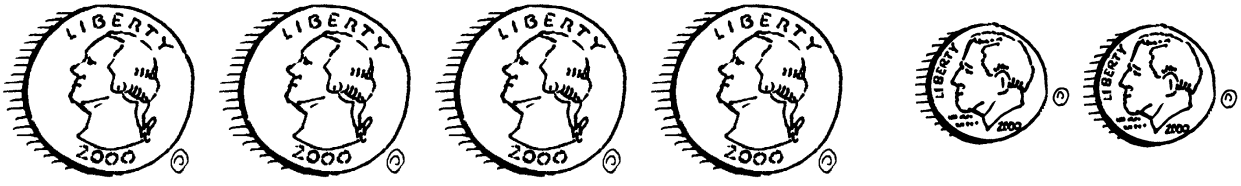
7. Jeremy had 24 pennies. He put them in groups so that each group had the same number of pennies. What might Jeremy's groups look like? Use words, pictures, and numbers to explain why your groups make sense. How many different ways can you find to do this?

8. Carmela made a picture graph about the pets that her friends have. More friends had dogs than cats. What might her graph have looked like? Use the pictures to make a graph that could be Carmela's graph. *(Students are given small pictures of dogs, cats, and fish.)*

9. Mrs. Clark's second graders took a survey of favorite ice cream flavors. 8 kids voted for chocolate; 5 kids voted for vanilla; 12 kids voted for strawberry. Create a pictograph that shows how Mrs. Clark's class voted.

10. Michael was using a spinner with four sections. Each section had a number in it. He said that it was impossible to spin a 1 using his spinner, but that he was certain he would get an even number when he spun. What could Michael's spinner look like?

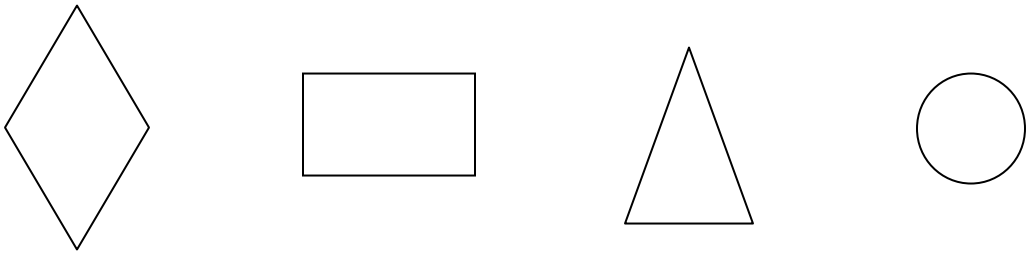
11. What is the total value of the coins below?



Task Sort - Key

1. Draw a shape. Show how to cut the shape into 2 halves. **HL**

2. How many vertices does each shape have? **LL**



3. If the difference between two numbers is 5, what could the 2 numbers be? **HL**

4. Explain this statement using pictures, numbers, and words: 5 + 5 = 7 + 3. **HL**

5. There are 13 pigs and 22 chickens in the barn yard. How many animals are there? Use words, pictures, and numbers to explain your thinking. **LL**

6. Write the 4 number sentences for the **fact family** 4, 8, 12 . **LL**

_____ _____

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