KENTUCKY CENTER FOR MATHEMATICS

The Kentucky Numeracy Project

Session 3 – Structuring to Five and Ten

February 17, 2011

Alice Gabbard

Cindy Aossey

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The Kentucky
Numeracy
Project
CLOSING
Structuring to Ten
Structuring to Five
INTROD UCTION

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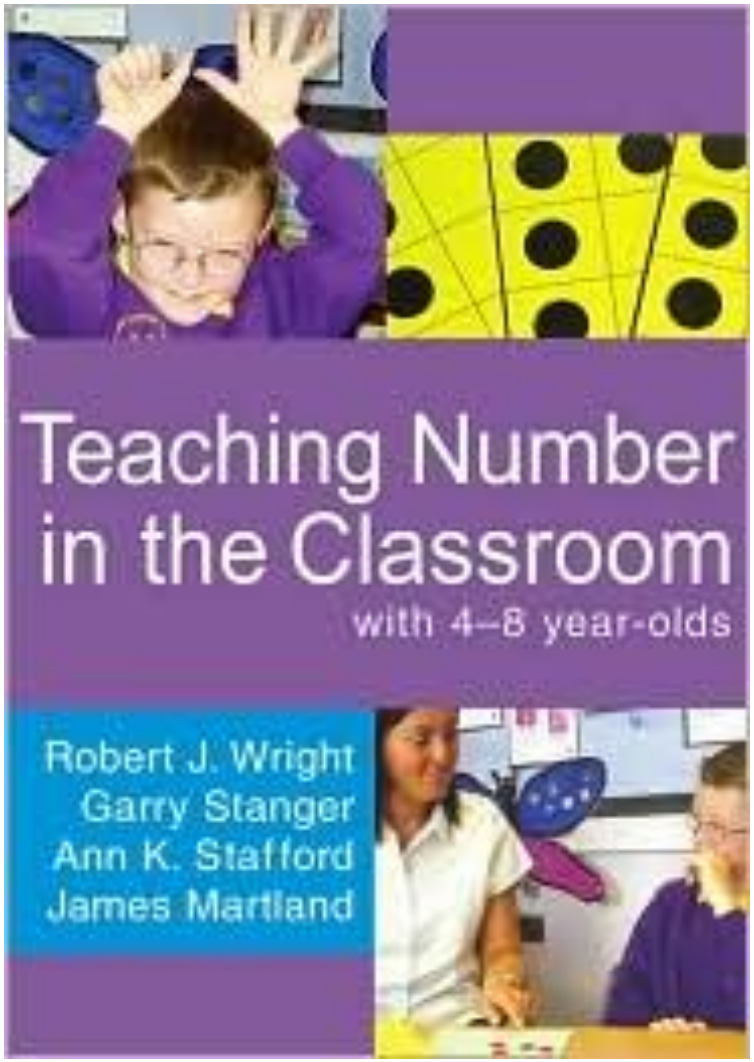
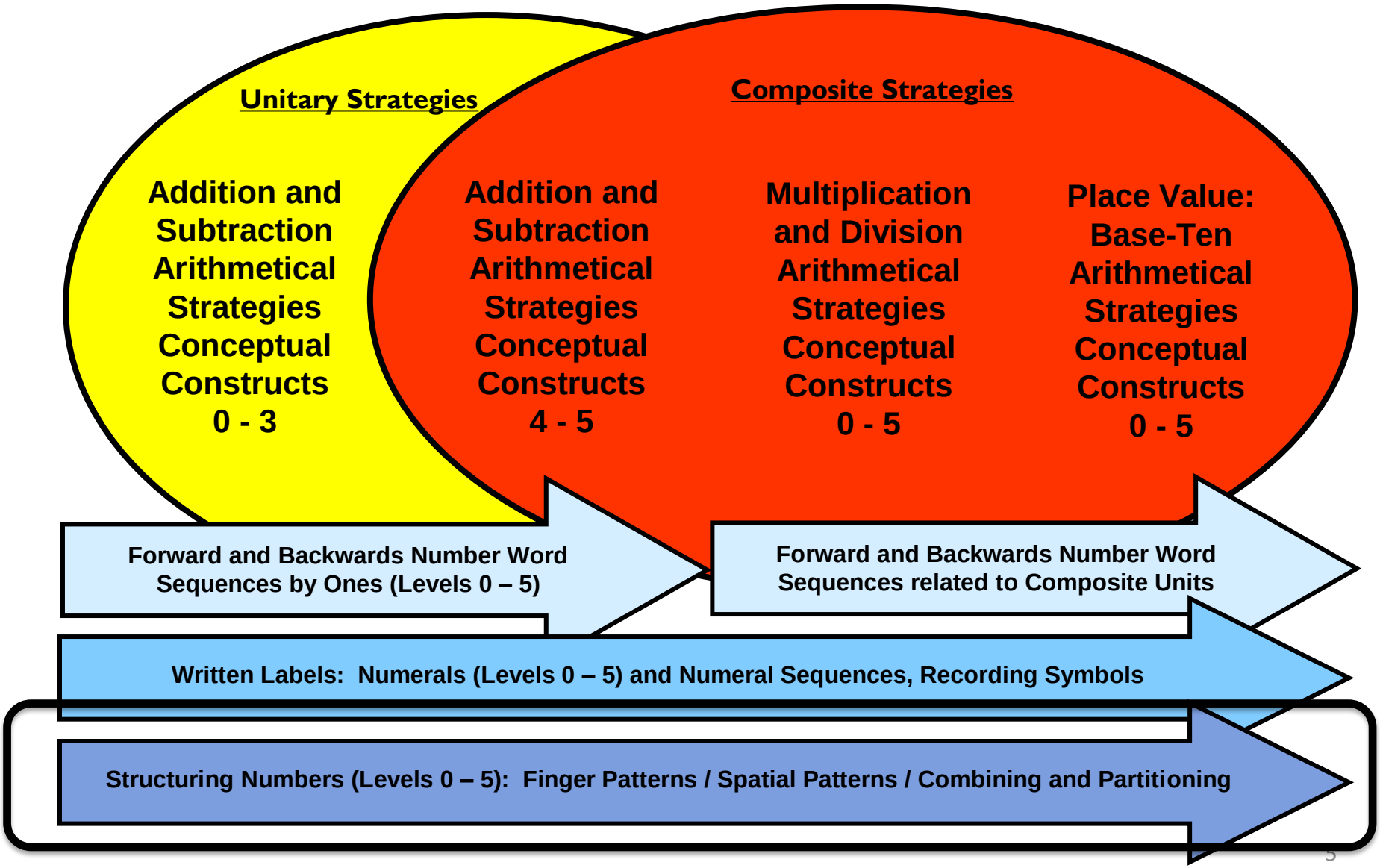
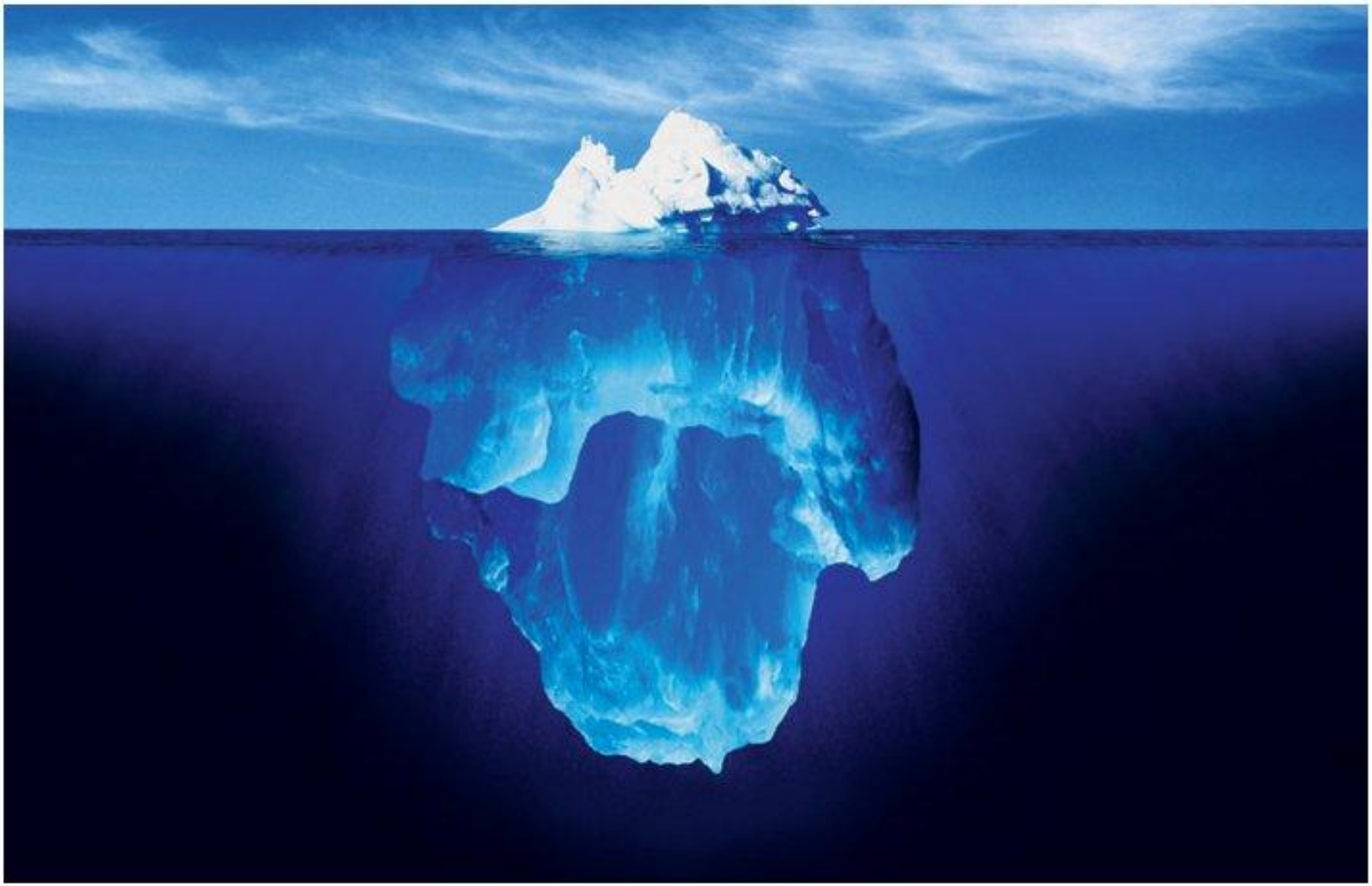


SAGE Publications 2006 (reprinted 2009),
ISBN 978-1-4129-0758-3

The Learning Framework in Number

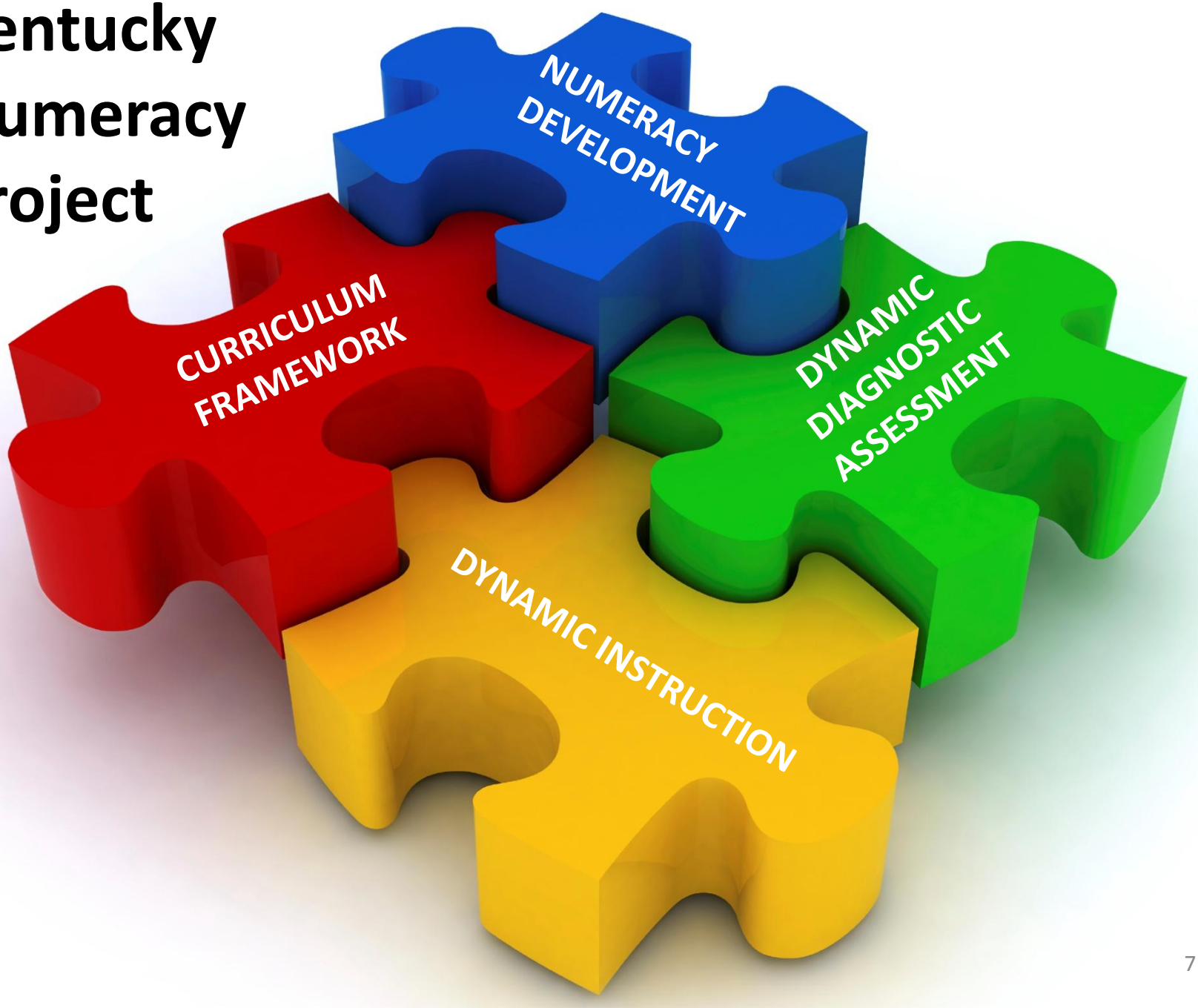


Teaching for Depth



Based on the work of David Webb, Freudenthal Institute

Kentucky Numeracy Project



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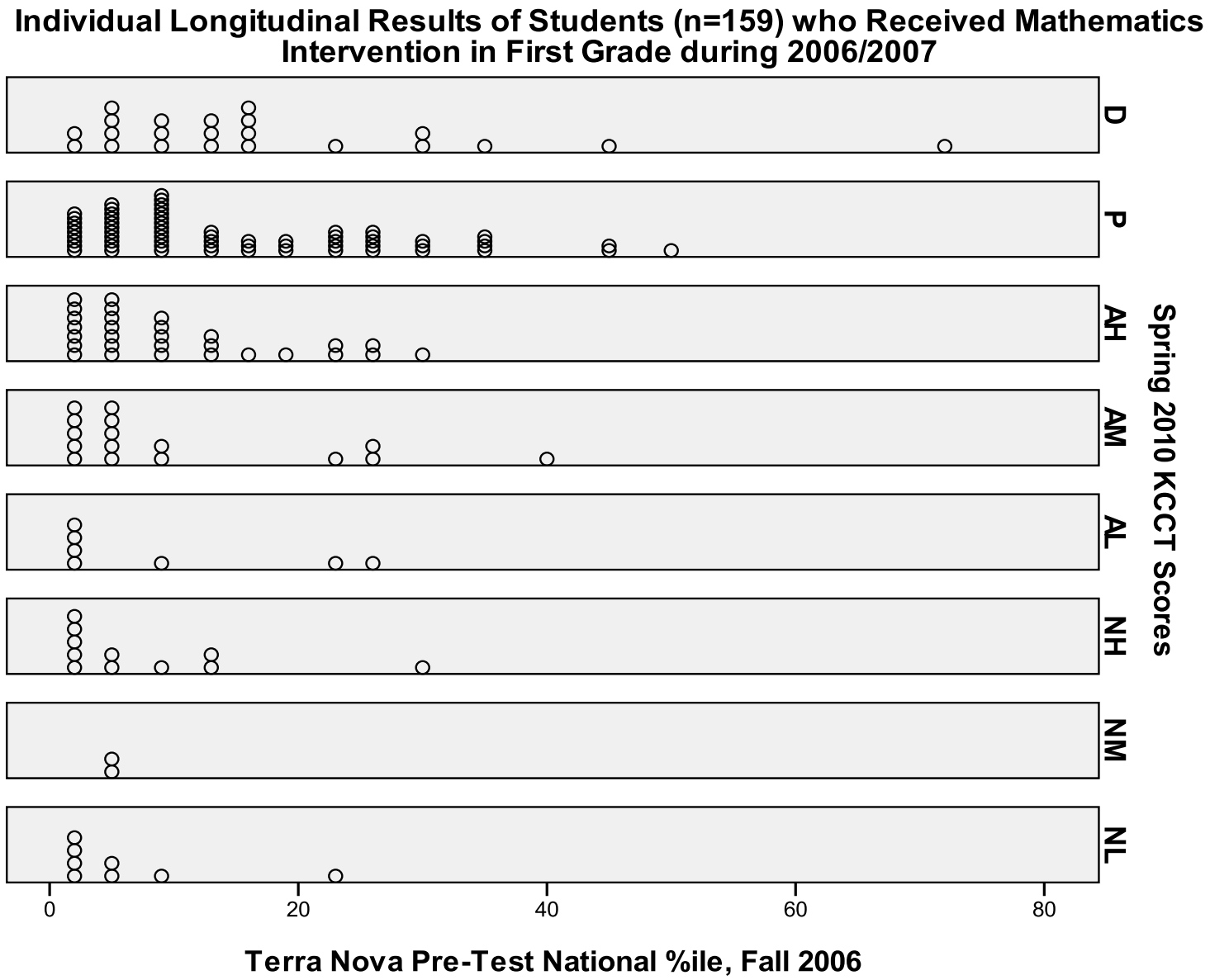

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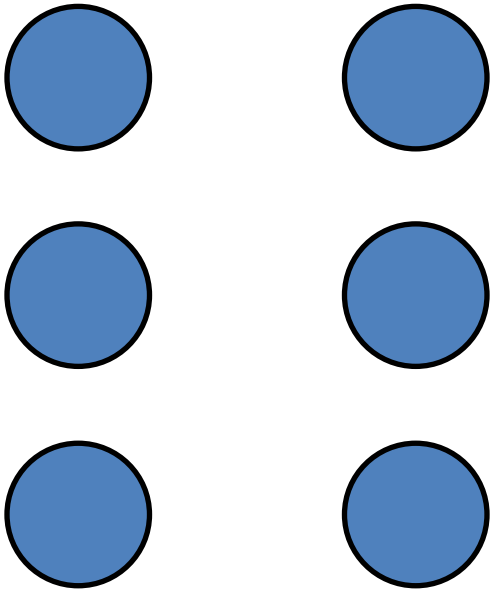
STRUCTURING NUMBER

Let's try a little experiment…



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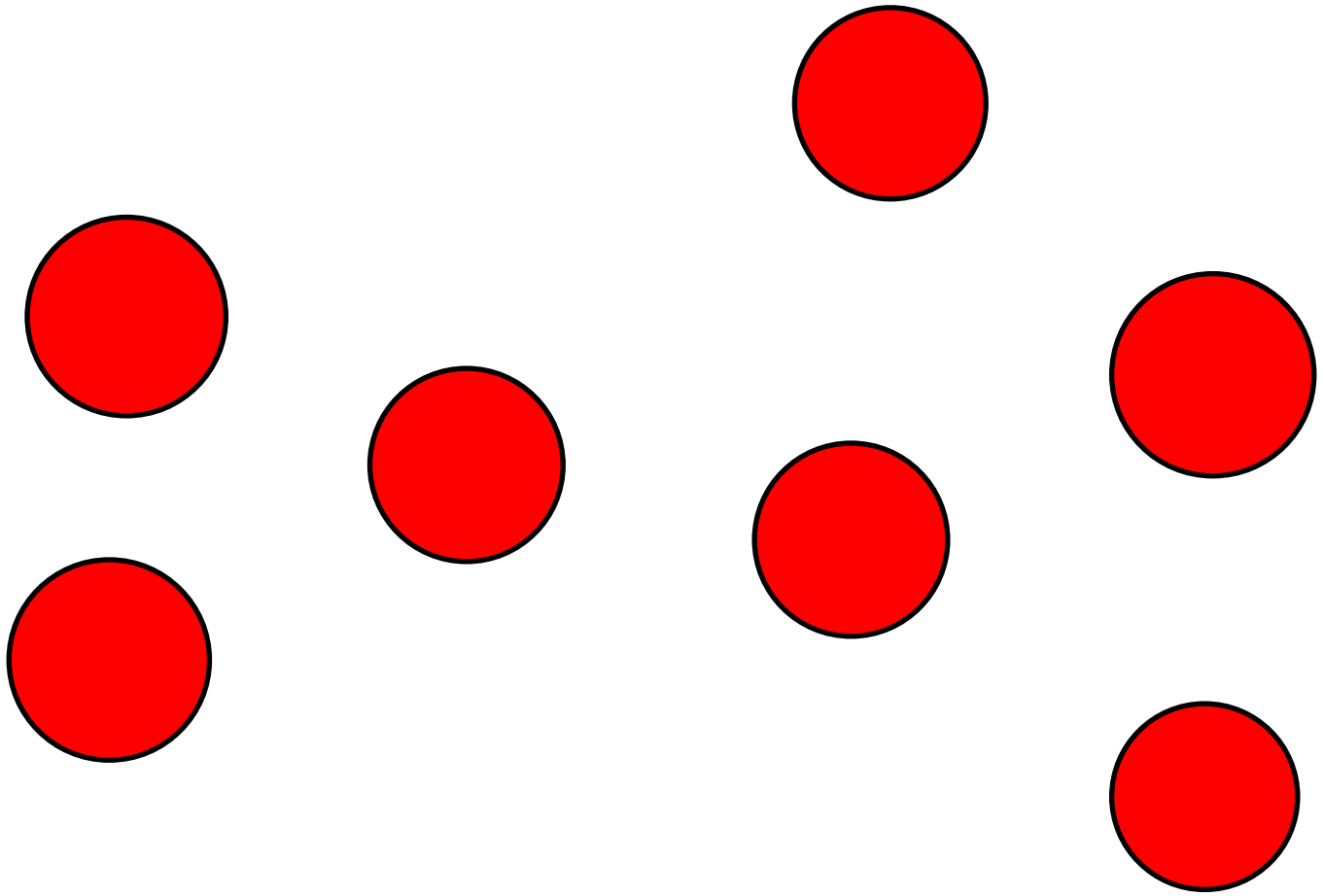
STRUCTURING NUMBER

How many did you see?
Did you have to count by ones?
Did you use the structure to tell how many?

Try again…



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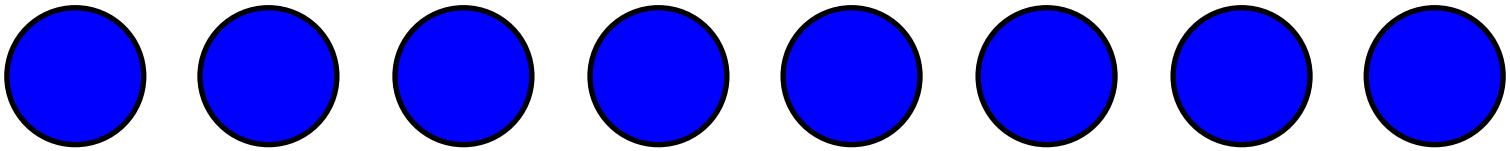
STRUCTURING NUMBER

If you could tell there were seven dots without counting, you were able to “subitize.”

Try again…



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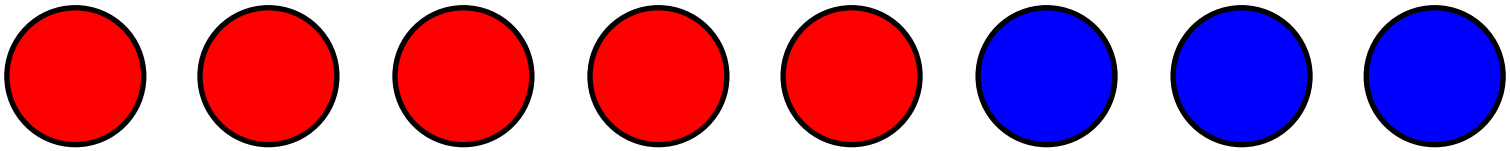
STRUCTURING NUMBER

A little tougher?
Most people can only subitize quantities to six or seven.

Try again, but this time with a hint. There are five red dots.

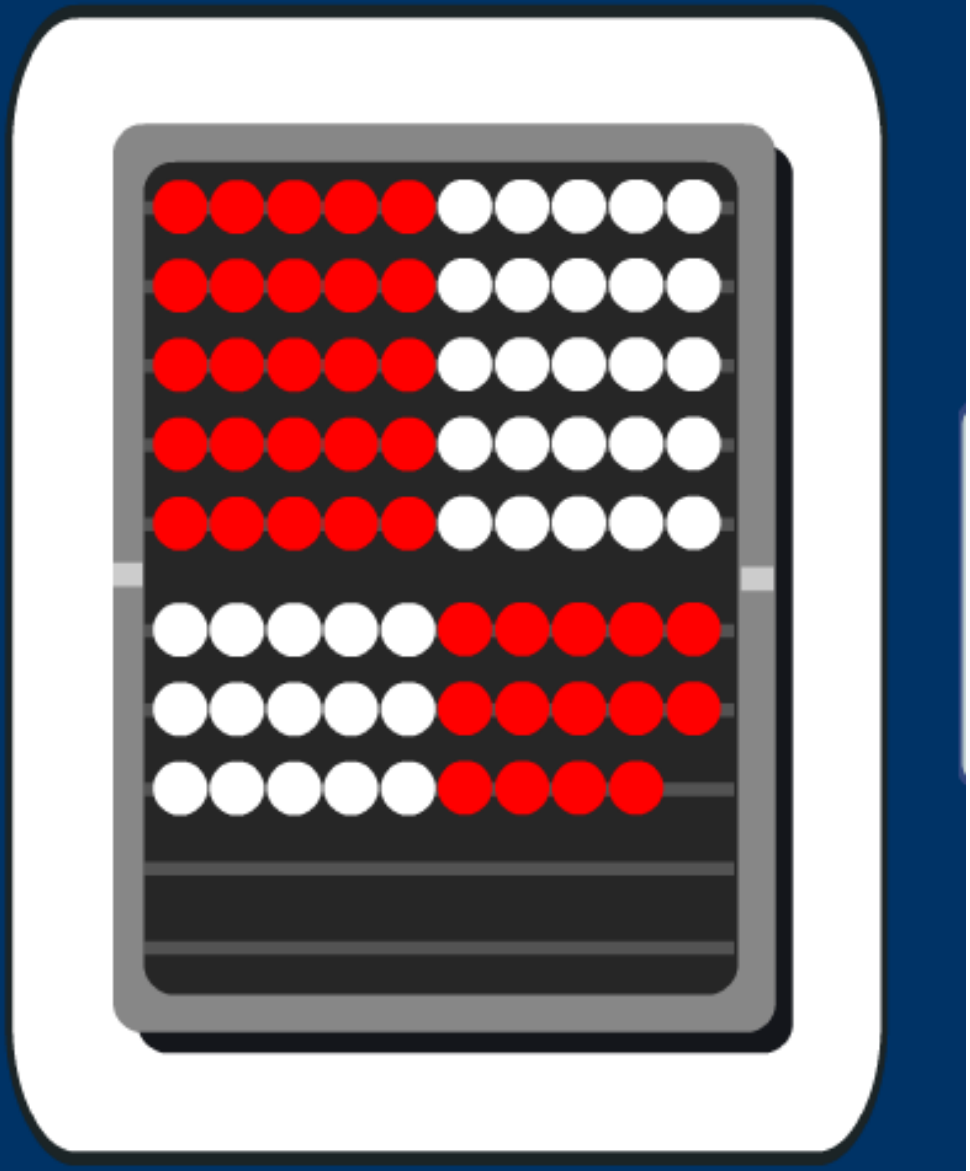


STRUCTURING NUMBER

What did you see?

Try again with a larger number…

eacher)



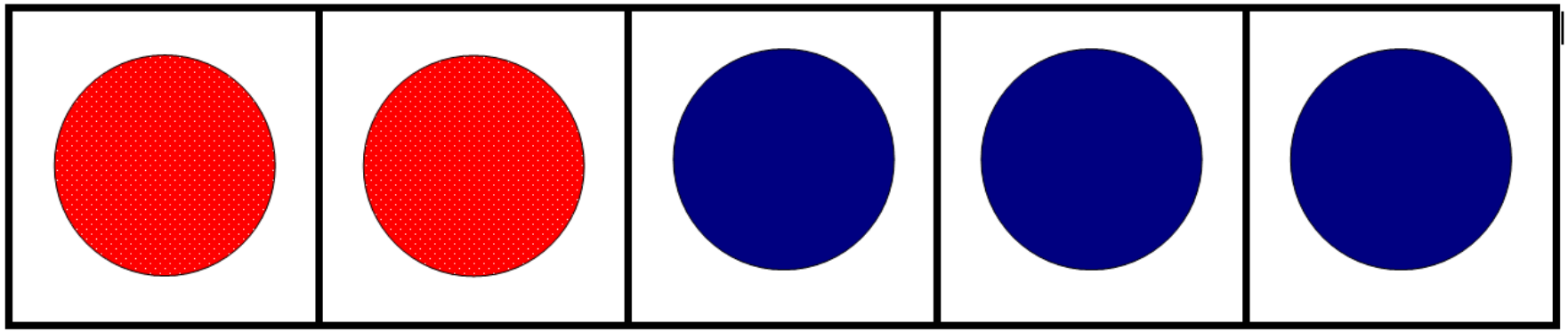
STRUCTURING NUMBER

What did you see?


Worship Team
Youth


-182
165
+357
829
Shapes
circle
rhombus
triangle
square
Place Value
MILLIONS
THOUSANDS
21,762,384
THOUSAND
Let's Count to 100!
ORDINAL NUMBERS 1-20
02/13/2009

Basic Facts – Flash Cards



Message from the President, Bethany Noblitt

As I write this, my last "Letter from the President," I reflect upon my time serving the KCTM board. Selfishly, I think of everything that KCTM has done for me! The KCTM board has been a part of my professional and personal life since 2003. I have learned so much and gained so much from this experience. First and foremost, serving on the KCTM board has given me the opportunity to work with and learn from many amazing mathematics educators in Kentucky. It is always so inspiring to see the dedication with which our state's teachers approach their profession. Whether it was the other KCTM board members with whom I worked, teachers who generously shared their expertise at the annual conference, administrators who supported KCTM and mathematics teaching in their schools, or other education professionals who contributed to the mission of KCTM – all of these people coming together in the name of mathematics education in Kentucky has been a spectacular thing to witness.

I will serve on the board for another two years as Past-President; however, my role on the board will certainly change during that time. I am thankful for the opportunity to continue my work with the KCTM over the next two years – I can't imagine not being a part of this wonderful, dedicated group of professionals.

I would like to specifically thank the following people for their hard work and dedication. These are the KCTM Board members and regular board meeting attendees who have given KCTM (and me!) so much during the past two (or more, in some cases) years.

Maggie McGatha is the best mentor I could have asked for as KCTM President. Her judgment and advice were always trusted and true.

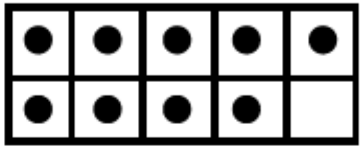
Kari Ostby was a truly outstanding President-Elect and Conference Program Chair. She was meticulous in the details of conference planning and will be a wonderful President.

(Continued on page 2)

Inside this issue:

http://kctm.org

Number Sense Throughout the School Year, Julie Dunn



A ten frame of nine dots is flashed to individual second graders. The question "How many did you see?" is posed by the teacher. Consider the various responses of second graders:

- Nine. I saw five on the top and counted the rest. Five, six, seven, eight, nine.
- Nine. Well all boxes filled in is ten and there is one missing.
- Nine. I know that four and four makes eight and there is one more dot so that's nine.
- Ten. I counted by two's. Two, four, six, eight, ten.
- I think nine. I counted by two's. Two, four, six, eight, and one more makes nine.
- Nine. I just knew it.
- I don't know. I only counted to three. Can you show me again?

This task exposed ways that students are able to think about mathematics in initial, developing, and more advanced stages of thinking about number. Although a seemingly simple task, this task revealed different levels of number sense.

What is number sense?

It is easier to identify a child with good number sense than define number sense itself. Number sense, also known as numeracy, number, or number knowledge, is a difficult concept to confine into a succinct definition. Even elementary teachers who have taught for decades find it tough to conjure an

Kentucky Common Core Academic Standards for Mathematical Content

Kindergarten: "…quickly recognizing the cardinalities of small sets of objects… " (9)

Domains:

Counting and Cardinality

Operations and Algebraic Thinking

Kentucky Common Core Academic Standards for Mathematical Practice

7 Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure.

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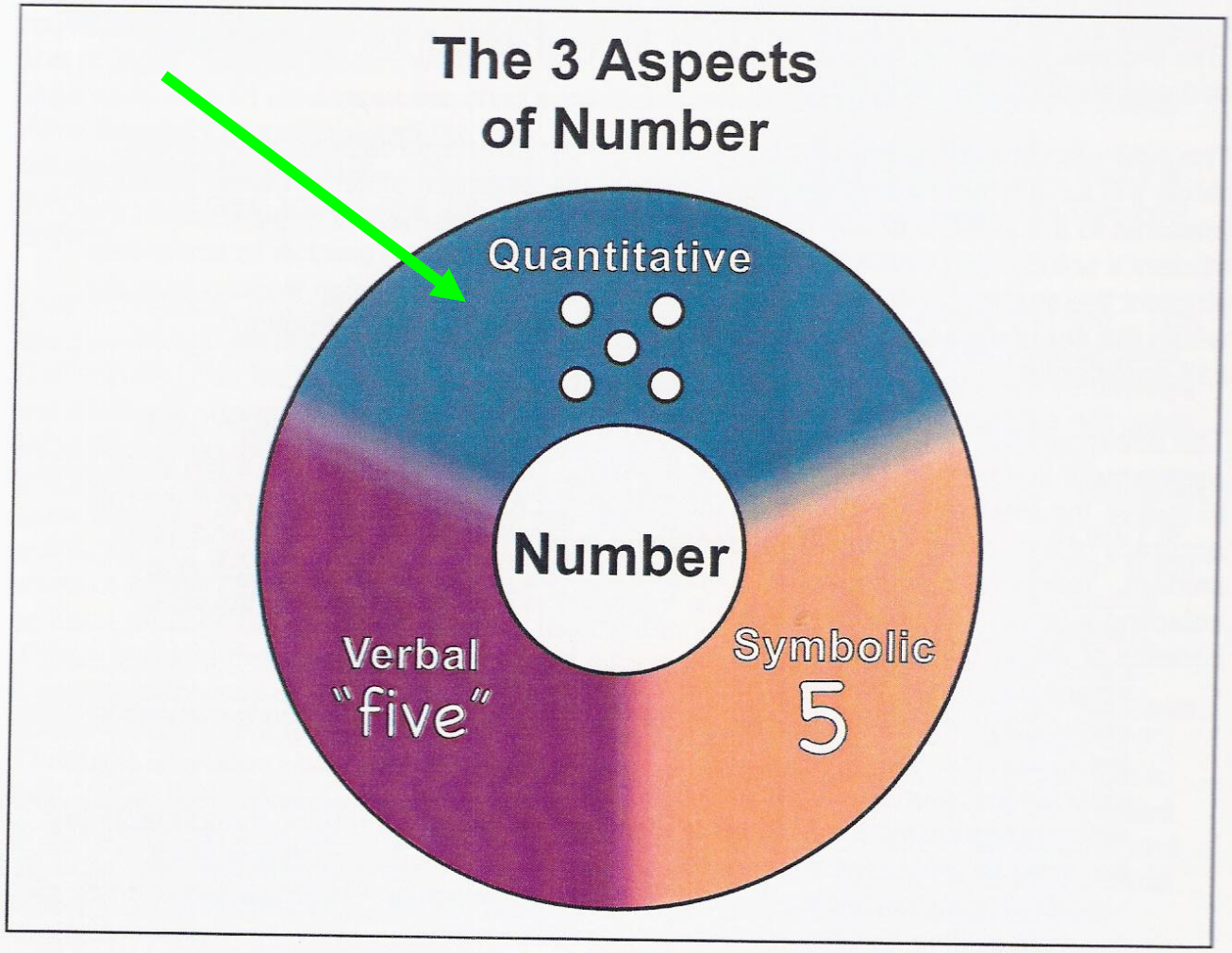
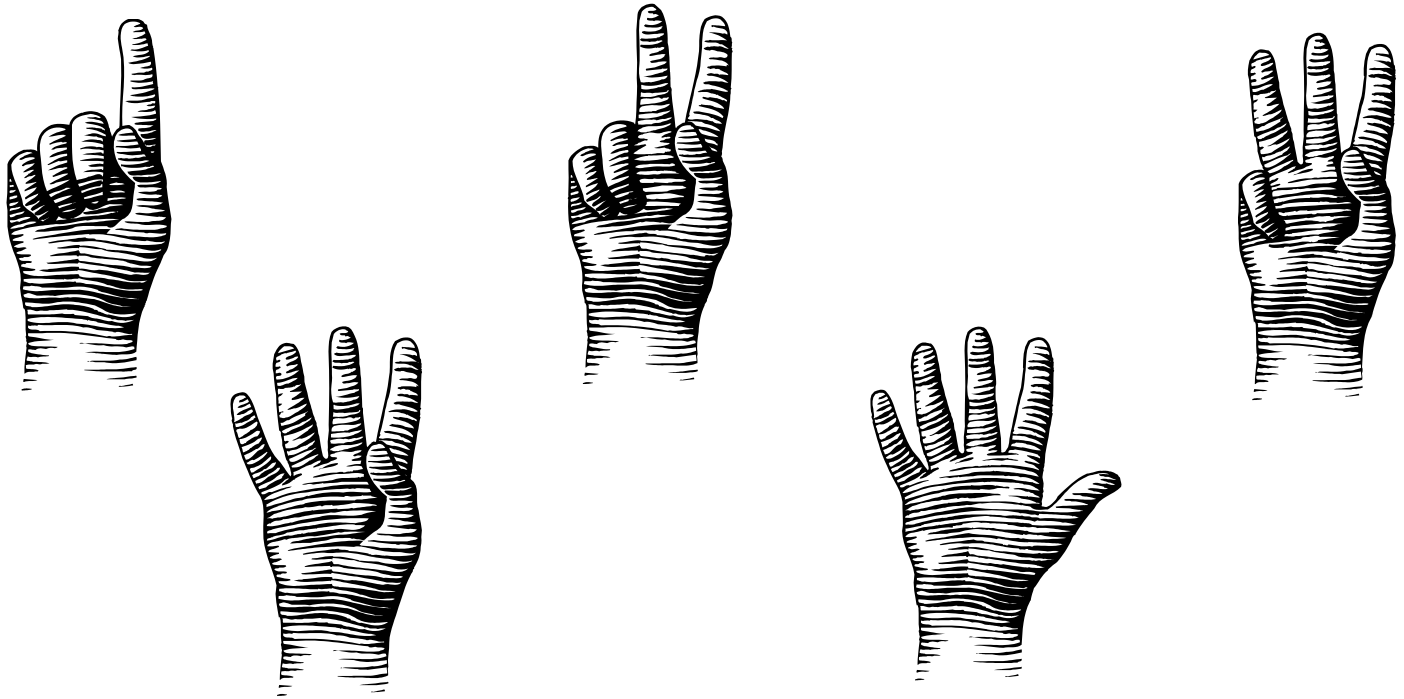
The Kentucky
Numeracy
Project
CLOSING
Structuring to Ten
Structuring to Five
INTRODUCTION

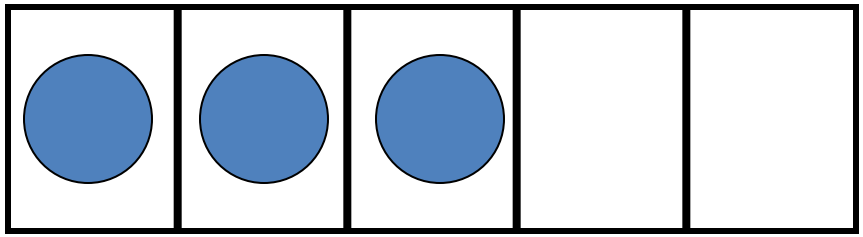


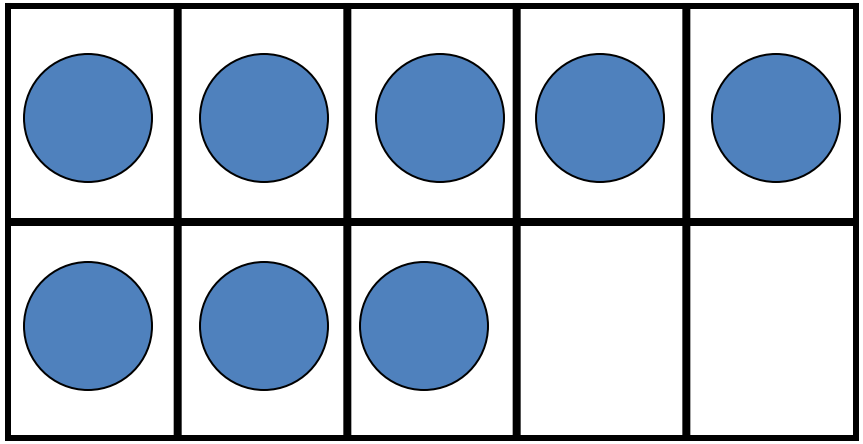
Spatial Patterns

Finger Patterns



Five and Ten Frames

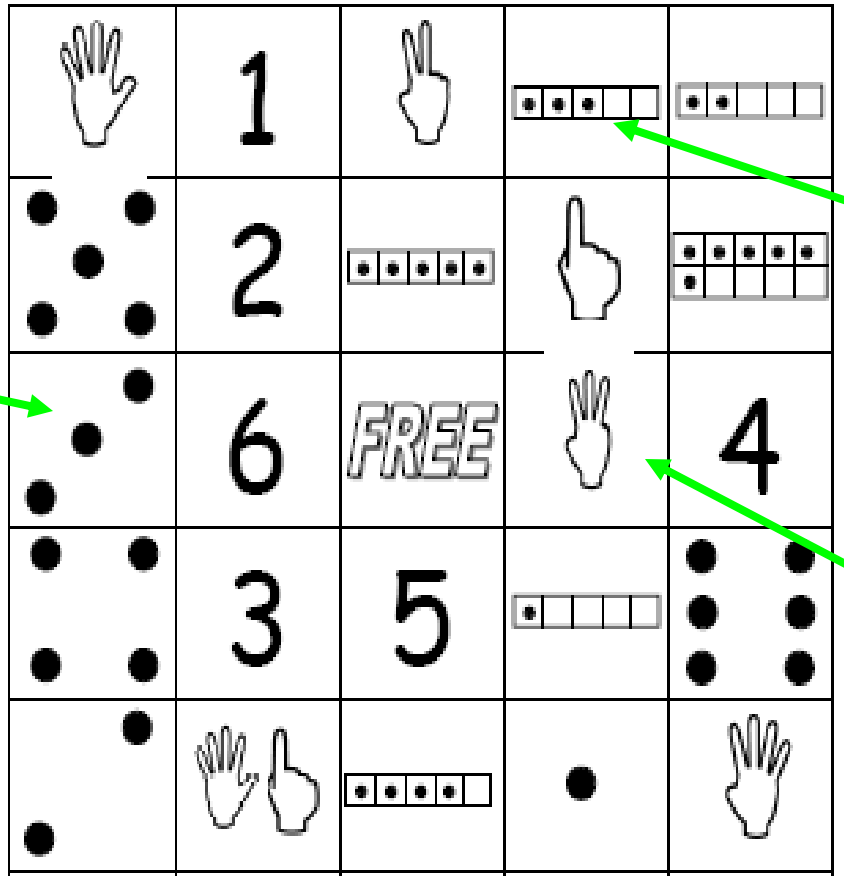




S 292.1

KNP Entry	Kentucky Common Core Academic Standard (KCAS) (*see glossary)	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand (from AVMR)	Construct/Level (from AVMR)	Numeracy Target (from AVMR)	"I CAN ....." (*see glossary)	Assessment for Learning	Student Grouping	Video Link	Print Link
S 292.1	K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	Counting & Cardinality	Know number names and the count sequence	Bingo Cards (see link), Bingo covers, die with regular dot pattern or numeral cube (1 to 6)	Give each student a Bingo Card filled with multiple representations of 1-6. Use the die (or spinner) to generate a random number 1-6. Students can place a chip on ONE square matching the amount rolled, choosing the numeral, finger pattern, dot pattern or frame. Game end when a student has 5 in a row, down, or diagonally.	Structuring	0 to 1 RED	facile structures to five	... recognize numbers 1 to 6 when shown as dot patterns, finger patterns, 5 or 10 frames or numeral.	Flash a regular 5 dot pattern and have student write or say matching number. Repeat for a regular 3 and a regular 6. Note if student can give amounts without counting by 1s.	small group / whole class		http://www.edu.gov.mb.ca/k12/cur/math/games/dot_bingo_k.pdf
	K.CC.3 Write numbers from 0 to	ity	e count	Bingo Cards	Give each student a Bingo card filled with multiple			o ten	... recognize numbers 5 to 10	Teacher should flash			

DOT BINGO



3 shown as a dot pattern

3 shown in a five frame

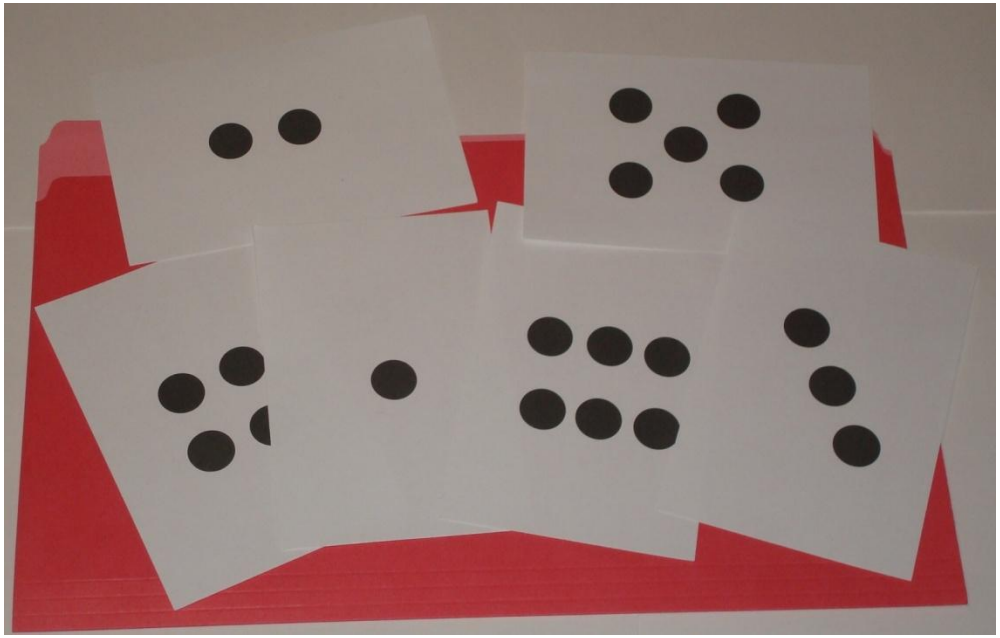
3 shown as a finger pattern

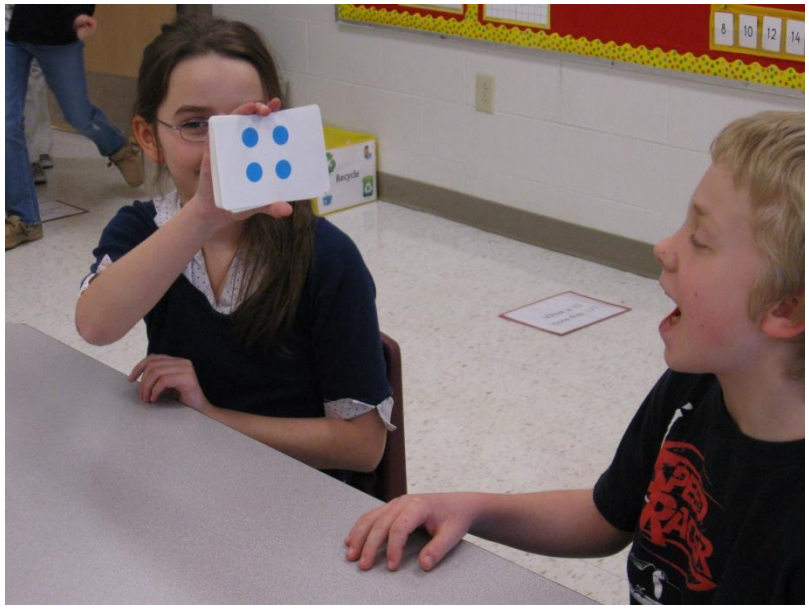
Ni 292.1

S 295.0

KNP Entry	Kentucky Common Core Academic Standard (KCAS) (*see	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand	Construct/Level	Numeracy Target	"I CAN ....." (*see glossary)	Assessment for Learning	Student Grouping	Video Link	Print Link	Interactive Website	Reference	Teacher Notes
S 295.0	K.OA.5 Fluently add and subtract within 5.	Operations and Algebraic Thinking	Understand addition as putting together & adding to, subtraction as taking apart & taking from	regular dot cards to 6	Flashed images: Flash* a dot card. Ask "what do you see?" or "How many dots?". If needed, flash card again.	Structuring	0 RED	intermediate structures to five	... recognize regular dot patterns to 6	Flash* a card showing 4 dots arranged in a regular dice pattern. Ask how many dots. Repeat with other regular patterns in range 1 to 6.	various					Regular dot cards can be made by placing sticker dots on paper plates or index cards in regular dice pattern arrangements. In addition to dot cards, other images such as finger patterns or 5 frames can be used. The goal is for students to be able to subitize* the dots. If the dot patterns are new for a student, allow student time to see, count, and possibly touch, the dots.

Regular dot patterns to 6

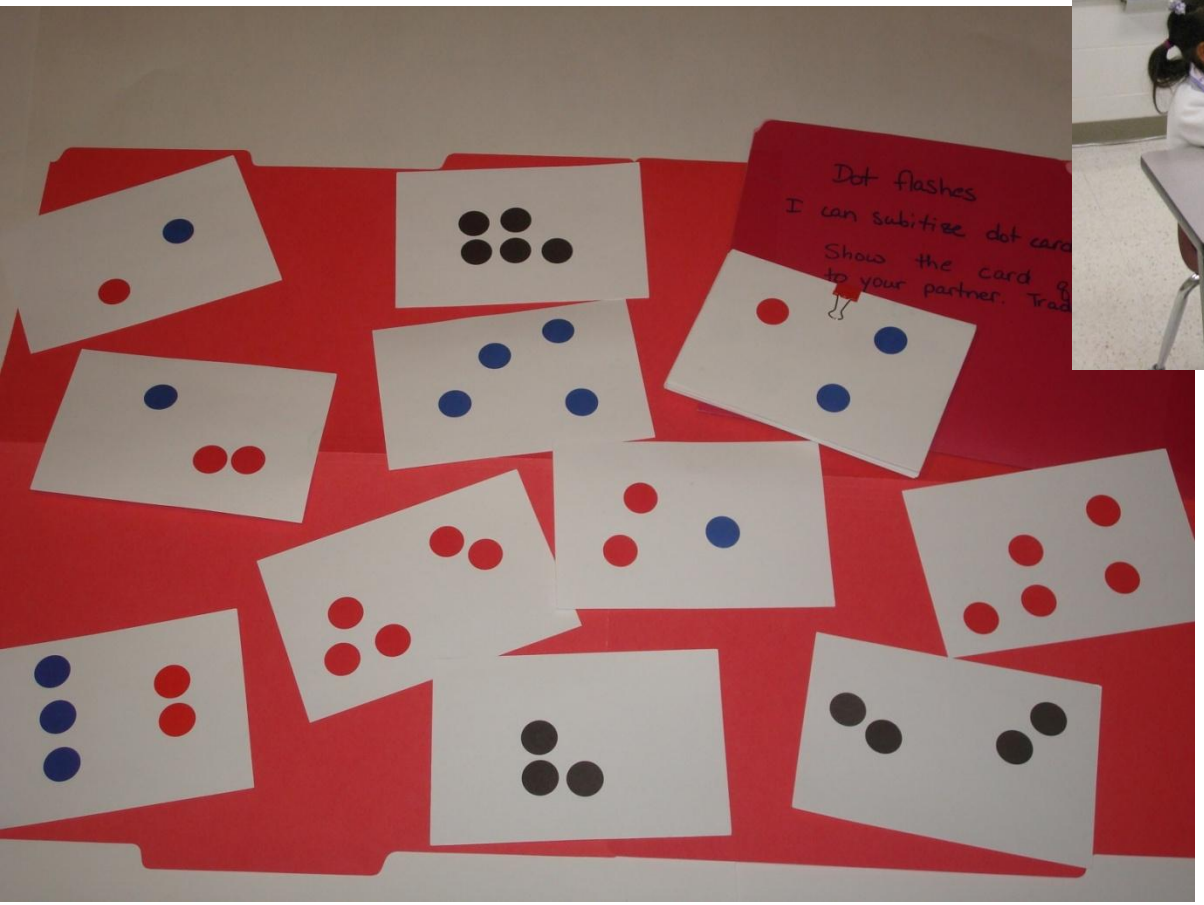




S 295.1

KNP Entry	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand	Construct/Level	Numeracy Target	"I CAN ....." (*see glossary)	Assessment for Learning	Student Grouping	Video Link	Print Link	Interactive Website	Reference	Teacher Notes
S 295.1	Dot cards showing up to 5 dots in either 1 or 2 colors and/or dominos with sums up to 5	Flashed images: Flash* a dot card. Ask "How many dots?" When appropriate, ask about any groups visible in the card. For example, if flashing a 1 & 3 domino, ask "How many dots on each side? How many dots altogether?". If needed, flash card again.	Structuring	0 to 1 RED	facile structures to five	... subitize quantities to 5	Flash* a dot card with 2 red dots and 3 blue dots. Ask student "How many dots?" Repeat for other irregular arrangements of 3 to 5 dots.	various		http://teachmath.openschoolnetwork.ca/Subitizing.h			Printables and examples of dot cards are available using the print link. (Use examples with up to 5 dots). Dot cards can be made by placing sticker dots on index cards or paper plates. In addition to dot cards, other images such as 5 frames, finger patterns or tallies can be used. The goal is for student to subitize* the whole or subitize sub-groups and determine the whole without counting by ones. Students should be proficient with activity S 295.0 before doing this activity.

Dot cards to 5



» EVENT CALENDAR
» LEAVE A COMMENT
» CONTACT DON
» HOME

GRADES

» Kindergarten
» Grade 1
» Grade 2
» Grade 3
» Grade 4
» Grade 5
» Grade 6
» Grade 7
» Grade 8

SUBITIZING

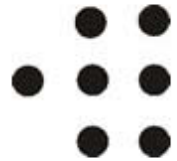
Subitizing is the ability to 'see' a small amount of objects and know how many there are without counting. Subitizing is what tells you what number you roll on a six sided dice - most adults no longer have to count the pips after playing board games for a while.

Subitizing is a fundamental skill in the development of students' understanding of number (*Baroody 1987, 115*). Students use patterns recognized to discover properties and skills such as conservation, compensation, unitizing, counting on, composing and decomposing numbers, as well as understanding of arithmetic and place value.

NUMBER SENSE

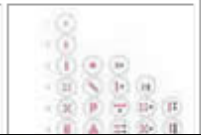
» 5 / 10 Frames
» Subitizing
» Part Part Whole
» Near Numbers (±1, ±2)
» Teen Numbers
» Place Value
» Estimating

The ability to subitize can be developed, and uses a student's pattern recognition skills. Part part whole understanding is usually used to subitize numbers over four or five.
This means a student looking at this pattern doesn't usually see 7, but instead 1 and 6, or maybe 2 and 5.
This is one of the reasons larger patterns shouldn't be used until students are familiar with various representations of numbers 1 to 5. When two colours are used in patterns, they also draw attention to smaller anchors and make the parts more obvious.



Subitizing pattern for 7

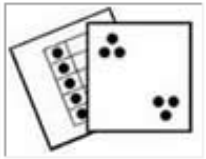
Dot Plates
A common tool is a set of dot patterns on paper plates - the dots can be easily made with a bingo dabber. Since paper plates are round, they are held up in essentially a random orientation



Dot Plates
A common tool is a set of dot patterns on paper plates - the dots can be easily made with a bingo dabber. Since paper plates are round, they are held up in essentially a random orientation each time. Two colours are used for advanced plates. Click the picture on the right for a pdf of suggested patterns from *Elementary and Middle School Mathematics: Teaching Developmentally*.

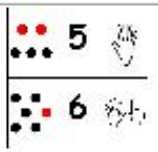
Dot Plate Questions / Activities
Dot plates are very effective when used for a few minutes of mental / oral math each day. This file details questions and tools for using dot plates as part of your program.

Dot Cards
A set of dot cards useful for a variety of student activities. This set contains 4 representations of the numbers 1 to 10, some with ten frames.

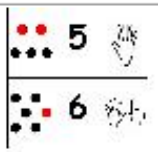


Dot Card Activities
A set of six basic games and activities (War, Trains, Number Sandwiches, Go Fish, Ten and Out) for the dot cards above.

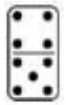
Concentration Cards Beginner
This is a set of cards from Manitoba Education and Youth. It includes four different representations of the numbers 1 to 6, and is suitable for playing concentration or other games in Kindergarten or grade 1.

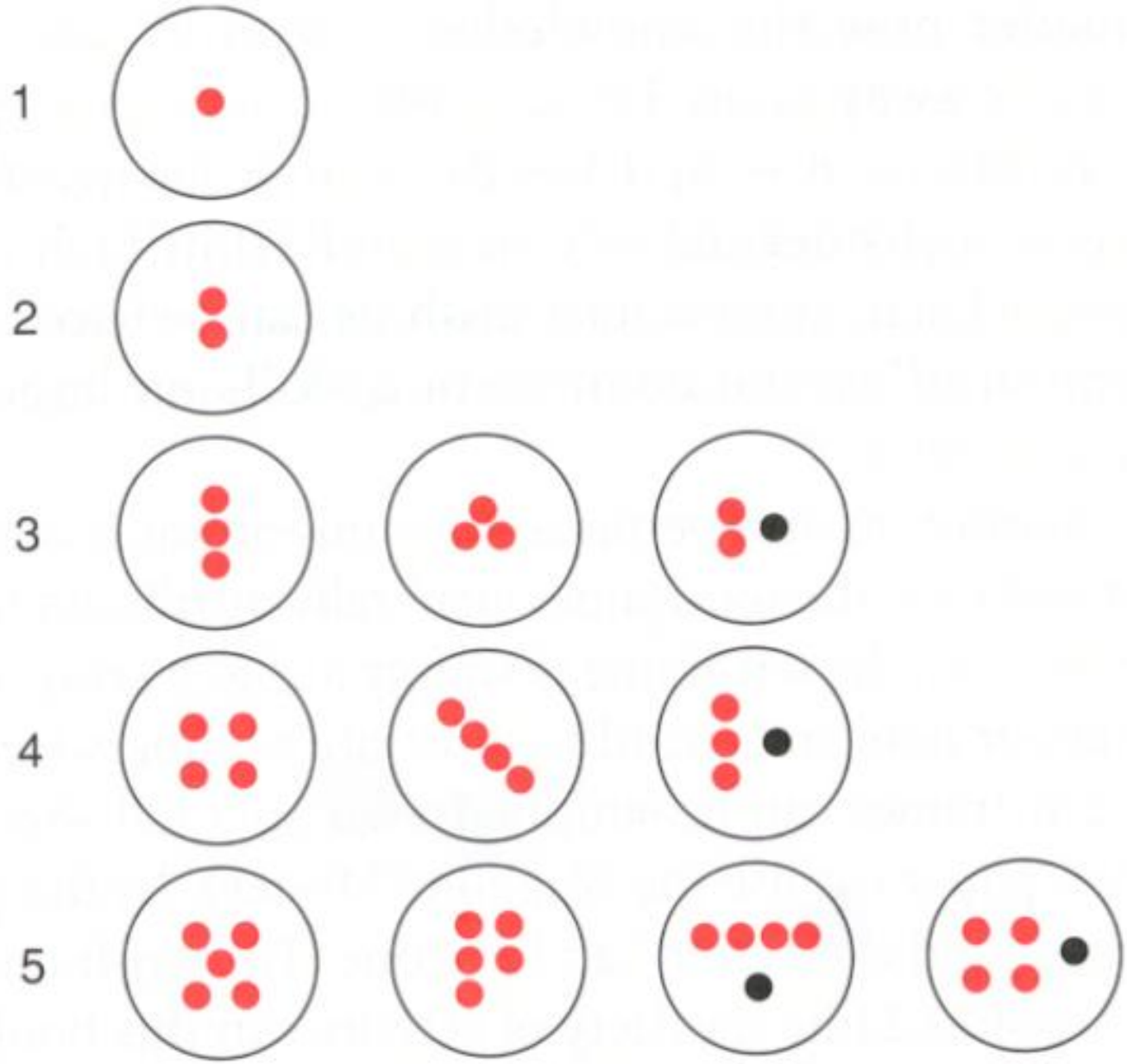


Concentration Cards Advanced
This is a set of cards from Manitoba Education and Youth. It includes four different representations of the numbers 5 to 10, and is suitable for playing concentration or other games in grade 1 to 3.

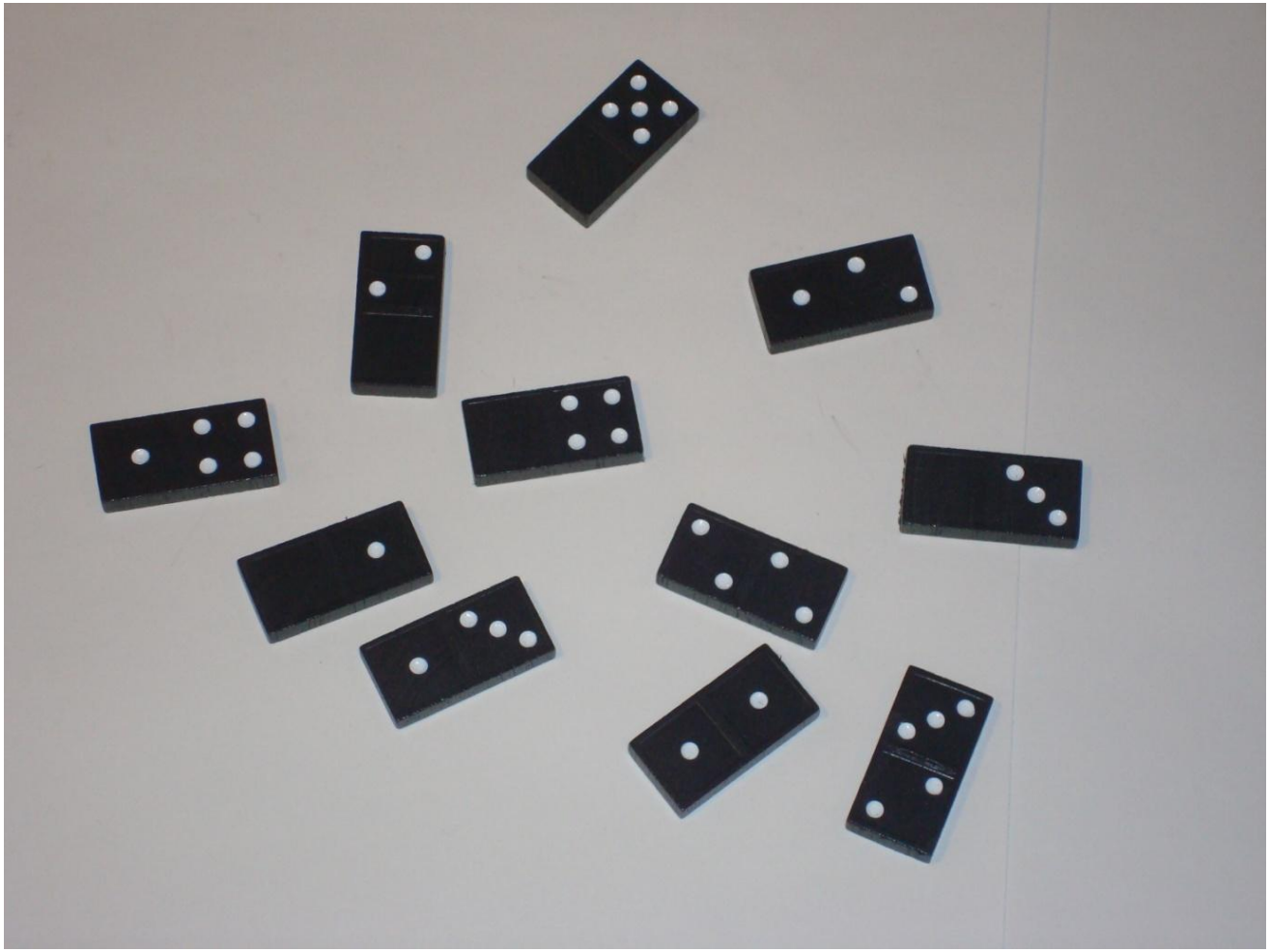


Domino Activities
Dominoes can help develop the ability to recognize dot patterns. This is a set of games and activities that use dominoes. Double 9 dominoes are a little more versatile when students are ready.

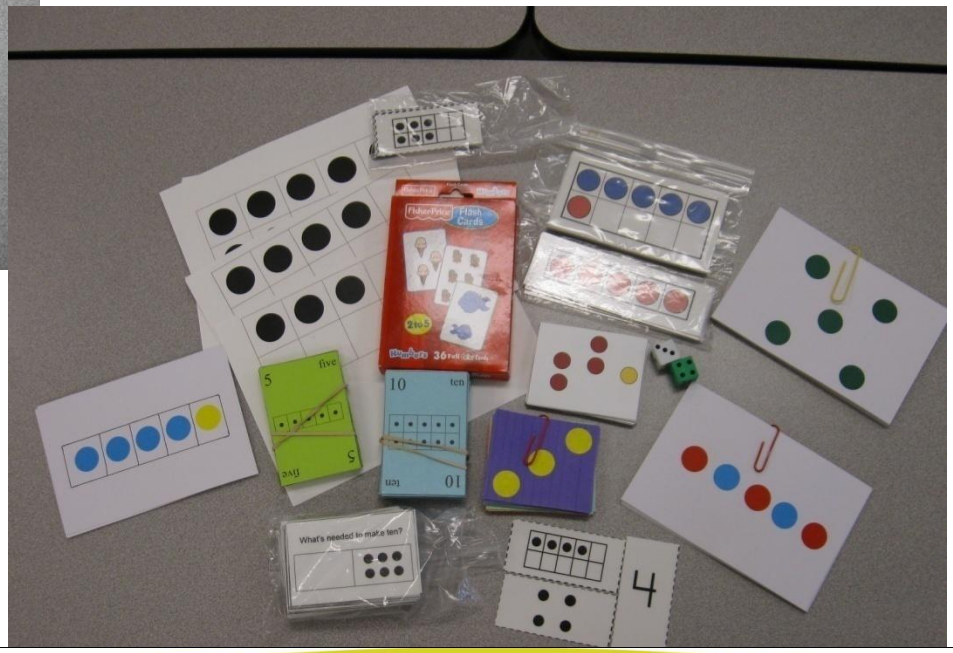



1
2
3
4
5

Dominos to 5



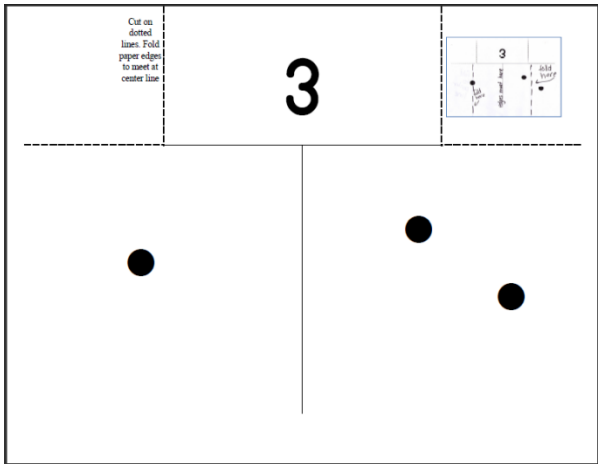
Structuring “Tool Box”

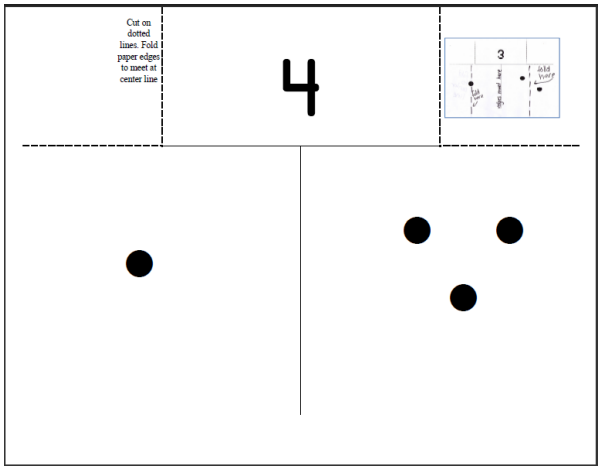


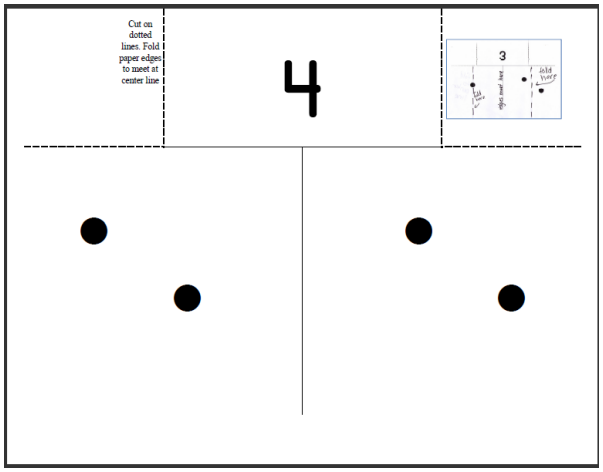
S 266.1

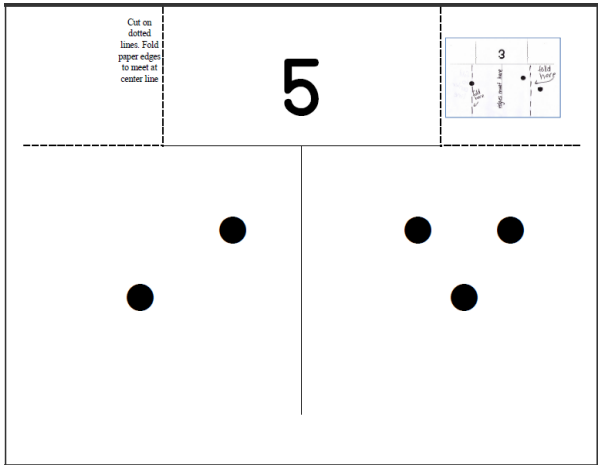
KNP Entry		Kentucky Common Core Academic Standard (KCAS) (*see glossary)	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand	Construct/Level	Numeracy Target	"I CAN ....." (*see glossary)	Assessment for Learning (*see glossary)	Student Grouping	Video Link	Print Link
266.1	S 266.1	K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by	Operations and Algebraic Thinking	Understand addition as putting together or adding to, subtraction as taking apart or taking from	combination dot cards up to 5 (see link - use only the cards to 5)	Combination Cards to 5: Print the combination cards (up to 5) on card stock. Cut and fold as indicated. Open one flap to reveal a given number of dots and the student tells the number that goes with it to make the total indicated at top. Next time the card is used, the other flap is opened.	Structuring	0 to 1 RED	facile structures to five	... tell the combinations up to 5 given one number.	Show the students the dot pattern for 3 and ask "What goes with 3 to equal 5?" Show the students the dot pattern for 2 and ask "What goes with 2 to equal 4?"	independent / group / whole class		http://www.kymath.org/intervention/doc/NumeracyProject/S_266-1.pdf

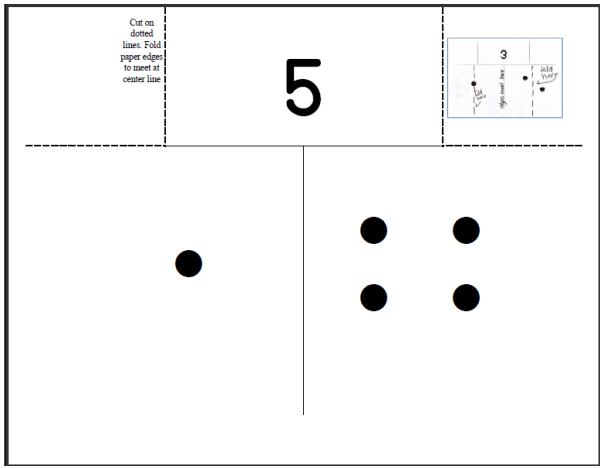
S 266.1

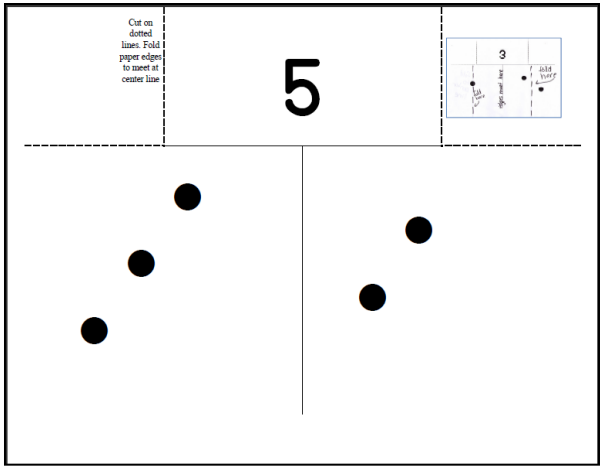

Cut on dotted lines. Fold paper edges to meet at center line
3

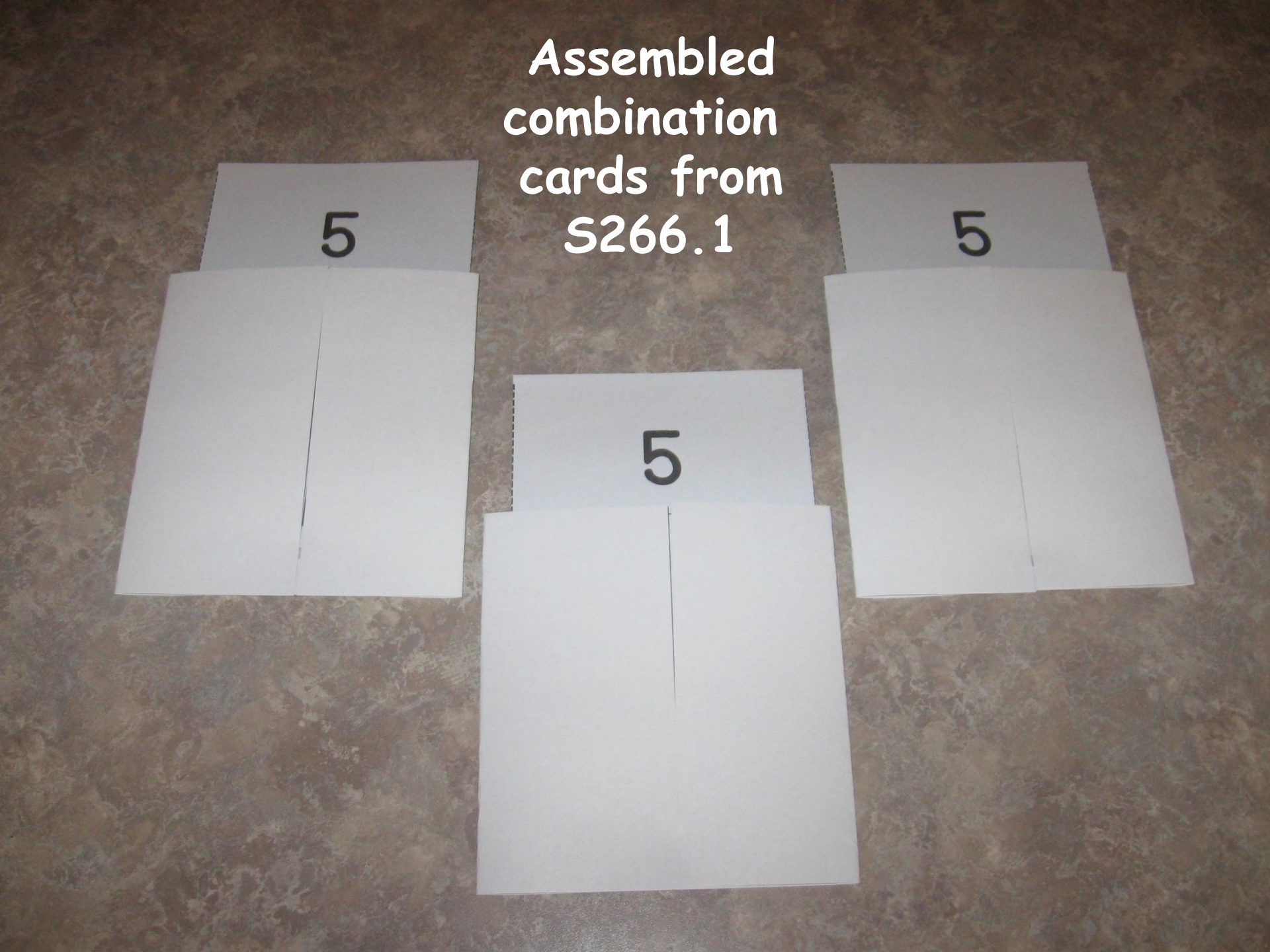

Cut on dotted lines. Fold paper edges to meet at center line
4


Cut on dotted lines. Fold paper edges to meet at center line
4

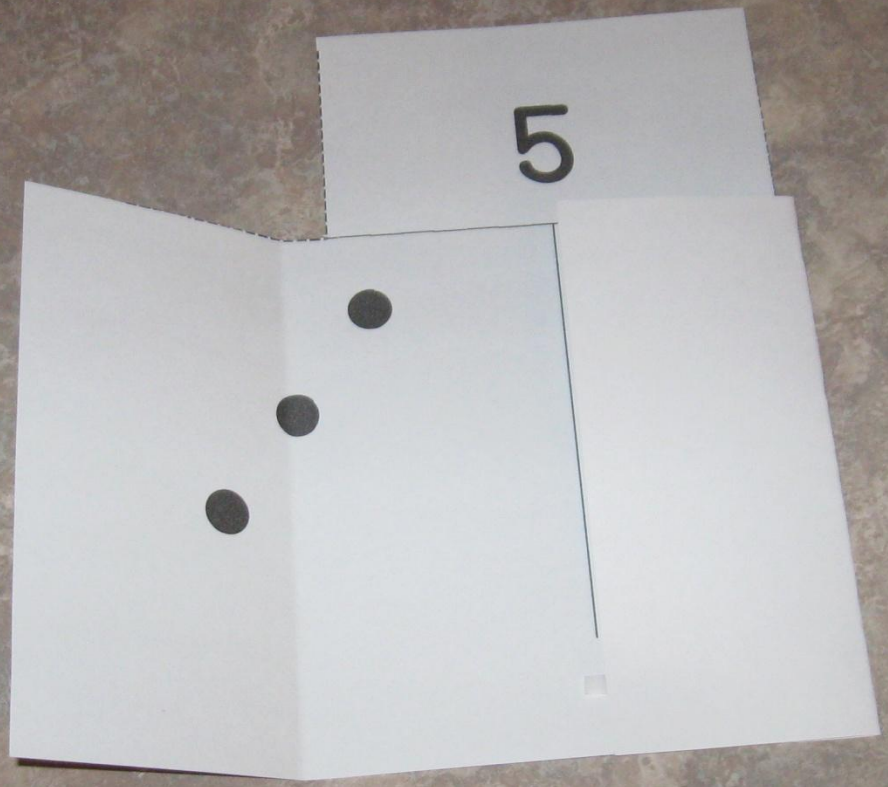

Cut on dotted lines. Fold paper edges to meet at center line
5

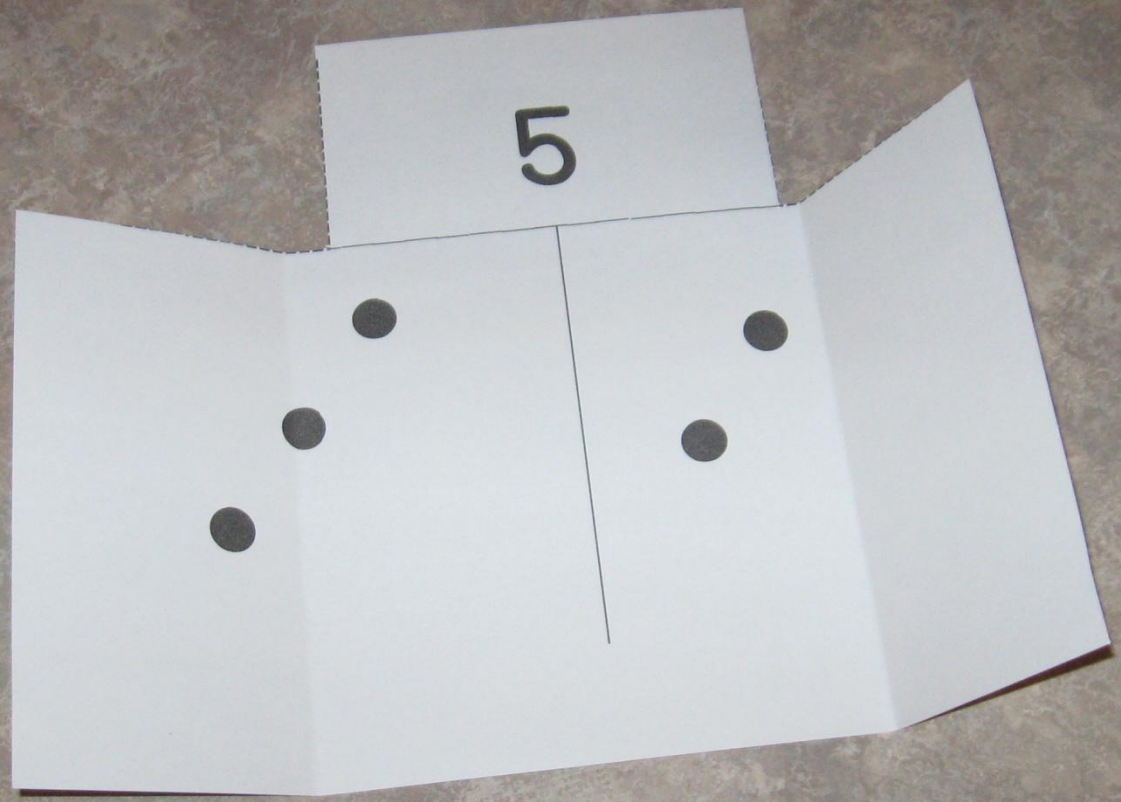

Cut on dotted lines. Fold paper edges to meet at center line
5

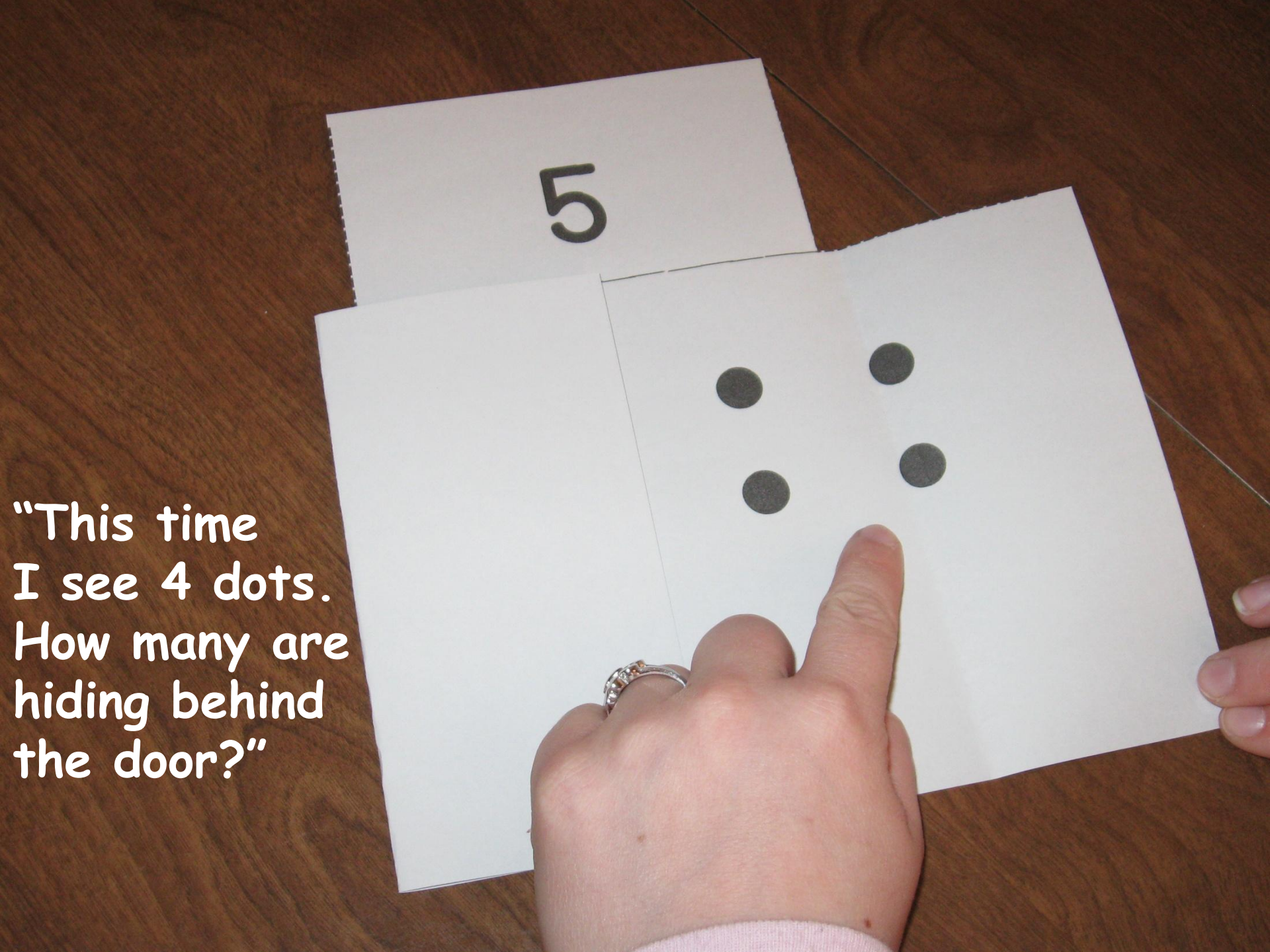

Cut on dotted lines. Fold paper edges to meet at center line
5

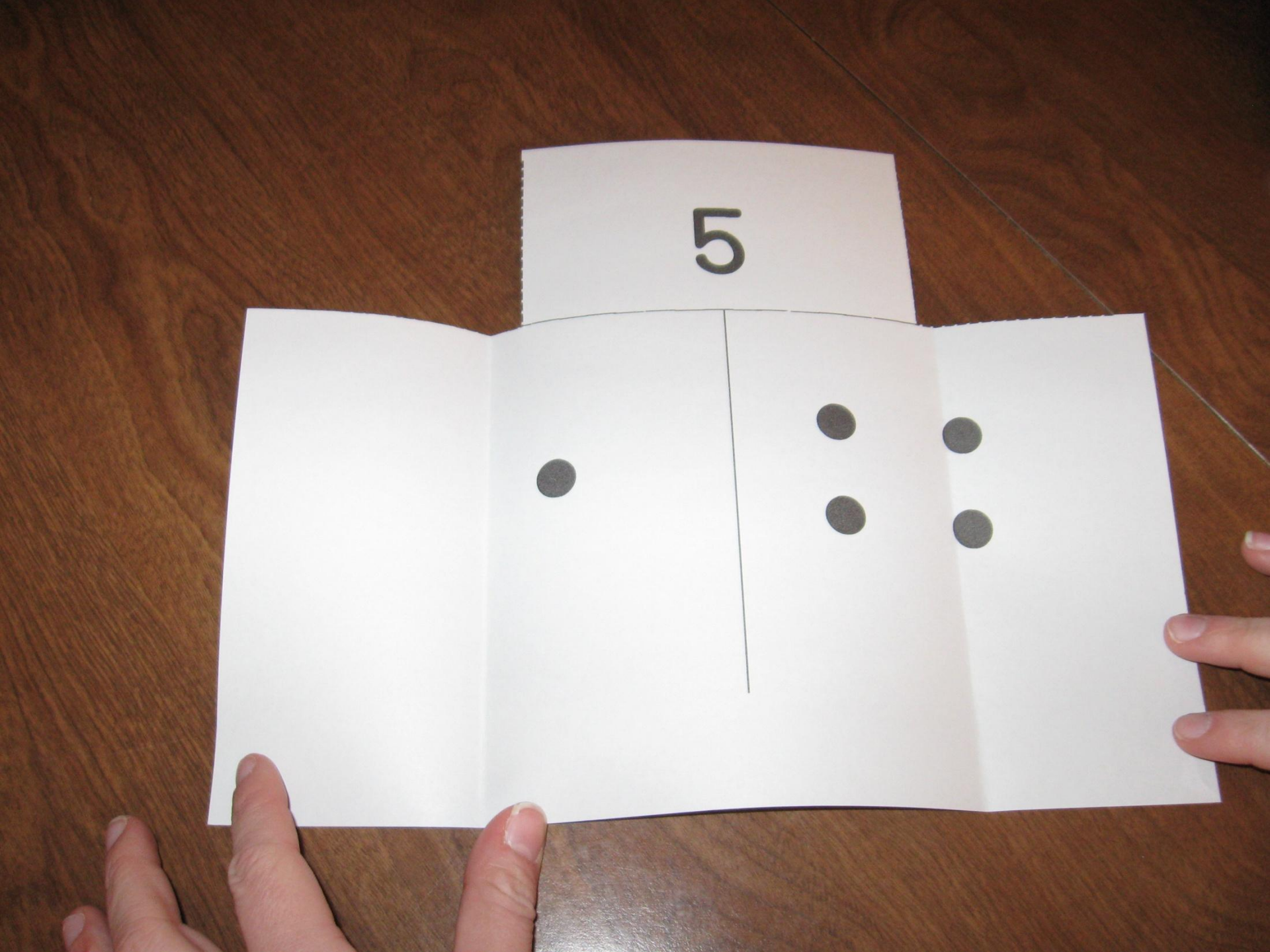

Assembled
combination
cards from
S266.1
5
5
5

"I see 3 dots. How many dots do you think are hiding behind the door?"



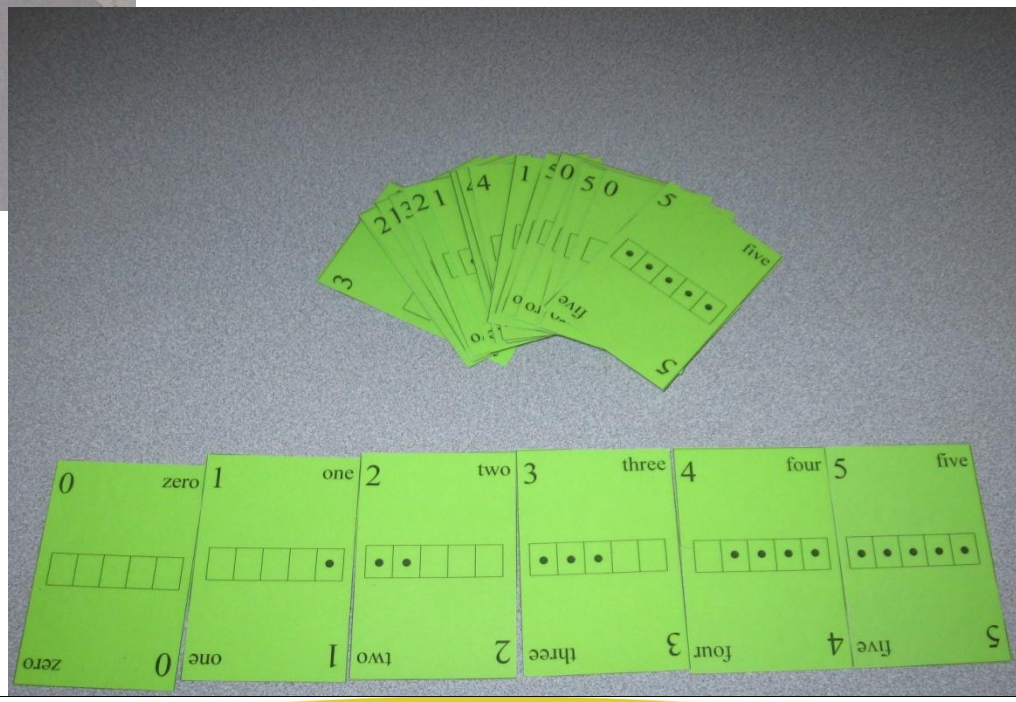

5


5
"This time
I see 4 dots.
How many are
hiding behind
the door?"

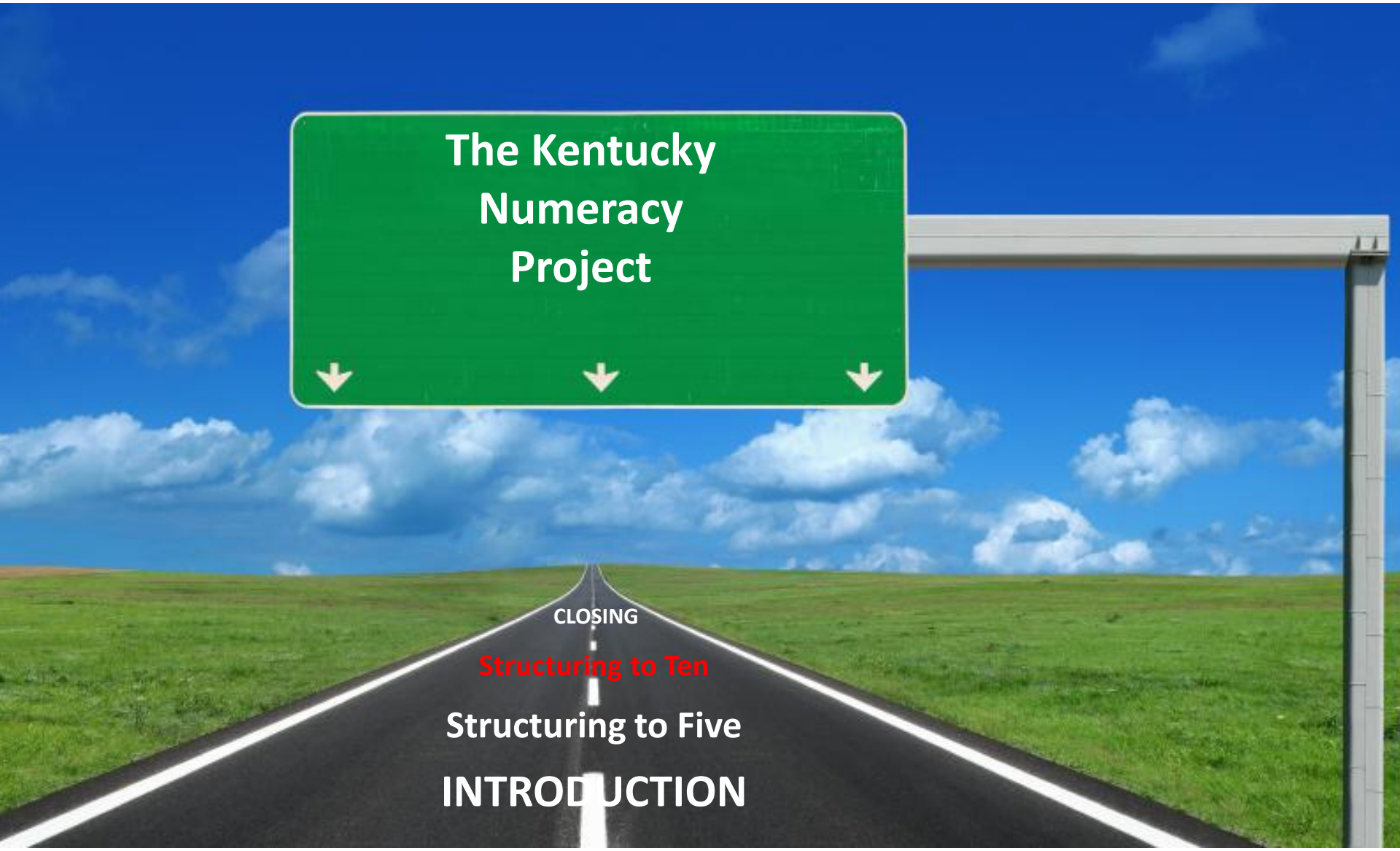

5

S 205.1

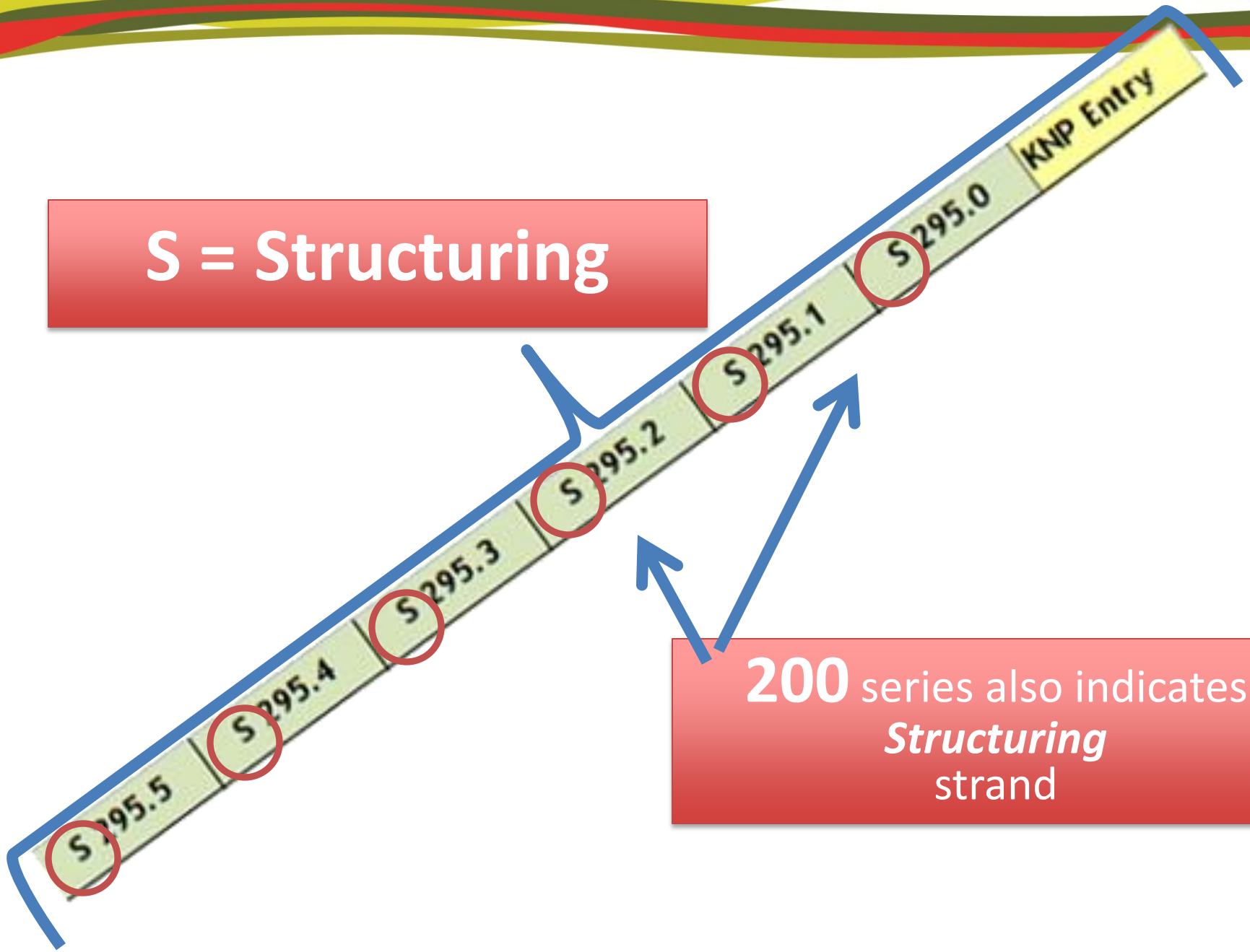
KNP Entry		Kentucky Common Core Academic Standard (KCAS) (*see glossary)	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand	Construct/Level	Numeracy Target	"I CAN ....." (*see glossary)	Assessment for Learning (*see glossary)
205.1	S 205.1	K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	Operations and Algebraic Thinking	Understand addition as putting together or adding to, subtraction as taking apart or taking from	Five Frame cards, 0 to 5, 4-6 of each (see link)	Go Fish: Each player is dealt five cards. The rest of the cards are placed in a stack face down in the center of the table. If the students have any pairs of cards that total 5, they place them down in front of them. Students take turns. On each turn, a player asks another player for a card that will go with a card in the player's hand to make 5. If he/she receives a card that makes 5, the pair is placed on the table. This completes a turn. If the player does not get a card that makes 5, he/she takes the top card from the deck. If the card drawn from the deck makes 5 with a card in the player's hand, the pair is placed on the table. This completes the turn. If there are no cards left in a player's hand but still cards in the deck, that player takes two cards from the deck and continues playing. The game is over when there are no more cards left in the deck. At the end of the game each player writes a list of the number pairs he/she made. The player with the most number pairs wins the game.	Structuring	0 to 1 RED	facile structures to five	...identify two numbers that add to 5	Ask student "What are two numbers that add to 5?... Another two?... Another two?"


0 zero
1 one
2 two
3 three
4 four
5 five

KENTUCKY CENTER FOR MATHEMATICS


The Kentucky
Numeracy
Project
CLOSING
Structuring to Ten
Structuring to Five
INTRODUCTION

S = Structuring

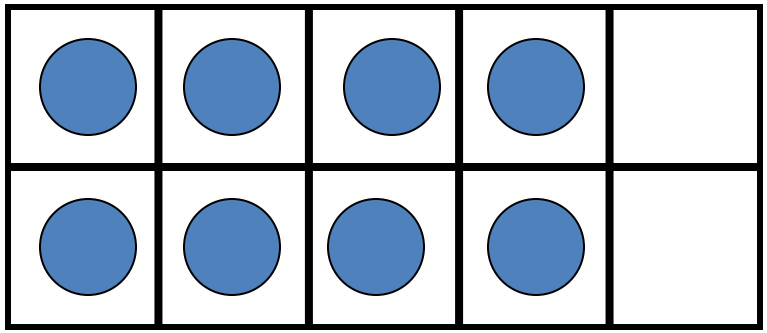


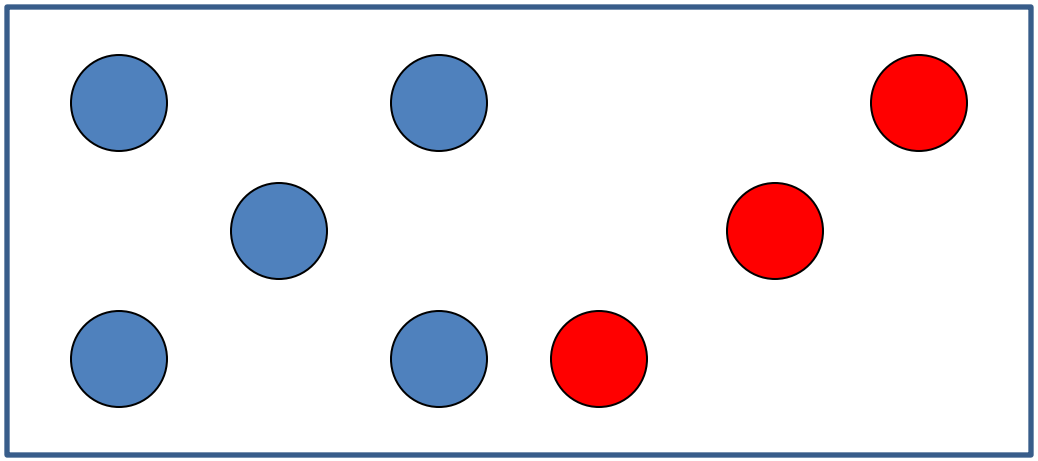
200 series also indicates ***Structuring*** strand

AVMR Levels and Folders

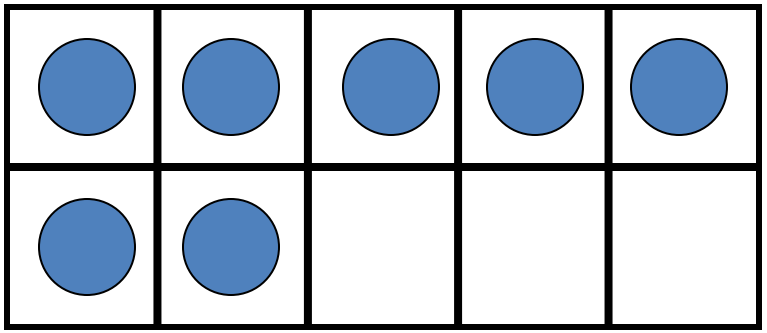
KNP Entry	Level	Folder Color	Numeracy Target
S 295.0	0	RED	structures to five
S 295.1	0 to 1		
S 295.2	1 to 2	BLUE	structures to ten
S 295.3	2 to 3	GREEN	
S 295.4	3 to 4	PURPLE	structures to twenty
S 295.5	4 to 5	PINK	

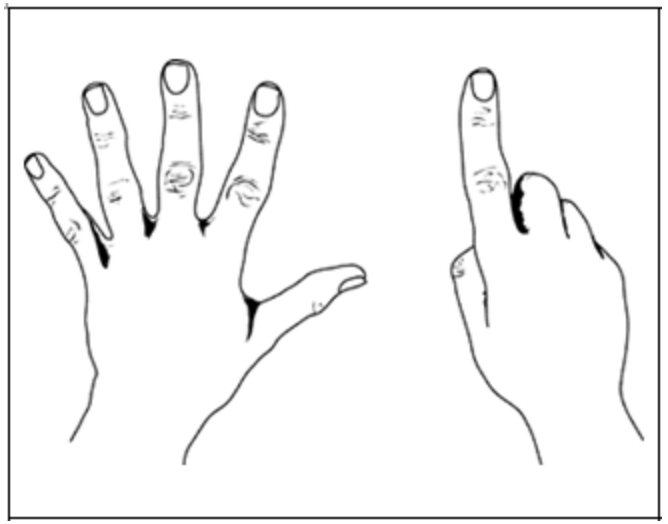
Structuring quantities 6 to 10

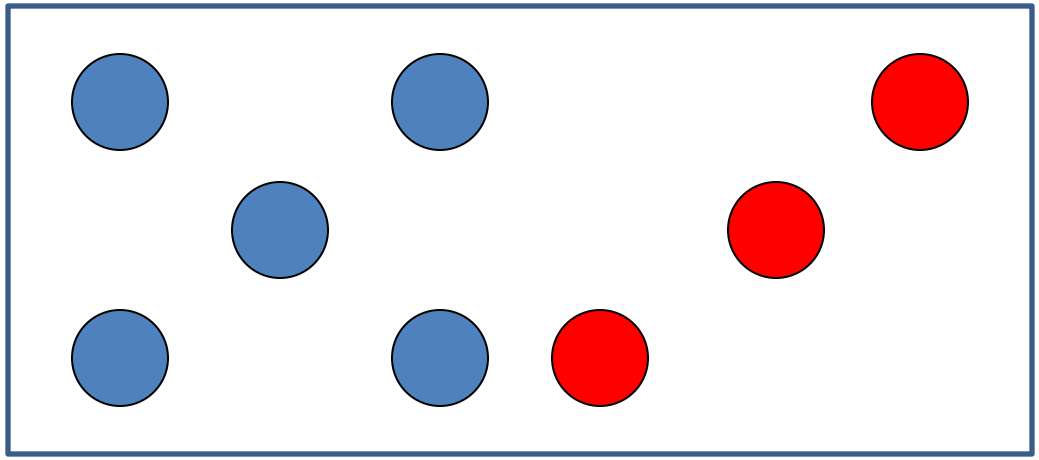




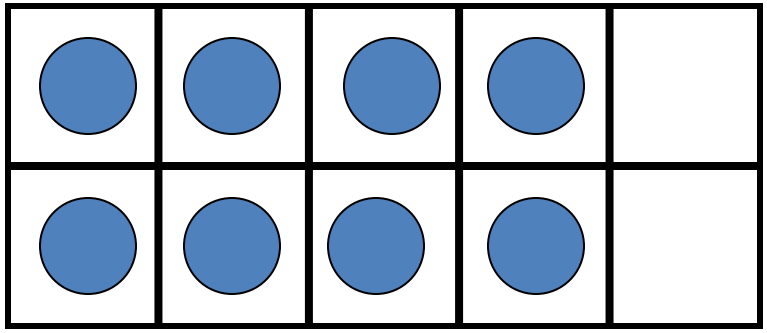
Five-wise structures

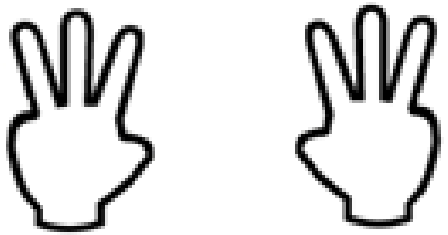


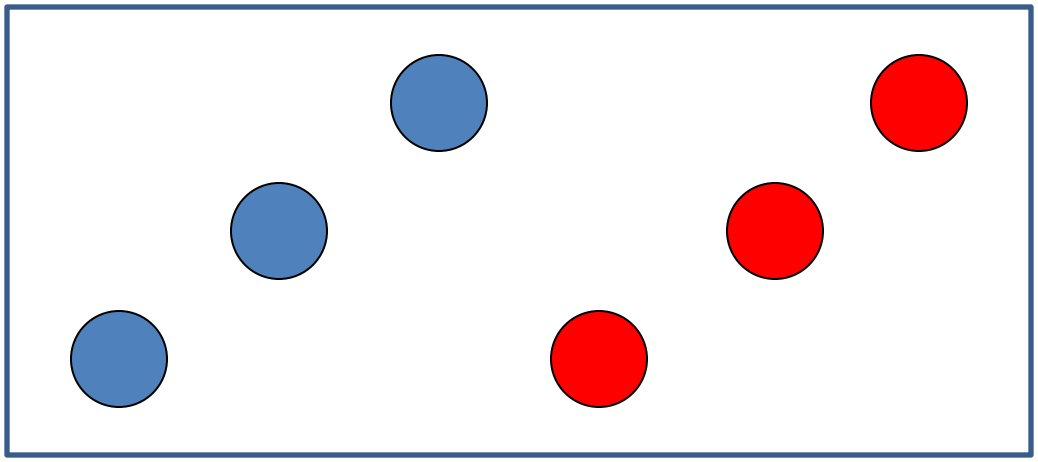




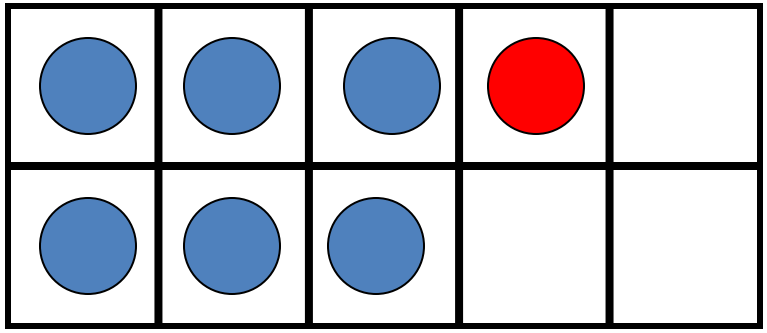
Pair-wise structures: Doubles

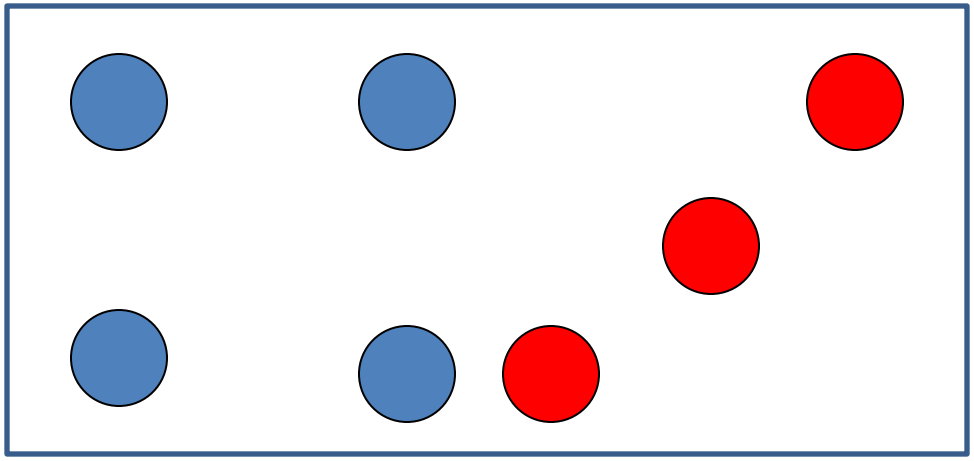


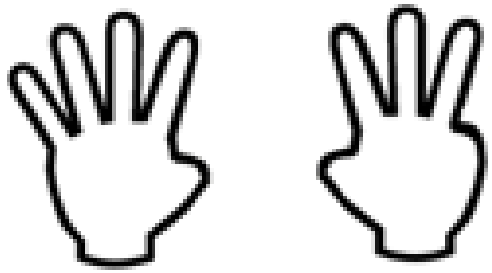




Pair-wise structures: Near Doubles



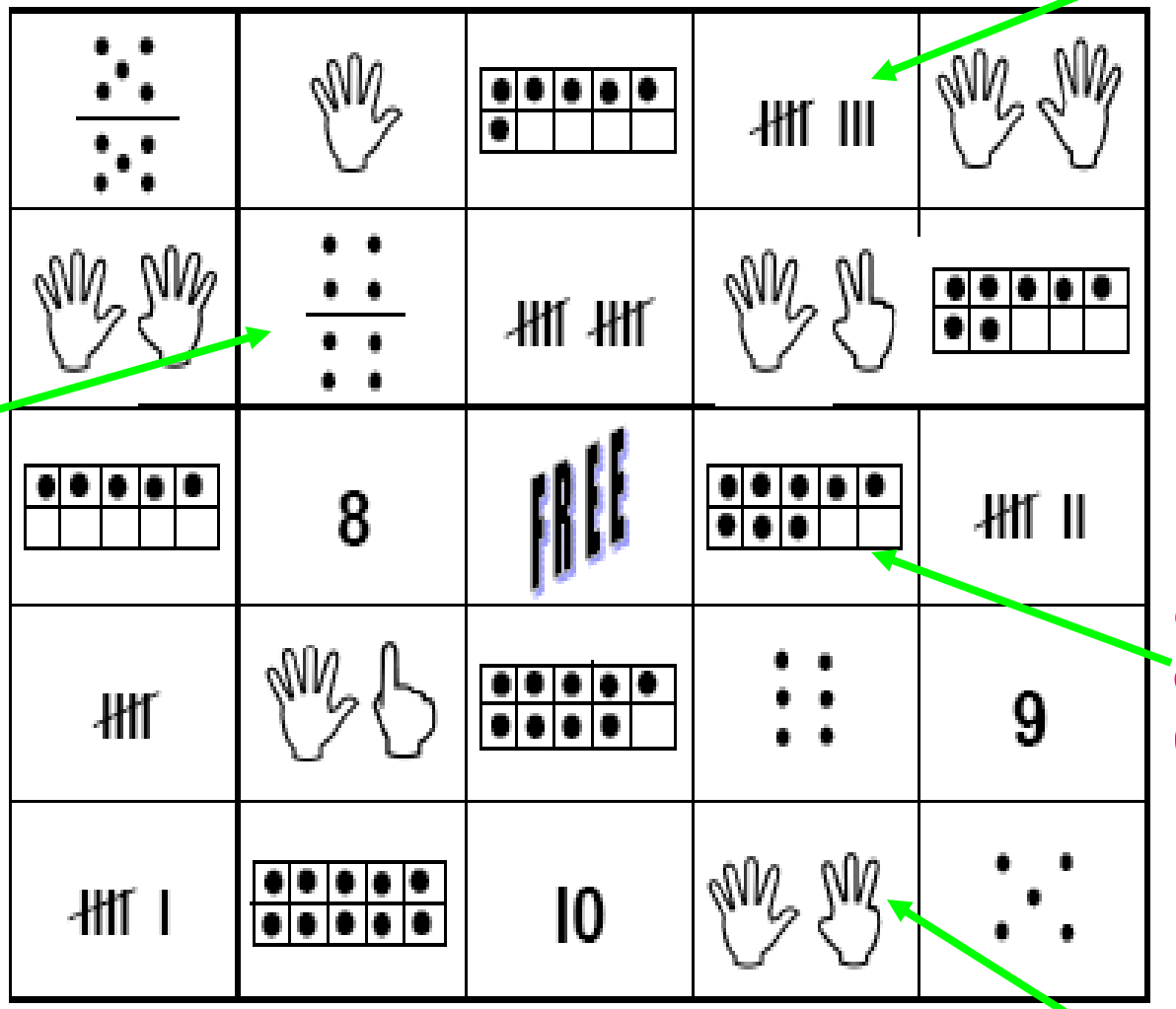




S 292.2

KNP Entry	Kentucky Common Core Academic Standard (KCAS) (*see glossary)	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand (from AVMR)	Construct/Level (from AVMR)	Numeracy Target (from AVMR)	"I CAN ....." (*see glossary)	Assessment for Learning	Student Grouping	Video Link	Print Link
S 292.2	K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	Counting & Cardinality	Know number names and the count sequence	Bingo Cards (see link), Bingo covers, cube with sides labeled "5,6,7,8,9,10"	Give each student a Bingo card filled with multiple representations of 5-10 (5 versions are avialable). Use the die (or spinner) to generate random numbers 5 to 10. Students can place a chip on ONE square matching the amount rolled, choosing the numeral, finger pattern, dot pattern, 10 frame. Game end when a student has 5 in a row, down, or diagonally.	Structuring	1 to 2 BLUE	intermediate structures to ten	... recognize numbers 5 to 10 when shown as dot patterns, tally marks, finger patterns, 10 frames or numeral.	Teacher should flash 6 fingers and have student write or say matching number. Repeat for 4 fingers and 9.	small group		5-10 Bingo Boards
	K.OA.2 Solve	ing	as		Give each student a Bingo card filled randomly with				quickly				

BINGO 5-10



8 shown as tallies (five-wise)

8 shown as a dot pattern (pair-wise)

8 shown in a ten frame (five-wise)

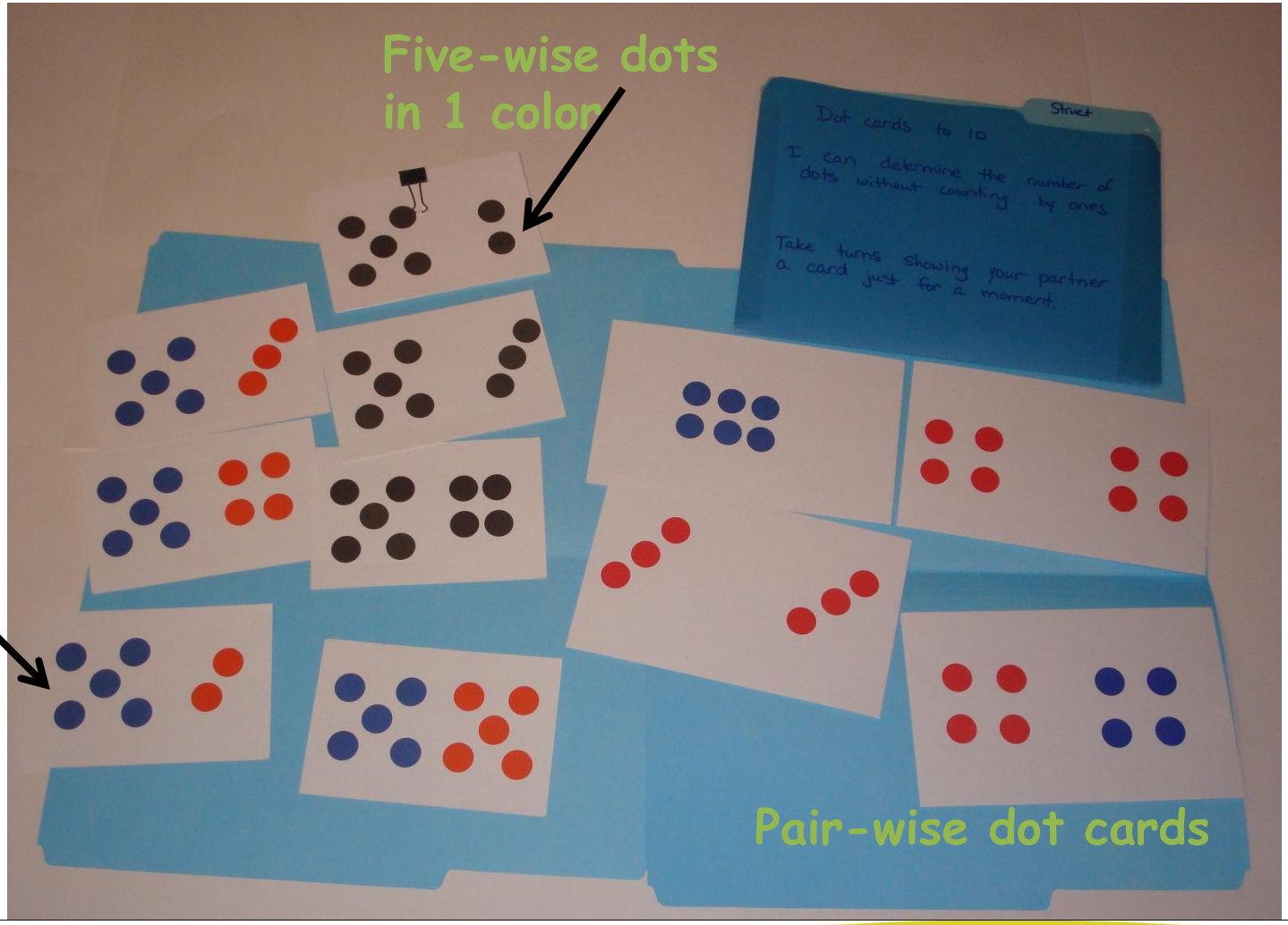
8 shown as a finger Pattern (five-wise)

Ni 292.2

S 295.2

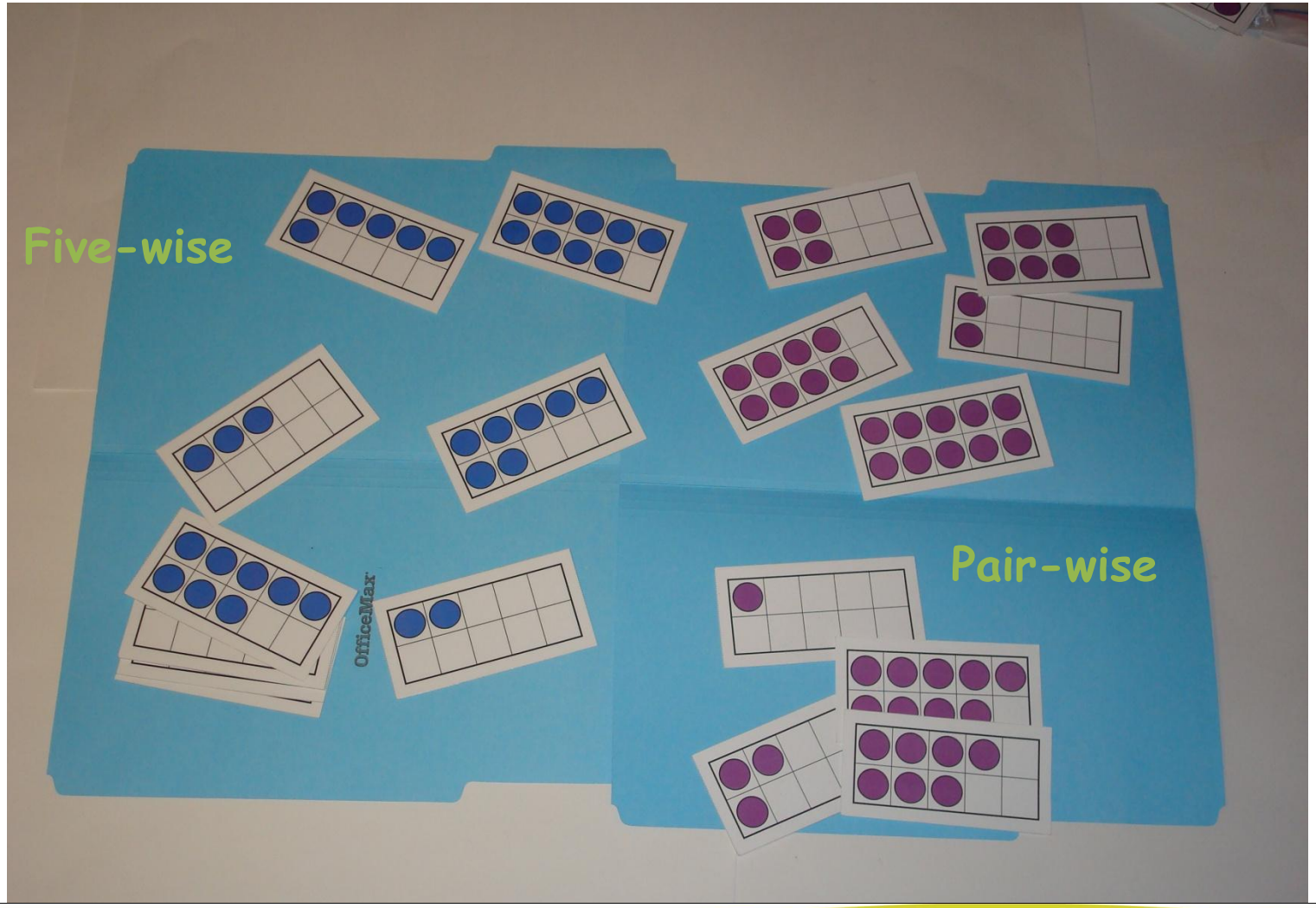
KNP Entry	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand	Construct/Level	Numeracy Target	"I CAN ....." (*see glossary)	Assessment for Learning	Student Grouping	Video Link	Print Link	Interactive Website	Reference	Teacher Notes
S 295.2	Dot cards showing 5 to 10 dots in a pair-wise or five-wise arrangement, 10 frames arranged either pair-wise or five-wise and/or finger pattern cards	Flashed images: Flash* a card. Ask "How many?" When appropriate, ask about any groups visible on the card. For example, if showing a finger pattern card with 5 fingers on one hand and 3 on the other, ask student to say the amount on each hand as well as the total. If needed, flash card again.	Structuring	1 to 2 BLUE	intermediate structures to ten	... recognize quantities up to 10 shown either five-wise or pair-wise	Hold up 7 fingers (5 on one hand, 2 on other) for 2-3 seconds. Ask student "How many fingers did you see? How many were on each hand?" Repeat with 6 fingers shown as 3 on each hand and 8 fingers show as 4 on each hand. Repeat with other groups if desired.	various		http://www.sparklebox.co.uk/md/counting/other.html	http://www.fi.uu.nl/toepassingen/00203/toepassing_rekenweb.h		Printable cards for finger patterns and dominos are available using the print link. The finger pattern printable is at the top. Domino cards are at the end of the list. At this level, use only the dominos in the range 5 to 10 that are shown pair-wise or five-wise more. The goal is for student to subitize* the groups and then determine the whole without counting by ones. For example, if a domino with sides 5 & 3 are shown, student should see a "5" and a "3" and know immediately that there are 8 dots in all. The resources available in the print link for activity S 295.1 also has a link for dot cards in a five-wise or pair-wise arrangement. The interactive website link is to a website created by the Freudenthal institute in the Netherlands. The directions are in Dutch but games are playable. At this level, the finger patterns game and the beadrack to 10 game are appropriate. Another option is the website available through the interactive link in S 295.3 (Dreambox teacher tools). On this site, the one row bead rack can be used.

Five-wise and Pair-wise dot cards to 10



Five-wise dots in 2 colors

Five-wise and Pair-wise ten frames



Main sections:
- Literacy
- Numeracy
- Topics
- Signs and labels
- Class management
- Miscellaneous
- Sharing Zone
- Photo Gallery
- Books
- Welsh
- Australia
- Parents
- By subject
- New resources

Other pages:
- Blog
- Start Page
- FREE toolbar
- FAQ and help
- Copyright info

Key Stage 2

Search:
Google™ Custom Se
Search

Counting

SparkleBox Foundation and KS1

Other resources

Suggest a resource

Counting hands (Ref: SB663)
Ten A4 printable sheets showing hands counting from 1 up to 10.

DOWNLOAD NOW!

Counting hands 2 (Ref: SB666)
Ten A4 printable sheets showing hands counting from 1 up to 10.

DOWNLOAD NOW!

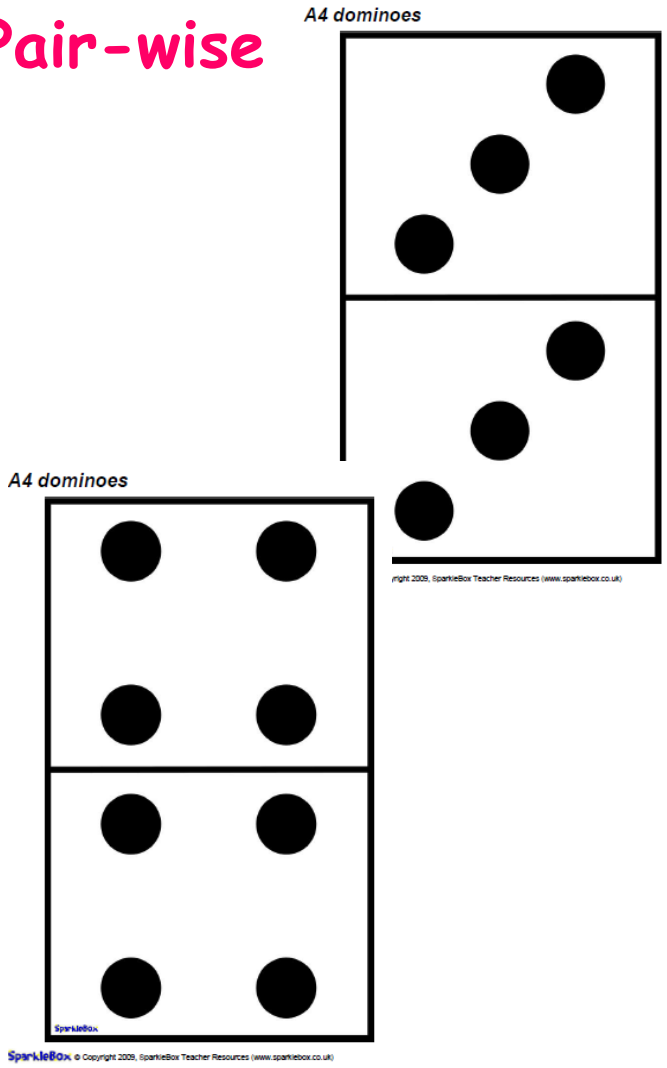
Counting hands - with numbers (Ref: SB2714)
A4 printable sheets showing hands with numbers counting from 0 to 10.

DOWNLOAD NOW!

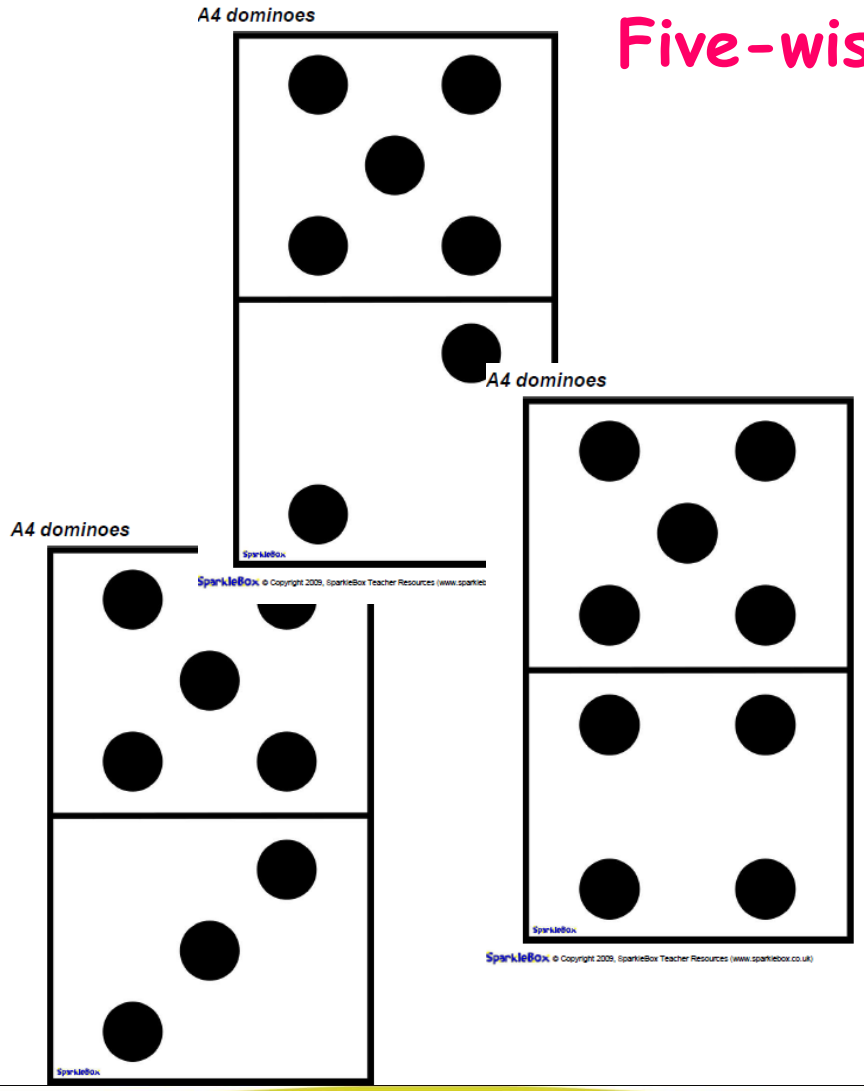
Finger patterns 6 to 10 arranged five-wise (S 295.2)

Dominos

Pair-wise



Five-wise



Interactive Website link – The Freudenthal Institute

home

Flitsbeelden

Home - Spelletjes pagina - Flitsbeelden

OK | 402647 views | 8 stemmen★★★★★ | Bekijk stemmen | Stem zelf

Spelletjes zonder tijdslimiet


handen


dobbelstenen

rekenrek onder de tien

rekenrek tot twintig


eierdozen

munten

munten2

Spelletjes met tijdslimiet


handen


dobbelstenen

rekenrek onder de tien

rekenrek tot twintig


eierdozen

munten

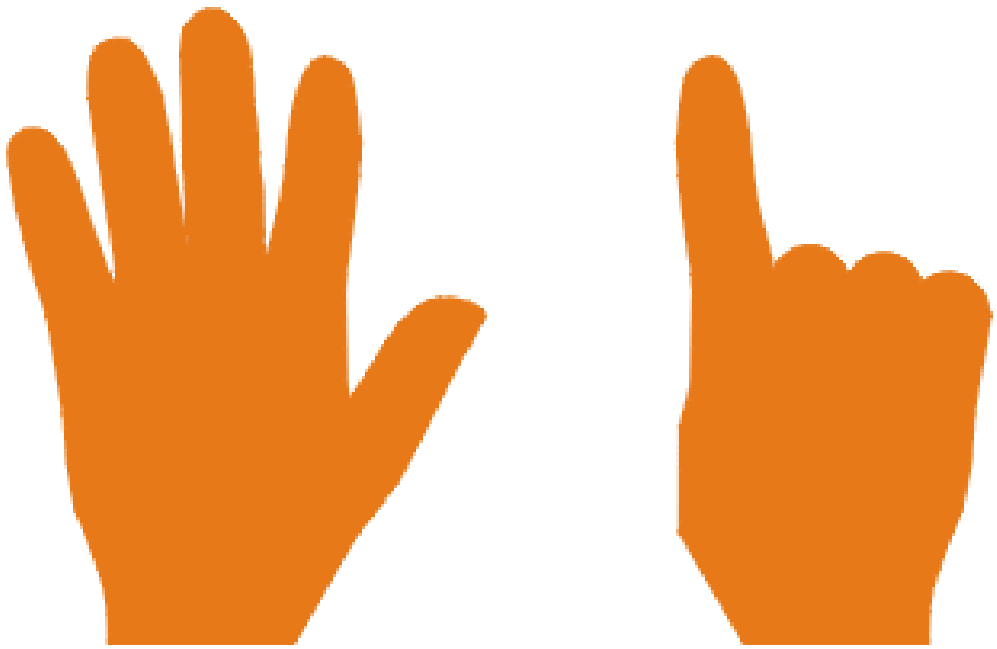
munten2

Druk op de goede knop als je het aantal weet!

stop

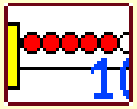
Flitstijd

0 1 2 3 4 5



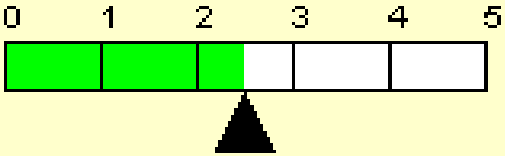
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

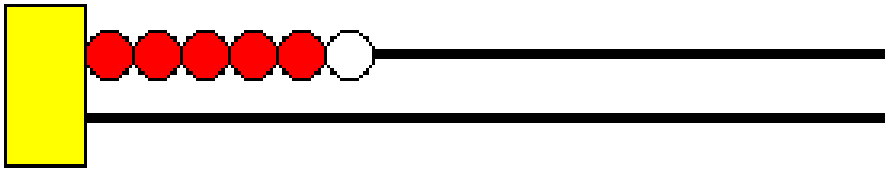
H

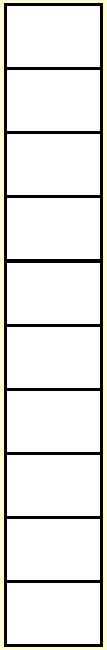


stop

Flitstijd







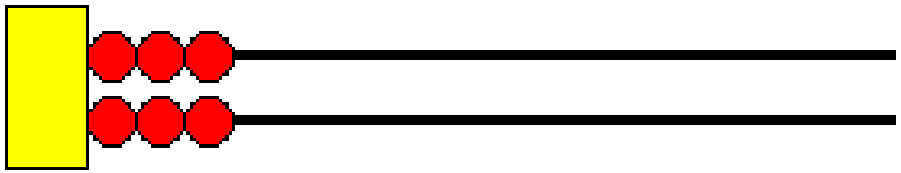
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

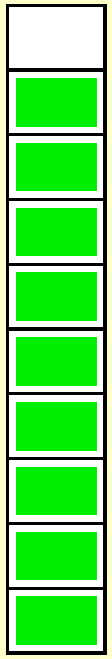
H

stop

Flitstijd

0 1 2 3 4 5





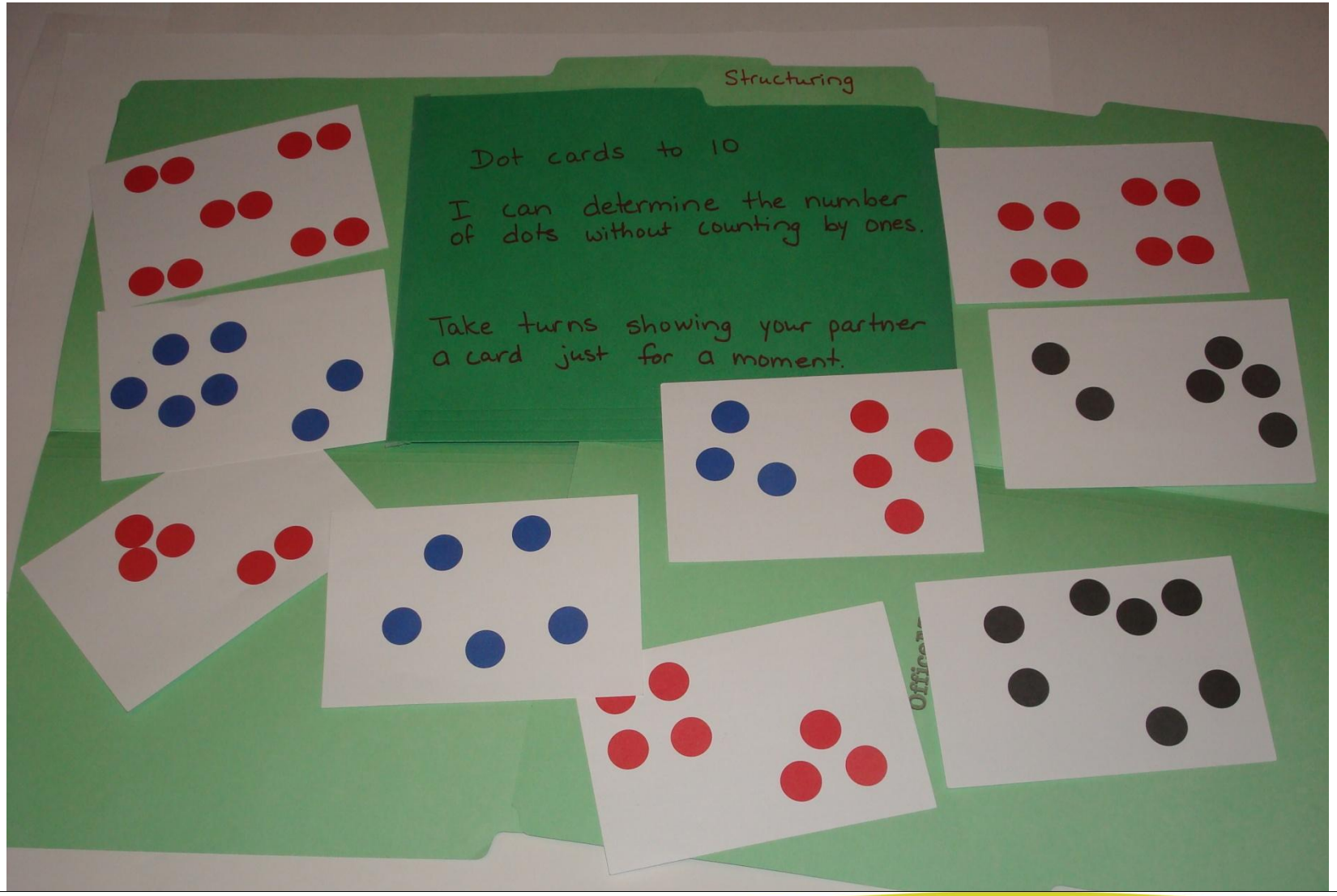
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

H

S 295.3

KNP Entry	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy	Construct/Level	Numeracy	"I CAN ....." (*see glossary)	Assessment for Learning	Student	Video Link	Print Link	Interactive	Reference	Teacher Notes
S 294.3	Dot cards showing up to 10 dots in either 1 or 2 colors, dominos with sums up to 10 and/or 10 frame cards	Flashed images: Flash* a card. Ask "How many?" If desired, ask about any groups visible in the card. For example, if flashing a card with 4 blue dots and 3 green dots, ask student "How many dots? What groups did you see?"	Structuring	2 to 3 GREEN	facile structures to ten	... quickly determine the number of dots in a flashed image with up to 10 dots.	Flash* a domino with 6 and 2 dots. Ask student "What do you see?" If needed, prompt student to state the total and the amounts on each side. Repeat with the 3&4 domino. If desired, continue with other dominos or with dot cards.	various		http://teachmath.openschoolnetwork.ca/Subitizing.htm	http://www.dreambox.com/teachertools-quick-images		Printables and examples of dot cards are available using the print link. Dot cards can be made by placing sticker dots on index cards or paper plates. In addition to dot cards, other images such as 10 frames & finger patterns can be used. The goal is for student to subitize* sub-groups and then determine the whole without counting by ones. At this point, students should be linking to and building on the standard structures (i.e. doubles and five-wise) that they learned in entry 294.2. For example, if student is flashed the domino with 4 &3, a student should immediately recognize the "4" and "3". The student might reason, "since 3 and 3 is 6, this is 7 in all". Similarly, if a student is flashed the domino 6 & 2, the student might reason "I know 5& 3 is 8 so that is 9." The interactive website link is to the Dreambox teacher tools. There you can use the "Quick images" lesson "Numbergram from 4 to 10" to show a variety of dot patterns to 10 using a projector. Also, the website hosted by the Freudenthal institute (see the interactive website link for S 294.2)has a dice activity and an egg carton activity that children can play.

A variety of dot cards to 10



» EVENT CALENDAR
» LEAVE A COMMENT
» CONTACT DON
» HOME

GRADES

» Kindergarten
» Grade 1
» Grade 2
» Grade 3
» Grade 4
» Grade 5
» Grade 6
» Grade 7
» Grade 8

SUBITIZING

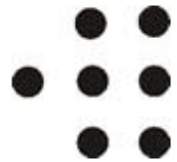
Subitizing is the ability to 'see' a small amount of objects and know how many there are without counting. Subitizing is what tells you what number you roll on a six sided dice - most adults no longer have to count the pips after playing board games for a while.

Subitizing is a fundamental skill in the development of students' understanding of number (*Baroody 1987, 115*). Students use patterns recognized to discover properties and skills such as conservation, compensation, unitizing, counting on, composing and decomposing numbers, as well as understanding of arithmetic and place value.

NUMBER SENSE

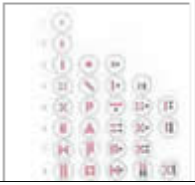
» 5 / 10 Frames
» Subitizing
» Part Part Whole
» Near Numbers (±1, ±2)
» Teen Numbers
» Place Value
» Estimating

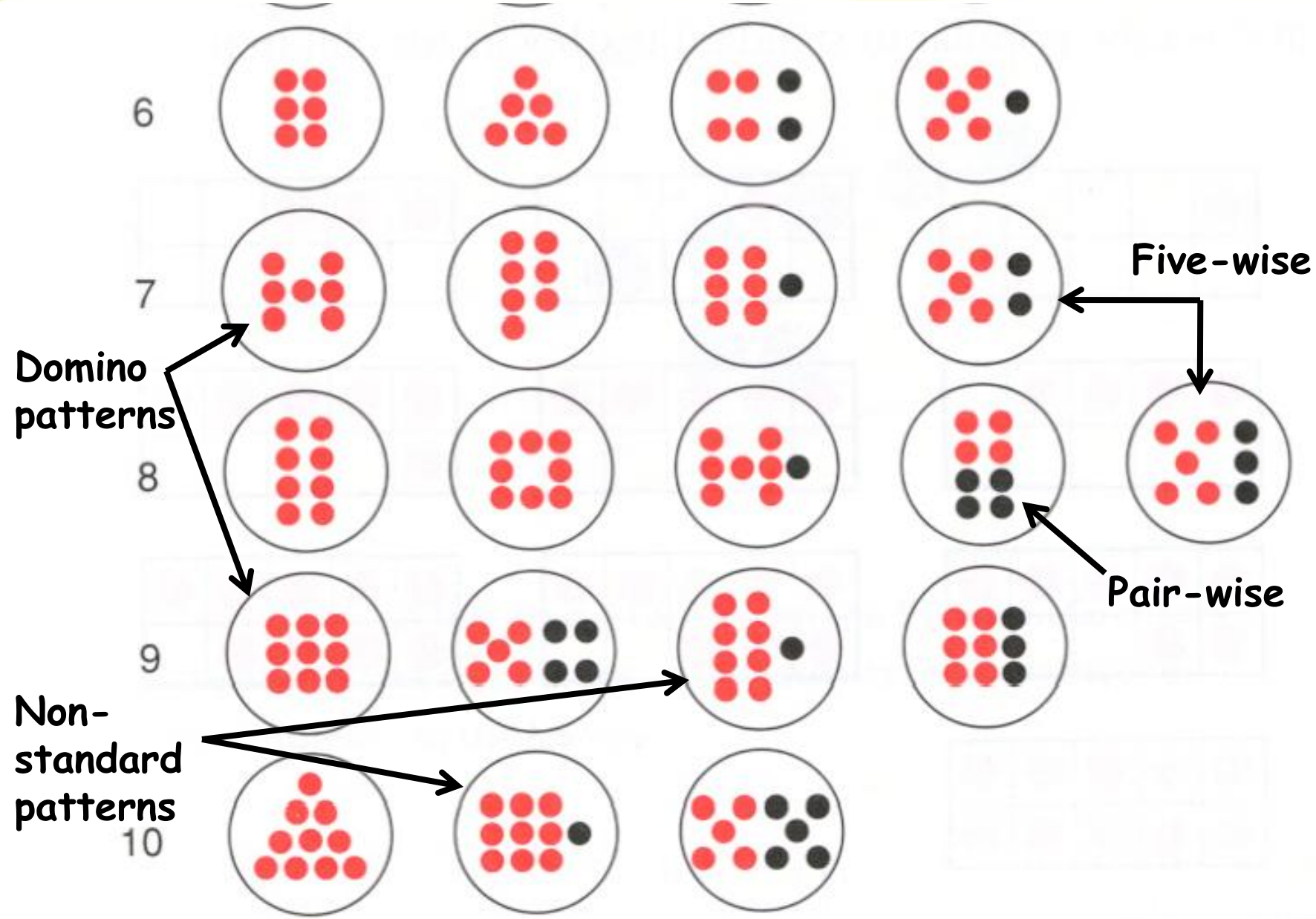
The ability to subitize can be developed, and uses a student's pattern recognition skills. Part part whole understanding is usually used to subitize numbers over four or five.
This means a student looking at this pattern doesn't usually see 7, but instead 1 and 6, or maybe 2 and 5.
This is one of the reasons larger patterns shouldn't be used until students are familiar with various representations of numbers 1 to 5. When two colours are used in patterns, they also draw attention to smaller anchors and make the parts more obvious.

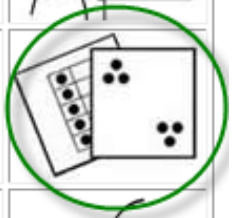
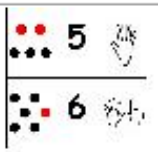
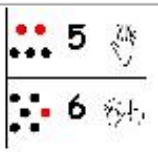
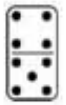


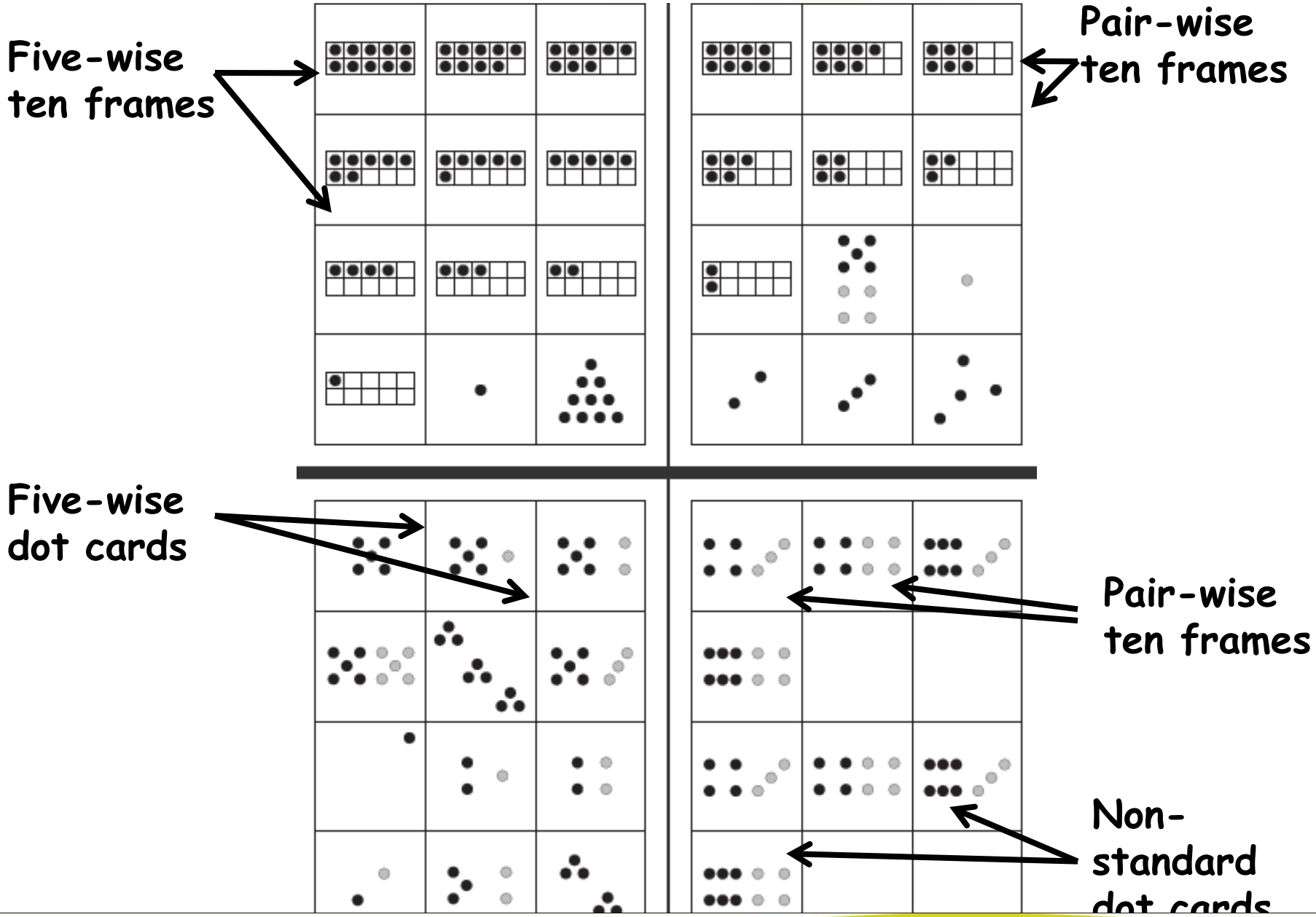
Subitizing pattern for 7

Dot Plates
A common tool is a set of dot patterns on paper plates - the dots can be easily made with a bingo dabber. Since paper plates are round, they are held up in essentially a random orientation each time. Two colours are used for advanced plates. Click the picture on the right for a pdf of suggested patterns from *Elementary and Middle School Mathematics: Teaching*




6
7
8
9
10
Domino patterns
Five-wise
Pair-wise
Non-standard patterns

A common tool is a set of dot patterns on paper plates - the dots can be easily made with a bingo dabber. Since paper plates are round, they are held up in essentially a random orientation each time. Two colours are used for advanced plates. Click the picture on the right for a pdf of suggested patterns from *Elementary and Middle School Mathematics: Teaching Developmentally*.	
Dot Plate Questions / Activities Dot plates are very effective when used for a few minutes of mental / oral math each day. This file details questions and tools for using dot plates as part of your program.	
Dot Cards A set of dot cards useful for a variety of student activities. This set contains 4 representations of the numbers 1 to 10, some with ten frames.	
Dot Card Activities A set of six basic games and activities (War, Trains, Number Sandwiches, Go Fish, Ten and Out) for the dot cards above.	
Concentration Cards Beginner This is a set of cards from Manitoba Education and Youth. It includes four different representations of the numbers 1 to 6, and is suitable for playing concentration or other games in Kindergarten or grade 1.	
Concentration Cards Advanced This is a set of cards from Manitoba Education and Youth. It includes four different representations of the numbers 5 to 10, and is suitable for playing concentration or other games in grade 1 to 3.	
Domino Activities Dominoes can help develop the ability to recognize dot patterns. This is a set of games and activities that use dominoes. Double 9 dominoes are a little more versatile when students are ready.	
Domino Flash Cards These are large domino cards that can be used for subitizing, for numbers over 6, dominos	


Five-wise ten frames
Pair-wise ten frames
Five-wise dot cards
Pair-wise ten frames
Non-standard dot cards

Interactive Website link – Dreambox teacher tools

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for students. These unique virtual manipulatives can be used in large- or small-group instructional settings with your interactive white board or projector, or on computers.

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Match-n-Make | Quick Images | Open Number Line | Snap Blocks

Quick Images: Identifying Amounts™

Using the quick images manipulative is a great way to engage students in communicating their mathematical thinking while offering opportunities for students to subitize and conceptualize numbers using visual images. The ideas here can be used as stand-alone activities, as a supplement to an

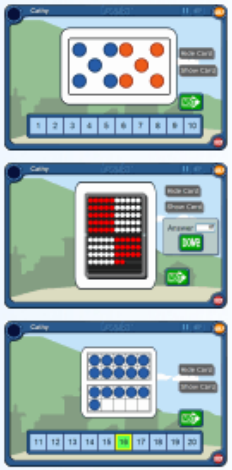
See the tenframe tutorial

See the mathrack tutorial

You need to enter your email address above to access the DreamBox Teacher Tools

Choose a quick images lesson:

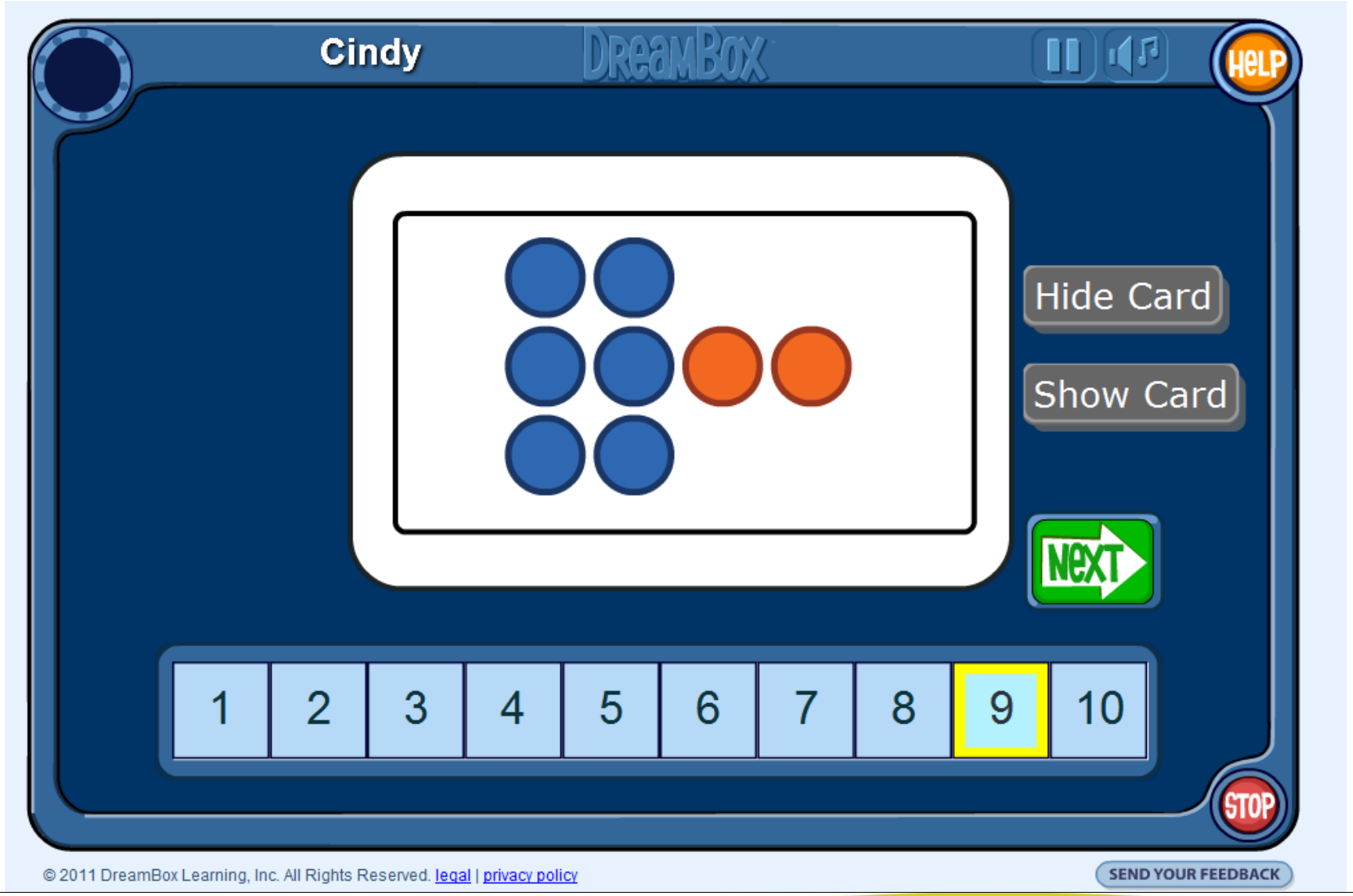
- Numbergram from 4 to 10
- Tenframe from 4 to 10
- Tenframe from 11 to 20
- Tenframe from 21 to 40
- One-Wire Mathrack from 4 to 10
- Two-Wire Mathrack from 11 to 20
- Two-Wire Mathrack from 4 to 20 (displayed as doubles)
- Ten-Wire Mathrack from 20 to 100 (multiples of 10 only)
- Ten-Wire Mathrack from 21 to 50
- Ten-Wire Mathrack from 41 to 100



Getting to know the manipulatives

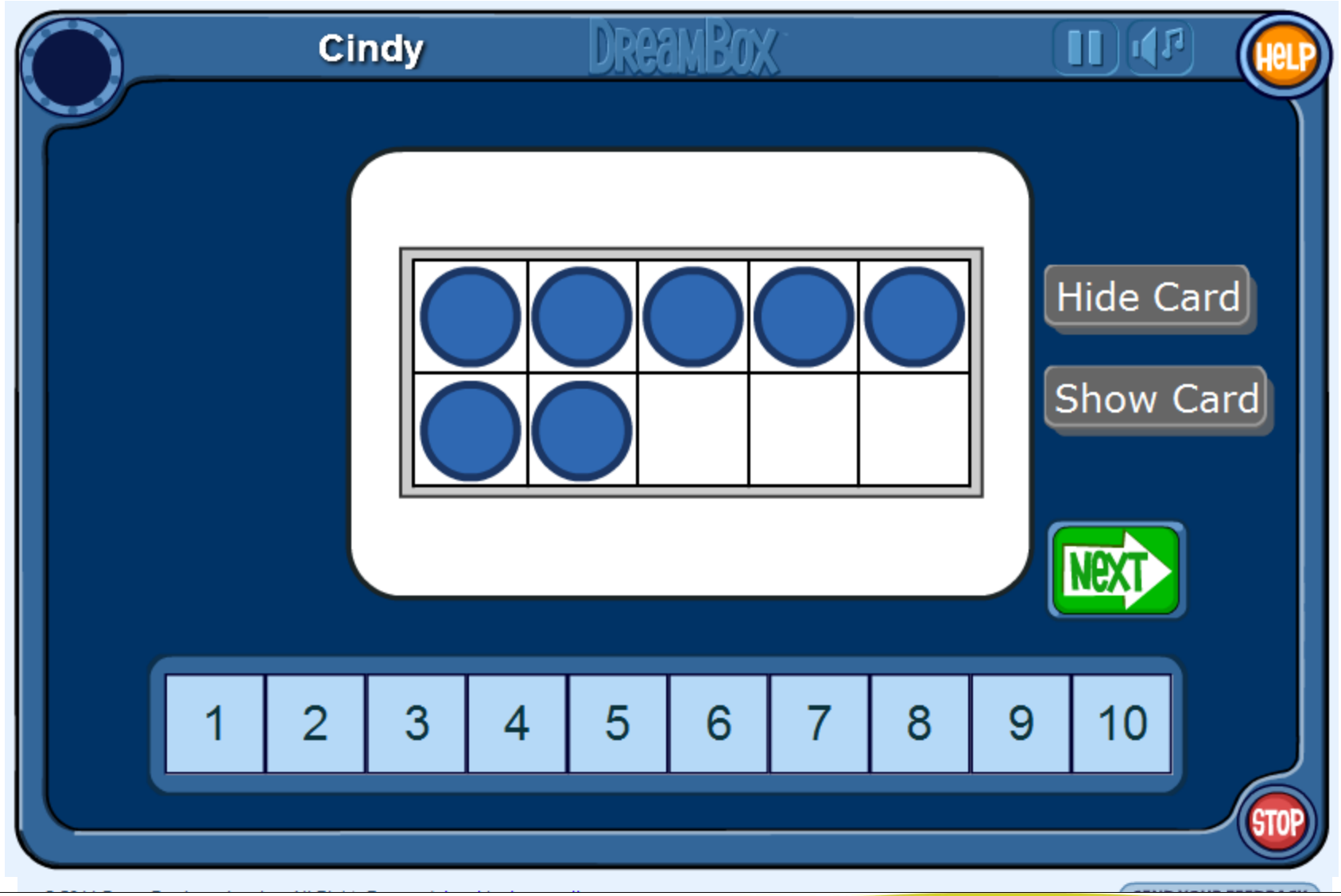
Three different visual math manipulatives support students in conceptualizing numbers as groups rather than individual objects to be

Numbergram From 4 to 10



Use “Hide Card” button to hide image

Other lessons are available

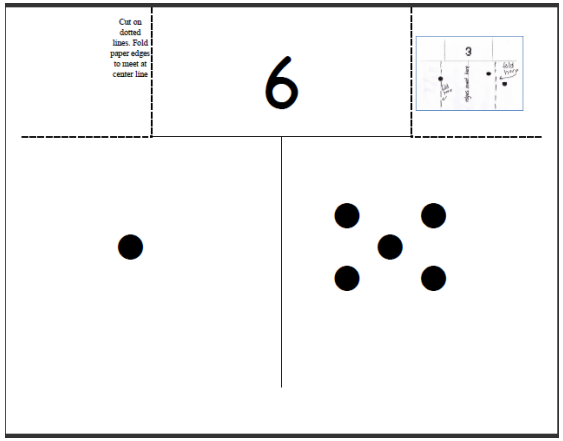


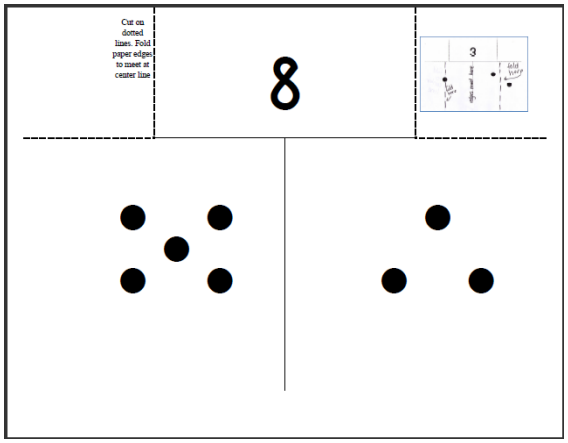
S 266

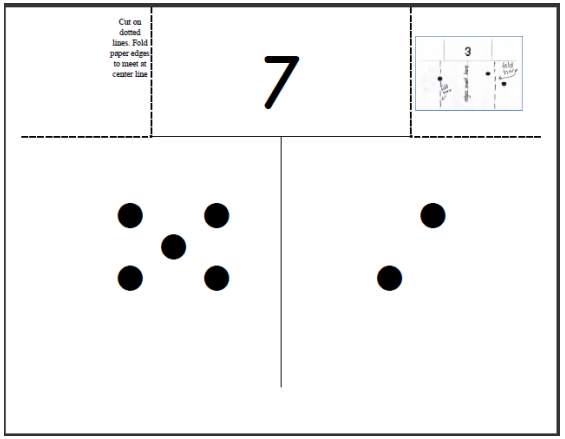
KNP Entry	Kentucky Common Core Academic Standard (KCAS) (*see glossary)	KCAS Domain	KCAS Cluster	Setting (situation & materials)	Activities: Exemplary Learning Experiences (*see glossary)	Numeracy Strand (from AWMR)	Construct/Level (from AWMR)	Numeracy Target (from AWMR)	"I CAN ....." (*see glossary)	Assessment for Learning
S 266.2	K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	Operations and Algebraic Thinking	Understand addition as putting together or adding to, subtraction as taking apart or taking from	5-plus combination dot cards (see link - other combination cards available as well)	5-plus Combination Cards: Print the 5+ combination cards on card stock. Cut and fold as indicated. Open one flap to reveal a given number of dots and the student tells the number that goes with it to make the total indicated at top. Next time the card is used, the other flap is opened.	Structuring	1 to 2 BLUE	intermediate structures to ten	... tell the combinations of 6, 7, 8, 9, 10 when shown one quantity in the form of dots.	Show the students the dot pattern for 3 and ask "What goes with 3 to equal 8?" Do the same for 2 (to equal 7) and 5 (to equal 9)
S 266.3	K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	Operations and Algebraic Thinking	Understand addition as putting together or adding to, subtraction as taking apart or taking from	combinations of 10 cards with numerals	Numeral combinations to 10: Print the combination cards on card stock. Cut and fold as indicated. Open one flap to reveal a numeral and the student tells the number that goes with it to make the number indicated at top. Next time the card is used, the other flap is opened.	Structuring	2 to 3 GREEN	facile structures to ten	... tell the combinations of 6, 7, 8, 9, 10 when given one number in bare numerals.	Show the students the dot pattern for 3 and ask "What goes with 3 to equal 5?" Show the students the dot pattern for 2 and ask "What goes with 2 to equal 4?"

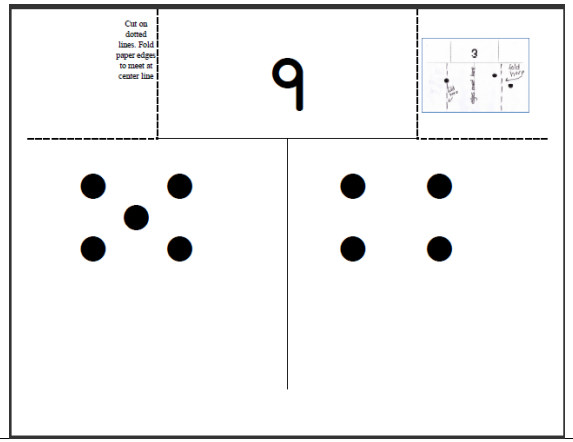
S 266.2

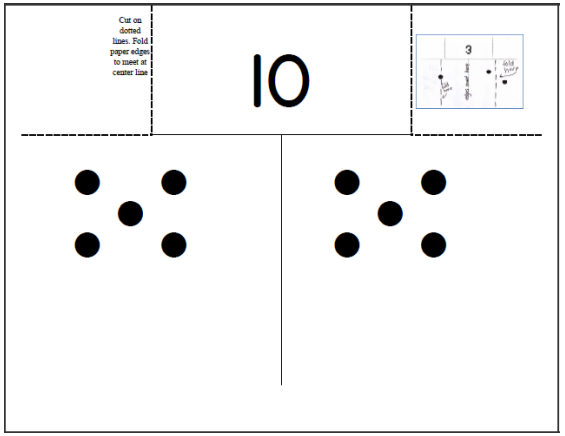
Five-wise combination cards to 10





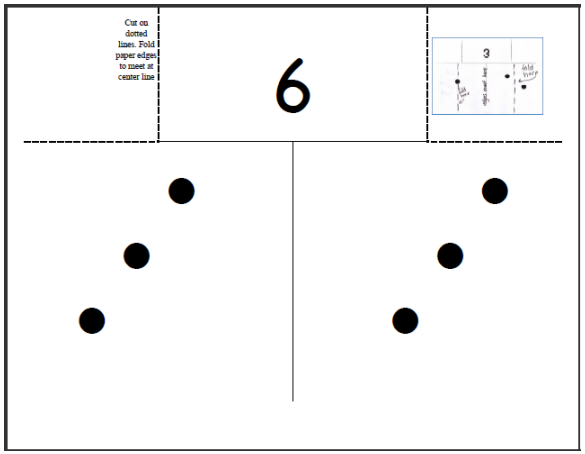


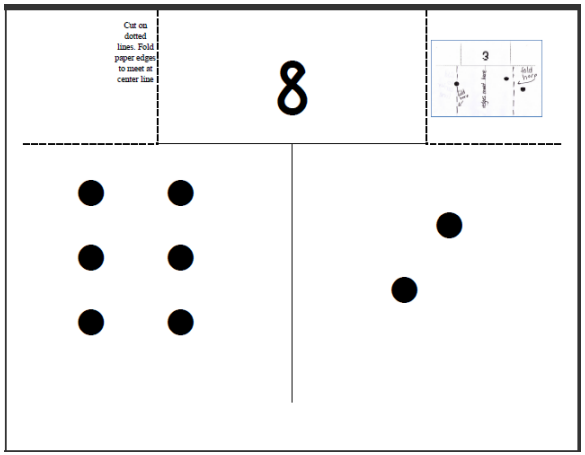


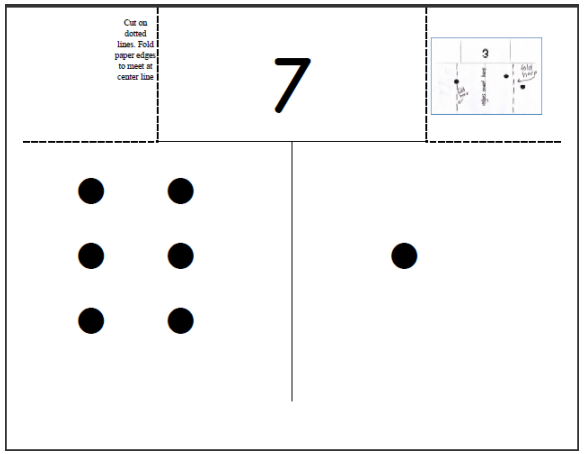


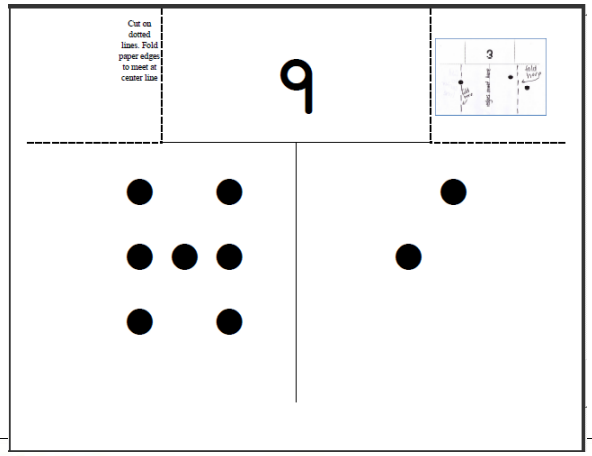
S 266.2

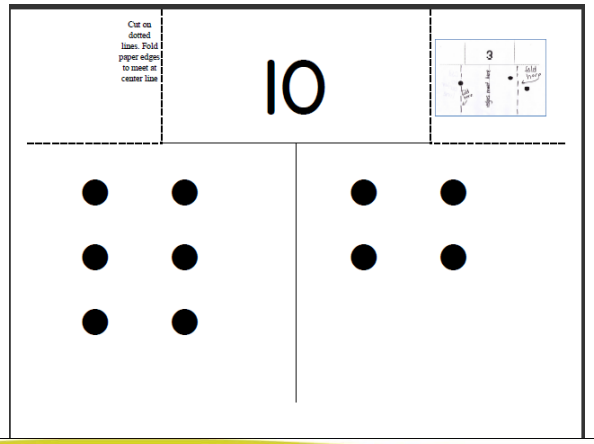
Examples of other combination cards to 10





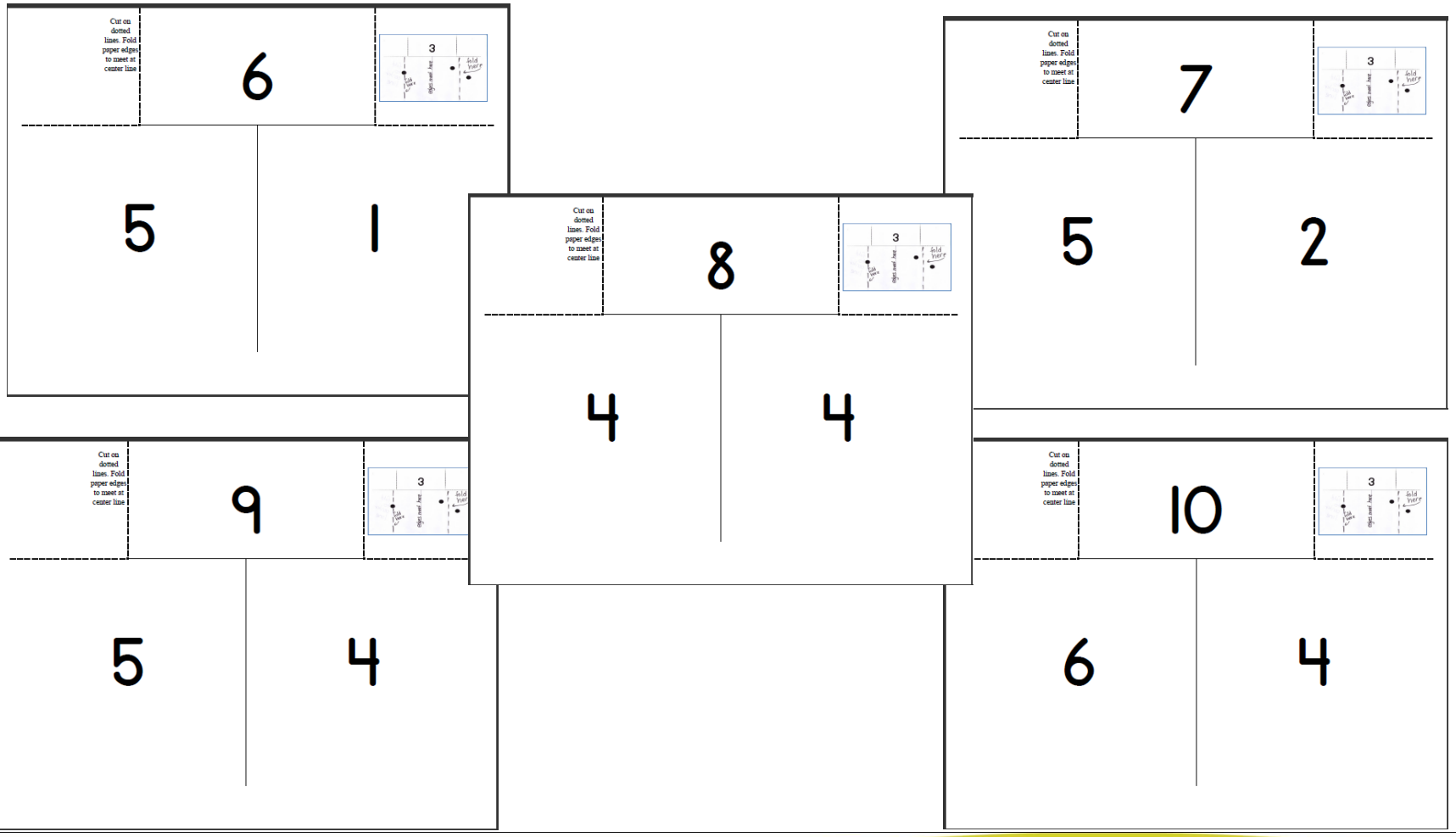






S 266.3

Examples of Numeral combination cards to 10



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Project
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Structuring to Ten
Structuring to Five
INTRODUCTION

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Webinar Archives:

KNP Webinar Session 1 - Introduction

KNP Webinar Session 2 - Number Words and Numerals

KNP Webinar Session 3 – Structuring to Five and Ten

.xls - **Kentucky Numeracy Project Intervention Guide** - More to come.... KNP task groups for the differ
working on the Glossary denotations. This will continue to be a living document with an ever-growing co

Word version of the Kentucky Numeracy Project Intervention Guide - *posted February 10, 2011*

Return to KNP

Numeral Roll

- **.pdf** - Numeral Roll directions and printables.
- Video:

Numeral roll Test video.wmv

Nb 102.0

Kentucky Common Core Academic Standard: K.CC.1 Count* to 100 by ones and tens.

Domain: Counting & Cardinality

KCAS Cluster: Know number names and the count* sequence

Setting (situation & materials): verbal

Activities: Exemplary Learning Experiences: Count* Around Activity: Students stand in a circle. The first student starts the Count* at 5 and the students Count* around the circle with each student saying the next number in the sequence 5-1. The student who says "1" sits down and the next child begins the Count* again at 5. Repeat until only one child is left standing.

Numeracy Strand (from AVMR): Number Words (backward)

Construct Level (from AVMR): 0 to 1 YELLOW

Numeracy Target (from AVMR): Initial BNWS from 'ten' (no NWB)

"I CAN": ... say number words backward from 5-1.

Assessment for Learning (*see glossary): Ask students to take turns counting* from 5 to 1.

Student Grouping: small group / whole class

Reference: 1

Teacher Notes: Prior to this activity the teacher may need to have students practice saying the Backward Number Word Sequence in a repetitive manner.

Submitted By:

Reviewer & Comments: Linda Montgomery and Mary Helen Hodges

Posted: 1.3.11

KENTUCKY CENTER FOR MATHEMATICS

Upcoming KNP Sessions, 3:30 to 4:30 p.m. ET

- March 10 – Addition and Subtraction
- March 31 – Structuring to Twenty
- April 21 – Advanced Addition and Subtraction
- May 12 – Multiplication and Division
- June 2 – Tens and Ones

http://kymath.org/intervention/iKNP.asp

Reflection Questions

1) What are your students' abilities to recognize flashed quantities, including five-wise and pair-wise patterns?
2) What are your students' abilities to instantly show different finger patterns for quantities 3 to 8?
3) Read the January 2011 KCTM article by Julie Dunn titled "Number Sense throughout the School Year." Which of the ideas in the article might help you to better develop numeracy foundations?
4) How can the internalization of flashed quantities support the memorization of facts for robust automaticity?