Seeing Patterns in Daily Routines

Cultivating Mathematical Practices 7 & 8

Presenters

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Mathematical Practices 7 & 8

SMP #7: Look for and make use of structure.

- Look for a pattern
- See structure
- Understand how numbers and spaces are organized and put together as parts and wholes.
- Recognize similarities and differences

Mathematical Practices 7 & 8

SMP #8: Look for and express regularity in repeated reasoning.

- Recognize repeated reasoning and use it to find efficient methods for solving problems
- Look for general methods for solving problems.

SMP 7 & 8 and Daily Routines

- Daily routines are a great place to highlight mathematical patterns.
- Students can look for patterns and structure in activities they do daily.
- Seeing that structure can allow students to form generalizations and efficient approaches to solving problems.

Recognize Similarities & Differences

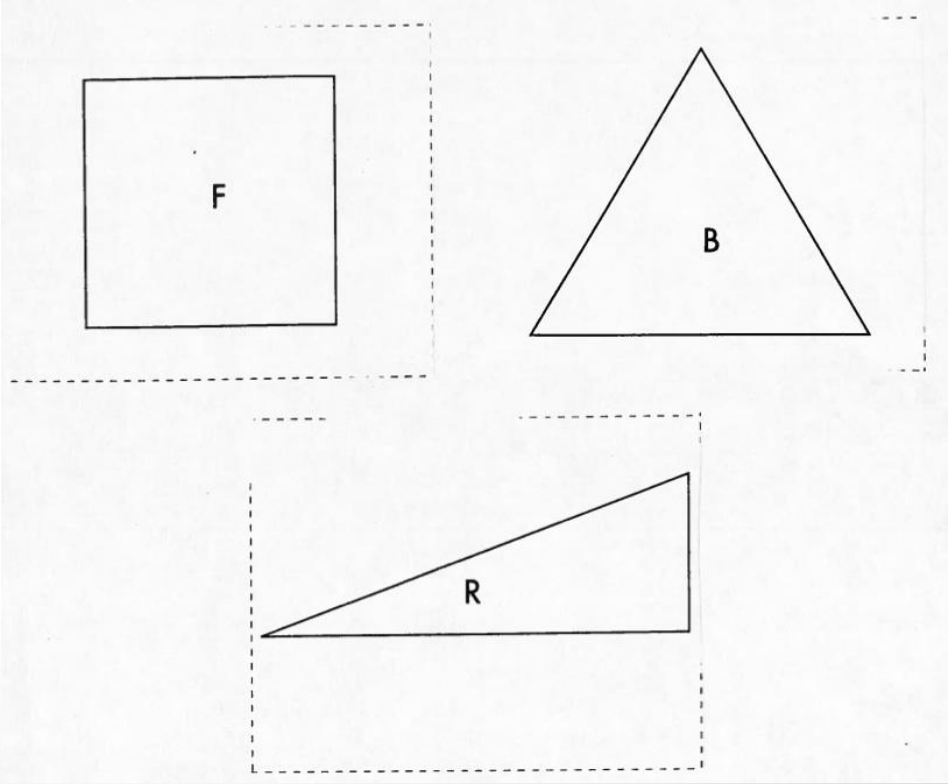
What stays the same and what is different is a great way to help children see structure and patterns. This can be done in a variety of contexts:

- shapes
- growing patterns
- money & number sentences

Recognize Similarities & Differences

Two are the same

One is different--



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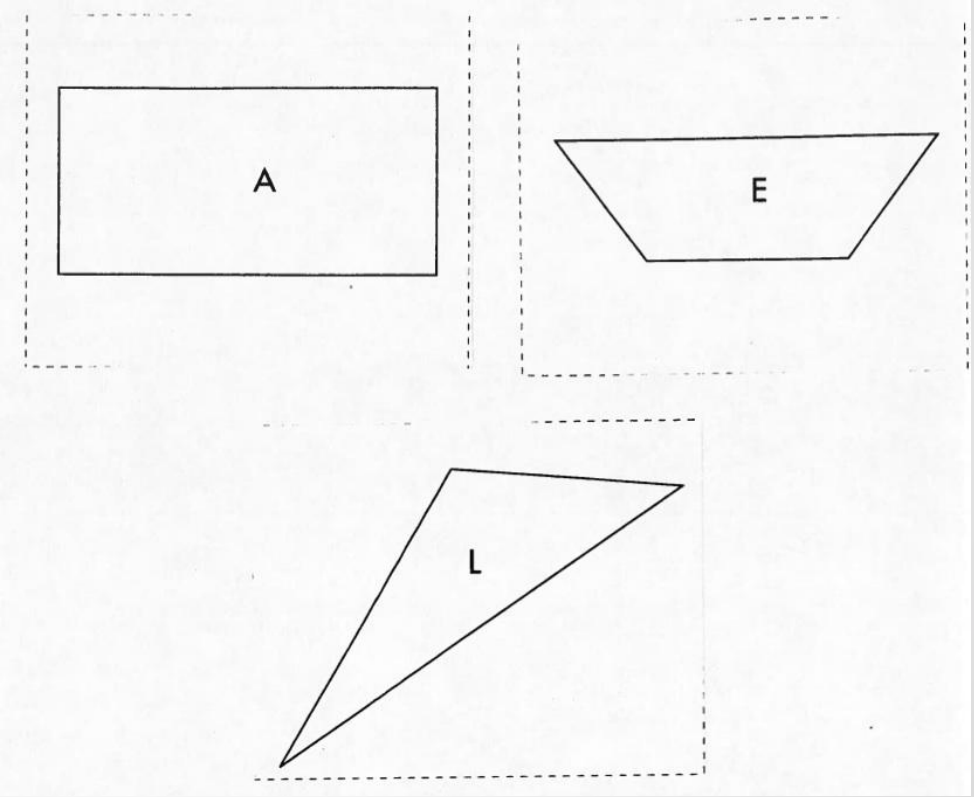

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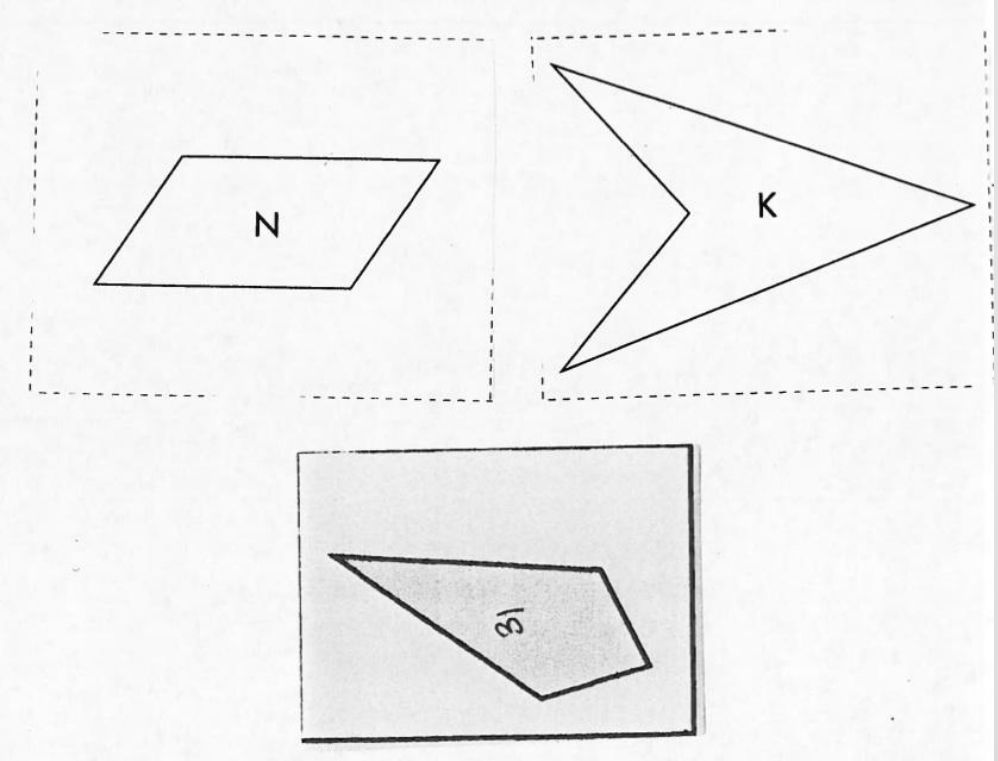


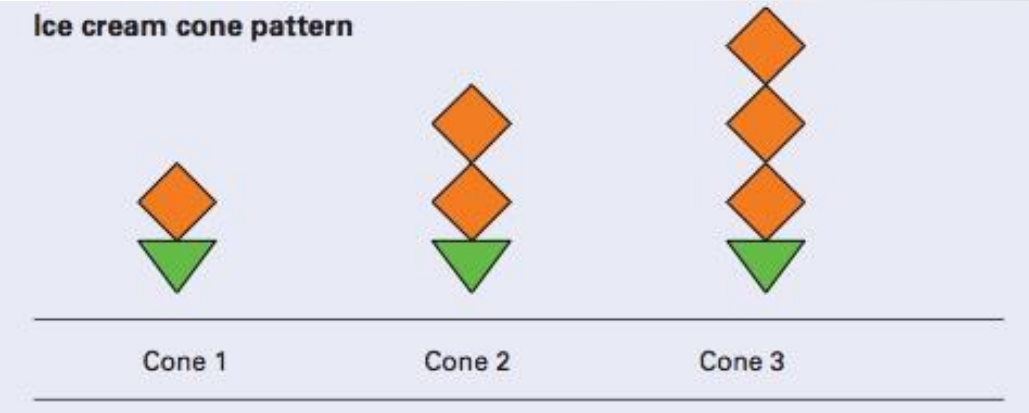
Recognize Similarities & Differences

Create your own “Two the Same, One Different” shape puzzle.

- what properties does it focus on?
- Is there more than one reasonable way to sort the shapes?

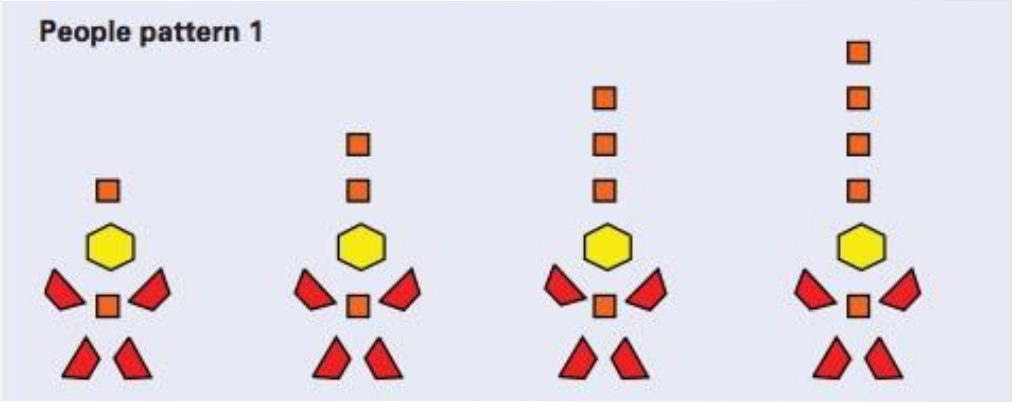
Growth Patterns

- What stays the same?
- What changes?
- How could you build the 10th cone in the pattern?



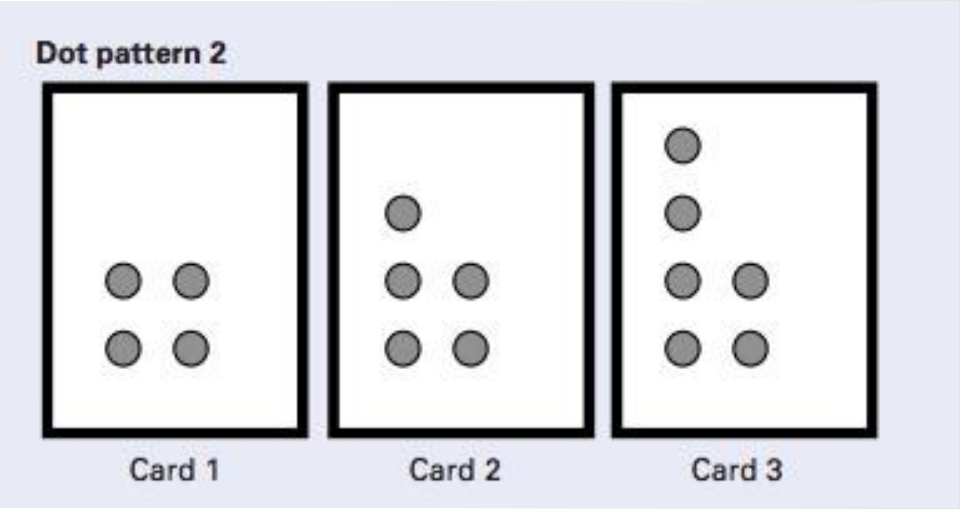
Growing Patterns

- What stays the same?
- What changes?
- How could you build the 8th person in the pattern?



Growth Patterns

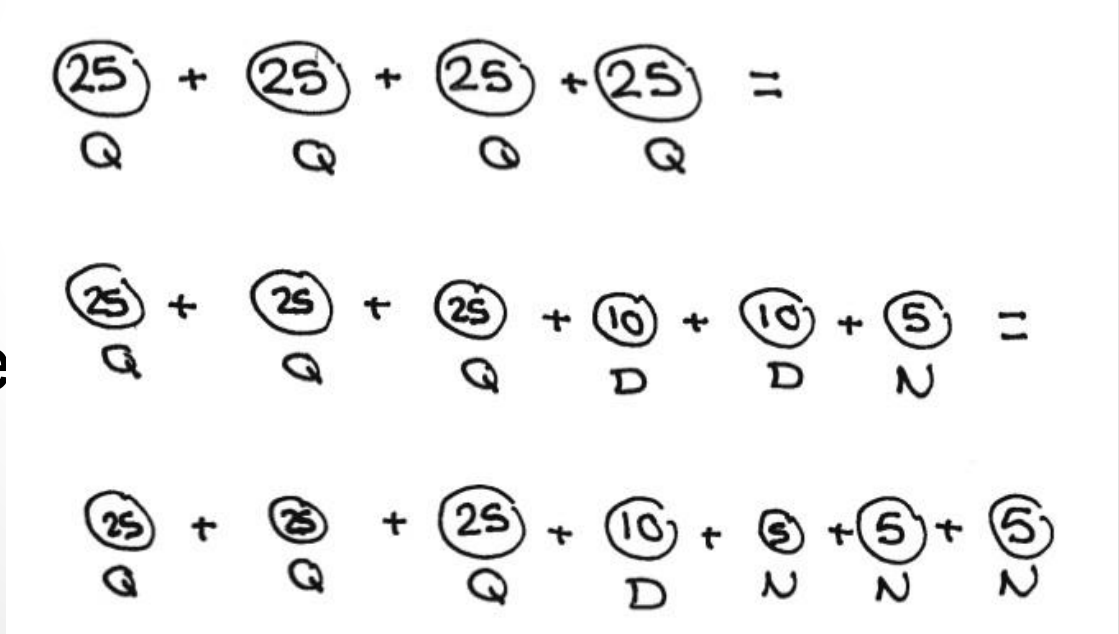
- What stays the same?
- What changes?
- How could you build the 12th card in this dot pattern?



Money Trains

How can we make $1.00 using coins?

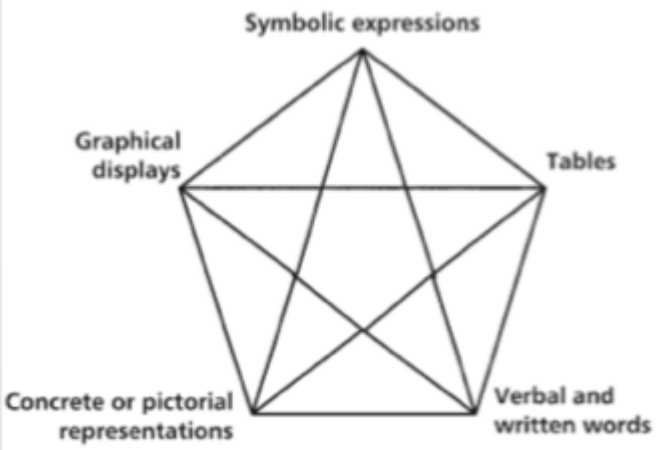
--Compose and decompose coins to make additional combinations



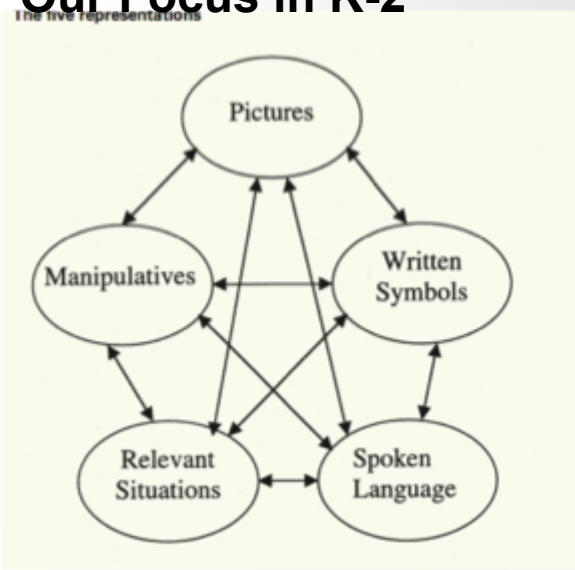
Representations (Explore Number Structure)

Representations/Models Stressed in Mathematics

(figure adapted from Friel, Rachlin, and Doyle 2001).



Our Focus in K-2



Clements, Lisa. "A Model for Understanding, Using, and Connecting Representations." *Teaching Children Mathematics*, (September 2004): 97-102.

Uses of Models/Representations

the mathematics that emerges from a model depends on what features of the model are stressed/ignored

(Mike Askew, "Models in Mind." *Primary Mathematics* (Autumn 2012):3)

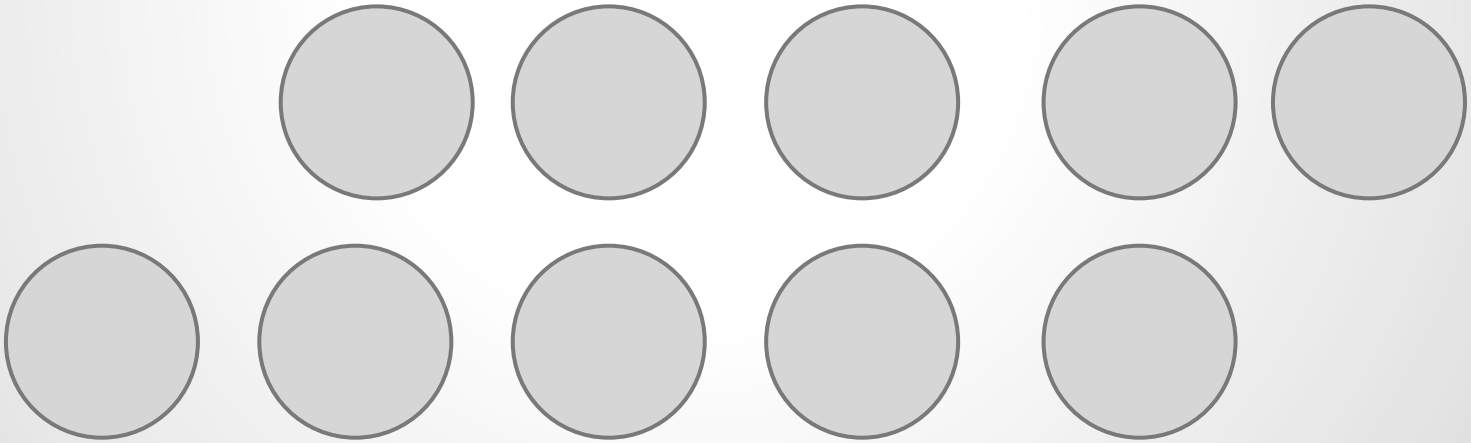
Models of Situations--Use model to help learners gain insight into mathematical structure, concepts and properties (not just getting right answers)

Models for Representing Students Strategies -- Learners may solve problems different ways and model(s) represent student thinking

Models as Tools for Thinking –the model itself become a tool for thinking/problem solving

Representations - Quick Images

- How many do you see?
- How did you “chunk” the image?



Representations - Quick Images

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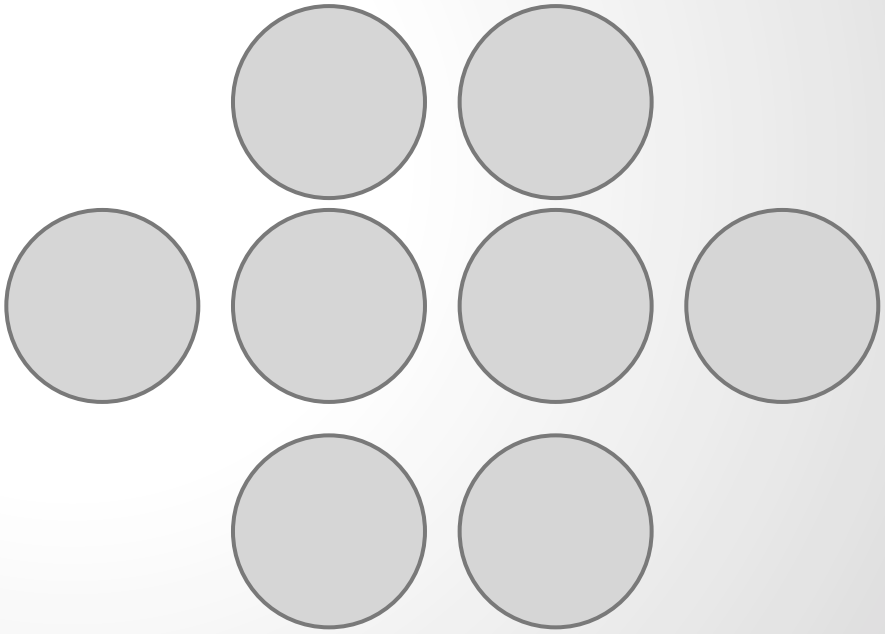
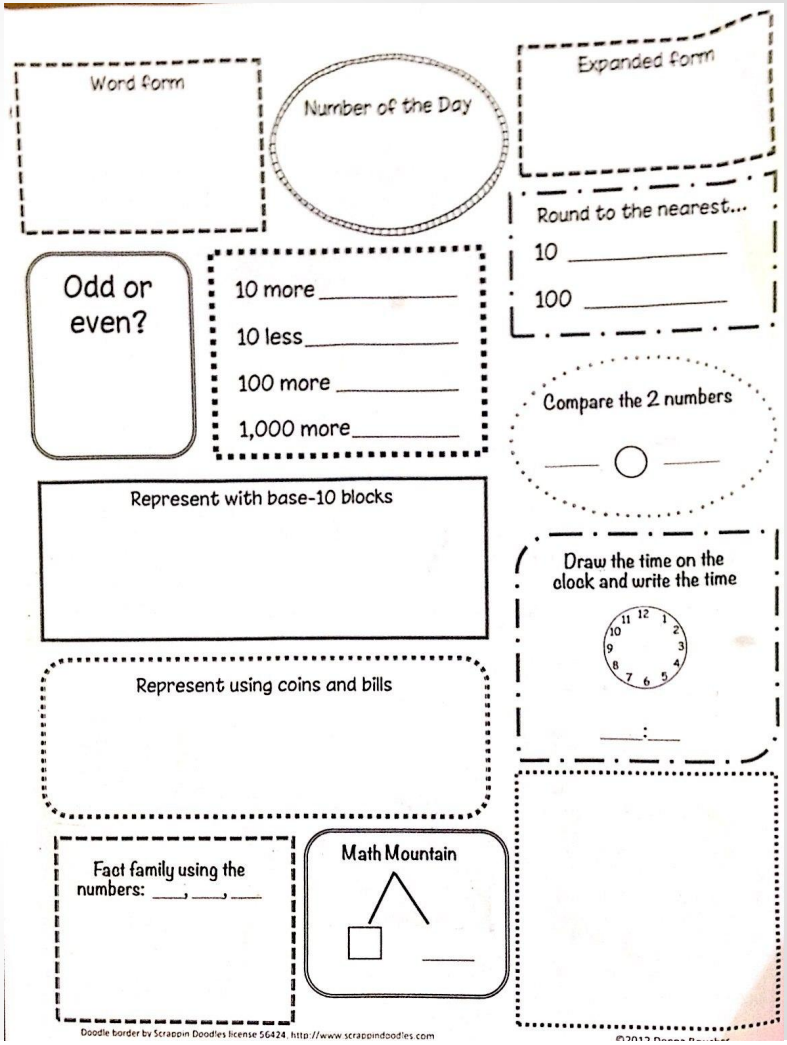
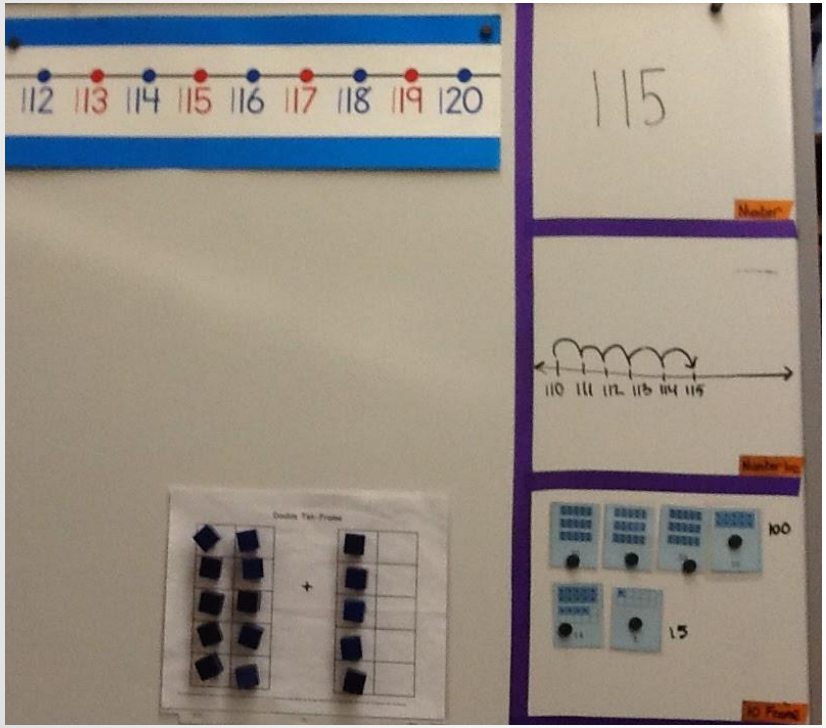


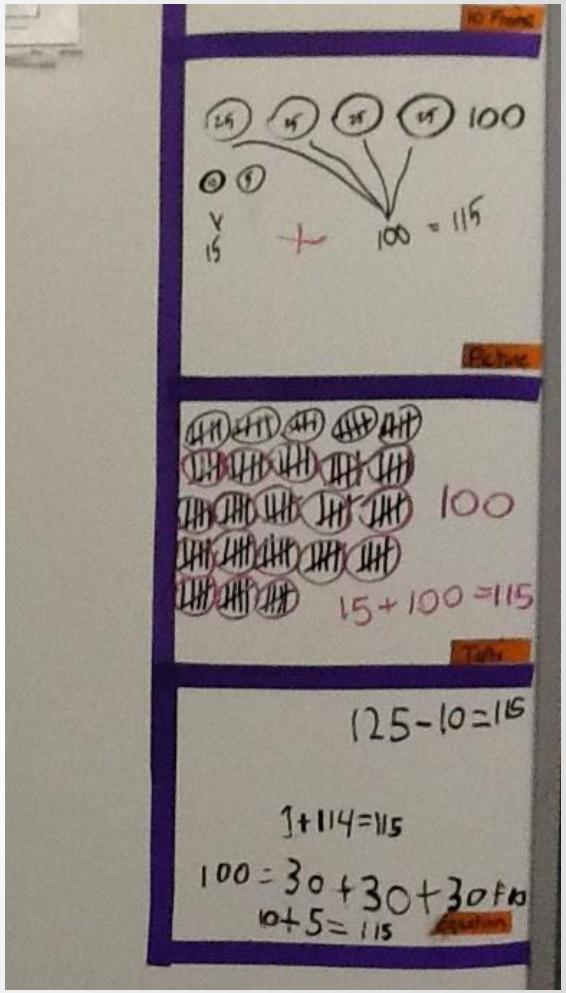
Calendar Routines

- representing a # variety of ways
- counting on/back
- comparing

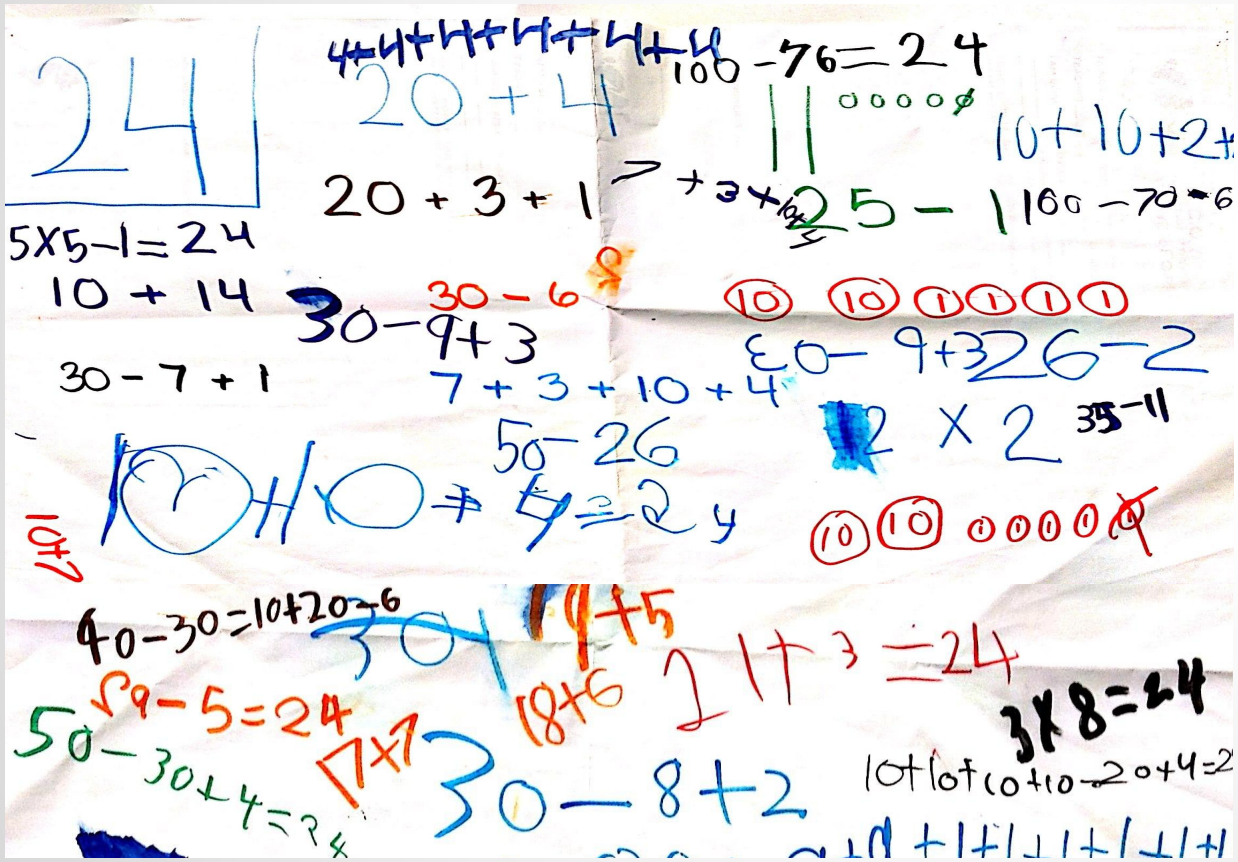


Number of the Day



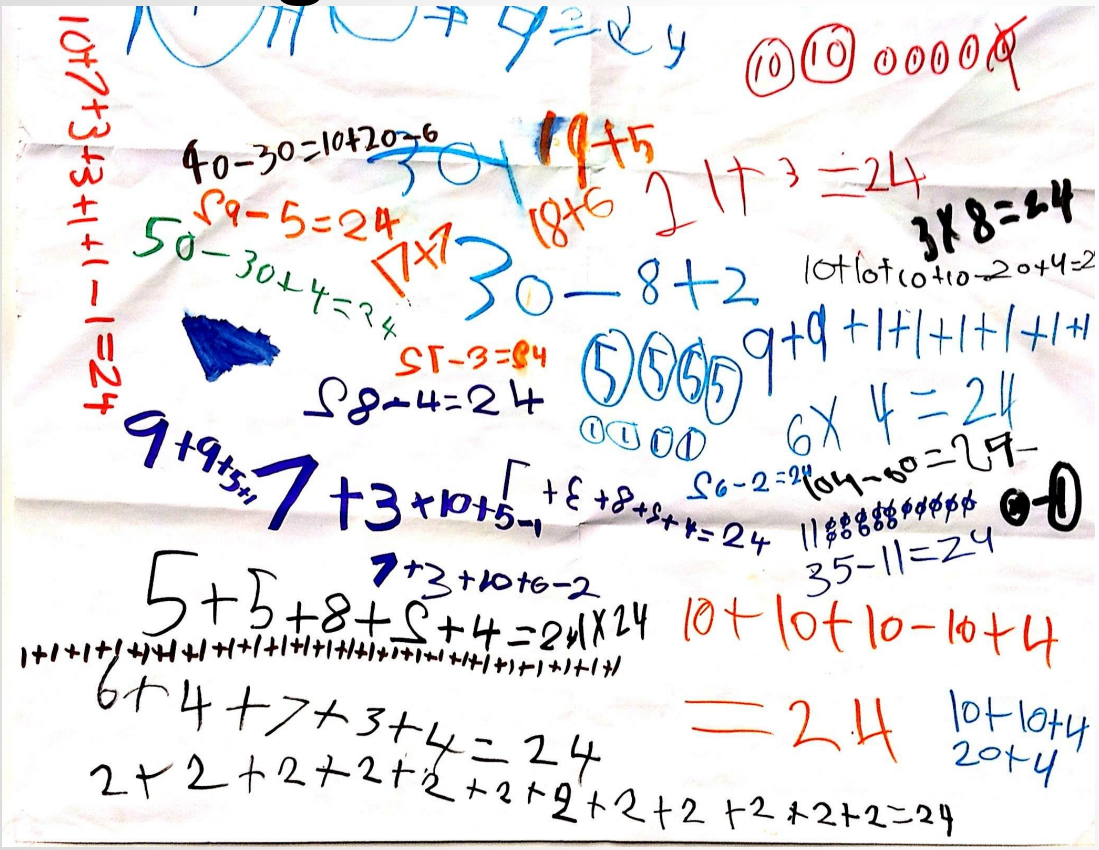


Number of the day - 24



How did the children use place value structure to create equivalent expressions?

Using Structure of 10 to Make 24



9+1

8+2

7+3

6+4

5+5

Other uses of structure?

Number Strings

What do you notice?

How are the number sentences the same? different?

25 - 1
26 - 2
27 - 3
28 - 4
29 - 5

Number Strings

- What do you notice?
- How are the number sentences the same? different?
- How can you use one fact to solve another?

5 + 5
5 + 6
3 + 7
3 + 8
4 + 6
4 + 7

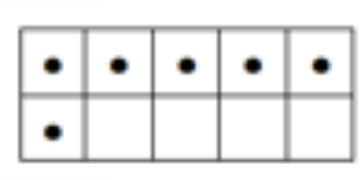
Number Strings

4 + 6 = ___

___ = 2 + 8

7 + 3 = ____

6 + ___ = 10



Write as many other 10 facts you can

- What do you notice?
- How are the number sentences the same? different?

Number Strings

- What do you notice?
- How are the number sentences the same? different?

5 + 6
6 + 5
3 + 9
9 + 3
2 + 8

Make Your Own Number String

- What mathematical property/relationship do you want to highlight?

- What number string could you use?

Other Ideas

How else can K-2 teachers use daily routines to foster Mathematical Practices 7 & 8?

Questions or Comments?

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