Parent University: Mathematical Foundations

What can I do to support my child's mathematical development at home?

What is Number Sense?

Number sense is a broad term that reflects a deep understanding of numbers – what they represent and how they behave. NCTM, 1989 describe five key elements of number sense

Number meaning

Number relationships

Number magnitude

Operations involving numbers

Referents for numbers and quantities

Boaler, 2009

- *The difference between high and low achieving students was not that the low achieving students knew less mathematics, but that they were interacting with mathematics differently.*

- *Lower achieving students seemed to cling to formal procedures they had learned, using them very precisely, not abandoning them even when it made sense to do so.*

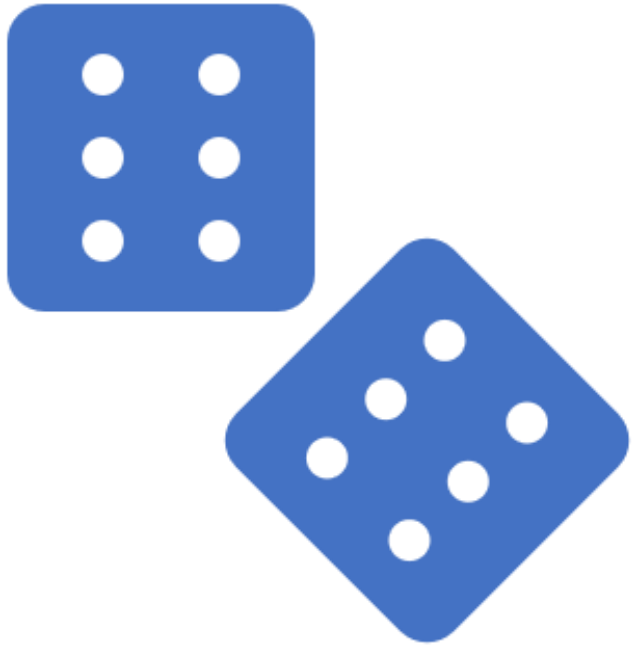
Why?

In summary, number sense, as assessed by the study's screening measure, is ***a strong predictor of later mathematics achievement – both at the end of first grade and the end of third grade****. With overall mathematics achievement, number sense is a significant factor, over and above both age and cognitive factors.*

Subitizing

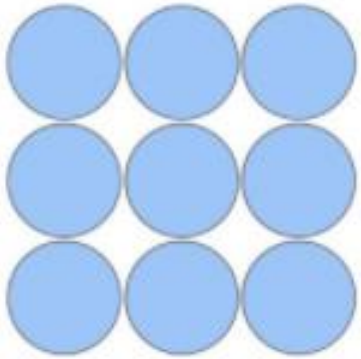
- The ability to give a rough figure of the numbers of objects (tell/count a number of dots in a block or a dice surface)

- To subitize is *to guess the number of countable objects without actually counting them one by one. Just like you read the words by sight, at the start (read sight words), without realizing actually reading them, letter for letter, you tell the numbers of objects by skipping the counting them one by one. Thus, to subitize means to guess almost correctly. The experts also call this activity estimating and find it to be coming from a developed number sense.*

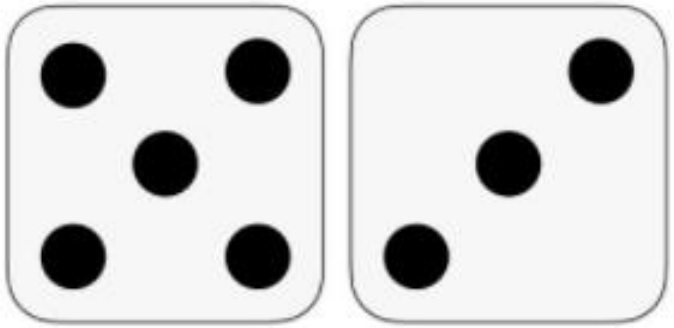


FINGERS

COUNTERS



DICE



PLAYING CARDS

DOMINOS

DOT PLATES

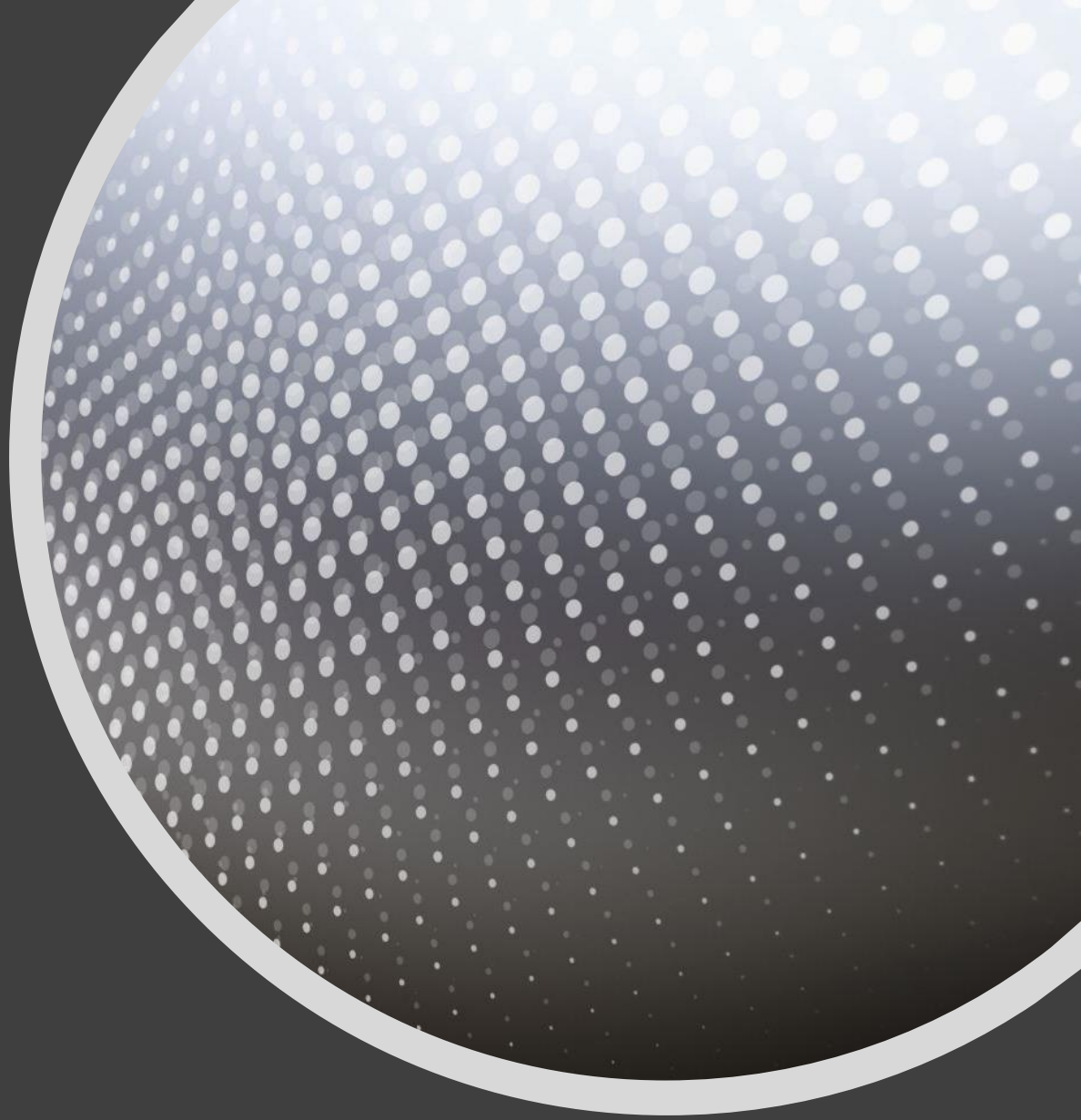
Examples of subitizing number

STOP! JOT!

What are some ways you already address SUBITIZING in your homes. If you don't, what COULD you do?

E.g. We play lots of board games with dice…

Be prepared to share in Breakout rooms.



How does subitizing support mathematical development?

It saves time!

It is more efficient than counting by 1.

Subitizing numbers saves time through not having to count each individual member of group, but instead by simply perceiving the number immediately (Reys, et al., 2012). This comes in useful later on in Mathematics learning when students begin to deal with more complex numbers, or begin to deal with mathematical operations.

How does subitizing support mathematical development?

It is an important precursor for more complex number ideas.

Early number order relations link directly to Subitizing skills, as students who can competently name small groups are able to understand number facts such as that 3>2 and that 4 is one less than 3.

This complex understanding of numbers facilitates learning of other mathematical processes as they go on in their schooling.

How does subitizing support mathematical development?

It helps consolidate and develop more elaborate counting skills.

Students who can Subitize small groups of numbers are able to develop their counting skills by beginning their counting after the subitized group, or by using subitizing to count forwards or backwards by twos, threes, or even larger groups later when they are exposed to more complex multiplication tables. (Reys, et al., 2012) This type of subitizing falls into the category of conceptual subitizing which occurs with larger number sets, and involves breaking the group into smaller parts (Clements, 1999).

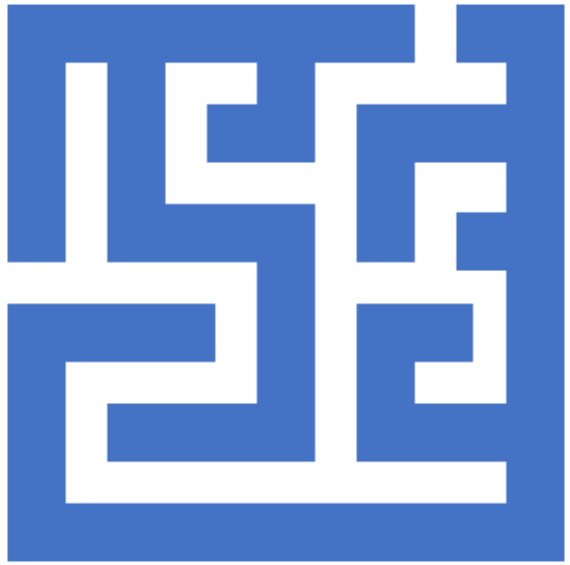
How does subitizing support mathematical development?

It quickens the process of learning addition and subtraction.

When children are able to subitize, it means that they are better equipped to handle addition and subtraction concepts, as they do not have to count each small group to be added or removed when learning operations with manipulatives (Reys, et al., 2012).

What to do at home?

- Model & Explain Problem Solving Strategies
- Mental math challenges



Another way to strengthen at Number Sense home

Encourage and model the use of virtual or physical manipulatives

Physical Manipulatives: Anything you have that shows One to One correspondence.

- Macaroni/pasta noodles
- Playing cards
- Old baseball cards
- Marbles
- Old puzzle pieces

Virtual Manipulatives/In person /Virtual

- https://www.didax.com/math/virtual-manipulatives.html
- *Google "Didax Virtual Manipulatives"*

- https://toytheater.com/category/teacher-tools/virtual-manipulatives/
- *Google "Toy Theater Virtual Manipulatives"*

They don’t have to be fancy, expensive manipulatives

Visual Mathematics are helpful too.

Medium doesn’t matter.

Drawing it out, is as helpful, and moving manipulatives.

Build It , Draw It, Write It

For each number or expression use manipulatives to build it, draw it and write it.

12

3+7

Choose 1

a) 20-11 b) 14+2 c) 3+3+3

This can be done on ANY paper, whiteboard, shaving cream pan, or mentally.

What we are actually capable of.

Questions?