The BIG Mathematical idea

Numbers tell how much and how many and can be represented in many different forms.

Learning Activity:

What can you make with your dots?

Curricular Competencies:

(Mathematical Habits of Mind)

- apply counting strategies and mental math strategies for addition to represent numbers (e.g., counting on, one more, one less, making 10, doubles).
- represent numbers pictorially
- describe their picture orally
- creatively represent numbers
- demonstrate flexibility with numbers through representing the same quantity of dots in multiple ways

Extension:
After each student has completed a page and you have compiled a class book, ask how many dots do you think we used to make our book?

Mathematical Concepts:

The students will know and understand:

Kindergarten
- Number Concepts to 10

Grade One
- Number Concepts to 20

Assessment:

Record anecdotal comments about the number each child chose to represent and the success and challenges they had with the task. Use this information to guide future lessons.

* Lesson Adapted from Burns, M. (2004). Math and literature. Sausalito, CA: Math Solutions Publications.

The BIG Mathematical idea

Numbers tell how much and how many and can be represented in many different forms.

Learning Activity:

Choose a number and represent it using animal pictures.

Curricular Competencies:

(Mathematical Habits of Mind)

- apply counting strategies and mental math strategies for addition to represent numbers (e.g., counting on, one more, one less, making 10, doubles).
- represent numbers pictorially
- orally communicate personal strategy(s) used
- creatively represent numbers
- demonstrate flexibility with numbers through representing the same number in multiple ways
- reflect on the strategies used by their peers (through sharing component as well through reading the class created book).

Mathematical Concepts:

The students will know and understand:

Kindergarten
- Number Concepts to 10

Grade One
- Number Concepts to 20

Grade Two
- Number Concepts to 100

Assessment:

Diagnostic interviews.
Record students ability to communicate - could he/she articulate strategy used
Document the strategy used on clipboard.

The BIG Mathematical idea

Numbers have values and can be described, represented, and calculated in many different ways. Algebraic symbols can be used to represent, model, and analyze scenarios.

Learning Activity:

How many ways can you make 12?

Curricular Competencies:

(Mathematical Habits of Mind)

- apply counting strategies and mental math strategies for addition to represent numbers (e.g., counting on, one more, one less, making 10, doubles).
- represent numbers concretely, pictorially, and symbolically
- orally communicate personal strategy(s) used
- creatively represent numbers
- demonstrate flexibility with numbers through representing the same number in multiple ways
- reflect on the strategies used by their peers (through sharing component as well through reading the class created book).

Mathematical Concepts:

The students will know and understand:

Grade One
- Number Concepts to 20
- Addition to 20

Grade Two
- Number Concepts to 100
- Addition to 100

Grade Three
- Number Concepts to 1000
- Addition to 1000

Assessment:

Record students ability to communicate - could he/she articulate strategy used
Document the strategy used on clipboard.

The BIG Mathematical idea

25

Numbers have values and can be described, represented, and calculated in many different ways. Algebraic symbols can be used to represent, model, and analyze scenarios.

Learning Activity:

My answer is 25. What might be my question?

Curricular Competencies:

(Mathematical Habits of Mind)

- apply counting strategies and/or knowledge of the concepts of addition, subtraction, multiplication, and division to represent numbers
- represent numbers concretely, pictorially, and symbolically
- communicate all solutions using numbers and symbols
- demonstrate flexibility with numbers through representing the same number in multiple ways
- reflect on the strategies used by their peers (through sharing component as well through reading the class created book).

Mathematical Concepts:

The students will know and understand:

Grade One
- Number Concepts to 20
- Addition to 20

Grade Two
- Number Concepts to 100
- Addition to 100

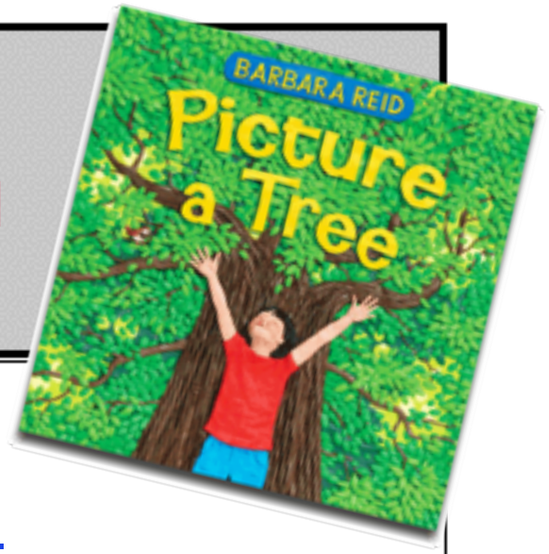
Grade Three
- Number Concepts to 1000
- Addition to 1000

Assessment:

Record information about the level of complexity of the equations.
Note any relationships or connections the student demonstrated between concepts.

The BIG Mathematical idea

Numbers have values and can be described, represented, and calculated in many ways.



Learning Activity:

Using plasticine create a fraction that you can see in your mind.

Curricular Competencies:

(Mathematical Habits of Mind)

- apply knowledge of fractions when visualizing fractions one sees in the real-world
- describe fractions one might see in the real-world
- represent a fraction concretely using plasticine
- orally communicate the fraction(s) represented using the Book Creator app - record narration of the page
- communicate in written form the fraction using words and symbols
- creatively construct fractions using plasticine
- reflect on the different fractions created by their peers (through sharing component was well as the Digital book)

Other Possibilities:

- Picture a Half, Picture a Quarter
- Do you see any fractions on the pages that are not stated? (e.g., The fractional part not being considered, the other part of the whole)
- Can any page in the class created book be described differently (allowing for knowledge of fractions and percent)

Mathematical Concepts:

The students will know and understand:

Grade Three

- fractions
- 2D and 3D objects

Assessment:

Four point rubric (Van de Walle,, 2006, Teaching Student-Centered Mathematics, Grades 3 -5, p. 33).

The BIG Mathematical idea

Numbers have values and can be described, represented, and calculated in many ways. Units of measure can be used to compare and determine the measurable values of objects and shapes. Objects and shapes can be measured and constructed.

Learning Activity:

Using plasticine show the 1/8 of the iceberg that is above the water and the 7/8 under the water.

Curricular Competencies:

(Mathematical Habits of Mind)

- estimate a fractional quantity
- apply knowledge of fractions to represent given fractions
- represent a concrete 3D model of fractions
- communicate either in writing or orally how the model was created
- using reason and logic defend your conjecture
- connect and understand that fractions can be seen in the real-world
- creatively construct fractional numbers using plasticine
- reflect on the strategies used by their peers (through sharing component) and critically examine these

Extension:

- demonstrate flexibility through representing the fractional quantities in multiple ways

Mathematical Concepts:

The students will know and understand:

Grade Three

- fractions
- 3D objects
- preservation of shape
- measurement using standard units

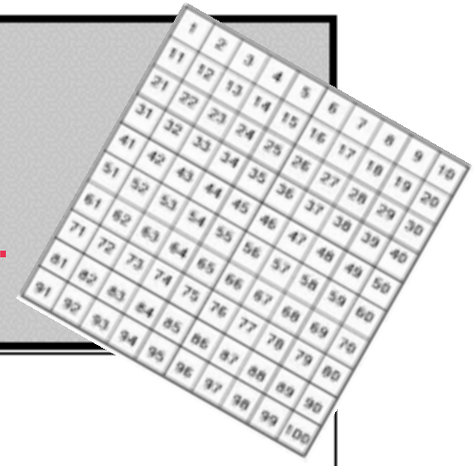
Assessment:

Four point rubric (Van de Walle, 2006, Teaching Student-Centered Mathematics, Grades 3 -5, p. 33).

*Lesson adapted from Sheffield, S. (2004). Math and nonfiction. Sausalito, CA: Math Solutions Publications.

The BIG Mathematical idea

Patterns represented in various ways show repeated regularities.



Learning Activity:

What patterns do you see?

Curricular Competencies:

(Mathematical Habits of Mind)

- apply knowledge of attributes and patterns to represent a pattern
- represent patterns concretely, pictorially, and symbolically
- communicate either in writing or orally how the model was created
- describe your pattern
- connect patterns with the real-world
- creatively construct patterns
- using the ShowMe app on the iPad, explain your thinking
- reflect on the strategies used by their peers (through sharing component) and critically examine these

Extension:

- can you build the same pattern another way
- can you label your pattern

Mathematical Concepts:

The students will know and understand:

Grade One
- Repeating patterns with multiple elements and attributes

Grade Two
- Repeating and increasing patterns

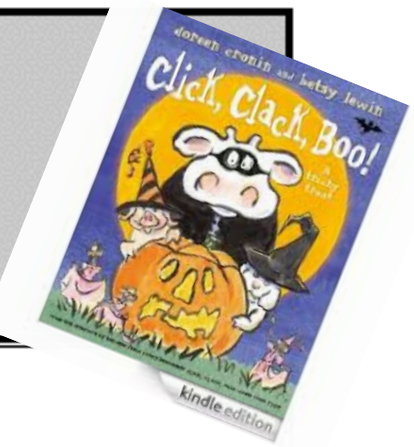
Grade Three
- Increasing and decreasing patterns

Assessment:

Use to guide future lessons and place in student's electronic portfolio.
Record the level of complexity of patterns notices and any misconceptions made.

The BIG Mathematical idea

Patterns represented in various ways show repeated regularities.



Learning Activity:

What patterns can you make?

Curricular Competencies:

(Mathematical Habits of Mind)

- apply knowledge of attributes and patterns to represent a pattern
- represent patterns concretely, pictorially, and symbolically
- communicate either in writing or orally how the model was created
- describe your pattern
- connect patterns with the real-world
- creatively construct patterns
- reflect on the strategies used by their peers (through sharing component and/or gallery walk) and critically examine these

Extension:

- can you build the same pattern another way
- can you label your pattern

Mathematical Concepts:

The students will know and understand:

Kindergarten

- Repeating patterns with two or three elements

Grade One

- Repeating patterns with multiple elements and attributes

Grade Two

- Repeating and increasing patterns

Assessment:

Record the number of attributes students were able to use.
Record whether or not students were able to label or translate their patterns.