

Davison Community Schools
ADVISORY CURRICULUM COUNCIL
Phase II, February 29, 2016

Developmental Kindergarten Math

Course Essential Questions:

- What role do shapes have in our world?
- Why is the number 10 an important number in our number system?
- What does it mean to compare and order objects?
- How does data help us make sense of our world?
- Why are there different ways to count?

MAJOR CLUSTERS	- areas of intensive focus, where students need fluent understanding and application of the core concepts.	approximately 70%
SUPPORTING CLUSTERS	- rethinking and linking; areas where some material is being covered, but in a way that applies core understandings.	approximately 20%
ADDITIONAL CLUSTERS	- expose students to other subjects, though at a distinct, level of depth and intensity.	approximately 10%

*Tier 3 Vocabulary Words are highlighted in yellow

**MP stands for math practice

Unit: Counting and Cardinality: Numbers One to Five

Essential Questions:

- How do we use numbers to count?
- What can help us to recognize numbers quickly and accurately without counting?

Essential Understanding:

- quantities are represented with numbers that are written with numerals
- the last number said when counting is how many objects the quantity has
- with small quantities of objects we subitize to determine how many there are

Curriculum Standards- DOK noted where applicable with Standards

Early Number Sense Learning Trajectory:

- **Subitizing**-ability to see small amounts as a whole and can perceive the amount without counting.
- **Magnitude**-ability to tell which of two sets has more without counting.
- **Counting** - ability to say the counting sequence before their one-to-one correspondence has developed
 - *Pre-counting*-Says some number words
 - *Chanter*-Says some words in sequence (singsong)
 - *Reciter*-Says some number words in sequence (w/out song)
 - *Corresponder*-Counts correctly using one-to-one correspondence up to at least five objects, but does not yet employ cardinality when asked, "How many"
 - *Counter to five*-Counts one to five objects meaningfully (now using cardinality)
 - *Producer*-Counts out a collection up to five
 - *Counter to ten*-Counts one to ten objects meaningfully
 - *Counter and producer* (more than ten)-Counts higher than ten, even when counting unorganized objects. Counter from n, using patterns, keeping track, forward and backward.

- **One-to-one correspondence**-say one number for each object counted
- **Cardinality**-the last number you say when counting a group of objects tells how many there are in all.
- **Hierarchical inclusion**-numbers build by exactly one each time-smaller numbers are part of bigger numbers.
- **Part/Whole relationship**-understand the parts of a number.(6 is made up of 5 and 1, 4 and 2, .and 3 and 3)
- **Compensation**-ability to see the parts of the whole and then to compensate to make friendlier numbers.
- **Unitizing**-in larger numbers they see numerals taking on different meaning depending on where it is in the number.

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).

K.CC.4 - Count to tell the number of objects. Understand the relationship between numbers and quantities; connect counting to cardinality.

- a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
- b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

K.CC.5 - Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

MP-Make sense of problems and persevere in solving them

MP: Reason abstractly and quantitatively

MP-Construct viable arguments and critique the reasoning of others

MP: Model with mathematics

MP: Use appropriate tools strategically

MP: Attend to Precision

MP: Look for and make use of structure

MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> ● quantities are represented using numbers and represent numbers using quantities ● the number of objects is the same regardless of their arrangement of the order in which they were counted ● that the last number name said tells the number of objects counted. 	<ul style="list-style-type: none"> ● write numbers 0 to 20 ● write the number that represents a given number of objects from 0-20 ● match each object with one and only one number name and each number with one and only one object. ● say the number names in order while matching each object with a number when counting objects. ● count out 1-20 objects ● count up to 20 objects arranged in a line, array, ● count as many as 10 objects in a scattered configuration.

Phase II Curriculum

Unit: Counting and Cardinality: Comparing and Ordering 0 to 5

Essential Questions:

- How do we use numbers to compare?
- Why is five a special/helpful number?
- How do numbers relate to each other?

Essential Understanding:

- numbers represent quantities which can be compared by the number of objects in each quantity.
- successive numbers increase in quantity by one.

Curriculum Standards- DOK noted where applicable with Standards

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).

K.CC.4 - Count to tell the number of objects. Understand the relationship between numbers and quantities; connect counting to cardinality.

- b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- c. Understand that each successive number name refers to a quantity that is one larger.

K.CC.5 - Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

MP-Make sense of problems and persevere in solving them

MP: Reason abstractly and quantitatively

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MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content

I Know ...

- quantities are represented using numbers and represent numbers using quantities
- the number of objects is the same regardless of their arrangement or the order in which they were counted
- that the last number name said tells the number of objects counted.
- that each successive number name refers to a quantity that is one larger.

Skills/Processes

I Can ...

- write numbers 0 to 20
- write the number that represents a given number of objects from 0-20
- say the number names in order while matching each object with a number when counting objects.
- count out 1-20 objects
- count up to 20 objects arranged in a line, array,
- count as many as 10 objects in a scattered configuration.

Phase II Curriculum

Unit: Counting and Cardinality: Six to Ten

Essential Questions:

- How do we use numbers to count?
- What can help us to recognize numbers quickly and accurately without counting?

Essential Understanding:

- we use numbers to represent how many objects are in a quantity so discussing quantities is more efficient
- subitizing helps us determine quantities without having to actually count

Curriculum Standards- DOK noted where applicable with Standards

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).

K.CC.4 - Count to tell the number of objects. Understand the relationship between numbers and quantities; connect counting to cardinality.

- When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
- Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- Understand that each successive number name refers to a quantity that is one larger.

K.CC.5 - Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

MP-Make sense of problems and persevere in solving them

MP: Reason abstractly and quantitatively

MP-Construct viable arguments and critique the reasoning of others

MP: Model with mathematics

MP: Use appropriate tools strategically

MP: Attend to Precision

MP: Look for and make use of structure

MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content

I Know ...

- quantities are represented using numbers and represent numbers using quantities
- the number of objects is the same regardless of their arrangement or the order in which they were counted
- that the last number name said tells the number of objects counted.
- that each successive number name refers to

Skills/Processes

I Can ...

- write numbers 0 to 20
- write the number that represents a given number of objects from 0-20
- match each object with one and only one number name and each number with one and only one object.
- say the number names in order while matching each object with a number when counting

a quantity that is one larger.

objects.

- count out 1-20 objects
- count up to 20 objects arranged in a line, array,
- count as many as 10 objects in a scattered configuration.

Phase II Curriculum

Unit: Counting and Cardinality: Comparing and Ordering Numbers 0 to 10

Essential Questions:

- How do we use numbers to compare?
- Why is five a special/helpful number?
- How do numbers relate to each other?

Essential Understanding:

- numbers represent quantities which can be compared by the number of objects in each quantity.
- successive numbers increase in quantity by one.

Curriculum Standards- DOK noted where applicable with Standards

- K.CC.2** - Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
- K.CC.4** - c. Understand that each successive number name refers to a quantity that is one larger.
- K.CC.6** - Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.)
- K.CC.7** - Compare two numbers between 1 and 10 presented as written numerals.

- MP-Make sense of problems and persevere in solving them
- MP-Reason abstractly and quantitatively**
- MP-Construct viable arguments and critique the reasoning of others
- MP-Model with mathematics**
- MP-Use appropriate tools strategically**
- MP-Attend to precision**
- MP-Look for and make use of structure**
- MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content

I Know ...

- that each successive number name refers to a quantity that is one larger.
- greater than, less than, or equal to.
- the quantity of each numeral 1-10

Skills/Processes

I Can ...

- count forward verbally by ones
- determine whether a group of 10 or fewer objects is greater than, less than, or equal to another group of 10 or fewer objects.
- compare written numerals to determine if they are greater than, less than, or equal to each other.

Phase II Curriculum

Unit: Counting and Cardinality: Numbers to 20

Essential Questions:

- How do we use numbers to count?
- What can help us to recognize numbers quickly and accurately without counting?

Essential Understanding:

- we use numbers to represent how many objects are in a quantity so discussing quantities is more efficient
- subitizing helps us determine quantities without having to actually count

Curriculum Standards- DOK noted where applicable with Standards

K.CC.2 - Count forward beginning from a given number within the known sequence (instead of having to begin at 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).

K.CC.4 - Count to tell the number of objects. Understand the relationship between numbers and quantities; connect counting to cardinality.

- b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

MP-Make sense of problems and persevere in solving them

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MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content

I Know ...

- quantities are represented using numbers and represent numbers using quantities
- the number of objects is the same regardless of their arrangement or the order in which they were counted
- that the last number name said tells the number of objects counted.

Skills/Processes

I Can ...

- Count forward verbally by ones
- write numbers 0 to 20
- write the number that represents a given number of objects from 0-20
- say the number names in order while matching each object with a number when counting objects.

Phase II Curriculum

Unit: Geometry: Positions and Locations of Shapes

Essential Questions:

- What makes a square a square, a circle a circle,...
- What shapes do we see in our environment?
- How do we describe the position of objects relative to other objects?

Essential Understanding:

- shapes can be found all around us in the world
- we use words like above, behind, below, in front of to describe relative position

Curriculum Standards- DOK noted where applicable with Standards

K.G.1 - Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

MP-Make sense of problems and persevere in solving them

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MP-Construct viable arguments and critique the reasoning of others

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LEARNING TARGETS

Knowledge/Content

I Know ...

- the shape words (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)
- the positional words (above, below, in front of, behind, and next to)

Skills/Processes

I Can ...

- describe objects in the environment using shape words
- use positional words such as above, below, beside, in front of, behind, and next to.
- determine the relative position of the position of 2- or 3- dimensional shapes within the environment, using the appropriate positional words to describe them

Phase II Curriculum

Unit: Measurement and Data

Essential Questions:

- How can I organize data I collect?
- What questions can I investigate?
- What are some ways we can sort a group of objects?
- What are different ways I can represent data I collect?
- How does data help us make predictions?

Essential Understanding:

- we can use our counting and comparing of numbers to answer questions and make predictions.

Curriculum Standards- DOK noted where applicable with Standards

K.MD.3 - Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)

MP-Make sense of problems and persevere in solving them

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LEARNING TARGETS

Knowledge/Content

I Know ...

- non-measurable attributes such as shape and color
- measurable attributes such as **length, weight, and height**
- what **classify** and **sort** mean
- that a category is the group that an object belongs to according to a particular, selected attribute.
- one to one correspondence with ten or less objects

Skills/Processes

I Can ...

- count objects in a given group
- sort objects into categories then determine the order by number of objects in each category (limit category counts to be less than or equal to ten)

Phase II Curriculum

Unit: Counting and Cardinality: Numbers to 60

Essential Questions:

- How do we use numbers to count?
- What can help us to recognize numbers quickly and accurately without counting?

Essential Understanding:

- we use numbers to represent how many objects are in a quantity so discussing quantities is more efficient
- subitizing helps us determine quantities without having to actually count

Curriculum Standards- DOK noted where applicable with Standards

K.CC.1 - Count to 60 by ones and by tens.

K.CC.2 - Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.CC.4 - Count to tell the number of objects. Understand the relationship between numbers and quantities; connect counting to cardinality.

b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

c. Understand that each successive number name refers to a quantity that is one larger.

K.CC.5 - Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

MP-Make sense of problems and persevere in solving them

MP-Reason abstractly and quantitatively

MP-Construct viable arguments and critique the reasoning of others

MP-Model with mathematics

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LEARNING TARGETS

Knowledge/Content

I Know ...

- the numerals from 0-60
- quantities are represented using numbers and represent numbers using quantities
- the number of objects is the same regardless of their arrangement or the order in which they were counted
- that the last number name said tells the number of objects counted.
- that each successive number name refers to a quantity that is one larger.

Skills/Processes

I Can ...

- count to 60 by ones starting at 0
- count to 60 by tens
- count forward verbally by ones
- say the number names in order while matching each object with a number when counting objects.
- match each object with one and only one number name and each number with one and only one object.
- count out 1-20 objects
- count up to 20 objects arranged in a line, array,

	<ul style="list-style-type: none"> count as many as 10 objects in a scattered configuration.
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Phase II Curriculum

Unit: Measurement

<p>Essential Questions:</p> <ul style="list-style-type: none"> Why are objects measured? What attributes of an object can be measured? What are different ways objects can be measured? How can I tell which of two objects is longer than the other? How can I tell which of two objects is heavier? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> Objects are measured and compared with attributes like height and weight.
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Curriculum Standards- DOK noted where applicable with Standards

K.MD.1 - Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.2 - Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

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LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none"> that objects have measurable attributes and know what they are called, such as length and weight the meaning of a variety of attributes two objects can be compared using a particular attribute using words like (taller, shorter, longer, larger, smaller) 	<ul style="list-style-type: none"> describe an object using multiple attributes such as: width, height, length, weight, etc. compare two objects and determine which has more or less of a measurable attribute describe the measurable attribute difference

Phase II Curriculum

Unit: Composing Numbers

Essential Questions:

- What does it mean to combine (compose) numbers?
- What are some ways that we can show the same number in different ways?
- How do teen numbers lay the foundation for place value?

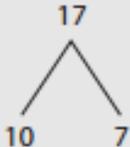
Essential Understanding:

- Numbers can be combined or composed and represented by a new number.

Curriculum Standards- DOK noted where applicable with Standards

K.NBT.1 - **Compose** and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Number-bond diagram and equation

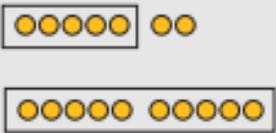


17
10 7

$17 = 10 + 7$

Decompositions of teen numbers can be recorded with diagrams or equations.

5- and 10-frames



Children can place small objects into 10-frames to show the ten as two rows of five and the extra ones within the next 10-frame, or work with strips that show ten ones in a column.

MP-Make sense of problems and persevere in solving them

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MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content I Know ...	Skills/Processes I Can ...
<ul style="list-style-type: none">• that numbers 11 - 19 represent a quantity• that numbers 11 - 19 are composed of 10 ones one, two, three, four, ..., nine ones	<ul style="list-style-type: none">• represent compositions of 11-19 by a drawing

Phase II Curriculum

Unit: Geometry: Analyzing, Comparing, and Composing Shapes

Essential Questions:

- What can we do to identify the shapes
- What shapes can we create by combining two or more shapes?

Essential Understanding:

- Shapes can be identified using attributes that are unique to them.
- The size and orientation of a shape does not affect the name of the shape
- New shapes can be combined to create new shapes

Curriculum Standards- DOK noted where applicable with Standards

K.G.2 - Correctly name shapes regardless of their orientations or overall size.

K.G.3 - Identify shapes as two-dimensional (lying in a plane, "flat").

K.G.4 - Analyze and compare two-, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.5 - Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6 - Compose simple shapes to form larger shapes. For example, "can you join these two triangles with full sides touching to make a rectangle?"

MP-Make sense of problems and persevere in solving them

MP-Reason abstractly and quantitatively

MP-Construct viable arguments and critique the reasoning of others

MP-Model with mathematics

MP-Use appropriate tools strategically

MP-Attend to precision

MP-Look for and make use of structure

MP-Look for and express regularity in repeated reasoning

LEARNING TARGETS

Knowledge/Content

I Know ...

- that size does not affect the name of the shape
- that orientation does not affect the name of the shape
- the difference between 2- and 3- dimensional shapes
- the basic shapes
- examples of the basic shapes in the real-world

Skills/Processes

I Can ...

- name shapes, regardless of orientation or size
- determine if an object is 2-dimensional
- identify attributes of shapes
- describe attributes of a variety of 2-dimensional shapes
- analyze and compare 2-shapes, in different sizes and orientations, describing their similarities, differences, and other attributes
- draw shapes found in the environment
- construct shapes from components
- analyze how to put simple shapes together to

compose a new or larger shape

- compose a new or larger shape using more than one simple shape