

# Growing a Strong STEM

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*Springdale Elementary School, Community Farmers Markets, The Wylde Center, Stewart Center, Forever Family*

Planning a Year of Science Lessons in the Garden

Lesson Format in the Garden Classroom

Essentials Tools for a Garden Classroom

Management in a Garden Classroom

Science Connections in the Garden

Planning a Year of Math Lessons in the Kitchen Classroom

Lesson Format in the Kitchen Classroom

Essentials Tools for a Kitchen Classroom

Management in a Kitchen Classroom

Math Connections in the Kitchen

Data Collection



# Planning a Year of Science Lessons in the Garden

1. District Pacing Guide
2. Planting Calendar



# Science Pacing Calendar

Atlanta Public Schools – Fall 2014

	8/4	8/11	8/18	8/25	9/1	9/8	9/15	9/22	9/29	10/6	Fall Break	10/13	10/20	10/27	11/3	11/10	11/17	Break	12/1	12/8	12/15	
K	Scientific Inquiry Skills		Living and Non-Living		Plants							Animals							Matter			
1			Plants and Animals									Magnets							Magnets			
2			Life Cycles									Seasonal Changes							Properties of Matter			
3			Habitats									Interdependence of Man							Heat Energy			
4			Ecosystems									Sound and Light							Forces and Motion			
5			Cells and Microorganisms				Genetics					Classification							Chemical and Physical Changes			

# Science Pacing Calendar

Atlanta Public Schools – Spring 2015

	1/5	1/12	1/19	1/26	2/2	2/9	Break	2/16	2/23	3/2	3/9	3/16	3/23	3/30	Spring Break	4/13	4/20	4/27	5/4	5/11	5/18	
K	Gravity and Motion							Day and Night								Rocks and Soils				Review		
1	Sound							Light and Shadows				Weather and Seasons				Water				Review		
2	Energy							Pushes and Pulls								Night Sky				Review		
3	Magnets							Rocks and Soils				Fossils				Review						
4	Stars and Solar System							Weather								Review						
5	Electricity and Magnetism							Earth								Review						

# Planting Calendar

## Atlanta Public Schools – Fall 2014

[illegible]



# Planting Calendar

## Atlanta Public Schools – Spring 2015

[illegible]

# Lesson Format in a Garden Classroom

The research conducted by Dr. Madeline Hunter showed that effective teachers use a methodology when they are planning and presenting a lesson. She discovered that no matter what the teacher's style, grade level of students, the subject matter being taught, or economic background of the students, an organized lesson consists of these elements that enhances and maximizes student learning.

*Engage*

*Explore*

*Explain*

*Extend*

*Evaluate*



# Management in a Garden Classroom

Expectations  
Boundaries  
Differentiated Groups  
Rewards / Consequences  
Student Selection

## Essential Tools for a Garden Classroom

Clipboards

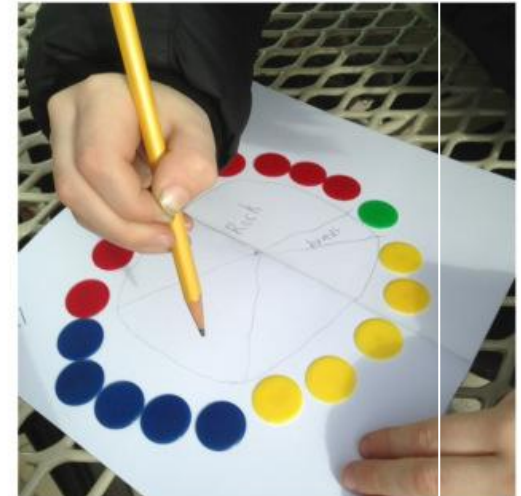
Pencils

Journals

Magnifying Glasses

Tape Measures

Thermometers





# Science Connections in the Garden

Georgia Performance Standards (By Domain, K-12)

## Earth Science

Astronomy (K, 2, 4, 6)

Rocks and Soils (K, 3, 5, 6)

Weather and Seasons (1, 4, 6)

## Life Science

Features of Plants and Animals (K, 1, 3, 5, 7)

Life Cycles (K, 1, 2, 5, 7)

Habitats and Ecosystems (3, 4, 7)

## Physical Science

Matter (K, 2, 5, 8)

Energy - Motion (K, 2, 4, 8)

Energy - Sound (1, 4, 8)

Energy - Light (1, 4, 8)

Magnets (1, 3, 5, 8)

	Earth Science	Life Science	Physical Science
K	<ul style="list-style-type: none"> <li>Day and night sky</li> <li>Rocks and soils</li> </ul>	<ul style="list-style-type: none"> <li>Living and non-living</li> <li>Plants and animals</li> <li>Parents and offspring</li> </ul>	<ul style="list-style-type: none"> <li>Physical attributes, 5 senses</li> <li>Composition of materials</li> <li>Motion</li> </ul>
1	<ul style="list-style-type: none"> <li>Weather patterns</li> <li>Seasons</li> </ul>	<ul style="list-style-type: none"> <li>Characteristics of living things</li> <li>Basic needs of living things</li> </ul>	<ul style="list-style-type: none"> <li>Sound</li> <li>Shadows</li> <li>Magnets</li> </ul>
2	<ul style="list-style-type: none"> <li>Motion and patterns of celestial bodies</li> <li>Changes of the earth's surface</li> </ul>	<ul style="list-style-type: none"> <li>Life cycles</li> </ul>	<ul style="list-style-type: none"> <li>Changing attributes of materials</li> <li>States of matter (solid, liquid, gas)</li> <li>Motion, pushes and pulls</li> </ul>
3	<ul style="list-style-type: none"> <li>Rocks and minerals of Georgia</li> <li>Soils and weathering</li> <li>Fossils</li> </ul>	<ul style="list-style-type: none"> <li>Habitats</li> <li>Features of organisms in Georgia</li> <li>Pollution and conservation</li> </ul>	<ul style="list-style-type: none"> <li>Heat energy</li> <li>Magnets</li> </ul>
4	<ul style="list-style-type: none"> <li>Stars and star patterns</li> <li>Solar system</li> <li>Weather - data and forecasting</li> </ul>	<ul style="list-style-type: none"> <li>Ecosystems</li> <li>Food web / food chain</li> <li>Adaptation - survival / extinction</li> </ul>	<ul style="list-style-type: none"> <li>Light and sound</li> <li>Force, mass, and motion (simple machines)</li> <li>Effects of gravity</li> </ul>
5	<ul style="list-style-type: none"> <li>Landforms of Georgia</li> <li>Effects of constructive and destructive forces</li> <li>Role of technology in control</li> </ul>	<ul style="list-style-type: none"> <li>Classification of organisms</li> <li>Inheritance of traits</li> <li>Learned behaviors</li> <li>Cells and microorganisms</li> </ul>	<ul style="list-style-type: none"> <li>Conservation of matter</li> <li>Physical changes</li> <li>Chemical changes</li> <li>Electricity and magnetism</li> </ul>
6	<ul style="list-style-type: none"> <li>Meteorology</li> <li>Oceanography</li> <li>Earth materials</li> <li>Earth in space</li> <li>Human impact on Earth</li> <li>Energy sources</li> </ul>		
7		<ul style="list-style-type: none"> <li>Diversity of living things</li> <li>Dichotomous key</li> <li>Structure and function of cells</li> <li>Tissues, organs, and organ systems</li> <li>Purpose of human body organ systems</li> <li>Heredity and genes</li> <li>Ecosystems</li> <li>Cycling of matter and energy</li> <li>Biological evolution</li> <li>Natural selection and fossil record</li> </ul>	
8			<ul style="list-style-type: none"> <li>Nature of matter</li> <li>Atomic theory / periodicity</li> <li>Conceptual acid / base - phase changes</li> <li>Law of conservation of matter</li> <li>Law of conservation of energy</li> <li>Conceptual laws of motion and forces</li> <li>Conceptual energy transformation</li> <li>Wave properties</li> <li>Electrical / magnetic forces</li> </ul>

High school students choose from a variety of in-depth courses including: Astronomy, Biology, Botany, Chemistry, Earth Systems, Ecology, Entomology, Environmental Science, Epidemiology, Forensic Science, Geology, Human Anatomy and Physiology, Meteorology, Microbiology, Oceanography, Physical Science, Physics, Zoology.

# Earth Science

## Weather and Seasons

- 1 - Weather patterns and seasons
- 4 - Weather data and forecasting

## Astronomy

- K - Day and night sky
- 2 - Motion and patterns of celestial bodies
- 4 - Solar system, stars, and star patterns



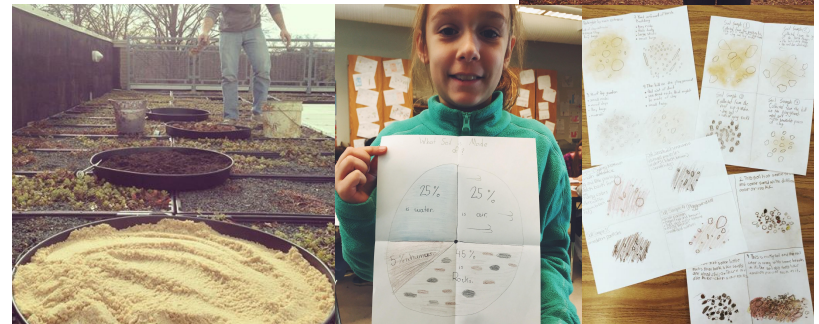
## Silent Reflection Time Outside *(to bring awareness to the season and the changes)*

- What is happening with the weather? What is the temperature? What is the recent rain fall? (Track on a line graph)
- What is happening in the sky? Where is the sun/moon positioned? What do the clouds look like? (Model)
- What is happening with the trees? (Illustrate)
- What is happening in the garden? (Illustrate)
- What is happening with the people? What are people wearing? What are people doing? (Illustrate)
- What is happening with the animals? (Illustrate)



## Rocks and Soils

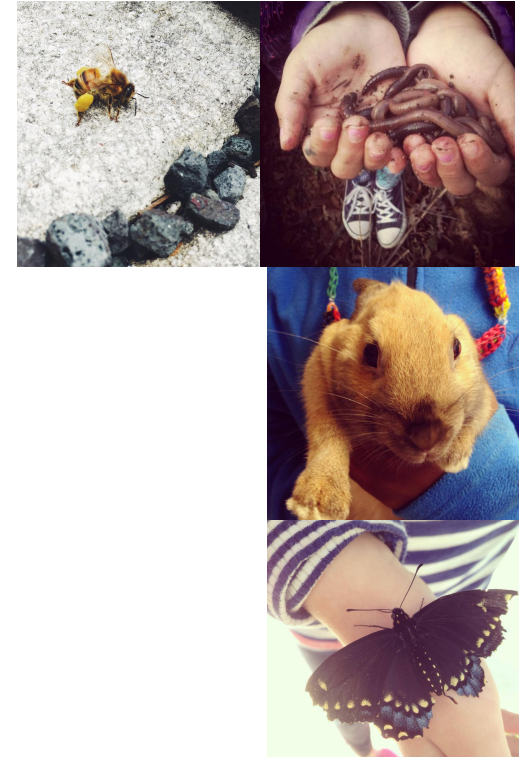
- K - Rocks and soils
- 3 - Rocks and minerals, weathering, soils, fossils
- 5 - Constructive and destructive forces, landforms of Georgia



# Life Science

## Features of Plants and Animals

- K - Living and non-living / plants and animals
- 1 - Characteristics of living things
  - Plant parts - root, stem, leaf, flowers
  - Animal characteristics - appearance, motion, growth, basic needs
- 3 - Adaptations of living things
- 5 - Classification of living things
  - Animals - vertebrate/invertebrate; fish, amphibian, reptile, bird, mammal
  - Plants - families, genus



## Life Cycles

- K - Parents and offspring
- 1 - Plant and animal needs to grow and thrive
- 2 - Life cycles of mammal, bird, amphibian, insect, tree, fungi
- 5 - Inheritance of traits



## Habitats and Ecosystems





# Physical Science

## Matter

- K - Physical attributes and composition of materials
- 2 - Changing states of matter
- 5 - Physical and chemical changes

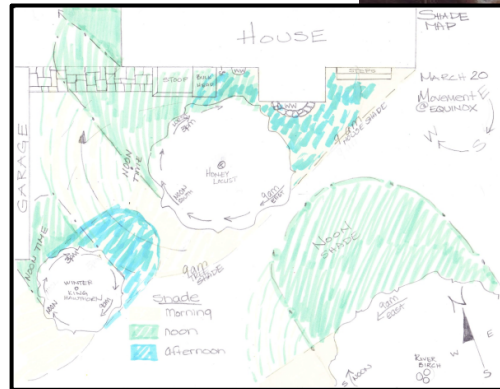
## Energy - Motion

- K - Motion
- 2 - Pushes and pulls
- 4 - Force, mass and motion (simple machines)

## Energy - Sound (1, 4, 8)

## Energy - Light (1, 4, 8)

## Magnets (1, 3, 5, 8)



# Planning a Year of Math Lessons in the Kitchen Classroom

1. District Pacing Guide
2. Harvesting Calendar





# Math Pacing Calendar

## Atlanta Public Schools – Fall 2014

	8/4	8/11	8/18	8/25	9/1	9/8	9/15	9/22	9/29	10/6	Fall Break	10/13	10/20	10/27	11/3	11/10	11/17	Break	12/1	12/8	12/15		
K	Geometry			Counting and Cardinality								Numbers and Operations in Base Ten							Operations and Algebraic Thinking				
1	Numbers and Operations in Base Ten											Operations and Algebraic Thinking							Operations and Algebraic Thinking				
2	Numbers and Operations in Base Ten							Operations and Algebraic Thinking				Operations and Algebraic Thinking			Measurement and Data				Measurement and Data				
3	Numbers and Operations in Base Ten							Operations and Algebraic Thinking				Operations and Algebraic Thinking							Operations and Algebraic Thinking				
4	Numbers and Operations in Base Ten							Fractions				Fractions							Fractions				
5	Operations and Algebraic Thinking											Numbers and Operations in Base Ten							Fractions				

# Math Pacing Calendar

## Atlanta Public Schools – Spring 2015

	1/5	1/12	1/19	1/26	2/2	2/9	Break	2/16	2/23	3/2	3/9	3/16	3/23	3/30	Spring Break	4/13	4/20	4/27	5/4	5/11	5/18	
K	Operations and Algebraic Thinking							Operations and Algebraic Thinking								Measurement and Data						
1	Numbers and Operations in Base Ten							Geometry				Measurement and Data				Measurement and Data						
2	Numbers and Operations in Base Ten							Operations and Algebraic Thinking								Geometry						
3	Geometry				Fractions			Fractions				Measurement and Data				Review						
4	Fractions		Operations and Algebraic Thinking					Geometry				Measurement and Data				Review						
5	Fractions		Measurement and Data					Geometry								Review						

## A close-up photograph of a plant, likely a species of knotweed. The image shows several large, ovate leaves with prominent yellow veins and greenish-yellow overall color. The leaves have serrated margins and some minor damage or staining. A thick, upright, and highly textured stem is visible in the upper left, showing a bumpy, almost scaly surface. The background is blurred, showing more foliage and a natural, outdoor setting.

Visit us online at [www.georgiaorganics.org](http://www.georgiaorganics.org)

[www.farmatl.org](http://www.farmatl.org)



# WINTER MARKET

## EVERY SATURDAY

McDONOUGH & TRINITY ST

**DOWNTOWN DECATUR**

10 AM to 1 PM



**VEGGIES  
PASTRIES  
Meats CHEESES**

**HOT FOOD  
SPREADS  
BREADS & MORE**

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### What's In Season?

- Arugula
- Beets
- Bok Choy
- Cabbage
- Carrots
- Cheese
- Herbs
- Honey
- Jams
- Kale
- Lettuce
- Mustard Greens
- Meats
- Radishes
- Sweet potatoes
- Turnips
- Winter Squash

### This Week's Vendors

- 4 Bellies Farm

### This Week at the Market...

Hello 2015! We are extremely excited to offer one of the few winter markets in the city. Each Saturday morning from January to March you can count on local produce from several farms bringing meats and vegetables. We have also a wonderful array of prepared food to have at market or to take home, from some of your favorite vendors and new ones as well.

Keep an eye out for the upcoming newsletters and social media communications to learn more about the products available during the winter months.

*We are open from 10am to 1pm next to Decatur High School, on the corner on N. McDonough and Trinity Streets. See you there!*

### Winter Vendors

- 4 Bellies Farm
- Capra Gia
- Crepe masters
- Earth Biscuit Crackers - Starting Jan. 17th
- Formaggio
- Furrowed Earth Farm
- Heavenly Breads
- Hidden Springs Honey
- Jen's Pesto
- Jimella's Bakery
- La Calavera Bakery
- Low Low Knows Bones
- Mountain Earth Farms
- Moon Organics

# Lesson Format in a Kitchen Classroom

## Raw Taste Tests

## Demonstration

Teacher models the creation of a recipe.

## Interactive Lesson

Teacher guides the students in the creation of a recipe.

1. Each group with a specific task (for a class dish)
2. Each member of each group with a specific task (for a group dish)

## Cooking Show

Student(s) independently create a recipe.



# Management in a Kitchen Classroom

Expectations  
Boundaries  
Forming Community  
Differentiated Groups  
Rewards / Consequences  
Student Selection

## Essential Tools for a Kitchen Classroom

### Hand Tools

Knives  
Choppers  
Graters  
Salad Spinners

### Appliances

Blender  
Induction Burner  
Countertop Oven



# Math Connections in the Kitchen Classroom

Counting and Cardinality (K)

Numbers and Operations in Base Ten (K-5)

The Number System (6-8)

Operations and Algebraic Thinking (K-5)

Expressions and Equations (6-8)

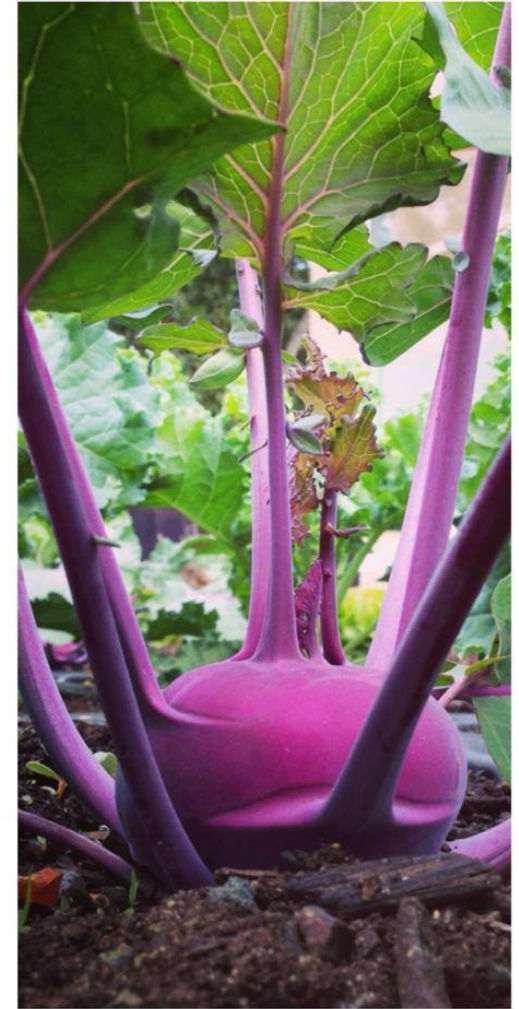
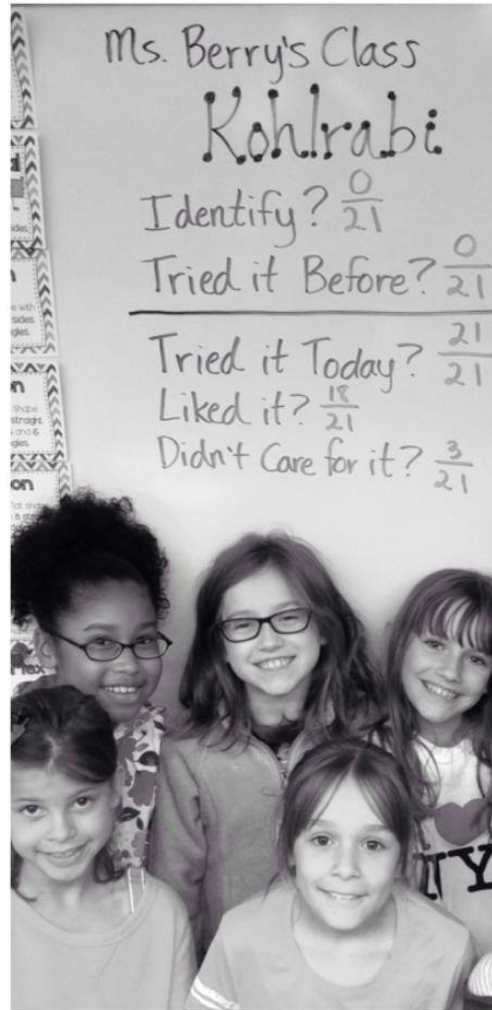
Numbers and Operations with Fractions (3-5)

Measurement and Data (K-5)

Geometry (K-8)

Ratios and Proportional Relationships (6-8)

Statistics and Probability (6-8)



*High school students delve deeper into statistics and probability, number and quantity, algebra, and functions.*

# Counting and Cardinality (K)

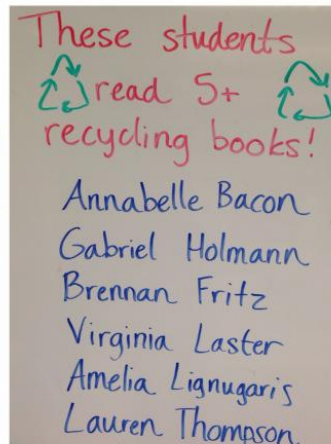
know number names and sequence, count to tell the number of objects, compare numbers

## Numbers and Operations in Base Ten (K-5)

understand place value system, use place value understanding and properties of operations to add and subtract, multiply and divide

## The Number System (6-8)

compute fluently with multi-digit numbers and find factors and multiples



# Operations and Algebraic Thinking (K-5)

represent and solve problems involving addition and subtraction

represent and solve problems involving multiplication and division

understand properties of and relationships between operations

# Expressions and Equations (6-8)

apply and extend understanding of arithmetic to algebraic expressions

solve real-life mathematical problems using numerical and algebraic expressions and equations


understand the connections between proportional relationships and linear equations

**Switch Witch**  
Participation

Brown	MH MH II	42	
Brigant	MH II	105	
Gulledge	MH MH I		
Hobbs	MH MH	35%	
Metcalen	MH		
Purkey	II		
Timerson	MH MH I	42	
Madlen	MH I	120	
Mailman	MH		20
Purcell	MH MH	35%	
White	MH MH I		667
Berry	MH IIII	31	
Fellows	MH III	113	
Marquis Davis		27%	30%
Pecora	MH MH II		
Scoutley	II		
Bordger	MH I	37	
Engish	MH I	109	
Lockwood	MH IIII		
Neal	MH MH I	34%	
Wyndham	MH		
Butler	IIII	25	
Naman	MH III	104	
Southcombe	MH II	24%	
Thurman	MH I		
Hall	MH	18	
Mckie	III	86	
Redel	MH		
Ridgins	MH	21%	

**Switch Witch**

70 lbs  
30 lbs  
30 lbs  
35 lbs  
15 lbs  
180 lbs of candy!

 = 175 pieces of candy  
We filled our container 63 times.

$$\begin{array}{r} 175 \\ \times 63 \\ \hline 10500 \\ + 11250 \\ \hline 11025 \end{array}$$
11,025 pieces of candy

We learned that each candy has about 10 grams of sugar.

$$11,025 \text{ candies} \times 10 \text{ g of sugar} =$$
110,250 g of sugar



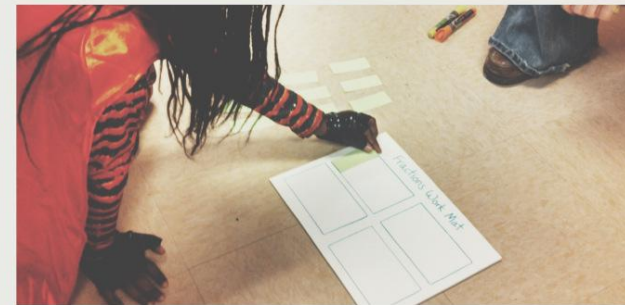
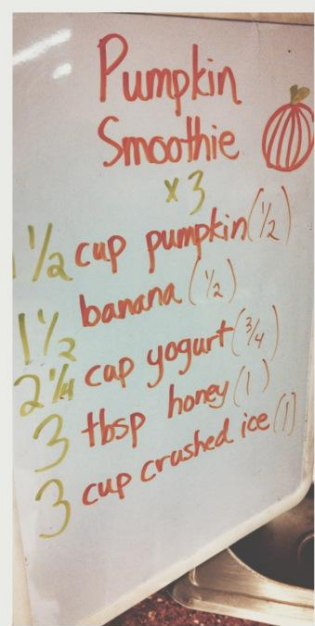
# Numbers and Operations with Fractions

develop understanding of fractions as numbers

extend understanding of fraction equivalence and ordering

understand decimal notation for fractions

add and subtract fractions



# Measurement and Data: Length

measure and estimate lengths, solve problems with measurement and estimation





# Measurement and Data: Time and Money

tell and write time, work with money



# Measurement and Data: Volume

understand concepts of volume

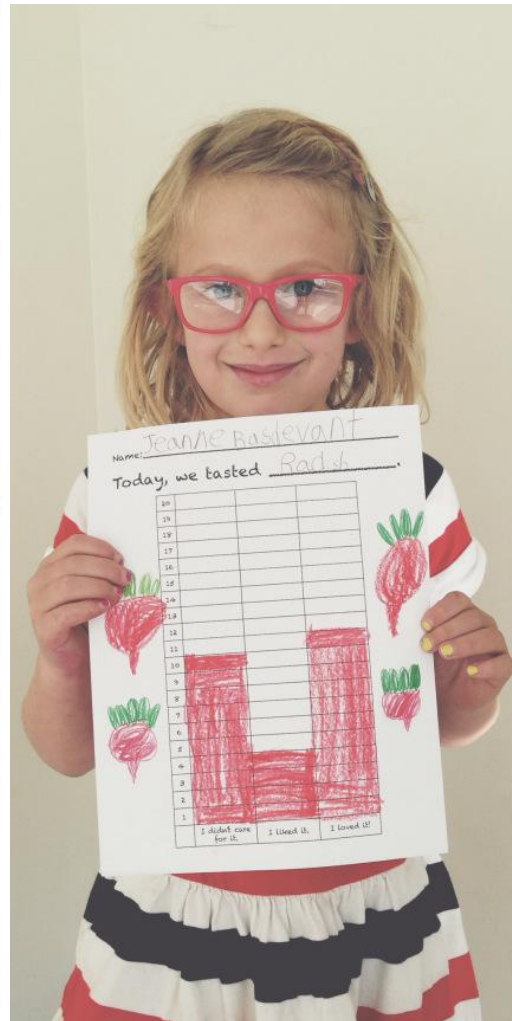
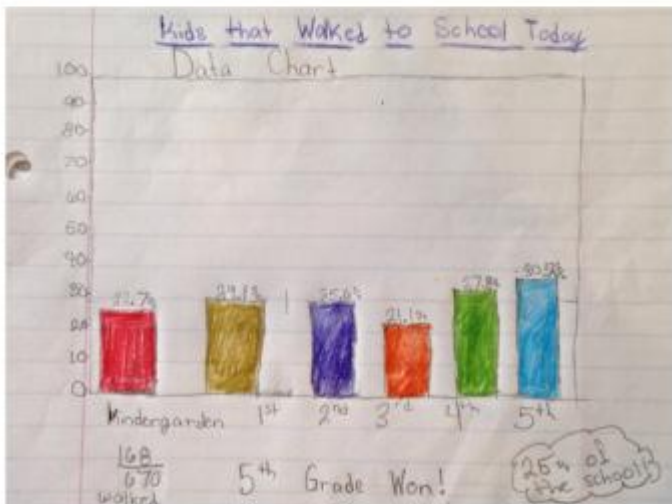




# Measurement and Data: Graphing

represent and interpret data

K<sup>th</sup> 32 students out of 135 = 23.7% of the grade  
 1<sup>st</sup> 29 students out of 120 = 24.1% of the grade  
 2<sup>nd</sup> 29 students out of 113 = 25.6% of the grade  
 3<sup>rd</sup> 23 students out of 109 = 21.1% of the grade  
 4<sup>th</sup> 29 students out of 104 = 27.8% of the grade  
 5<sup>th</sup> 26 students out of 86 = 30.2% of the grade  
  
 5<sup>th</sup> grade got the highest %, but lets  
 give a clap to everybody who walked  
 to school actually 168 students out of  
 670 walked! That's 25.1% of the school!



# Geometry

identify, describe, analyze, compare, create, compose shapes

reasons with shapes and their attributes

draw and identify lines and angles

understand concepts of area, recognize perimeter





# Ratios and Proportional Relationships

understand ratio concepts and use ratio reasoning to solve problems

analyze proportional relationships and use them to solve real-world problems

## Tasting: Dill Dressing

Posted on [October 20, 2013](#) by [Jenna Shea](#) [Edit](#)

Serving vegetables with a tasty dressing is a great way to get kids to try something new for the first time. This dill dressing from [Schoolyard Sprouts](#) is one of our favorites. I like it because it's a big idea more than a recipe so kids can be creative and mix it perfect to their taste.



First, combine 1 part plain yogurt (or sour cream) with 2 parts mayonnaise.



Then, squeeze in some lemon juice and add some fresh dill to taste.





# Statistics and Probability

develop understanding of statistical variability

summarize and describe distributions

use random sampling to draw inferences about a population

draw informal comparative inferences about two populations

