Unit 5: Graphs, Data, Shapes, & Their Attributes

Content Area: **Math**
Course(s): **Sample Course**
Time Period: **MayJun**
Length: **approx. 6 weeks / 2nd Grade**
Status: **Published**

Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Mathematics: Grade 2

Unit 5: Graphs, Data, Shapes & Their Attributes

Belleville Board of Education

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Board Approved: August 30, 2017

Unit Overview

Unit 5 focuses on graphs, data, shapes, and thier attributes.

- Students will learn how to represent and interpret data.
- Students will learn how to reason with shapes and their attributes.

NJSLS

Below are the New Jersey Student Learning Standards associated with the student learning objectives for Unit 5.

MA.2.G.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
MA.2.G.A.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
MA.2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
MA.2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
MA.2.MD.D.9	Generate measurement data by measuring lengths of several objects to the nearest whole

	unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
MA.2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
MA.2.OA.C.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Exit Skills

By the end of Unit 5, 2nd grade Math students should be able to:

- Understand line plots
- Work with bar graphs
- Understand picture graphs
- Draw conclusions from graphs
- Learn about 2-Dimensional Shapes
- Identify polygons and angles
- Draw 2-Dimensional Shapes
- Identify cubes
- Divide rectangles into equal squares
- Partition shapes
- Identify equal shapes and different shapes

Enduring Understanding

1. The lengths of objects can be organized in different ways. A line plot can be used as a visual representation of the relative lengths of objects.

2. Different types of data can be displayed on a line plot. Line plots are useful for organizing large sets of data.

3. Bar graphs can be used to organize and display data. The height, or length, of bars in a bar graph makes it easy to compare data.

4. Picture graphs use a single symbol to show data. This makes it easy to compare two or more categories.

5. Picture graphs and bar graphs are useful tools for comparing data.

6. Good math thinkers know how to think about words and numbers to solve problems.

7. Polygons can be classified and sorted based on their attributes.

8. Polygons can be described by their number of sides and angles.

9. Draw two-dimensional shapes based on physical attributes, such as the number of sides and vertices.

10. You can describe a cube by talking about its faces, edges, and vertices. Knowing these attributes helps you draw a cube. You can use dot paper as a tool to draw cubes.

11. A rectangle can be divided into rows and columns of squares that are teh same size; you can count or add in different ways to find the total number of them.

12. A whole can have equal parts.

Essential Questions

- How can line plots, bar graphs, and picture graphs be used to show data and answer questions?
- How can shapes be described, compared, and broken into parts?

Learning Objectives

Objectives: Graphs and Data

- Measure the lengths of objects, then make a line plot to organize the data.
- Draw bar graphs and use them to solve problems.
- Draw picture graphs and use them to solve problems.
- Draw conclusions from graphs.
- Reason about data in bar graphs and picture graphs to write and solve problems.
- Recognize shapes by how they look.
- Describe the plane shapes by how they look.
- Reason about data in bar graphs and picture graphs to write and solve problems.
- Draw cubes and describe how they look.
- Divide rectangels into rows and columns of equalized squares.
- Divide circles and rectangles into halves, thirds, and fourths.
- Make equal shares that do not have the same shape.
- Use repeated reasoning to divide rectangles into rows and columns and to create designs with equal shares.

Interdisciplinary Connections

Math and Science Project STEM

Topic 1-Comparing Objects and Data

- Have students compare thier own backpack with other backpacks in the class. Ask students why they think their own backpack works well for them.
- Discuss with students the differences and similarities among their backpacls. Ask how they could group the backpacks into different categories.
- Extension-Have students measure the height of their own backpack and compare it to the heights of other students' backpacks.

Topic 2- All About Shape

- Discuss with students how different tools have different shapes.
- Ask students if they have noticed that tools are made of shapes that help them work well for a given purpose. For example, scredrivers have a handle, a shaft, and different kinds of tips.
- Extension-Have students think about a project or chore they could do at home. Have them make a list of the tools they would use to do that project of chore.

LA.K-12.NJSLSA.R	Reading
LA.K-12.NJSLSA.W	Writing
SCI.K-2-ETS1	Engineering Design
TECH.8.1.2	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21stcentury.

Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

21st Century/Interdisciplinary Themes

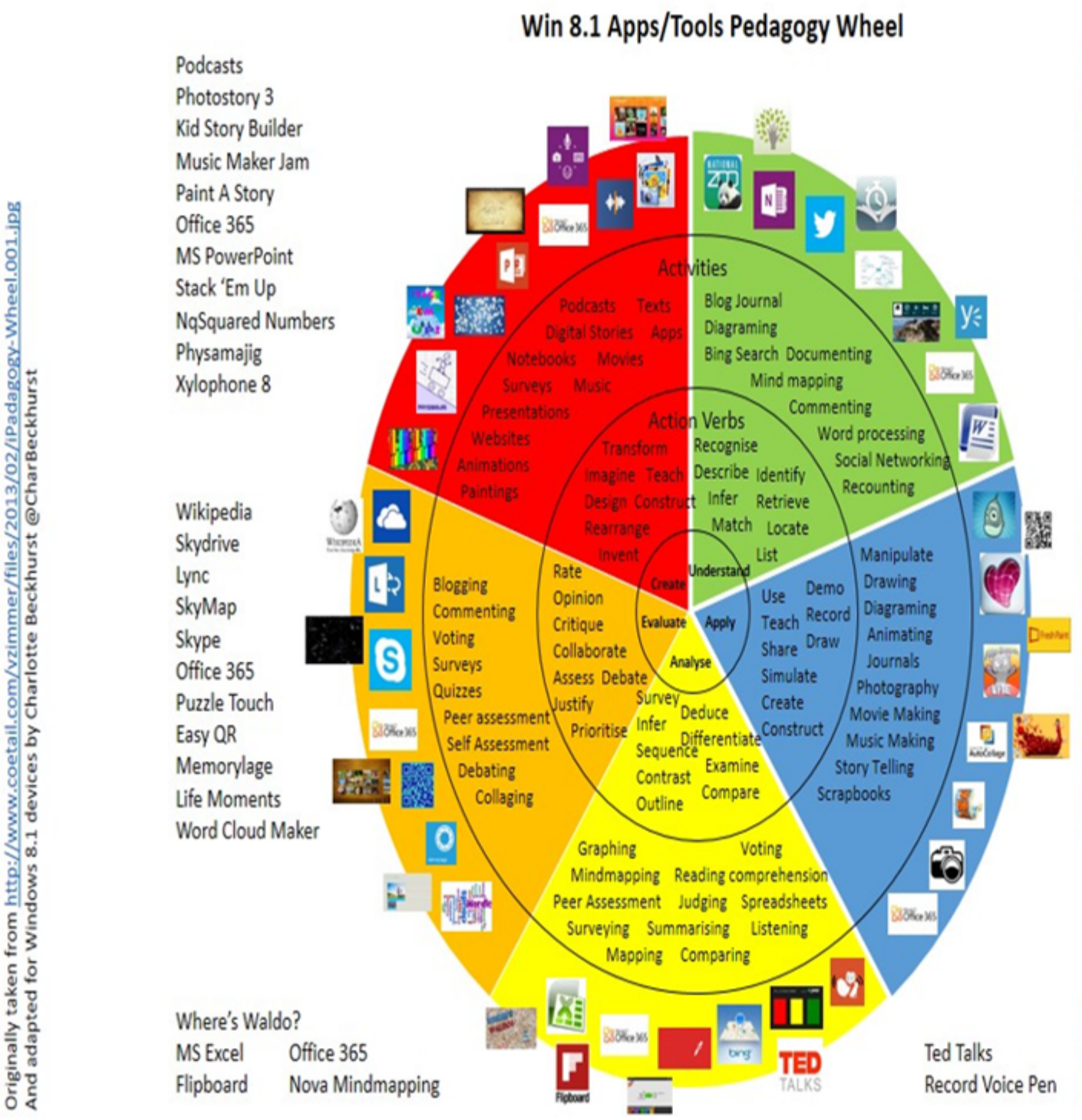
- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

21st Century Skills

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

Technology Infusion

What technology can be used in this unit to enhance learning?



Differentiation

Resources:

- NJDOE: Instructional Supports and Scaffolds for Success in Implementing the Common Core State

Standards http://www.state.nj.us/education/modelcurriculum/success/math/k2/

- enVision math 2.0 Technology Center, Homework and Practice, On-Level and Advanced Activity Centers, and Math Diagnosis and Intervention System 2.0

Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;

- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this secion.

- Admit Tickets
- Anticipation Guide

- Common benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit tests

Primary Resources

enVision math 2.0 Teacher's Guide, Digital Resources, Intervention Activities & State of NJ, Department of Education: New Jersey Model Curriculum

Ancillary Resources

Please list ALL other resources available to strengthen your lesson.