Unit 2: Matter

Content Area: **Science**
Course(s): **Science Gr 2**
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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Science: Grade 2

Unit 2: Matter

Belleville Board of Education

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Unit Overview

In this unit, students will

- describe and classify materials by their observable properties.
- select and use materials based on these properties.
- use evidence to describe how heating and cooling cause changes to matter.
- use evidence to describe reversible and irreversible changes to matter.
- explore how an object can be taken apart and its pieces used to make another object.

Performance Expectations include:

- **2-PS1-1:** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- **2-PS1-2:** Analyze data obtained from testing different materials to determine which materials have properties that are best suited for an intended purpose.
- **2-PS1-3:** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
- **2-PS1-4:** Construct an argument with evidence that some changes caused heating or cooling can be reversed and some cannot.

Lesson 1 Overview:

- Students will explore properties of matter as they discover matter can be described and classified by their properties.

Lesson 2 Overview:

- Students will explore how heating and cooling can cause changes to matter.

Lesson 3 Overview:

- Students will deepen their understanding of matter by exploring that some changes to matter are reversible and some are not.

Lesson 4 Overview:

- Students will explore how objects can be put together from a small set of pieces.

Enduring Understanding

Lesson 1

- **Enduring Understanding**: use evidence to describe and classify materials based on their observable properties (the properties of matter)
- **Essential Question**: What are the properties of matter?

Lesson 2

- **Enduring Understanding:** use evidence to describe how heating and cooling matter may cause changes that can be observed
- **Essential Question:** How do heating and cooling change matter?

Lesson 3

- **Enduring Understanding:** Construct an argument with evidence that some changes to matter can be reversed and some cannot
- **Essential Question:** How does matter change?

Lesson 4

- **Enduring Understanding:** use observations as evidence to explain how an object made of a small set of pieces can be taken apart and made into a new object
- **Essential Question:** How are objects put together?

Essential Questions

Unit 2 Essential Questions:

- What is matter?
- What are the properties of matter?
- How does heating change matter?
- How does cooling change matter?
- How does matter change?
- What is the cause and effect of changing matter?
- How are objects taken apart?
- How can object pieces be put back together?

Exit Skills

By the end of Grade 2, Science Unit 2, the student should be able to:

- describe matter and identify its properties
- describe how heating and cooling changes matter
- identify how pieces of matter can be joined to create objects

New Jersey Student Learning Standards (NJSLS-S)

Attached are the standards used in Unit 2:

SCI.2.2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
SCI.2.2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
SCI.2.2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
SCI.2.2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Interdisciplinary Connections

Attached are the Interdisciplinary Connections for Unit 2:

LA.W.2.8	Recall information from experiences or gather information from provided sources to

	answer a question.
LA.RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
LA.RI.2.8	Describe and identify the logical connections of how reasons support specific points the author makes in a text.
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.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.A.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
MA.2.NBT.A.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Learning Objectives

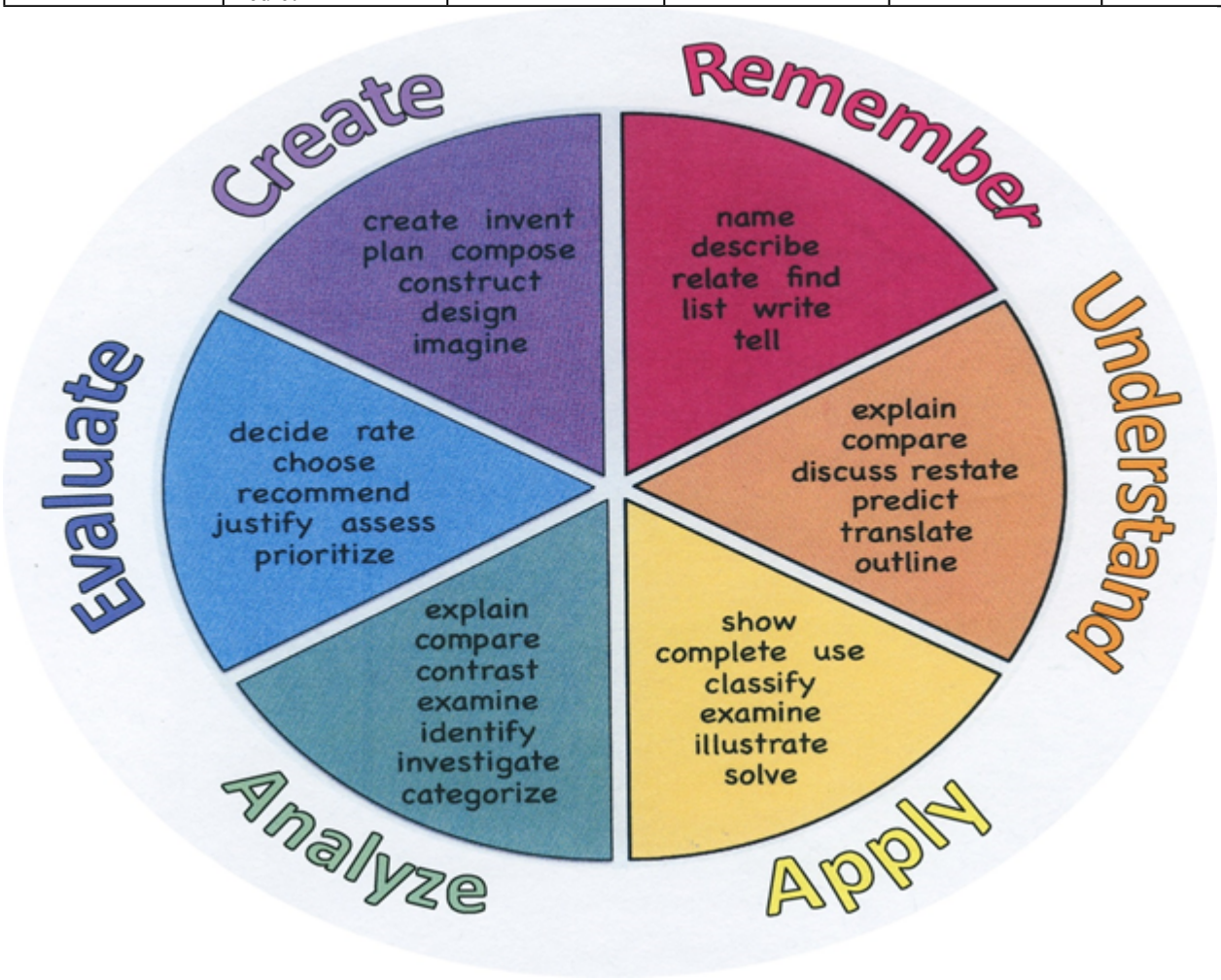
Unit 2 Learning Objectives:

- SWDAT: identify and descibe what matter is
- SWDAT: describe and classify matter by their observable properties
- SWDAT: select and use materials based on these properties
- SWDAT: use evidence to describe how heating and cooling cause changes to matter
- SWDAT: use evidence to describe reversible and ireversible changes to matter
- SWDAT: explore how an object can be taken apart and its pieces used to make another object

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play

Draw Outline Point Quote Recall Recognize Repeat Reproduce	Paraphrase Represent Restate Rewrite Select Show Summarize Tell Translate Associate Compute Convert Discuss Estimate Extrapolate Generalize Predict	Add Calculate Change Classify Complete Compute Discover Divide Examine Graph Interpolate Manipulate Modify Operate Subtract	Detect Diagram Discriminate Illustrate Outline Point out Separate	Rate Support Test	Drive Devise Generate Integrate Prescribe Propose Reconstruct Revise Rewrite Transform



Suggested Activities & Best Practices

- Vocabulary Game- Guess the word
- Unit Hands-on Projects
- Student collaborations to build on prior knowledge
- Engineer it activity to explore properties of matter

Evidence of Student Learning - Checking for Understanding (CFU)

Use appropriate tool to check for student learning and understanding based on teacher's preference. Attached are various examples:

- 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 & Materials

Unit 2 materials include:

- Student Interactive WorkText
- Teacher Edition Text
- Online Student Edition

Ancillary Resources

Additional Resources:

- online resources to provide further information to students
- vocabulary cards
- word wall
- posters

Technology Infusion

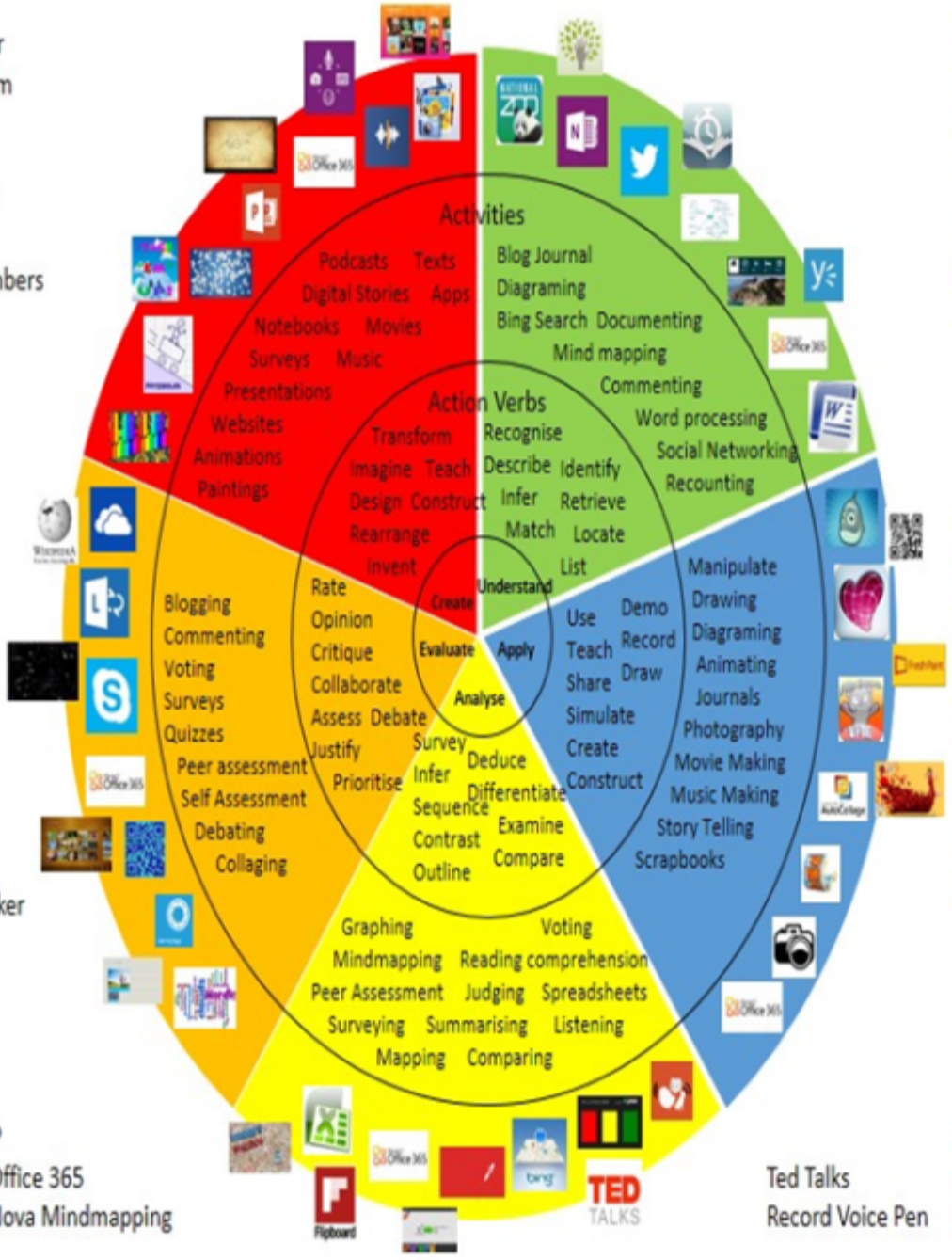
Technology available:

- SMART Technology
- Online Websites
- Computer Access
- Online Activities and Assessments

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

Mastery and infusion of **21st Century Skills & Technology** and their Alignment to the core content areas is essential to student learning. The core content areas include:

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;
- Visual and Performing Arts.

21st Century Skills/Interdisciplinary Themes

- 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

21st Century Skills

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

Differentiation

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products

- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

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

Special Education Learning

- 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

English Language Learning (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

Sample Lesson

Using the template below, please develop a **Sample Lesson** for the first unit only.

Unit Name:

NJSLS:

Interdisciplinary Connection:

Statement of Objective:

Anticipatory Set/Do Now:

Learning Activity:

Student Assessment/CFU's:

Materials:

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: