Science Unit 3- Plan Matter and Energy Grade 3

Unit Length:





Grade 3 Water

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UNIT OVERVIEW

Matter and Energy

Summary

The **Matter and Energy Module** consists of four sequential investigations to introduce the multiple forms that matter and energy can take and to give students experience with the transfer of energy from one form to another. Light absorption and reflection is the focus of an entire investigation. Students also conduct and observe chemical reactions and are introduced to atoms and elements.

Knowledge:		Skills:		
Student will Know		Students will be able to		
•	Light from the Sun is the source of most of the energy on	• Identify sources of stored energy.		
	Earth.	• Learn that light from the sun is the source of most of the		
•	Organisms use stored energy in food as fuel for life	energy on Earth.		
	processes.	Observe energy sources doing work.		
•	Energy can be converted from one form to another.	• Learn how organisms used stored energy in food as fuel from		
•	Energy can be carried from one place to another by waves,	life processes.		
	electric current and moving objects.	• Learn how energy can be converted from one form to another.		
•	Organisms and machines convert stored energy to motion	• Observe that energy can be carried from one place to another		
	and heat.	by waves, electric current, and moving objects		
•	light is a form of energy that travels in straight lines from a light source.	• Learn that organisms and machines convert stored energy to motion and heat.		
•	Light can reflect from the surface of a mirror.	• Learn that light is a form of energy that travels in straight lines		
•	An object is seen only when light from that object enters the	from a light source.		
	eye. White light is a mixture of all colors of light	• Find out now light can reflect (bounce off) from the surface of		
	Light can be absorbed and reflected by matter	• Learn that an object is seen only when light from that object		
	Apparent color on an object is the result of the light it	enters the eve.		
	reflects.	 Learn that white light is a mixture of all colors of light. 		
•	Apparent color of an object is affected by the color of light	• Learn that light can be absorbed and reflected by matter.		
	striking it.	• Learn that the apparent color of an object is the result of the		
•	The defining characteristics of solids, liquids, and gases.	light it reflects.		
•	The standard metric units for measuring mass and volume; the gram and the liter.	• Observe that the apparent color of an object is affected by the color of light striking it.		
•	How to use a balance to determine and compare masses.	• Predict outcomes of investigations and compare to results.		
•	How to use graduated cylinders and syringes to measure and compare volumes of liquids.	• Explore properties of the three forms of matter, solid, liquid, and gas.		
•	How to measure temperature in standard metric units using a	• Determine defining characteristics of solids, liquids and gases.		
	thermometer calibrated in degrees Celsius.	• Learn the standard metric units for measuring mass and		
•	Heat affects the rate of evaporation of liquid water.	volume; the gram and the liter.		
•	That all matter is made of tiny particles.	• Use a balance to determine and compare masses.		
•	Melting occurs when solids are heated. When two substances are combined, a reaction may occur,	• Use graduated cylinders and syringes to measure and compare volumes of liquids.		
	producing a new substance with unique properties.	• Make multiple observations to improve accuracy.		
•		• Make predictions and compare them to data.		
		• Collect and use data to draw conclusions.		
		• Differentiate evidence from opinion.		
		Measure temperature in standard metric units using a		
		Malt solid substances using best		
		 Ment solid substances using near. Learn that heat affects the rate of evanoration of liquid water 		
		 Conduct a simple chemical reaction and compare the products 		
		to the original substances that reacted.		
		• Learn that all matter is made of tiny particles.		
		• Make predictions in the context of conducting science		
		investigations.		
		• Use numerical data collected in an investigation to compare results and develop conclusions.		
	Evidence of Understanding:			
Pre- Assessment, I-Check Assessments, Unit Assessments				
Notebook and Journal Entries				
Performance Assessments				
Re	ading Prompts			
Stı	Student Observation/Anecdotal Notes			

Homework

Preconception /Misconceptions

<u>Matter</u>

- Gases are not matter.
- Matter is something that can be handled and takes up space.
- Energy is an ingredient in matter.
- Matter is continuous.
- The space between particles is filled.
- Expansion of matter is due to the expansion of particles, rather than an increase of particle spacing.
- Gases are not matter because they are invisible.
- Gas has no weight even if it has color it has no weight.
- Gases weigh less than the materials that created them.
- Air neither has mass nor can it occupy space.
- When gases expand more gas is present.

List other that you discover in your class:

Energy

- Energy is truly lost in many energy transformations.
- There is no relationship between matter and energy.
- If energy is conserved, why are we running out of it?
- Energy can be changed completely from one form to another (no energy losses).
- Things "use up" energy.
- Energy is confined to some particular origin, such as what we get from food or what the electric company sells.
- An object at rest has no energy.
- The only type of potential energy is gravitational.
- Doubling the speed of a moving object doubles the kinetic energy.
- Energy is a "thing." This is a fuzzy notion, probably because of the way we talk about newtonmeters or joules. It is difficult to imagine an "amount" of an abstraction.
- The terms "energy" and "force" are interchangeable.

List other that you discover in your class:

New Jersey Common Core Standards

5.1 Science	All students will understand that science is both a body of knowledge and an evidence-based, model-			
Practices	building enterprise that continually extends, refines, and revises knowledge. The four Science Practices			
	strands encompass the knowledge and reasoning skills that students must acquire to be proficient in			
	science.			
Strand A	Understand Scientific Explanations: Students understand core concepts and principles of science			
	and use measurement and observation tools to assist in categorizing, representing, and interpreting			
	the natural and designed world. Who, what, when, where, why, and how questions form the basis for			
	young learners' investigations during sensory explorations, experimentation, and focused inquiry			
5.1.4.A.1	Fundamental scientific concepts and principles and the links between them are more useful than discrete			
	facts.			
5.1.4.A.2	Outcomes of investigations are used to build and refine questions, models, and explanations.			
Strand B	Generate Scientific Evidence Through Active Investigations: Observations and investigations form			
	young learners' understandings of science concepts.			
5.1.4.B.2	Tools and technology are used to gather, analyze, and communicate results.			
5.1.4.B.3	Evidence is used to construct and defend arguments			
5.1.4.B.4	Reasoning is used to support scientific conclusions.			
Stand C	Reflect on Scientific Knowledge: Interacting with peers and adults to share questions and			
	explorations about the natural world builds young learners' scientific knowledge.			
5.1.4.C.1	Scientific understanding changes over time as new evidence and updated arguments emerge.			
5.1.4.C.2	Revisions of predictions and explanations occur when new arguments emerge that account more			
	completely for available evidence.			
Strand D	Participate Productively in Science: Science practices include drawing or "writing" on observation			
	clipboards, making rubbings, or charting the growth of plants.			
5.1.4.D.1	Science has unique norms for participation. These include adopting a critical stance, demonstrating a			
	willingness to ask questions and seek help, and developing a sense of trust and skepticism.			
5.1.4.D.2	In order to determine which arguments and explanations are most persuasive, communities of learners			
	work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories (e.g.,			
514D2	scientific argumentation and representation).			
5.1.4.D.3	Instruments of measurement can be used to safely gather accurate information for making scientific			
5.2 Dhysical	All students will understand that physical science principles including fundamental ideas about matter			
S.2 Flysical	An students will understand that physical science principles, including fundamental ideas about matter,			
Science	Farth systems science			
Strand A	All objects and substances in the natural world are composed of matter. Matter has two fundamental			
Strand A	properties: matter takes up space and matter has inertia			
52442	Fach state of matter has unique properties (e.g. gases can be compressed while solids and liquids cannot:			
5.2.1.11.2	the shape of a solid is independent of its container: liquids and gases take the shape of their containers)			
524A3	Objects and substances have properties, such as weight and volume, that can be measured using			
	appropriate tools. Unknown substances can sometimes be identified by their properties.			
5.4 Earth	All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems.			
Science	and is a part of the all-encompassing system of the universe.			
Strand G	Biogeochemical Cycles: The biogeochemical cycles in the Earth systems include the flow of microscopic			
	and macroscopic resources from one reservoir in the hydrosphere, geosphere, atmosphere, or biosphere to			
	another, are driven by Earth's internal and external sources of energy, and are impacted by human activity.			
5.4.4.G.3	Most of Earth's surface is covered by water. Water circulates through the crust, oceans, and atmosphere in			
	what is known as the water cycle.			

Performance Expectations

2-PS1-1 Plan and conduct an investigation to describe and classify kinds of materials by their observable properties. 2-PS1-4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

NGSS Science and Engineering Practices

<u>Planning and Carrying Out Investigations</u>: Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior expe3rience and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

• Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, to answer a question. (2-PS1-1)

<u>Constructing Explanations and Designing solutions</u> in 3-5 builds on K-2 experiences and progresses the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions

* Obtain and combine information from books and other reliable media to explain phenomena.

<u>Engaging in Argument from Evidence</u> Builds on prior knowledge and progresses to comparing ideas and representations about the natural and designed worlds –Construct an argument with evidence to support a claim (2-PS1-4)

<u>Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</u> Scientistws search for cause and effect relationships to explain natural events (2-PS1-4)

Disciplinary Core Ideas

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. **PS1.A**
- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. **PS1.B Chemical Reactions 2-** PS1-4

Cross Cutting Concepts

<u>Patterns.</u> Patterns in the natural and human designed world can be observed. (2-PS1-1) <u>Cause and Effect</u>, Events have causes that generate observable patterns (2-PS1-4)

Common Core State Standards

CCSS: English Language Arts			
Reading Informational Text			
RI.3.10	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the		
	basis for the answers.		
RI3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in		
	technical procedures in a text, using language that pertains to time, sequence, and cause/effect.		
RI3.9	Compare and contrast the most important points and key details presented in two texts on the same		
	topic		
	CCSS: Writing-		
W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.		
W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.		
CCSS: Speaking and Listening:			
SL.3.1	Write informative/explanatory texts to examine a topic and convey ideas and information clearly		
SL3.2.	Determine the main ideas and supporting details of a text read aloud or information presented in diverse		
	media and formats, including visually, quantitatively, and orally.		
SL.3.2	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail		
CCSS: Mathematics			
3.MD.B.3	Measurement and data: Draw a scaled picture graph and a scaled bar graph to represent a data set with		
	several categories. Solve one- and two-step "how many more" and "how many less" problems using		
	information presented in scaled bar graphs.		

Before beginning unit administer pretest.

Check that all materials are available, usable, and ready



Investigation 1 Energy			
Students investigate different forms of energy (light, heat, sound, and motion) and determine ways that energy is converted to make things happen. They explore ways that energy forms are carried from one place to another.			
 Energy makes things happen Energy takes many forms Most of the energy used by organisms, incluse Stored energy can be converted to other form Energy can be carried from one place to another 	Core Con ding humans, as of energy. ther by wayes	<i>ceptual Ideas</i> comes from the Sun in the form of light.	
New Vocabulary		<i>Extensions</i>	
Battery, chemical energy, convert, electric o	current,	Math Extension-Problem of the Week pg 23 of sc	vience
electricity, energy, energy source, energy transfer, food, forms of energy, fossil fuel, fuel, heat, light, moving object, stored energy, Sun, wave			n
n	aut 11 "Er	anon Connecs"	
<u> </u>	ari.11 - En Sum	marv	
Students investigate different sources of energy. candle to create a flame, a solar cell to convert lig a definition of energy. It makes things happen.	They use batt ght into move	eries to turn on a flashlight, run a motor, and create ment, and rubbing their hands to generate heat. Th	e sound; a ey develop
 Energy makes things happen Energy takes many forms, Energy can be stored. Most of the energy used by organisms included 	<u>Una</u>	<u>derstandings</u> comes formthe Sun in the form of light	
wost of the energy used by organisms, menu	Foci	us Ouestions	
 What does energy do? Where can energy be stored? What are some different sources of energy?? 			
Teacher Preparation		Body Of Evidence	Est. Time
 Send Letter to Parents Home (Teacher Master) Read TE "At A Glance", "Background for the Teacher" & "Teaching Children About Energy" Watch Video Demonstration of Inv. 1 Part1 Review "Materials" "Getting Ready"& "Guiding the Investigation" Prepare materials 	 Pre- A Noteb Readin Writin Journa Studen Indivi Home Cross Inform Scores sent Data to be r 	assessment ook Investigation Entry ng: Foss Student text <i>Energy Sources</i> pg 1 ng Prompt: Review Questions al Entry nt Observation/ Anecdotal Notes dual Work work Curriculum Extensions national Text to District ecorded in Genesis	5 Sessions

Part 1.2 – Converting Energy				
<u>Summary</u> Students determine the various ways that energy is converted to make different things happen. They use cards to match different stored energy sources with what the sources can make happen.				
 Stored energy can converted to other forms of Machines and living things can convert energy 	<u>Understandings</u> f energy. y into motion and heat			
² Wachines and Wing things can convert energ	Focus Question			
> What are some ways energy is converted (cha	inged) from one form to another?			
Teacher Preparation	Body Of Evidence	Est. Time		
 Watch Video Demo of Inv.1 Part 2 Review "Materials" and "Getting Ready" &"Guiding the Investigation" Prepare materials 	 Notebook Investigation Entry Reading: FOSS Student text <i>Energy Conversion</i> pg. 8 Writing Prompt: Review Questions p.8 Journal Entry I Check 1 – Step 20 Student Observation/Anecdotal Notes Homework Individual work Cross Curriculum Extensions Information Text 	3 sessions		
	Summary			
Students investigate different ways that energy can be carried from one place to another. They visit stations that demonstrate energy carried in wires by electric current, in the air by sound waves, by rolling objects, and by a spring toy. In a class demonstration, students observe waves carrying energy in water.				
> Energy can be carried from one place to anot	her by waves, electric current, and moving objects.			
Focus Question How does energy move from one place to another?				
Teacher Preparation	Body Of Evidence	Est. Time		
 Watch Video Demonstration of Inv. 1 Part 3 Review "Materials" "Getting Ready" & "Guiding the Investigation" Prepare materials 	 Notebook Investigation Entry Reading: FOSS Student text <i>Energy on the Move</i> pg. 14 Writing Prompt: Review Questions Journal Entry I Check 1 – Step 20 Student Observation/Anecdotal Notes Homework Individual work Cross Curriculum Extensions Information Text 	5 sessions		
Suggested Center Activities: Rising Reader Readorium, Spelling City; FOSS Digital Resources: eBook, Audio Stories;				
suggested websites; word wall activities; extension activities; and additional supporting Science activities.				
Cummating Activity. Degin planning with students cummating project. Suggestions:				

Investigation 2 "Light"

<u>Summary</u>

Students use mirrors to reflect light and learn that light travels in straight lines. They are introduced to blocked light (shadows), light absorption, and white light as a mixture of all colors of light. They investigate first hand and through simulations, video, and readings how the appearance of an object is affected by the color of light striking it.

Concepts:

- Light is a form of energy that travels in straight lines from a light source.
- Light can reflect off surfaces that it strikes.
- > An object is seen only when light from that object enters an eye.
- > White light is a mixture of all colors.
- Light can be absorbed by matter.
- > The apparent color of an object is affected by the color of light striking it.

New Vocabulary Investigation 2	Extensions
Absorb, appearance, color, light source, mirror, ray, reflect,	Math - Problem of the Week pg. 38 Science Resources
reflection, shadow, white light	Language – Write Mirror Messages
	Science- Share Light. Look at symmetry of faces, Make
	a Periscope

Part 2.1 – "Reflected Light"

<u>Summary</u>

Students use mirrors to experience the reflections of light. They start by using mirrors outside to discover how to see objects behind them and to reflect a bright spot onto walls. In the classroom, they determine that a mirror can be used to reflect light, that is, to change its direction of travel. Students use flashlights and mirrors to reflect light in numerous ways, reinforcing the idea that light can reflect from surfaces.

Understandings

- \blacktriangleright Light is a form of energy that travels in straight \lines from a light source.
- Light can reflect (bounce off) surfaces that it strikes
- ➤ A mirror is a smooth reflective, surface.

Focus Question

	How can you change the direction light travels?				
	Teacher Preparation		Body Of Evidence	Est. Time	
\triangleright	Read TE	V	Notebook Investigation Entry	2 sessions	
	"At A Glance", "Background for the Teacher"&	\triangleright	Reading: FOSS Student text Reflection pg 24		
	"Light"	\succ	Writing Prompt: Review Questions p. 28		
\triangleright	Watch Video Demonstration of Inv. 2 Part1	\triangleright	Journal Entry		
\triangleright	Review	\succ	Student Observation/Anecdotal Notes		
	"Materials" "Getting Ready" & "Guiding the	\succ	Journal Entry		
	Investigation"	\triangleright	Homework (Suggestions)		
\triangleright	Prepare materials	\triangleright	Cross Curriculum Extensions		
\triangleright	Show students video about light and shadows	\triangleright	Information Text		
	and have them read expository article about color				
	and vision.				

Part 2.2 " – Colored Light"						
	Summary					
Stu	dents are introduced to the idea of light	absorption and the definition of white light as a mixture of all color	rs of light.			
The	ey use gels and tubes to create colored-l	ight environments into which they can place small colored plastic c	ubes.			
Stu	dents observe that the apparent color of	the cubes is affected by the color of the light striking them inside	the tubes.			
		Understandings				
\succ	White light is a mixture of all colors of	flight				
\triangleright	Light can be absorbed by matter.					
\succ	The apparent color of an object is the r	esult of the light it reflects.				
\succ	The apparent color of an object is affected by the color of light striking it.					
\triangleright	A shadow is created when an opaque object blocks light.					
		Focus Questions				
\succ	What happens when white light strikes	an object?				
\triangleright	What happens when colored light strik	es an object?				
	Teacher PreparationBody Of EvidenceEst. Time					
\succ	Watch Video Demo of Inv.2 Part 2	Reading: FOSS Student text Throw a Little Light on Sight	6 sessions			
\succ	Review "Materials" and "Getting	pg 29				
	Ready"	Review Questions from video				
		Notebook Investigation Entry				
\succ	Prepare materials	Journal Entry				
		Student Observation/Anecdotal Notes				
\succ	Show video about light	Homework (Suggestions)				
		➤ I-check 2				
\triangleright	Administer and record I-Check 2	 Cross Curriculum Extensions Interdisciplinary Extensions 				
Suggested Center Activities: Rising Reader Readorium, Spelling City; FOSS Digital Resources: eBook, Audio Stories;						
sug	suggested websites; word wall activities; extension activities; and additional supporting Science activities.					

<u>Investigation 3 – Matter</u> Summarv

Students work with different states of matter, measure mass and volume using metric standards and tools, and solve problems using their knowledge of metric measurement. They develop a set of defining characteristics for states of matter. They read about the difference between opinion and evidence.				
· · ·	Conc	cepts		
The behavior of a sample of ma	atter in an open cont	ainer indicates its st	ate.	
The gram is the standard unit o	f measurement used	to quantify mass in	the metric system.	
Volume is a measure of the thr	ee-dimensional spac	e occupied by matte	r.	
The liter is the standard for me	asuring fluid volume	e in the metric system	n.	
<u>New Vocabulary Investiga</u>	tion 2		<u>Extensions</u>	
Balance, capacity, gas, graduated cyl	inder, gram (g),	Math - Problem of	the Week pg. 53 Science Resources	
kilogram (k), liquid, liter (l), mass, mat	ter, metric system,	Estimate Capacity	of other containers	
milliliter (ml), prediction, solid, state,	syringe, volume	Science- Determin	e Volume of Solid Objects	
		Language- Discuss	Metric Prefixes	
	Part 3.1 "Fact	of the Matter"		
<u>Summary</u> Students sort a variety of materials based on state, solid, liquids, and gas. They summarize the properties of the different forms of matter and develop a set of defining characteristics for each				
<u>^</u>	Underst	andings		
Common matter on Earth has three to be a set of the	forms (states): solid,	liquid, and gas.		
The behavior of a sample of matter i	n an open container i	ndicates its states.		
	Focus Q	<u>uestions</u>		
What are the properties of solids, liquids	, and gases?			
Teacher Preparation	Body Of	Evidence	Est. Time	
Read TE	Reading: FOSS	Student text Ice is	3 sessions	
"At A Glance", "-Background for	States of Matter	pg. 39		
the Teacher-solids, liquids, and	Writing Prom	pt: Review		
gases"&"Teaching Children About	Questions pg. 42,			
Matter"	Notebook Investigation Entry			
Watch Video Demonstration of Inv.	Demonstration of Inv. > Journal Entry			
3 Part1	Student Observation/Anecdotal			
Review	Notes			
"Materials" "Getting Ready"	Homework (Suggestions)			
&"Guiding the Investigation"				
Prepare materials				
Suggested Center Activities: Rising Reader Readorium, Spelling City; FOSS Digital Resources: eBook, Audio Stories;				
suggested websites; word wall activities; extension activities; and additional supporting Science activities.				
Cuiminating Activity: Continue to work on projects.				

Part 3.2 "Weighty Matters"					
<u>Summary</u> Students learn the concept of mass – the stuff of the world. – and how to measure mass by weighing. They weigh a metal disk in paper-clip units. After reporting the mass of the metal disks in paper-clips, which are different sizes, students recognize the need for standard unit of measure. The gram is introduced. After determining the mass of water a sponge can soak up, students read a related article.					
 Measurement is used to quantify observations. A measurement standard is a unit agreed upon and used by a large number of people. The gram (g) is the standard unit of measure used to quantify mass in the metric system. Volume is a measurement of three-dimensional space occupied by matter. Opinion is based on belief; scientific evidence is based on observation. 					
 What is mass? How can you measure the mass of an object? 					
Teacher Preparation	Body Of Evidence	Est. Time			
 Read TE Watch Video Demonstration of Inv 3 Part2 Review Materials" "Getting Ready" & "Guiding the Investigation" Prepare materials 	 Reading: FOSS Student text Oponions and Evidence pg. 43 Writing Prompt: Review Questions pg. 46 Notebook Investigation Entry Journal Entry Student Observation/Anecdotal Notes Homework (Suggestions) Cross Curriculum Extensions Informational Text Reading 	4 sessions			

Part 3.3: "A Matter of Volume"

<u>Summary</u>

Students learn the conventions associated with measuring fluid liquid volume. Different-size vials, used as units to measure the capacity of a plastic cup filled with water, help establish the need for a standard unit of volume. The liter and milliliter are introduced.

Understandings

- \blacktriangleright A measurement standard is a unit agreed upon and used by a large number of people.
- > The liter (L) is the standard for measuring fluid volume in the metric system
- > Common matter on Earth has three forms (statesa0: solid, liquid, and gas.

Focus Questions

\succ	What is volume?			
\succ	How can you measure the volume of a liquid?			
	Teacher Preparation		Body Of Evidence	Est. Time
\triangleright	Read TE	\succ	Reading: FOSS Student text The Metric	6 sessions
\triangleright	Watch Video Demonstration of Inv. 3 Part3		System pg. 47	
\triangleright	Review	\succ	Writing Prompt: Review Questions pg. 53	
	"Materials" "Getting Ready" & "Guiding the	\succ	Notebook Investigation Entry	
	Investigation"	\succ	Journal Entry	
\triangleright	Prepare materials	\succ	Student Observation/Anecdotal Notes	
\triangleright	Administer and Record I[Check 3	\succ	Homework (Suggestions)	
		\succ	I-Check 3	
		\succ	Cross Curriculum Extensions	
		\succ	Informational Text Reading	

Investigation 4 **Changing Matter** Summary Students use a thermometer to measure and record temperatures as they explore melting of common substances. The class conducts an evaporation investigation, and students use the data to draw conclusions. Students combine substances and observe the results of a chemical reaction. They read about solids, liquids, and gases and about reactions. Concepts > Degree Celsius is the unit used when scientists measure temperature. Melting occurs when solids are heated. Different substances melt at different temperatures. \triangleright > When two substances are combined, a reaction may occur, producing a new substance with unique properties. ➤ All matter is made of particles. New Vocabulary Investigation 4 Extensions Carbon dioxide, degree Celsius (C°), evaporation, melting, Science Extension- Conservation of Matter particle, reaction, substance, temperature, thermometer Part4. 1:"Measuring Temperature" Summary Students are introduced to the concept of temperature and the tool used for measuring temperature, the thermometer. Students compare the temperature of three cups of water using their fingers as gauges. They realize a standard is needed as well as a more accurate devise to meassur4e temperature. **Understandings** A measurement standard is a unit agreed upon and used by a large number of people. \triangleright Degree Celsius is the unit used when scientists measure temperature. \geq Melting occurs when solids are heated. \triangleright Different substances melt at different temperatures. \geq Focus Questions How can you measure the temperature of a liquid? Teacher Prenaration Dody Of Evide

Deed TE	Notebook Investigation Entry	1 sossions
► Reau IE		1 565510115
"At A Glance", "-Background for the	Journal Entry	•
Teacher (Heat and temperature)"&"Teaching	Student Observation/Anecdotal Notes	
Children About Changing Matter"	Homework (Suggestions)	
Watch Video Demonstration of Inv. 4 Part1	 Cross Curriculum Extensions 	
> Review	 Informational Text Reading 	
"Materials" "Getting Ready" & "Guiding the		
Investigation"		
Prepare materials		

	Investigation 4: Part 2. Waterwheels			
	Summary			
Students put samples of chocolate, margar	ine, wax, and $\overline{a \text{ pebble in}}$ a cup. They place the cup in hot wate	r and observe		
what happens to the samples. This is follow	wed by a demonstration of transferring heat to liquid water and	comparing the		
amount of evaporation to a similar cup that	t was not heated.			
^	Understandings			
Evaporation occurs when liquids are h	eated			
All matter on Earth is made of tiny part	ticles.			
	Focus Question			
How can you melt a solid?				
What happens to the water in a contain	ner if you leave it out and heat it up?			
Teacher Preparation	Body Of Evidence	Est. Time		
Watch Video Demo of Inv.4Part	Reading: FOSS Student text Change of State pg. 54	4 sessions		
2	Writing: Summary questions pg 62			
Review "Materials" and	Notebook Investigation Entry			
"Getting Ready" & "Guiding	Journal Entry			
the Investigation"	Student Observation/Anecdotal Notes			
	Homework			
Prepare Materials	Cross Curriculum Extensions			
In	vestigation 4: Part 3. Water from Home			
Students conduct the vinegar and baking soda reaction. They determine the mass of the starting substances, predict what will happen to the mass when the two are mixed, and then determine the mass of the products. They learn that new substances form when baking soda and vinegar are mixed, and the loss of gas to the atmosphere accounts for the observed loss of mass				
	Understanding			
When two substances are combined. a	a reaction may occur, producing a new substance with unique r	properties		
	Focus Question			
What are some of the properties of water t	hat affect its quality?			
Teacher Preparation	Body Of Evidence	Est. Time		
Watch Video Demo of Inv.4Part 3	Reading: FOSS Student text <i>Reactions pg 60;</i>	6 sessions		
Review "Materials" and "Getting	Summary: Changing Matter pg. 63			
Ready" & "Guiding the	Writing: Summary questions			
Investigation"	Notebook Investigation Entry			
	➢ Journal Entry			
Prepare Materials	Student Observation/Anecdotal Notes			
	I-Check 4 and End of Unit Assessment			
Administer and record I-Check 4 and end	➤ Homework			
of unit assessment	Cross Curriculum Extensions			
	End of Unit Assessment			
Suggested Center Activities: Rising Reader Readorium, Spelling City; FOSS Digital Resources: eBook, Audio Stories;				
suggested websites; word wall activities; e	xtension activities; and additional supporting Science activities	5.		
Culminating Project: Students complete project, and present to class				

Unit ends June 19th, 2015. The Unit takes an estimated 41 session and there are sessions scheduled. (3 additional science days built in) Session = 45 minutes

Assessments:

The following items are to be tracked by the teacher and recorded in Genesis for administration and parents to view.

Writing prompts Notebook Investigation Entry Journal Entries Student Observations Anecdotal Notes Homework Summative Assessments: Pre-assessment, I-checks, End of Unit assessments, Post Assessment (data to be recorded)

This guide is intended to support the collection of a Body of Evidence. A student's Body of Evidence should, at a minimum, include work form the listed prompts and in-class investigations that demonstrate a student's level of proficiency. The FOSS pre-assessment given at the beginning of the unit, the I-checks given after each investigation and Grade 3 DISTRICT Earth Science Benchmark Assessment given at the end of the unit (Post-assessment) may also be included in the body of evidence.

Materials Sheet

Be aware that the classroom teacher or school site must supply a few items. Here is a summary of supplies not included in the kit.

DRAWER 1 - PERMANENT EQUIPMENT					
Quantity	Item Description	Inventory Checklist			
8	Balances with pointers				
200	Gram pieces, multicolored				
1 bag	Gravel, 1.2 kg/bag				
2	Mass sets, 35/set				
1	Meter tape				
2	Pitchers				
1	Poster, FOSS Safety				
1	Transparencies set, 3/set				
1	Video, All about Light (DVD)				
1	Video, All about Solids, Liquids, and Gases (DVD)				
1	Video, All about the Transfer of Energy (DVD)				
1	Teacher Guide				
1	Teacher Preparation Video				
•	FOSS Science Resources books, Matter and Energy				
	DRAWER 2 - PERMANENT EQUIPMENT				
8	Basins				
1	Beaker 1-liter				
8	Beakers 100-ml				
10	Cloth pieces knit 10 cm (4") square				
16	Containers 1/2-liter				
8	Containers, 1-liter				
10	Disks. metal				
8	Graduated cylinders, 50-mL				
1	Marking pen, permanent, fine-point				
100	Paper clips, large				
200	Paper clips, regular				
10	Plastic chips				
50	Plastic cups				
1 cont.	Rice, 350 g/container				
8	Sponges, small				
1	Spoon set, 1, 2, 5, 15, 25-mL				
2	Spoons, 5-mL				
8	Syringes, 50-mL				
16	Thermometers, Celsius, alcohol				
5	Vials, 12-dram, with caps				
5	Vials, 7-dram, with caps				
10	Wood squares				
50	Zip bags, 1-liter				
20	Zip bags, medium				
24	Zip bags, small				

DRAWER 3 - PERMANENT EQUIPMENT					
Quantity	Item Description	Inventory Checklist			
32	AA-cells				
1	Basin, clear				
2	Batteries, 9-V				
1	Bottle, 1-liter, red				
1	Bubblewrap sheet				
16	Cardboard tubes, 1.5" diameter, w/ hole and cap				
16 sets	Colored gels (green and red)				
10	Craft sticks				
16	Energy card sets				
16	Flashlights, small				
1	Funnel				
1	Lamp with 75-watt bulb				
32	Mirror clips				
32	Mirrors, plastic				
5	Motors, 1.5-V, with wire leads				
1 bag	Pebbles, small, 0.5 kg /bag				
100	Rubber bands, #14				
2	Solar cells with leads				
1	Spring toy				
2	Table tennis balls				
2	Tennis balls				
2	Tone generators, FOSS				
1 box	Toothpicks, flat, 750/box				
10	Tubes, plastic, 5 cm, (2") long				
50	Vials, plastic with screw caps, 30-mL				
8	Wires, #14, solid, insulated, 13 cm				
	DRAWER 3 - CONSUMABLE ITEMS				
1 cont.	Baking soda, 450 g/container				
1 box	Birthday candles, dripless				
1 bag	Sand, 0.75 kg /bag				
2 pads	Self-stick notes, 100/pad				

Unit Resources:

Content books-

- FOSS Student Book with Unit
- See Reading Extensions in TE
- FOSS Reading Supplemental Books
- Sun, Moon and Stars Series

FOSS Website: www.fossweb.com (additional resources and web sites found there)

Spelling City: www.spellingcity.com

United Streaming Videos http://www.discoveryeducation.com//?ref=streaming&returnUrl=http%3A%2F%2Fstreaming%2Ediscoveryeducation%2 Ecom%2Findex%2Ecfm

Brainpop (see if your school has license for this) http://www.brainpopjr.com/