4th Grade Matter Unit Unit Blueprint

T.R.A.C.S. Investigating Propertiesinvestigations and observations and not change the records later.conclusions/answers to questions in student lab journalstheir observations?Investigating Properties12C(2, 5)#2: Keep a patchash thatconclusions/answers to questions in student lab journalstheir observations?	Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
benchmarks)Assessment, the assessments are formative and should be used to guide teaching and learning.)BSCS Science T.R.A.C.S.12A(3-5)#1: Keep records of their investigations and observations and not change the records later.All lab observations, data tables, and conclusions/answers to questions in student lab journals• Do students consistently record their observations?BSCS Science and 712C(3-5)#3: Keep a notebook that describes observations made, carefully distinguishes actual observations from ideas and speculations about what was observed, and is understandable weeks or months later.• Do students consistently record their observations in student lab journalsBSCS Science Investigating Heat & Changes in Materials Lessons 1-6 and 9/12C(3-5)#3: Keep a notebook that describes observations made, carefully distinguishes actual observations from ideas and speculations about what was observed, and is understandable weeks or months later.• Do students refrain from changing their observations on the experiment is completed?Heat & Changes in Materials Lessons 1-6 and 9/• Do students record observation and 9• Do students record observation observed observation observed observation observed observation observed observation observed observations observed observation observed observation on ot inferences, ideas, or		_			Student Learning
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Investigating // weeks or months later. Heat & Changes // weeks or months later. in Materials // and use their data Lessons 1-6 // and 9 and 9 // black			1		
Heat & Changes in Materials and use their data Lessons 1-6 and 9 ////////////////////////////////////			· · · · · · · · · · · · · · · · · · ·		
<i>in Materials</i> Lessons 1-6 and 9			weeks or months later.		
Lessons 1-6 and 9					
and 9 Understanding questions? • Do students record observation not inferences, ideas, or	in Materials				
Do students record observation not inferences, ideas, or	Lessons 1-6				
not inferences, ideas, or	and 9				
speculations?					
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Lesson	Essential & Unit Questions (for conceptual	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Formative and Summative Assessments (Unless noted as a Summative	Using Assessments to Monitor Student Learning
BSCS Science T.R.A.C.S. Investigating Properties Lesson 1: Which is Which? Pacing Suggestions: Day 1-	benchmarks)	Reinforce 4D(K-2)#1: Objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, etc.)	Assessment, the assessments are formative and should be used to guide teaching and learning.) <i>Missing Object</i> activity (See page 41 in Teacher's Edition.) Class description of the bags of salt and powdered drink mix (See Step 3 on pages 41 & 42 in Teacher's Edition.) Journal entry describing the properties of cornstarch and salt (<i>Solving the Case of</i> <i>the Confused Chaf.</i> pages 43 45 in	 <i>Missing Object</i> Do students use many physical properties to describe the object? <i>Class description of the bags of salt and powdered drink mix</i> Do students describe the physical properties of the powders? Do students generate enough descriptors to differentiate the
Day 1-Teaching StrategiesSteps 1, 2, & 5 onpages 41-43 inTeacher's GuideDay 2-Teaching Strategies,Steps 3 & 4 on pages41 & 42 in Teacher'sGuideDay 3-Teaching StrategiesSteps 6 & 7 on pages43-45 in Teacher'sGuideDay 4-Teaching StrategiesStep 8 on pages 45 &46 in Teacher's Guide			 the Confused Chef—pages 43-45 in Teacher's Edition) & class discussion Summative Assessment: Checking Understanding questions 1 & 2 (See pages 45 & 46 of Teacher's Edition.) -OR- Write a letter to Carmelita identifying the two powders and explaining the properties used to determine the identity of the powders. (Teacher-generated direction sheet available under "Teacher Resources" on electronic curriculum) Click to view sample of student work. 	descriptors to differentiate the two powders? Solving the Case of the Confused Chef See Sharing Results on pages 44-45 for detailed information about student responses. Checking Understanding Do students understand that both powders have properties and the properties unique to each powder help in identifying them?
Teacher Resources:		12C(3-5)#2: Measure and mix dry and liquid materials in prescribed amounts, exercising reasonable safety [and demonstrating correct lab techniques].	Teacher observation of students measuring 5 mL of salt for the <i>Solving</i> <i>the Case of the Confused Chef</i> lab activity (See "Teacher Tips" for information on proper lab technique.)	 Do students accurately measure the prescribed amount of the substance? Do students demonstrate correct lab technique?

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
			teaching and learning.)	
Lesson 2:		Introduction to 12D(6-8)#1:	Students construct data tables from a	• Are students able to create a table
Exploring Five		Organize information in simple	model in student text and enter lab data	from a model?
White Powders		tables and graphs and identify		• Do students enter data in an
		relationships they reveal. (See	Click to view samples of student work.	organized method?
Pacing		essay on page 76 in Benchmarks	2	• Are their tables legible?
Suggestions:		about the importance of student-		C C
Day 1-		generated tables and graphs at this		
Teaching Strategies		grade level.)		
Steps 1 & 2 on	/	12C(3-5)#2: Measure and mix dry	Teacher observation of students	• Do students accurately measure
pages 51-53 in		and liquid materials in prescribed	measuring 20 mL of water in	the prescribed amount of the
Teacher's Guide		amounts, exercising reasonable	Investigating with Water lab	substance?
Day 2-		safety [and demonstrating correct	0 0 0	• Do students demonstrate correct
Teaching Strategies		lab techniques].	In Checking Understanding activity,	lab technique?
Step 3 & 4 on pages		1 1	student teams measure liquid (See page	1
53 & 54 in			55 in Teacher's Edition.)	
Teacher's Guide	In general, how	4D(3-5)#4: When a new material	Class discussion of <i>Investigating with</i>	Do students recognize that the
Day 3-	does mixing two	is made by combining two or	Water lab results (See page 54, Making	mixed substance has new properties
Assessment	or more	more materials, it has properties	Meaning section in Teacher's Edition.)	that are different from the original
Strategies on pages	materials affect	that are different from the	incoming section in reacher's Editionity	parts?
and Step 5 on pages	their properties?	original materials. For that	Checking Understanding #6 (See page	parts.
55 & 56	Why is this	reason, a lot of different materials	55 in Teacher's Edition.)	
55 & 50	important?	can be made from a small number	55 m reacher's Edition.)	
Teacher	important.	of basic kinds of materials.		
Resources:		of basic kinds of matchais.		

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
	,		teaching and learning.)	
Lesson 3:	/	Introduction to 12D(6-8)#1:	In Investigating with Vinegar, Red	• Do students enter data in an
Investigating with		Organize information in simple	Cabbage Juice, and Iodine, students add	organized method?
<u>Other Liquids</u>		tables and graphs and identify	additional columns to the data table they	• In Checking Understanding, are
		relationships they reveal. (See	constructed in Lesson 2	students able to create a table
Suggested Pacing:		essay on page 76 in Benchmarks		using previous tables as models?
Day 1-		about the importance of student-	In Checking Understanding, student	
Steps 1-5 on pages		generated tables and graphs at this	teams design new data tables (See page	
38 & 39 in Student		grade level.)	63 in Teacher's Edition.)	
Guide				
Day 2-			Click to view samples of student work.	
Steps 6-9 on pages	/			
40 & 41 in Student		12C(3-5)#2: Measure and mix dry	Students measure 20 mL of five	• Do students accurately measure
Guide		and liquid materials in prescribed	different powders in <i>Investigating with</i>	the prescribed amount of the
Day 3-		amounts, exercising reasonable	Vinegar, Red Cabbage Juice, and Iodine	substance?
Steps 10 & 11 on page 41 in Student		safety [and demonstrating correct		• Do students demonstrate correct
Guide		lab techniques].	Class discussion of <i>Investigating with</i>	lab technique? Class discussion of lab
Day 4-	In general, how does mixing two	4D(3-5)#4: When a new material		Do students understand that a
Students plan	-	is made by combining two or	Vinegar, Red Cabbage Juice, and Iodine lab results (See page 63, Making	property of the powders is the way
experiment for	or more materials affect	more materials, it has properties that are different from the	<i>Meaning</i> section in Teacher's Edition.)	they react when mixed with water,
Checking	their properties?	original materials. For that	<i>Meaning</i> section in reacher's Edition.)	iodine, and cabbage juice?
Understanding and	Why is this	reason, a lot of different materials		iounie, and cabbage juice?
make a data table	important?	can be made from a small number	Checking for Understanding is a lab	Checking Understanding
Day 5-	important?	of basic kinds of materials.	application of the benchmark (See pages	When designing their experiments,
Students conduct		of basic kinds of materials.	64 & 65 in Teacher's Edition.)	do the students use their knowledge
experiment and			64 & 65 III Teacher's Edition.)	about the properties of the powders
complete <i>Checking</i>				when combined with different
Understanding				liquids?
Teacher				
Resources:				
e 3				

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
× (173			teaching and learning.)	
Lesson 4: The		Illinois Performance Descriptor:	Students design and conduct experiment	See Assessment Strategies on page
<u>Mystery Mixture</u>		Students will design and conduct	in Identifying the Mystery Mixture (See	72 in Teacher's Edition.
D .		experiments (See page 76 in	<i>Team Task</i> on pages 70 & 71 in	
Pacing		Benchmarks about the importance	Teacher's Edition.)	
Suggestions:		of student-designed experiments.)		
Day 1-	T 11		Click to view samples of student work.	
Steps 1-3 on pages	In general, how	4D(3-5)#4: When a new material is		
46 & 47 in Student Guide	does mixing two or more	made by combining two or more materials, it has properties that are	Question 5, second bullet on <i>Directions</i>	
Day 2-	materials affect	different from the original	for Identifying the Mystery Mixture (see	
Steps 4 & 5 on page	their properties?	materials. For that reason, a lot of	page 48 in Student Guide and/or page 71	
48 in Student Guide	Why is this	different materials can be made	in Teacher's Edition) and class	
Day 3-	important?	from a small number of basic kinds	discussion of <i>The Mystery Mixture</i>	
Steps 4-6 under	important.	of materials.	discussion of the mystery mixture	
Assessment		of materials.		
Strategies on pages				
72-73 in Teacher's				
Guide				
Teacher				
Resources:				
3				

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions (for conceptual benchmarks)	(Bolded sections indicate portion of benchmark addressed)	Assessments (Unless noted as a Summative Assessment, the assessments are	Student Learning
	benefiniarks)		formative and should be used to guide teaching and learning.)	
Lesson 5: Does it	/	Introduction to 12D(6-8)#1:	Student-generated data table for Is There	• Are students able to construct a
<u>Disappear?</u>		Organize information in simple tables and graphs and identify	Powder Here? Lab	useable data table for the experiment?
Suggested Pacing: Day 1- Session 1 on pages 78 & 79 in Teacher's Guide Day 2- Teaching Strategies Steps 6 & & on		relationships they reveal. (See essay on page 76 in Benchmarks about the importance of student- generated tables and graphs at this grade level.)	Click to view sample of student work.	 Do their tables include straight lines, a title, and column headings? Do students enter data in an organized method? Are their tables legible? Are students' construction and use of data tables improving?
pages 79 & 80 in Teacher's Guide		12C(3-5)#2: Measure and mix dry and liquid materials in prescribed amounts, exercising reasonable safety [and demonstrating correct lab techniques].	Students measure specified quantities of water in <i>Is There Powder Here?</i> lab	 Do students accurately measure the prescribed amount of the substance? Do students demonstrate correct lab technique?
Teacher Resources:		Related to 4D(3-5)#4: When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials.	Lab journal entry and class discussion of Direction #7 in <i>Is There Powder Here?</i> lab. (See Step 7, <i>Making Meaning</i> , on pages 79 & 80 in Teacher's Edition)	 Despite the difference in appearance, do students recognize that the crystals are still salt and alum? Do students understand that even though they mixed the powders with water, the original parts are still present?
Lesson 6: How Much Will Dissolve?		Lesson is related to solubility rates—no content benchmarks directly related to lesson. Lesson is not necessary for Lesson 7.		
Skip Lesson				

Secret Mixturedoes mixing two or moreStudents will design and conduct experiments (See page 76 in Benchmarks about the importance of student-designed experiments.)design/conduct experiment and analyze data in The Secret Mixture lab (See page 93 in Teacher's Edition)do the students use their about the properties of t when combined with dif liquids?Pacing Suggestions: Day 1— Steps 1 & 2 on page 65 in Student Guide & Step 1 on page 66 in Student Guide Day 2—Mote students use their experiments (See page 76 in Benchmarks about the importance of student-designed experiments.)do the students use their about the properties of t when combined with dif liquids?		Using Assessments to N Student Learning	Formative and Summative Assessments (Unless noted as a Summative	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Essential & Unit Questions (for conceptual	Lesson
Secret Mixturedoes mixing two or moreStudents will design and conduct experiments (See page 76 in Benchmarks about the importance of student-designed experiments.)design/conduct experiment and analyze data in The Secret Mixture lab (See page 93 in Teacher's Edition)do the students use their about the properties of t when combined with dif liquids?Pacing Suggestions: Day 1— Steps 1 & 2 on page 65 in Student Guide & Step 1 on page 66 in Student Guide Day 2—Why is this important?Students will design and conduct experiments (See page 76 in Benchmarks about the importance of student-designed experiments.)do the students use their about the properties of t 			formative and should be used to guide teaching and learning.)			
Steps 2-3 on pages reason, a lot of different materials 66-67 in Student can be made from a small number Guide of basic kinds of materials. Day 3 - Introduction to 12D(6-8)#1: Step 4 on page 67 in Introduction to 12D(6-8)#1: Student Guide Organize information in simple tables and graphs and identify relationships they reveal. (See Resources: essay on page 76 in Benchmarks about the importance of student-generated tables and graphs at this grade level.) grade level.)	ir knowledge the powders	When designing their experies do the students <u>use</u> their kn about the properties of the when combined with differ liquids?	Summative Assessment: Students design/conduct experiment and analyze data in <i>The Secret Mixture</i> lab (See page	Students will design and conduct experiments (See page 76 in <i>Benchmarks</i> about the importance of student-designed experiments.) 4D(3-5)#4: When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials. Introduction to 12D(6-8)#1: Organize information in simple tables and graphs and identify relationships they reveal. (See essay on page 76 in Benchmarks about the importance of student- generated tables and graphs at this	does mixing two or more materials affect their properties? Why is this	Secret Mixture Pacing Suggestions: Day 1— Steps 1 & 2 on page 65 in Student Guide & Step 1 on page 66 in Student Guide Day 2— Steps 2-3 on pages 66-67 in Student Guide Day 3— Step 4 on page 67 in Student Guide Teacher

Lesson	Essential & Unit Questions (for conceptual benchmarks)	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Formative and Summative Assessments (Unless noted as a Summative Assessment, the assessments are formative and should be used to guide	Using Assessments to Monitor Student Learning
BSCS Science T.R.A.C.S. Investigating Heat & Changes in Materials Lesson 1: What Does Heating Do?	How do heating and cooling affect materials?	Reinforces 4D(K-2)#2: Things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them. 4D(3-5)#1: Heating and cooling cause changes in the properties of materials. Many changes in the properties occur faster under hotter conditions.	teaching and learning.) Class discussion of lab (See <i>Sharing</i> <i>Ideas</i> on page 48 in Teacher's Edition.) <i>Checking Understanding</i> , questions 1, 2, & 4 (See page 49 in Teacher's Edition.)	See pages 48 &49 Teacher's Guide for specific information on what to expect in students' answers. Also, read <i>Assessment Strategies</i> on page 48.
Pacing Suggestions: Day 1 – Session 1 on pages 45-47 in Teacher's Edition Day 2 – Session 2 on pages 47 & 48 in Teacher's Edition Day 3 – Session 3 on pages 48 & 49 in Teacher's Edition Teacher Resources:		Introduction to 12D(6-8)#1: Organize information in simple tables and graphs and identify relationships they reveal. (See essay on page 76 in Benchmarks about the importance of student- generated tables and graphs at this grade level.)	Student-generated data table (<i>Note: The</i> Lesson, as written in the Teacher's Guide on page 45, assumes minimal exposure to student-generated data tables. Since students have completed the lessons in the Properties module, they should need significantly less support than provided in the text.) Click to view sample of student work.	 Are students able to recreate the data table provided in the book? Do their tables include straight lines, a title, and column headings? Do students enter data in an organized method? Are their tables legible?

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
	/		teaching and learning.)	
Lesson 2: What	/	Introduction to 12D(6-8)#1:	Student-generated data table for	• Are students able to recreate the
Does Cooling Do?		Organize information in simple	Removing Heat lab	data table provided in the book?
л ·		tables and graphs and identify		• Do their tables include straight
Pacing		relationships they reveal. (See		lines, a title, and column headings?
Suggestions:		essay on page 76 in Benchmarks		Do students enter data in an
Day 1 –		about the importance of student-		
<i>Teaching Strategies</i> Step 1 and first		generated tables and graphs at this		organized method? • Are their tables legible?
triangle in Step 2 on		grade level.)		 Are their tables legible? Is there improvement between the
pages 54 & 55 in				tables generated for Lessons 1 &
Teacher's Edition				2. For example, do they allow
Day 2 –				more space, if needed?
Remainder of Step 2	How do heating	Reinforces 4D(K-2)#2: Things can	Checking Understanding, Questions 1-4	See Step 4 on page 57 Teacher's
and Step 3 on pages	and cooling	be done to materials to change	(See page 57 in Teacher's Edition.)	Edition for specific information on
55 & 56 in	affect materials?	some of their properties, but not all	(See page 57 in Teacher's Edition.)	what to expect in students' answers.
Teacher's Edition	arreet materials:	materials respond the same way to		Also, read Assessment Strategies on
Day 3 –		what is done to them.		page 57.
Session 2 on page		4D(3-5)#1: Heating and cooling		puge 57.
57 in Teacher's		cause changes in the properties		
Edition		of materials. Many changes in the		
		properties occur faster under hotter		
Teacher		conditions.		
Resources:				
5-3				

Lesson	Essential & Unit Questions (for conceptual benchmarks)	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Formative and Summative Assessments (Unless noted as a Summative Assessment, the assessments are formative and should be used to guide	Using Assessments to Monitor Student Learning
Lesson 3: How Hot Is It? Pacing Suggestions: Day 1 – Session 1 on pages 63-65 in Teacher's Edition Day 2 – <i>Teaching Strategies</i> Step 4 on pages 65 & 66 in Teacher's Edition Day 3 – Steps 5-7 on pages 66-68 in Teacher's Edition Day 4 –		12D(3-5)#3: Use numerical data in describing objects and events. 12C(6-8)#3: Use analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various magnitudes. 12D(6-8)#1: Organize information in simple [student- generated] tables and graphs and	teaching and learning.) Comparing Temperatures (See Comparing Temperatures—Team Task on pages 65 & 66 in Teacher's Edition.) Checking Understanding (See page 69 in BSCS Teacher's Edition.) Student-generated data table for Comparing Temperatures lab (See bottom of page 65 in Teacher's Edition.)	 Comparing Temperatures Do students use the thermometers correctly? (Ex: Do they keep the bulb submerged for 30 seconds prior to taking a reading?) When discussing the results, do students use the quantitative data they collected to make comparisons? Checking Understanding Are students able to read and use the thermometers correctly? (If doing a performance assessment, do they keep the bulb submerged for approximately 30 seconds prior to taking a reading?) Do students understand the data they will collect, and are they able to create some type of organized
Day 4 – Checking Understanding on page 69 in Teacher's Edition Teacher Resources:		generated] tables and graphs and identify relationships they reveal. (See essay on page 76 in Benchmarks.)	Click to view sample of student work.	 to create some type of organized data table with <u>some</u> teacher support? Do their tables include straight lines, a title, and column headings? Do students enter data in an organized method? Are their tables legible?

Lesson	Essential & Unit Questions	Benchmarks (Bolded sections indicate portion	Formative and Summative Assessments	Using Assessments to Monitor Student Learning
	(for conceptual benchmarks)	of benchmark addressed)	(Unless noted as a Summative Assessment, the assessments are formative and should be used to guide teaching and learning.)	Student Learning
	Why do the results of similar experiments rarely turn out exactly the same? What is a "fair" experiment? Why should experiments be "fair?"	1A(3-5)#1: Results of similar scientific investigations seldom turn out exactly the same. Sometimes this is because of unexpected differences in the things being investigated, sometimes because of unrealized differences in the methods used or in the circumstances in which the investigation is carried out and sometimes just because of uncertainties in observations. It is not always easy to tell which. 12E(305)#2: Recognize when comparisons might not be fair because some conditions are not kept the same.	Class discussion of <i>Comparing</i> <i>Temperatures</i> data (See <i>Graphing the</i> <i>Data</i> on pages 66 & 67 in Teacher's Edition.) Class discussion of <i>How Cold Was It?</i> data (See <i>Explaining Temperature</i> <i>Readings</i> on page 68 in Teacher's Edition.)	 <i>Comparing Temperatures</i> Do students understand that results of experiments rarely turn out exactly the same? Do students understand if conditions of an experiment are not kept the same, the comparisons are not fair? Are students able to generate some reasonable explanations for variations in the data? <i>How Cold Was It?</i> Are students able to generate some reasonable explanations for variations in the data?

Lesson	Essential & Unit Questions (for conceptual benchmarks)	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Formative and Summative Assessments (Unless noted as a Summative Assessment, the assessments are formative and should be used to guide teaching and learning.)	Using Assessments to Monitor Student Learning
Lesson 4: Where Does Heat Flow? Pacing Suggestions: Day 1 – Session 1 on pages 74-76 in Teacher's Edition Day 2 – Teaching Strategies Steps 3 & 4 on pages 76 & 77 in Teacher's Edition Day 3 – Step 5 on page 77 in Teacher's Edition Day 4– Checking Understanding on pages 78 & 79 in		12D(6-8)#1: Organize information in simple [student-generated] tables and graphs and identify relationships they reveal. (See essay on page 76 in Benchmarks.)	Student-generated data table for <i>Transferring Heat</i> lab (See <i>Preparing</i> <i>for the Transferring Heat Activity</i> on pages 75 & 76 in Teacher's Edition.) <u>Click to view sample of student work.</u> <i>Graphing Changing Temperatures</i> (See Step 5 on pages 77 & 78 in Teacher's Edition.) <u>Click to view sample of student work.</u>	 Student-Generated Tables Do students understand the data they will collect, and are they able to create some type of organized data table with <u>some</u> teacher support? Do their tables include straight lines, a title, and column headings? Do students enter data in an organized method? Are their tables legible? Student-Generated Graphs Are students able to construct graphs of the data? (Depending on the amount of exposure to graphing, students will most likely need some teacher support.) Are students able to use the graph to describe the changes that occurred during the experiment?
Teacher's Edition Teacher Resources:		12D(3-5)#3: Use numerical data in describing objects and events. 12C(6-8)#3: Use analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, and temperature, and choose appropriate units for reporting various magnitudes.	<i>Transferring Heat</i> —data collection and analysis (See Steps 3 & 4 on pages 76 & 77 in Teacher's Edition.)	 Are students able to efficiently and accurately take temperature readings? When writing the sentence describing the graph (see the bottom of page 47 in the Student Guide), do the students use the data to describe what happened?

Lesson	Essential & Unit Questions (for conceptual benchmarks)	Benchmarks (Bolded sections indicate portion of benchmark addressed)	Formative and Summative Assessments (Unless noted as a Summative Assessment, the assessments are formative and should be used to guide	Using Assessments to Monitor Student Learning
	What happens when warmer things are placed by cooler things?	4E(3-5)#2: When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all at the same temperature. A warmer object can warm a cooler one by contact or at a distance.	teaching and learning.) Class discussion of lab data (See Sharing the Data on page 77 in Teacher's Edition) Checking Understanding Questions 1 and 2 (See pages 78 & 79 in Teacher's Edition.) Add additional question/task: Draw a diagram of heat flow of the two containers of the experiment.	 Class Discussion of Data Do students understand that the warm water lost heat and the cold water gained heat? (See <i>Information for the Teacher</i> on pages 79 & 80 for additional information on heat transfer.)
	What are conductors? What kinds of materials conduct heat? How can heat loss be decreased?	Opportunity to introduce 4E(3-5)#3: Some materials conduct heat much better than others. Poor conductors can reduce heat loss.	Checking Understanding Question 4 (See pages 78 & 79 in Teacher's Edition.)	Do students' answers reveal any knowledge about conductors and insulators? If not, this is an opportunity to introduce the idea of an insulator.

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
			teaching and learning.)	
Lesson 5: It's	/	12D(6-8)#1: Organize information	Student-generated data table for Melting	Student-Generated Tables
Melting!		in simple [student-generated]	Ice lab (See page 85 in Teacher's	• Do students understand the data
		tables and graphs and identify	Edition and "Teacher Tips" under	they will collect, and are they able
Pacing		relationships they reveal. (See	"Teacher Resources" on the electronic	to create some type of organized
Suggestions:		essay on page 76 in Benchmarks.)	curriculum.)	data table with minimal teacher
Day 1 –				support?
Teaching Strategies			Click to view sample of student work.	• Do their tables include straight
Steps 1 & 2 on				lines, a title, and column
pages 84 & 85 in				headings?
Teacher's Edition			Graphing the Temperature of Melting	• Do students enter data in an
Day 2 –			<i>Ice</i> (See <i>Graphing the Data</i> — <i>Individual</i>	organized method?
Steps 3 & 4 on			Task on page 87 in Teacher's Edition.)	• Are their tables legible?
pages 85 & 86 in				Student-Generated Graphs
Teacher's Edition				• Are students able to construct
Day 3 –				graphs of the data with less
Steps 5-7 on pages				teacher support and greater quality
86-88 in Teacher's				than in Lesson 4?
Edition				• Are students able to use the graph
Day 4 –	/			to describe the changes that
Checking	/			occurred during the experiment?
Understanding on		12D(3-5)#3: Use numerical data in	Melting Ice lab (See pages 85 & 86 in	• Are students able to efficiently and
pages 88 & 89 in		describing objects and events.	Teacher's Edition.)	fairly accurately take temperature
Teacher's Edition		12C(6-8)#3: Use analog and		readings? (At this point, most
		digital meters on instruments		students should be somewhat
Teacher		used to make direct		proficient at reading a
Resources:		measurements of length, volume,		thermometer.)
		weight, elapsed time, rates, and		• When writing the sentence
3		temperature, and choose		describing the graph (see the
		appropriate units for reporting		bottom of page 54 in the Student
		various magnitudes.		Guide), do the students use the
				data to describe what happened?
	/			

Lesson	Essential & Unit Questions	Benchmarks (Bolded sections indicate portion	Formative and Summative Assessments	Using Assessments to Monitor Student Learning
	(for conceptual benchmarks)	of benchmark addressed)	(Unless noted as a Summative Assessment, the assessments are formative and should be used to guide	Staten Lenning
	What happens when warmer things are placed by cooler things?	4E(3-5)#2: When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all at the same temperature. A warmer object can warm a cooler one by contact or at a distance.	formative and should be used to guide teaching and learning.) Checking Understanding Questions 5 & 7 (See pages 88 & 89 in Teacher's Edition.)	See Assessment Strategies and Checking Understanding on pages 87 & 88 in Teacher's Edition for information on students' answers.

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
	, ,		formative and should be used to guide	
			teaching and learning.)	
Lesson 6: It's	/	12D(6-8)#1: Organize information	Summative Assessment: Student-	Student-Generated Tables
Freezing!		in simple [student-generated]	generated data table for Freezing Water	• Do students understand the data
-		tables and graphs and identify	lab (See Creating a Data Table on page	they will collect, and are they able
Pacing		relationships they reveal. (See	95 in Teacher's Edition.)	to create some type of organized
Suggestions:		essay on page 76 in Benchmarks.)		data table without teacher support?
Day 1 –			Student-generated graph of Freezing	• Do their tables include straight
Session 1 on pages			Water lab	lines, a title, and column
94 & 95 in			Note: Use Teacher-generated graph	headings?
Teacher's Edition			paper, available under "Teacher	• Do students enter data in an
Day 2 –			Resources" on electronic curriculum, in	organized method?
Session 2 on page			place of the Graphing the Temperature	• Are their tables legible?
95 & 96 in			of Freezing Water (BLM 6-1) that is	Student-Generated Graphs
Teacher's Edition			included in the Teacher's Edition (See	• Are students able to construct
Day 3 –			<i>Graphing the Data—Individual Task</i> on	graphs of the data with less
Steps 5-6 on pages			page 97 in Teacher's Edition.)	teacher support and greater quality
97 & 98 in				than in Lesson 5?
Teacher's Edition				• Are students able to use the graph
Optional: Step 7 on	/			to describe the changes that
pages 98 & 99				occurred during the experiment?
Day 4 –		12D(3-5)#3: Use numerical data in	Freezing Water lab and lab data (See	Freezing Water
Checking		describing objects and events.	pages 95 & 96 in Teacher's Edition.)	• Are students able to efficiently and
Understanding on		12C(6-8)#3: Use analog and		fairly accurately take temperature
pages 99 & 100		digital meters on instruments	Checking Understanding Questions 1-3,	readings?
		used to make direct	6 & 8 (See pages 99 & 100 in Teacher's	• When writing the sentence
Teacher		measurements of length, volume,	Edition.)	describing the graph (see the
Resources:		weight, elapsed time, rates, and		bottom of page 63 in the Student
		temperature, and choose		Guide), do the students use the
		appropriate units for reporting		data to describe what happened?
		various magnitudes.		Checking Understanding
				• Do students use their data to
	/			answer the questions?

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	How do heating and cooling affect materials?	4D(3-5)#1: Heating and cooling cause changes in the properties of materials. Many kinds of changes occur faster under hotter conditions.	<i>Checking Understanding</i> Questions 4 & 5 (See pages 99 & 100 in Teacher's Edition.)	See page 100 in Teacher's Guide for information on student answers.
Lesson 7: Where Does the Liquid Go? SKIP LESSON				
Lesson 8: Getting Into Hot Water SKIP LESSON				

Lesson	Essential &	Benchmarks	Formative and Summative	Using Assessments to Monitor
	Unit Questions	(Bolded sections indicate portion	Assessments	Student Learning
	(for conceptual	of benchmark addressed)	(Unless noted as a Summative	
	benchmarks)		Assessment, the assessments are	
			formative and should be used to guide	
			teaching and learning.)	
Lesson 9: What	How do heating	12D(3-5)#3: Use numerical data in	Summative Assessment: Tasks 1-4 on	See pages 127 & 128 in Teacher's
<u>Have You</u>	and cooling	describing objects and events.	pages 125 & 126 in Teacher's Edition	Edition for detailed information
Learned?	affect materials?	4E(3-5)#2: When warmer things		about student answers.
	What happens	are put with cooler ones, the warm		
Pacing	when warmer	ones lose heat and the cool ones		
Suggestions:	things are placed	gain it until they are all at the same		
Day 1 –	by cooler things?	temperature. A warmer object can		
Assessment Tasks 1		warm a cooler one by contact or at		
& 2		a distance.		
Day 2 –		4D(3-5)#1: Heating and cooling		
Assessment Tasks 3		cause changes in the properties of		
& 4		materials. Many kinds of changes		
		occur faster under hotter		
		conditions.		
		12D(6-8)#1: Organize information		
		in simple [student-generated]		
		tables and graphs and identify		
		relationships they reveal. (See		
		essay on page 76 in Benchmarks)		