Science Assessment Item Collaborative

Presentation of an

Item Cluster Prototype

for assessment of the NGSS

Welcome. The presentation will begin shortly.

Thursday, November 19, 2015
1:00 p.m. ET

Science Assessment Item Collaborative

Presentation of an

Item Cluster Prototype

for assessment of the NGSS

Thursday, November 19, 2015
1:00 p.m. ET

Presentation Logistics

- Webinar is being recorded
- All lines are muted by the host
- Please submit questions to “WestEd Host” via the chat box
- The presentation and links to documents will be made available following the webinar
- Presenters:
  - Scott Norton: Strategic Initiative Director, CCSSO
  - Kevin King: Senior Assessment Manager, WestEd
  - Nicolle Romero: Science Assessment Development Manager, WestEd
  - Peter McLaren: Director, State and District Support for Science, Achieve

Overview

- Background on the Science Assessment Item Collaborative (SAIC)
- Supporting Documentation
  - Assessment Framework
  - Item Specifications Guidelines
- Intent of Item Cluster Prototypes
- Process of Item Cluster Prototype Development
- Design and Alignment Expectations
- Item Cluster Prototype Preview
- Access to Prototypes

Background on SAIC

- In response to requests from chiefs, in January 2015 CCSSO established a collaborative, the Science Assessment Item Collaborative (SAIC), to support states in moving to assessments aligned to the Next Generation Science Standards (NGSS).
- The ultimate goal of this collaborative is to develop high-quality assessment items, aligned to the NGSS, that are accessible to states.
- 14 states and the U.S. Virgin Islands joined the Collaborative and provided input and feedback on the resources developed.
  - AR, CA, CT, DE, HI, IL, KY, MD, MA, MI, NV, OR, WA, WV, and USVI

SAIC Resources

- During the first phase of this work, the Collaborative, in partnership with WestEd, developed several resources: a SAIC Assessment Framework, SAIC Item Specifications Guidelines, and prototype items for grade 5 and high school (available within the coming month). These resources are freely available to all states.
- Following the conclusion of this presentation, CCSSO will be distributing the link to the prototype item cluster for grade 5.

SAIC Next Steps

- During previous discussions with SAIC members, some states have indicated that there is an additional set of resources that they would find useful in order to move toward assessment development.
- CCSSO is starting a Phase 1.5 to support development of these additional resources.
- If you have any questions, please contact Kirsten.carr@ccsso.org.

Context for Development and Use of SAIC Resources

- Assessment Framework
- Item Specifications Guidelines
- Item Cluster Prototypes
  - Grade 5
  - High School

Supporting Documentation: Assessment Framework

- Provides a range of options and accompanying rationales for the development of NGSS-aligned item clusters for summative assessment
- Rooted in three seminal resources:
  - *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (NRC, 2012)
  - *Next Generation Science Standards: For States, by States* (NGSS Lead States, 2013)
  - *Developing Assessments for the Next Generation Science Standards* (NRC, 2014)
- Intended uses of the Assessment Framework:
  - As a guiding document for the development of state and local assessment design and test specifications
  - To inform states' development processes

Supporting Documentation: Assessment Framework

- Presents a starting point for the implementation of a large-scale assessment measuring the NGSS
- Not intended to provide a full assessment solution for states
- Focus on large-scale summative assessment, with applications to other types of assessments

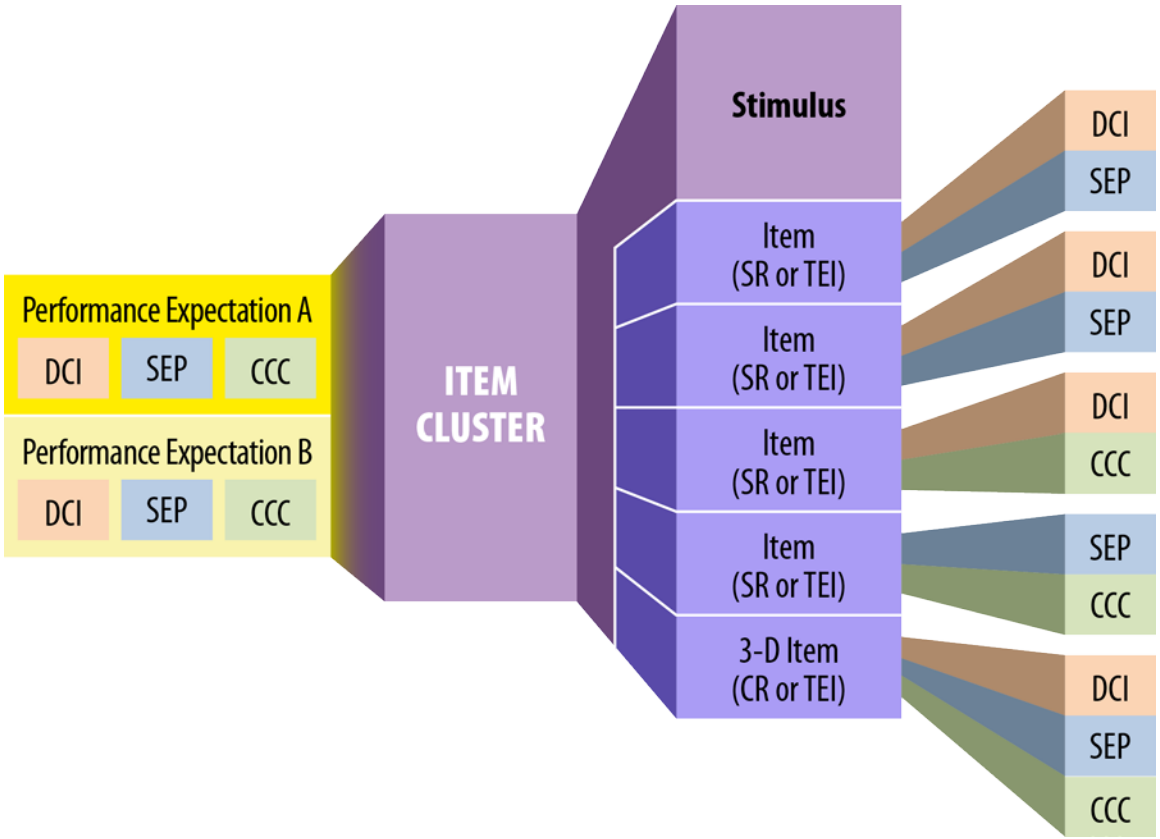
Supporting Documentation: Assessment Framework

- The Assessment Framework presents an approach to item development that takes into consideration the following premises:
  - Item clusters, not individual items, are the base unit for the SAIC test development.
  - Item clusters are the primary focus for developers in terms of alignment to the NGSS.
    - That is, each item cluster must demonstrate strong three-dimensional alignment to the NGSS.
  - To qualify as NGSS-aligned, item clusters must be aligned to one or more PEs and must be inclusive of all of the dimensions associated with the PE(s) (i.e., DCI, SEP, CCC).
  - Each individual item within the cluster must align with at least two dimensions of the NGSS (e.g., DCI, SEP, and/or CCC) to qualify for inclusion in an item cluster.

Supporting Documentation: Item Specifications Guidelines

- Articulates the NGSS–to–item cluster correlations that are necessary for the development of NGSS-aligned items, item clusters, and assessments
- Key element of the sample PE item specifications:
  - linkage of PE Evidence Statements to item cluster development
- Describes item types and subtypes of items that can be considered for use in item clusters

Item Cluster Structure for Two PEs



Intent of Item Cluster Prototypes

- Present an item cluster to demonstrate how the ideas in the SAIC Assessment Framework can be implemented
- Present an example of how large-scale summative assessment item clusters can be crafted to fulfill the expectations of the *K-12* Framework and the NGSS
- Address multiple expectations:
  - Appropriate PE bundling
  - Appropriate phenomenon and stimulus determination for the PE bundle
  - Meet alignment expectations at multiple levels (e.g., PE, three dimensions, item part, item, item cluster)

Process of Item Cluster Prototype Development

- Establish a review committee of SAIC members and content experts
- Determine an appropriate PE bundle
- Determine a targeted phenomenon
- Multiple rounds of feedback and updates from review committee and full collaborative, focused on:
  - Phenomenon choice
  - Item card template structure and supporting information
  - Alignment judgments and expectations

Design and Alignment Expectations

- Large-scale summative assessment application
- Assume computer delivery
- Remain delivery system-agnostic
- Focus on achievement of alignment expectations
- Range of item types to be represented; not intended as an exhaustive set of item types
- Include some constructed-response items
  - No presumption of use of AI or hand scoring
- Representation of functional items
  - i.e., functionality is described and represented in item cards
- Additional design decisions explained in prototype front matter

Item Cluster Prototype Preview

Pages extracted from the Grade 5 Item Cluster Prototype:

- Item Cluster Alignment (p. 1)
- Item Cluster Overview (p. 2)
- Stimulus Screen (p. 7)
- Item Overview (p. 12)
- Item Card (pp. 13-14)
- Metadata Table (p. 32)

Item Cluster Alignment

Level:	Grade 5
Primary Target Domain:	Physical Sciences
Target PEs:	5-PS1-1, 5-PS1-2
Crosscutting Concept(s) Focus:	Scale, Proportion, and Quantity
Science and Engineering Practice(s) Focus:	Developing and Using Models, Using Mathematics and Computational Thinking
Reasoning for PE Groupings:	Mass (size micro to macro), and conservation of mass
Phenomenon:	Sugar is no longer visible when it dissolves in water, but the mass of the mixture stays the same
Allowable Item Types:	SR, TE, CR

	5-PS1-1	5-PS1-2
Performance Expectations:	Develop a model to describe that matter is made of particles too small to be seen.	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
Target Clarifications:	Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.	Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.
Assessment Boundary:	Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.	Assessment does not include distinguishing mass and weight.

Disciplinary Core Idea(s):	**PS1.A: Structure and Properties of Matter** • Matter of any type can be subdivided into particles that are too small to see, but even then, the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.	**PS1.A: Structure and Properties of Matter** • The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. **PS1.B: Chemical Reactions** • No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)
Science and Engineering Practice(s):	**Developing and Using Models** Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Use models to describe phenomena.	**Using Mathematics and Computational Thinking** Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. • Measure and graph quantities such as weight to address scientific and engineering questions and problems.
Crosscutting Concept(s):	**Scale, Proportion, and Quantity** • Natural objects exist from the very small to the immensely large.	**Scale, Proportion, and Quantity** • Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. *Connections to Nature of Science* **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** • Science assumes consistent patterns in natural systems.

Item Cluster Overview

5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.

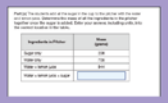
5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

ITEM CLUSTER

Stimulus

Item 1: Text Entry / Table Fill-In

5-PS1-2 SEP CCC



Item 2a: Computation

Item 2b: Graphing (TEI)

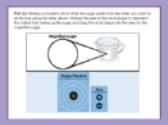
5-PS1-2 DCI SEP CCC

Item 2c: Short Answer

Item 3(a–b): Multiple Choice / Multiple Select

5-PS1-2 DCI SEP CCC

Item 4a: Short Answer



Item 4b: Building a Model (Drag-and-Drop, TEI)

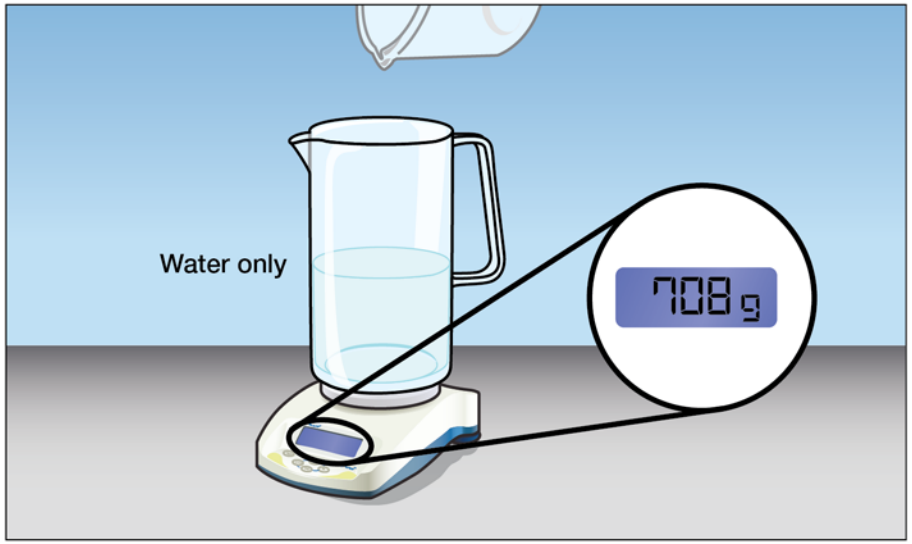
5-PS1-1 DCI SEP CCC

Item 5(a–b): Constructed Response

5-PS1-1 DCI SEP CCC

Stimulus Screen

Next, the students pour water into the empty pitcher on the scale.



REPLAY

Click REPLAY to watch the animation/video again.

Click NEXT to continue.

NEXT

Stimulus

Media (animation/video): All of the water is poured into the pitcher and the scale reads 708 g. Mass reading on the scale changes gradually as an ingredient is being added.

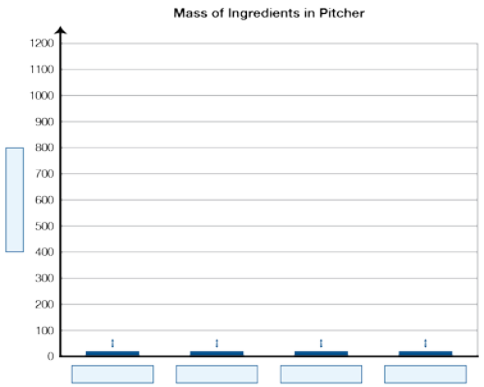
Platform prompt and student control

Item Overview—Student View

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	

Part (b) Now you will graph the data you collected. Complete the graph to show the mass of the ingredients in the pitcher after each ingredient is added. Click on the top of the bar to drag and change the height of each bar. Then, type in a label in the appropriate space below each bar. Type in the appropriate label along the vertical axis (be sure to include an appropriate unit).



Part (c) After stirring, the students observe that none of the sugar could be seen in the lemonade mixture. Explain how the mass of the ingredients in the pitcher right after the sugar is added compares to the mass of the ingredients after the sugar is stirred.

Click NEXT to continue to the next question. NEXT

5-PS1-2
Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

Full alignment to the PE and targeted dimensions is intended through the entirety of the item cluster. Partial to strong alignment to the dimensions for each item is achieved through alignment to the evidence statements, and is inclusive of all item parts for any given item.

PS1.A: Structure and Properties of Matter
- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.

PS1.B: Chemical Reactions
- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)

Using Mathematics and Computational Thinking
Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.
- Measure and graph quantities such as weight to address scientific and engineering questions and problems.

Scale, Proportion, and Quantity
- Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

Item Card—Before Student Interaction

BEFORE STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student enters an alphanumeric response in this field. It is recommended that students have access to a calculator for this item. A character limit will be included for the response field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Item Card—After Student Interaction

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Student View

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—UI Notes

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Item Notes and Information

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Before/After Heading

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Stem

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Graphic

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Alphanumeric Entry Field

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Platform Prompt and Student Control

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—UI Notes

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—UI Note, General

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—UI Notes, Component-Specific Labels

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Click NEXT to continue to the next question. NEXT

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Item Notes and Information

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Item Type and Estimated Time

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Evidence Statement Alignment

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Note on Item Alignment

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Item Card—Scoring Notes

AFTER STUDENT INTERACTION

Part (a) The students add all the sugar in the cup to the pitcher with the water and lemon juice. **Determine the total mass of all the ingredients in the pitcher once the sugar is added. Enter your answer, including units, into the correct location in the table.**

Ingredients in Pitcher	Mass (grams)
Sugar only	206
Water only	708
Water + lemon juice	944
Water + lemon juice + sugar	**1150**

Click NEXT to continue to the next question. NEXT

Stem

*Item 2 Parts (a), (b), and (c) will appear together on the same screen, and students may change their responses to Part (a), Part (b), or Part (c) at their discretion before clicking NEXT and continuing to Item 3. Students may **not** return to Item 1 at this stage in the administration.*

Student entered an alphanumeric response in this field.

Platform prompt and student control

Item Type: Computation
Estimated Time: 1 min

Evidence Statement Alignment:
(5-PS1-2)
(2) Mathematical/computational analysis: (a) Students measure and/or calculate the difference between the total weight of the substances (using standard units) before and after they are heated, cooled, and/or mixed.

(2) Mathematical/computational analysis: (c) Students use their measurements and calculations to describe that the total weights of the substances did not change, regardless of the reaction or changes in properties that were observed.

Note on Item Alignment:
What is being elicited from the student (evidence)? The student can calculate the mass of the sugar added to the liquid and reason that the mass of the sugar did not change when it was added to the liquid, even though the sugar was no longer visible in the liquid (i.e., it dissolved).

Scoring Notes: 1 point is awarded for the correct alphanumeric response.

Metadata Table

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	9 of 11	12	24	

Metadata Table—Brief Description Column

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	**9 of 11**	**12**	**24**	

Metadata Table—Item Type Column

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	**9 of 11**	**12**	**24**	

Metadata Table—Performance Expectation (PE) Column

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	N/A	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	9 of 11	12	24	

Metadata Table—Dimensions Columns

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	N/A	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	**9 of 11**	**12**	**24**	

Metadata Table—Evidence Statement Alignment Columns

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	9 of 11	12	24	

Metadata Table—Scoring and Time Columns

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	**9 of 11**	12	24	

Metadata Table—Item Row

Item	Item Part	Brief Description	Item Type	PE	DCI	SEP	CCC	EV Level	EVs	Points	Estimated Time (min)	Hand or Automated Scoring
Stimulus		Preparing lemonade	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3	*N/A*
1	1	Designing and populating a data table	Text Entry/ Table Fill-In	5-PS1-2	*N/A*	5	3	1	1.a.i 1.a.ii	2	2	A
2	2a	Calculate mass of ingredient	Computation	5-PS1-2	PS1.A PS1.B	5	3	1	1.a.i 1.a.ii	1	1	A
	2b	Graphing masses of ingredients	Graphing					2	2.a	2	2	A
	2c	Describe properties of individual ingredients	Short Answer					2	2.c	1	2	H
3	3a	Claim for conservation of mass	Multiple Choice	5-PS1-2	PS1.A PS1.B	5	3	2	2.d	1	1	A
	3b	Identify evidence of conservation of mass	Multiple Select					2	2.d	1	1	A
Stimulus		Investigating ingredients	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1	*N/A*
4	4a	Describe that both sugar and water are made up of particles	Short Answer	5-PS1-1	PS1.A	2	3	1	1.a.ii	1	2	H
	4b	Building a model to show particles of matter	Building a Model (Drag-and-Drop)					1	1.a.i 1.a.ii	1	3	A or H
5	5a–b	Describing the model and use of model in explaining science phenomenon	Constructed Response	5-PS1-1	PS1.A	2	3	2, 3	2.a.i 3.a	2	6	H
								Total:	**9 of 11**	**12**	**24**	

Context for Item Cluster Prototype Review

- Prototype Front Matter
- Assessment Framework

Access to Prototypes

- The Grade 5 Item Cluster Prototype will be posted at the following locations:
  - CCSSO website: http://www.ccsso.org/Resources/Resources_Listing.html
  - CSAI website: http://www.csai-online.org/spotlight/science-assessment-item-collaborative
- The High School Item Cluster Prototype will be posted in early December at the same locations.
- The Assessment Framework and the Item Specifications Guidelines are available at the same locations.
- Webinar slides will be available on the CSAI site.
- Please provide feedback on any of the SAIC resources through the comment link on the CSAI site or directly to kking@wested.org.

Thank you for attending.