



NM-ASR Spring 2020 Census Field Test Guide and Blueprint

Census Field Test Layout

The New Mexico Assessment of Science Readiness (NM-ASR) census field test will be administered on the computer, using the same iTester platform as the previous Science SBA test. Universal tools, accessibility features, and accommodations will be included to provide access for a broad range of diverse student needs. Spanish forms, paper-based forms, large print forms, and Braille forms will also be available.

At each grade students will have 2 back-to-back sessions as shown:

<u>NM-ASR Grades 5 and 8</u>		<u>NM-ASR Grade 11</u>	
Session 1	Session 2	Session 1	Session 2
14 items	14 items	17 items	17 items
~45 min	~45 min	~55 min	~55 min
MS-2	MS-2	MS-2	MS-2
MS-2	MS-2	MS-2	MS-2
MS-2	MS-2	MS-2	MS-2
MS-2	MS-2	MS-2	MS-2
MS-2	MS-2	MS-2	OE
OE	OE	MS-2	Cluster
Cluster	Cluster	MS-2	Cluster
Cluster	Cluster	MS-2	Cluster
		OE	
		Cluster	
		Cluster	

Testing Details

- All eligible students in grades 5, 8, and 11 must take the NM-ASR in spring 2020 as required by the PED's waiver from US Department of Education: <https://webnew.ped.state.nm.us/bureaus/assessment-3/nmasr/>
 - **This is not an optional field test**
- The administration window for NM-ASR is **March 2-27, 2020**.
- The NM-ASR will be given as a field test, meaning data will be gathered on how the items on the test perform, but students will not receive individual scores or score reports for the test.



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- In order to test the performance of many items or test questions, each student will be assigned only one of several different forms.
- While each form is unique some items will overlap, all items are aligned to the performance expectations (standards) in the *New Mexico STEM Ready! Science Standards*, and on each form students will respond to questions about physical sciences, life sciences, and earth and space sciences. The specific performance expectations tested on each form will differ, however.
 - All standards from grades 3, 4, and 5, *except* 5-SS-1 NM, are eligible to be field tested on the grade 5 test.
 - All standards in the middle school grade band (6-8), *including* MS-ESS3-3 NM, are eligible to be field tested on the grade 8 test.
 - All standards in the high school grade band (9-12), *except* HS-LS2-7 NM and HS-SS-1 NM, are eligible to be field tested on the grade 11 test.
 - Because of the nature of the new science standards, all items will require students to use multiple dimensions of the standards to answer. The three dimensions are the disciplinary core ideas (i.e., content or “what students know”); the science and engineering practices (i.e., the inquiry skills and understandings or “what students do”); and the crosscutting concepts (i.e., the themes that unify science concepts or “how students think”).

Item Types

Three different item types are included on the NM-ASR:

1. Clusters
2. Machine scored 2 point items (MS-2)
3. Open ended short response items (OE)

Descriptions and examples of each item type are provided on the following pages.



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- **Clusters:** Clusters are a set of 4 items all associated with an introductory passage, or “stimulus” worth a total of 6 points.
 - The stimulus typically contains both text and graphics such as diagrams, tables, or graphs. An example of a cluster from the *grade 5 practice test* is below.

Read the information. Then answer the questions that follow. ➔

Investigating Gas Production

In class, a teacher demonstrates a chemical reaction by mixing vinegar and baking soda to produce bubbles of gas. Eliana wonders whether mixing other substances could also produce a gas. She decides to test different combinations of sugar, water, vinegar, and baking soda.

Some properties of these substances are shown in the table.

Properties of Substances

Substance	Color	Solid or Liquid	Attracted to a Magnet	Conducts Electricity
Sugar	White	Solid	No	No
Water	Clear	Liquid	No	Yes
Vinegar	Clear	Liquid	No	Yes
Baking soda	White	Solid	No	No

Investigation 1

Eliana mixes a small amount of each liquid and solid in a bowl and observes whether bubbles of gas are produced. Her observations are shown in the table.

Investigation 1 Observations

Liquid Used	Solid Used	Gas Produced
Water	Sugar	No
Water	Baking soda	No
Vinegar	Sugar	No
Vinegar	Baking soda	Yes

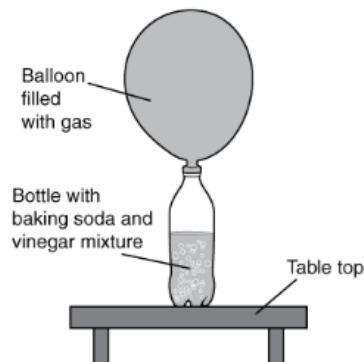
Investigation 2

Next, Eliana wonders whether changing the amount of baking soda would change the amount of gas produced. To investigate, she follows these steps:

1. Record the mass of a balloon.
2. Pour 50 milliliters of vinegar into a bottle.
3. Put 5 milliliters of baking soda inside the balloon. Hold the balloon so that the baking soda stays inside the balloon and attach the open end of the balloon to the top of the bottle.
4. Lift the balloon so that the baking soda falls into the bottle with vinegar.
5. Wait one minute.
6. Carefully remove the balloon from the bottle without allowing any gas to escape.
7. Measure the mass of the balloon filled with gas.
8. Calculate the mass of gas produced by subtracting the mass of the balloon from the mass of the balloon filled with gas.
9. Repeat steps 1–8 until three trials have been completed.
10. Repeat steps 1–9 with 10 milliliters and 15 milliliters of baking soda.

The results of one trial are shown in the diagram.

Gas in a Balloon



Eliana's data are shown in the table.

Investigation 2 Data

Amount of Baking Soda (milliliters)	Mass of Gas Produced (grams)			Average Mass of Gas Produced (grams)
	Trial 1	Trial 2	Trial 3	
5	1.0	0.8	1.2	1.0
10	1.5	1.9	1.4	1.6
15	2.4	1.9	2.6	2.3



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- Two of the items in the cluster are machine-scored items worth 1 point each. These items may be multiple-choice, multi-select, or technology-enhanced items (e.g., drag-and-drop, hot spot, drop-down selections).

Which evidence from the investigations supports the claim that mixing vinegar and baking soda produces a new substance?

Hide All

- (A) A gas is produced when a liquid and a solid are mixed.
- (B) When a liquid and solid are mixed, the mass does not change.
- (C) The properties of substances stay the same when the substances are mixed.
- (D) Different amounts of baking soda can be mixed with the same amount of vinegar.

MS-1 cluster item, grade 5 practice test

- The other two items in the cluster are machine-scored items worth 2 points each. These items have two parts, with Part a worth 1 point and Part b also worth 1 point. Each part of the item may be presented as multiple-choice, multi-select, or technology-enhanced (e.g., drag-and-drop, hot spot, drop-down selections).

This question has two parts. Be sure to answer both parts of the question.

Part a
Eliana claims that when baking soda and vinegar are mixed, a new substance forms.

Select the phrase that describes an observation from investigation 2 that supports her claim.

After baking soda and vinegar are mixed,

Part b
Which observation is evidence that the new substance inside the balloon is a gas?

Hide All

- (A) The new substance filled the balloon.
- (B) The new substance has more mass than the baking soda.
- (C) The new substance takes up less space than the vinegar.
- (D) The new substance increases as the baking soda increases.

MS-2 cluster item, grade 5 practice test

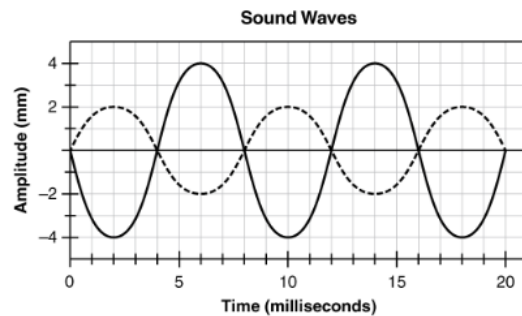


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- **MS-2 Items:** MS-2 items are standalone, or individual, machine-scored items.
 - As in the cluster, the standalone MS-2 items are worth 2 points and have two parts, with Part a worth 1 point and Part b also worth 1 point. Each part of the item may be presented as multiple-choice, multi-select, or technology-enhanced (e.g., drag-and-drop, hot spot, drop-down selections).

This question has two parts. Be sure to answer both parts of the question.

Elaine is researching the characteristics of sound waves as she listens to music. She finds a diagram that shows two sound waves.



Key	
---	Wave 1
—	Wave 2

Part a

Select the number that describes the sound waves in the diagram.

Wave 1 has the energy of Wave 2.

Part b

Elaine predicts that the energy in each sound wave would double if the frequency of the wave doubled.

Which statement describes her prediction?

- (A) Her prediction is correct because the energy of a wave is proportional to the wave's frequency.
- (B) Her prediction is incorrect because the energy of a wave is proportional to the square of the wave's frequency.
- (C) Her prediction is correct because the energy of a wave is proportional to speed and a wave with twice the frequency has twice the speed.
- (D) Her prediction is incorrect because the energy of a wave is proportional to the wavelength and a wave with twice the frequency has half the wavelength.

MS-2 item, grade 8 practice test



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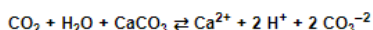
- **OE Items:** OE, or open-ended, items are standalone items that require students to provide a written response to a prompt or question.
 - The prompt or question may be a single prompt, or more typically, the item will be written with multiple, scaffolded parts for students to answer.
 - The items are worth 4 points each and are hand-scored for 4, 3, 2, 1, or 0 points by trained scorers using a rubric and scoring notes.

This question has two parts. Be sure to answer both parts of the question.

Some students work at a local aquarium. One of their tasks is to care for mollusks and corals in ocean water in a tank at the aquarium. The students need to make sure that the ocean water has the right balance of calcium ions (Ca^{2+}) and carbonate ions (CO_3^{2-}) that the mollusks and corals need to build their shells and skeletons.

To do this, the students need to ensure that calcium and carbonate ions are continuously added to the ocean water in the tank. The students know that ocean water contains calcium carbonate, which naturally breaks down into calcium and carbonate ions. The equilibrium relationship between the components in the water is shown in the equation.

Equilibrium Equation



The students decide to test the equilibrium relationships in the equation. With ocean water as an input, the students remove calcium ions (Ca^{2+}) as the ions form in the water in the tank. The students observe that as they remove calcium ions, more calcium ions form in the tank. They realize that this is an example of Le Chatelier's principle that describes the equilibrium relationships in the water.

The people who work at the aquarium tell the students that ocean water contains carbon dioxide (CO_2) and that increasing amounts of CO_2 in ocean water can cause some of the calcium carbonate (CaCO_3) in the shells and skeletons of ocean organisms to dissolve.

The students want to solve this problem by decreasing the amount of carbon dioxide in ocean water.

- Describe one way students could decrease the amount of CO_2 in ocean water by applying Le Chatelier's principle.
- Describe one constraint on implementing the change described in Part (a).

OE item, grade 11 practice test

Practice Tests

A practice test for each grade (5, 8, 11) is available 24/7 and can be accessed at <https://newmexico.onlinehelp.cognia.org/practice-tests/>

Currently the practice tests are single-session tests with 2 clusters, 2-3 MS-2 items, and 1 OE item per grade. In January 2020, the practice tests will be expanded to include more items of each type.