Sample Questions
General Information About The Nation’s Report Card

Grade 12
Mathematics
Reading
Science
Letter From Dr. Peggy Carr, NCES

As Associate Commissioner of the National Center for Education Statistics (NCES), and on behalf of the National Assessment of Educational Progress (NAEP), I want to thank you for your participation in the NAEP 2019 assessments. The NAEP program is an essential measure of student achievement in the United States. NAEP results provide valuable information on what students in our country know and can do in various subjects.

In 2019, most fourth-, eighth-, and twelfth-grade students will take the NAEP mathematics, reading, and science assessments on NAEP-provided tablets, while a small subset of students will take paper-and-pencil versions. Administering assessments via both tablets and paper booklets helps to evaluate any difference in student performance between the two types of administration.

At the end of each NAEP assessment, students voluntarily complete a 15-minute survey questionnaire about themselves and their educational experiences in and outside of the classroom. To learn more about NAEP survey questionnaires, visit https://nces.ed.gov/nationsreportcard/experience/survey_questionnaires.aspx.

Results of the 2019 mathematics, reading, and science assessments will be reported as The Nation’s Report Card. Assessment results are widely discussed in the press and are used by educators, researchers, policymakers, and elected officials to make decisions about education policy and funding.

This booklet provides helpful information on the NAEP 2019 assessments for grade 12 in mathematics, reading, and science. You’ll also find details on sample questions for these three subjects in order to promote understanding of the assessment, as well as links to the 2019 survey questionnaires. Additional information for teachers and schools can be found at http://nces.ed.gov/nationsreportcard/educators, including more details about the NAEP assessment and the critical role of educators in the NAEP program.

If you have any questions or comments regarding NAEP or would like to view previous report cards, please visit the NAEP website at http://nces.ed.gov/nationsreportcard. To learn more about NAEP digitally based assessments and view tutorials, visit https://nces.ed.gov/nationsreportcard/dba.

Peggy G. Carr, Ph.D.
Associate Commissioner
National Center for Education Statistics
Institute of Education Sciences

NAEP is administered by the National Center for Education Statistics, within the U.S. Department of Education’s Institute of Education Sciences. Policy for the assessment, including its content and standards, is set by the independent, bipartisan National Assessment Governing Board (http://www.nagb.org).
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According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this voluntary information collection is 1850-0928. The time required to complete this information collection is estimated to average 90 minutes, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate, suggestions for improving this collection, or any comments or concerns regarding the status of your individual submission, please write to: National Assessment of Educational Progress (NAEP), National Center for Education Statistics (NCES), Potomac Center Plaza, 550 12th St., SW, 4th floor, Washington, DC 20202.

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Authorization and Confidentiality Assurance
National Center for Education Statistics (NCES) is authorized to conduct NAEP by the National Assessment of Educational Progress Authorization Act (20 U.S.C. §9622). All of the information provided by participants may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). By law, every NCES employee as well as every NCES agent, such as contractors and NAEP coordinators, has taken an oath and is subject to a jail term of up to 5 years, a fine of $250,000, or both if he or she willfully discloses ANY identifiable information about you. Electronic submission of your information will be monitored for viruses, malware, and other threats by Federal employees and contractors in accordance with the Cybersecurity Enhancement Act of 2015. The collected information will be combined across respondents to produce statistical reports.

A project of the National Center for Education Statistics (NCES), Institute of Education Sciences, U.S. Department of Education.
II. The NAEP Assessments

NAEP Overview

NAEP serves a different role than state assessments. While states have their own unique assessments with different content standards, the same NAEP assessment is administered in every state, providing a common measure of student achievement.

Each student answers questions in only one subject and one format—either a digitally based or a paper-based assessment. Each NAEP assessment takes approximately 90 to 125 minutes for a student to complete (including transition time, instructions, and completion of a survey questionnaire).

NAEP assessment results for grade 12 are reported for the nation in civics, economics, geography, mathematics, reading, science, U.S. history, and writing. The NAEP assessment is not designed to provide results for individual schools or students. All data collected from the assessment results will be used for statistical purposes only.*

NAEP Frameworks

Each NAEP assessment is built around an organizing framework, which is the blueprint that guides the development of the assessment. The National Assessment Governing Board oversees the development of the NAEP frameworks, which describe the specific knowledge and skills to be assessed in each subject. Frameworks incorporate ideas and input from subject area experts, school administrators, policymakers, teachers, parents, and others. Learn more about NAEP frameworks at https://www.nagb.gov/naep-frameworks/frameworks-overview.html.

NAEP Digitally Based Assessments

Many of our nation's schools are equipped with computers, and an increasing number of schools are making digital tools an integral component of the learning environment, reflecting that the knowledge and skills needed for future educational and workplace success involve the use of new technologies. The NAEP program is evolving to address the changing educational landscape through its transition to digitally based assessments. These assessments allow for the collection of new types of data that provide in-depth understanding of what students know and can do in various subjects. Some questions

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may include multimedia, such as audio and video. Other questions may allow the use of embedded technological features (such as a scratchwork tool) to form a response, or may engage students in solving problems within realistic scenarios.

The NAEP digitally based assessments incorporate cutting-edge learning technologies. At the beginning of each assessment, students take a brief interactive tutorial designed to teach them about the system and the tools they use to take the assessment. Some parts of the tutorials are the same across subjects, while other parts are specific to each subject. For example, because mathematics uses different tools at each grade, there are different tutorials for each grade in mathematics.

To learn more about NAEP digitally based assessments and view a NAEP tutorial, visit https://nces.ed.gov/nationsreportcard/dba/.
Mathematics
Grade 12

The NAEP 2019 mathematics assessment measures students’ ability to solve problems in five mathematics content areas: number properties and operations; measurement; geometry; data analysis, statistics, and probability; and algebra. Within each of these five content areas, students are asked questions of low, moderate, or high mathematical complexity. Mathematical complexity is a measure of the level of demand placed on a student's thinking in order to answer a question correctly.

In 2019, most students will take a digitally based version of the mathematics assessment on touchscreen tablets with keyboards. Some grade 12 students will take the paper-and-pencil based assessment for trend and validity purposes. During the digitally based assessment, students will have access to onscreen tools that will help them interact with the assessment. Some of these tools include a scratchwork tool, a calculator, a math keyboard, magnification, a read-aloud option, and a progress bar and timer.

For the digitally based version of the assessment, calculator use is permitted on approximately 40 percent of the test questions. NAEP provides a scientific calculator for students who receive a section of questions where calculator use is permitted.

The digitally based version of the assessment includes selected-response and constructed-response item types. The selected-response items may include single- and multiple-selection multiple choice, inline choice, zone (hot spot), matching, and interactive items. The short and extended constructed-response questions allow students to communicate their ideas and demonstrate the reasoning they used to solve problems. The short constructed-response and extended constructed-response questions combined make up approximately 50 percent of student assessment time, and the selected-response items combine to make up the other 50 percent of student assessment time.

The paper-based version of the assessment includes single-selection multiple-choice items and short and extended constructed-response items. As in the digitally based assessment, the short constructed-response and extended constructed-response questions combined make up approximately 50 percent of student assessment time and the multiple-choice items make up the other 50 percent of student assessment time.

The paper-based version of the assessment also incorporates the use of calculators, rulers, protractors, and other ancillary materials such as geometric shapes, in some parts of the assessment, but not all.
For the paper-based version of the assessment, calculator use is permitted on approximately 35 percent of the test questions. Students may use their own scientific or graphing calculators, with some restrictions for test security purposes. (Students who do not bring their own calculator are provided with a scientific calculator.) These items are designed so that students who bring their own graphing calculators are not at an advantage compared to students who use the scientific calculator provided by NAEP.

For more information regarding the mathematics assessment framework, please visit the National Assessment Governing Board’s website at https://www.nagb.gov/naep-frameworks/mathematics.html.

### NAEP Mathematics Framework
**Distribution of Questions Across Content Areas**

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Properties and Operations</td>
<td>10%</td>
</tr>
<tr>
<td>Measurement and Geometry*</td>
<td>30%</td>
</tr>
<tr>
<td>Data Analysis, Statistics, and Probability</td>
<td>25%</td>
</tr>
<tr>
<td>Algebra</td>
<td>35%</td>
</tr>
</tbody>
</table>

* These two content areas at grade 12 are combined because “this reflects the fact that the majority of measurement topics suitable for twelfth-grade students are geometric in nature” (Mathematics Framework for the 2011 National Assessment of Educational Progress, p.5).
Directions

Below are the General Directions for the mathematics digitally based assessment. Students will see these instructions on the screen prior to beginning the assessment.

This assessment has several sections of mathematics questions. You received a reference sheet that contains mathematical formulas that may be useful for answering some of the questions in these sections.

When you are finished with these sections, you will be asked to answer questions about yourself and your experiences in and out of school.

If time runs out before you complete a section, your work will be saved.

Tap the Next arrow to begin.

Here is an example of directions a student might see during the mathematics assessment.

This section has 20 mathematics questions. You have 30 minutes to complete this section.

You cannot use the calculator in this section.

If you finish before time is up, you may review your work.

Tap the Next arrow to continue.
Sample Questions

The following mathematics sample questions and correct student responses are available in the NAEP Questions Tool. For additional sample questions and responses, visit https://nces.ed.gov/nationsreportcard/nqt/.

Learn more about NAEP digitally based assessments and view interactive tutorials at https://nces.ed.gov/nationsreportcard/dba/.

1. Which of the following expressions is NOT equivalent to \((a + b)(x + y)\) ?

- A \((a + b)x + (a + b)y\)
- B \(a(x + y) + b(x + y)\)
- C \((b + a)(y + x)\)
- D \(ax + by\)
- E \(ax + bx + ay + by\)

2. Bob is going on a trip. He will be taking a taxi, a flight, and then a train. Bob chose the following three companies based on their claims.

- Tom’s Taxi Service claims that it is on time 95 percent of the time.
- Friendly Flyer Airlines claims that it is on time 93 percent of the time.
- Rapid Railways claims that it is on time 98 percent of the time.

Based on the three companies’ claims, what is the approximate probability that all three parts of Bob’s trip will be on time, assuming that all three probabilities are independent?

87%

\[0.95 \times 0.93 \times 0.98 = 0.8658 \approx 0.87\]
Given: \(C\) is the midpoint of \(BE\).
\(\angle B\) and \(\angle E\) are right angles.

Prove that \(AC \cong DC\) and give a reason for each statement in your proof.

\[
\begin{align*}
\overline{BC} & \cong \overline{EC} \quad \text{definition of midpoint} \\
\angle BCA & \cong \angle ECD \quad \text{vertical angles are equal} \\
\angle B & \cong \angle E \quad \text{given} \\
\triangle ABC & \cong \triangle DEC \quad \text{Angle Side Angle theorem} \\
\overline{AC} & \cong \overline{DC} \quad \text{Corresponding parts of congruent triangles are congruent}
\end{align*}
\]
The NAEP 2019 reading assessment measures students’ ability to understand, interpret, and think critically about grade-appropriate texts. Recognizing that readers vary their approach according to the demands of different types of text, the NAEP framework specifies the assessment of reading in two major text types: literary text and informational text. The assessment includes reading materials selected from publications and other resources typically available to students in and out of school.

The framework for the NAEP reading assessment conceptualizes reading as a dynamic cognitive process. The framework suggests reading is a complex process that includes

- understanding written text;
- developing and interpreting meaning; and
- using meaning as appropriate to type of text, purpose, and situation.

The NAEP reading assessment contains selected-response questions, as well as short and extended constructed-response questions. Students spend approximately 50 percent of their assessment time providing written answers to constructed-response questions.

In 2019, some students will take the paper-and-pencil version of the reading assessment, and some will take a digitally based assessment on touchscreen tablets with keyboards. During the digitally based assessment, students will have access to onscreen tools that will help them navigate the assessment. Some of these tools include a help window, zoom tool, progress bar and timer, a read-aloud option, and an annotation tool, which will allow them to use an onscreen pencil and highlighter tools to mark up passages and items.

For more information regarding the reading assessment framework, please visit the National Assessment Governing Board’s website at https://www.nagb.gov/naep-frameworks/reading.html.

<table>
<thead>
<tr>
<th>NAEP Reading Framework Distribution of Literary and Informational Passages at Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literary text</td>
</tr>
<tr>
<td>Informational text</td>
</tr>
</tbody>
</table>
Directions

Below are the General Directions for the reading digitally based assessment. Students will see these instructions on the screen prior to beginning the assessment.

This assessment has several sections of reading passages and questions. When you are finished with these sections, you will be asked to answer questions about yourself and your experiences in and out of school.

If time runs out before you complete a section, your work will be saved.

Tap the Next arrow to begin.

Here is an example of directions a student might see during the reading assessment.

In this section, you have 30 minutes to read a story and answer 10 questions about it.

If you finish before time is up, you may review your work.

Tap the Next arrow to continue.
Sample Questions

The following reading passage, sample questions, and correct student responses are from previous NAEP reading assessments and are available in the NAEP Questions Tool. For additional sample questions and responses, visit https://nces.ed.gov/nationsreportcard/nqt/.

Learn more about NAEP digitally based assessments and view interactive tutorials at https://nces.ed.gov/nationsreportcard/dba/.
The Open Window

by Saki (H. H. Munro) (1870–1916)

“My aunt will be down presently, Mr. Nuttel,” said a very self-possessed young lady of fifteen; “in the meantime you must try and put up with me.”

Framton Nuttel endeavored to say the correct something which should duly flatter the niece of the moment without unduly discounting the aunt that was to come. Privately he doubted more than ever whether these formal visits on a succession of total strangers would do much towards helping the nerve cure which he was supposed to be undergoing.

“I know how it will be,” his sister had said when he was preparing to migrate to this rural retreat; “you will bury yourself down there and not speak to a living soul, and your nerves will be worse than ever from moping. I shall just give you letters of introduction to all the people I know there. Some of them, as far as I can remember, were quite nice.”

Framton wondered whether Mrs. Sappleton, the lady to whom he was presenting one of the letters of introduction, came into the nice division.

“Do you know many of the people round here?” asked the niece, when she judged that they had had sufficient silent communion.

“Hardly a soul,” said Framton. “My sister was staying here, at the rectory, you know, some four years ago, and she gave me letters of introduction to some of the people here.”

He made the last statement in a tone of distinct regret.

“Then you know practically nothing about my aunt?” pursued the self-possessed young lady.

“Only her name and address,” admitted the caller. He was wondering whether Mrs. Sappleton was in the married or widowed state. An undefinable something about the room seemed to suggest masculine habitation.
“Her great tragedy happened just three years ago,” said the child; “that would be since your sister’s time.”
“Her tragedy?” asked Framton; somehow in this restful country spot tragedies seemed out of place.
“You may wonder why we keep that window wide open on an October afternoon,” said the niece, indicating a large French window that opened onto a lawn.
“It is quite warm for the time of the year,” said Framton; “but has that window got anything to do with the tragedy?”
“Out through that window, three years ago to a day, her husband and her two young brothers went off for their day’s shooting. They never came back. In crossing the moor to their favorite snipe-shooting ground they were all three engulfed in a treacherous piece of bog. It had been that dreadful wet summer, you know, and places that were safe in other years gave way suddenly without warning. Their bodies were never recovered. That was the dreadful part of it.” Here the child’s voice lost its self-possessed note and became faltering human. “Poor aunt always thinks that they will come back someday, they and the little brown spaniel that was lost with them, and walk in at that window just as they used to do. That is why the window is kept open every evening till it is quite dusk. Poor dear aunt, she has often told me how they went out, her husband with his white waterproof coat over his arm, and Ronnie, her youngest brother, singing, ‘Bertie, why do you bound?’ as he always did to tease her, because she said it got on her nerves. Do you know, sometimes on still, quiet evenings like this, I almost get a creepy feeling that they will all walk in through that window—”
She broke off with a little shudder. It was a relief to Framton when the aunt bustled into the room with a whirl of apologies for being late in making her appearance.
“I hope Vera has been amusing you?” she said.
“She has been very interesting,” said Framton.
“I hope you don’t mind the open window,” said Mrs. Sappleton briskly, “my husband and brothers will be home
directly from shooting, and they always come in this way.
They’ve been out for snipe in the marshes today, so they’ll
make a fine mess over my poor carpets. So like you menfolk,
isn’t it?”

She rattled on cheerfully about the shooting and the scarcity
of birds, and the prospects for duck in the winter. To Framton
it was all purely horrible. He made a desperate but only
partially successful effort to turn the talk onto a less ghastly
topic; he was conscious that his hostess was giving him only
a fragment of her attention, and her eyes were constantly
straying past him to the open window and the lawn beyond.
It was certainly an unfortunate coincidence that he should
have paid his visit on this tragic anniversary.

“The doctors agree in ordering me complete rest, an absence
of mental excitement, and avoidance of anything in the nature
of violent physical exercise,” announced Framton, who labored
under the tolerably widespread delusion that total strangers
and chance acquaintances are hungry for the least detail of
one’s ailments and infirmities, their cause and cure. “On the
matter of diet they are not so much in agreement,” he continued.

“No?” said Mrs. Sappleton, in a voice which only replaced a
yawn at the last moment. Then she suddenly brightened into
alert attention—but not to what Framton was saying.

“Here they are at last!” she cried. “Just in time for tea, and
don’t they look as if they were muddy up to the eyes!”

Framton shivered slightly and turned towards the niece with
a look intended to convey sympathetic comprehension. The
child was staring out through the open window with a dazed
horror in her eyes. In a chill shock of nameless fear Framton
swung round in his seat and looked in the same direction.

In the deepening twilight three figures were walking across
the lawn towards the window; they all carried guns under their
arms, and one of them was additionally burdened with a white
cloak hung over his shoulders. A tired brown spaniel kept close
at their heels. Noiselessly they neared the house, and then a
hoarse young voice chanted out of the dusk: “I said, Bertie, why do you bound?”

Framton grabbed wildly at his stick and hat; the hall door, the gravel drive, and the front gate were dimly noted stages in his headlong retreat. A cyclist coming along the road had to run into the hedge to avoid imminent collision.

“Here we are, my dear,” said the bearer of the white mackintosh, coming in through the window; “fairly muddy, but most of it’s dry. Who was that who bolted out as we came up?”

“A most extraordinary man, a Mr. Nuttel,” said Mrs. Sappleton; “could only talk about his illnesses, and dashed off without a word of goodbye or apology when you arrived. One would think he had seen a ghost.”

“I expect it was the spaniel,” said the niece calmly; “he told me he had a horror of dogs. He was once hunted into a cemetery somewhere on the banks of the Ganges by a pack of pariah dogs, and had to spend the night in a newly dug grave with the creatures snarling and grinning and foaming just above him. Enough to make anyone lose their nerve.”

Romance at short notice was her specialty.
The following sample questions and correct student responses are available in the NAEP Questions Tool. For additional sample questions and responses, visit https://nces.ed.gov/nationsreportcard/nqt/.

1. Which of the following best describes what happens in the story?
   □ A young man visits his aunt and tells her about a recent tragedy.
   □ A young girl amuses her family by telling them scary stories.
   □ A young girl makes up a story and frightens a nervous visitor.
   □ A family plays a trick on a young man from out of town.

2. Using specific details from the story, explain what Vera does or says to make Framton believe her.

   Vera makes Framton believe her while she was telling the story her voice lost its self-possessed quality and actually became human. She also broke off the story ending with a shudder. She is a very believable person and very good at lying.
3. One critic described Saki as an author who uses both comedy and horror in his writing. Using specific references to the story, explain how the critic’s description applies to “The Open Window.”

Saki uses horror at first, when Vera describes the tragic tale of Mrs. Sappleton’s family. She creates a detailed story, and the reader believes it as well. The terror grows as Mrs. Sappleton acts as though nothing has happened. When her sons and husbands come walking back, it appears to the reader as though the figures are terrifying ghosts. The ending is full of comic relief, however, when you realize that it all was merely a trick from Vera.
Science
Grade 12

The NAEP 2019 science assessment includes selected-response questions, short constructed-response questions, and extended constructed-response questions. At least 50 percent of the assessment time is devoted to constructed-response questions. These questions measure students’ knowledge of facts, ability to integrate this knowledge into larger constructs, and capacity to use the tools, procedures, and reasoning processes of science to develop an increased understanding of the natural world.

In 2019, some students will take the paper-and-pencil version of the science assessment, and some will take a digitally based assessment on touchscreen tablets with keyboards. During the digitally based assessment, students will have access to onscreen tools that will help them interact with the assessment. Some of these in-system tools include magnification, a read-aloud option, and a progress bar and timer.

The NAEP 2019 science assessment is organized according to science content and practices in the NAEP science framework. For more information regarding the science assessment framework, please visit the National Assessment Governing Board’s website at https://www.nagb.gov/naep-frameworks/science.html.

### NAEP Science Framework Distribution of Questions Across Content Areas

<table>
<thead>
<tr>
<th>Physical Science (37.5%)*</th>
<th>Life Science (37.5%)*</th>
<th>Earth and Space Science (25%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matter</td>
<td>Structures and Functions of Living Systems</td>
<td></td>
</tr>
<tr>
<td>• Properties of matter</td>
<td>• Organization and development</td>
<td></td>
</tr>
<tr>
<td>• Changes in matter</td>
<td>• Matter and energy transformations</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>• Interdependence</td>
<td></td>
</tr>
<tr>
<td>• Forms of energy</td>
<td>Changes in Living Systems</td>
<td></td>
</tr>
<tr>
<td>• Energy transfer and conservation</td>
<td>• Heredity and reproduction</td>
<td></td>
</tr>
<tr>
<td>Motion</td>
<td>• Evolution and diversity</td>
<td></td>
</tr>
<tr>
<td>• Motion at the macroscopic level</td>
<td>Earth in Space and Time</td>
<td></td>
</tr>
<tr>
<td>• Forces affecting motion</td>
<td>• Objects in the universe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earth Structures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Properties of Earth materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earth Systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Energy in Earth systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Climate and weather</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Biogeochemical cycles</td>
<td></td>
</tr>
</tbody>
</table>

* Item distribution for the content areas is measured by percentage of student response time.

### Science Practices

The framework reflects these four science practices**:  

- Identifying science principles (20%)
- Using science principles (40%)
- Using scientific inquiry (30%)
- Using technological design (10%)

** Item distribution for the science practices is measured by percentage of student response time.
Directions

Below are the General Directions for the science digitally based assessment. Students will see these instructions on the screen prior to beginning the assessment.

<table>
<thead>
<tr>
<th>This assessment has several sections of science questions. You received a reference sheet that contains the periodic table of elements that may be useful for answering some of the questions in these sections.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you are finished with these sections, you will be asked to answer questions about yourself and your experiences in and out of school.</td>
</tr>
<tr>
<td>If time runs out before you complete a section, your work will be saved.</td>
</tr>
<tr>
<td>Tap the Next arrow to begin.</td>
</tr>
</tbody>
</table>

Here is an example of directions a student might see during the science assessment.

<table>
<thead>
<tr>
<th>This section has 20 science questions. You have 30 minutes to complete this section.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you finish before time is up, you may review your work.</td>
</tr>
<tr>
<td>Tap the Next arrow to continue.</td>
</tr>
</tbody>
</table>
The following question refers to the growth of bacteria.

A scientist studied the growth rate of a species of bacterium. The scientist introduced some of the bacteria into a flask of nutrient-rich solution and monitored the growth of the bacterial population by measuring the number of living cells in the solution.

The graph below shows the growth of the bacterial population over time in hours (h).

1. The scientist wanted to determine the effect of an antibiotic on the growth of the bacterium. To a second flask of nutrient-rich solution with the bacterial cells, he added the antibiotic, and monitored the growth of the bacterial population.

The data showed that most of the bacteria in the solution died, but some survived. The scientist concluded that some of the bacteria were resistant to the antibiotic.

Explain why some of the bacteria were resistant to the antibiotic, based on the theory of evolution.

**Some bacteria were resistant because of mutations which happened within their DNA, which made them able to withstand the antibiotic, these bacteria then passed the new genes to their offspring.**
2. Two dogs pull on a flat-bottom sled with forces of equal magnitude in the directions indicated by the arrows below. The dot represents the sled.

Which arrow best represents the direction of motion of the sled?

- Option A
- Option B
- Option C
- Option D
3. The picture below shows a rock formation with folded layers.

**ROCK FORMATION**

Which statement best explains how the rock layers folded?

- ☐ The rock melted and flowed downhill.
- ☐ The rock was deformed by a meteorite impact.
- ☐ The rock was suddenly pulled apart during an earthquake.
- ☐ The rock was slowly compressed due to tectonic plate movement.
III. NAEP 2019 Survey Questionnaires

Each year, students, teachers, and school administrators who participate in the NAEP assessments voluntarily complete survey questionnaires. Student survey questionnaires collect valuable information about students’ educational experiences, opportunities to learn both in and out of the classroom, and other factors related to student learning.

In 2019, students who take the NAEP mathematics, reading, and science assessments will be asked to complete a survey questionnaire. Students have 15 minutes to complete the questionnaire, which is located at the end of each NAEP assessment. While they are encouraged to answer as many questions as they feel comfortable with, students can skip any part of the questionnaire by leaving a response blank.

All data collected from the survey questionnaires will be used for statistical purposes only.* This data can help educators, policymakers, and researchers to better understand the context in which students learn, and, in turn, can help improve education in our nation’s classrooms.

To view the NAEP 2019 student survey questionnaires for the twelfth-grade mathematics, reading, and science assessments, visit https://nces.ed.gov/nationsreportcard/experience/survey_questionnaires.aspx. You’ll also find student, teacher, and school survey questionnaires for other NAEP subjects, FAQs, and general information about NAEP survey questionnaires.


Survey Questionnaire Directions

Below are the directions students will see on the screen prior to beginning the NAEP survey questionnaire.

This section contains questions about you and your experiences in and out of school. You may skip any question you do not want to answer. Answer questions about your home based on where you live most of the time during the school year.

Tap the Next arrow to continue.

* All of the information provided by participants may be used only for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose except as required by law (20 U.S.C. §9573 and 6 U.S.C. §151). By law, every NCES employee as well as every NCES agent, such as contractors and NAEP coordinators, has taken an oath and is subject to a jail term of up to 5 years, a fine of $250,000, or both if he or she willfully discloses ANY identifiable information about you. Electronic submission of your information will be monitored for viruses, malware, and other threats by Federal employees and contractors in accordance with the Cybersecurity Enhancement Act of 2015. The collected information will be combined across respondents to produce statistical reports.
IV. NAEP Questions Tool

Introduction

After every assessment cycle, the National Center for Education Statistics (NCES) releases dozens of assessment questions to the public. Teachers, researchers, and the public can access these released questions using the NAEP Questions Tool (NQT). The NQT allows users to search for questions by subject, grade, difficulty, and other characteristics. You can also view scoring guides, keys, national performance data, demographic group data, and student responses (for constructed-response questions only). The tool also allows users to create customized reports and to print selected questions and all associated information.

How do I access the NAEP Questions Tool?

The NQT is available at https://nces.ed.gov/nationsreportcard/nqt.

What can I do with the NAEP Questions Tool?

The NQT provides easy-to-follow instructions so teachers, parents, and students can

• sort and select NAEP questions;
• “test yourself” on any NAEP subject with a customizable assessment function;
• create online, self-scoring assessments that students can login to take anytime; and
• compare results to how students performed across the nation.

If you need help navigating the NQT, there is a Help button on every page.

Where can I find more information about the subjects NAEP assesses?

The NAEP website contains a wealth of information about the subjects NAEP assesses and can be accessed at https://nces.ed.gov/nationsreportcard.

How can I get additional help?

For more help with features on the NAEP website, click “Help” on the top right toolbar.

For additional assistance, write to us via the Contact NAEP page at https://nces.ed.gov/nationsreportcard/contactus.aspx.
V. About NAEP

OVERVIEW. NAEP is the largest nationally representative and continuing assessment of what our nation's students know and can do in various academic subjects. NAEP is administered by the National Center for Education Statistics (NCES), located within the U.S. Department of Education's Institute of Education Sciences. For more information about the NAEP program, visit the NAEP website at https://nces.ed.gov/nationsreportcard.

PARTICIPATION. States and districts that receive Title I funds are required to participate in NAEP reading and mathematics assessments at grades 4 and 8 every other year. Student participation is always voluntary. Your school's NAEP coordinator can provide you with more information. Contact your school for details.

CONTENT. The National Assessment Governing Board, an independent body of educators, community leaders, and assessment experts, sets policy for NAEP and oversees the creation of the NAEP frameworks, which describe the specific knowledge and skills that should be assessed. For additional information on framework development, visit the Governing Board's website at https://www.nagb.gov/naep-frameworks/frameworks-overview.html.

SAMPLE QUESTIONS. For each assessment, some of the test questions, along with performance data, are made available to the public to provide concrete samples of NAEP content and results. For every assessment, NAEP provides sample questions booklets for participating schools as well as information about the assessment design and questions. Released questions and student performance data may be viewed and downloaded from the NCES website at https://nces.ed.gov/nationsreportcard/nqt.

SECURE QUESTIONS. On written request, parents and educators may review NAEP questions and instruments still in use. These arrangements must be made in advance, and persons reviewing the assessment may not remove the booklets from the room, copy them, or take notes. Contact your school's NAEP coordinator for more information.

PUBLICATIONS. NAEP reports and brochures can be searched and downloaded from the NAEP website at https://nces.ed.gov/nationsreportcard.

FOR FURTHER INFORMATION. For prompt field staff support on these or other matters, call the NAEP help desk at 800–283–6237.

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