

Section B

A Parent and Educator Guide to Understanding the Colorado Measures of Academic Success (CMAS) Student Performance Report

Program Overview

Colorado Measures of Academic Success (CMAS) are Colorado's standards-based assessments designed to measure the Colorado Academic Standards (CAS) in the content areas of science and social studies. The CAS contain the concepts and skills students need to learn in order to be successful in the current grade and to make academic progress from year to year. CMAS science assessments are given to students in grades 5 and 8 while CMAS social studies assessments are given in grades 4 and 7 each spring. **The purpose of the CMAS is to indicate the degree to which students have mastered the CAS in science and social studies at the end of the tested grade level. CMAS results are intended to provide one measure of a student's academic progress relative to the CAS.**

CMAS for science and social studies are Colorado's first state-wide computer-based assessments. The online nature of the assessments allows for new item types that were not possible under the prior paper-based system, such as science simulations. Online assessments also foster increased student engagement. The assessments were designed to provide high level content area information (i.e., a science score or social studies score) as well as standard specific scores (i.e., score for history, geography, economics and civics).

A Student Performance Report is created for each student who takes a CMAS assessment so that parents can understand their child's command over the Colorado Academic Standards in the assessed grade level and content area. This section of the guide explains the elements of the Student Performance Report.

Types of Scores on the CMAS Student Performance Report

To understand each part of the Student Performance Report, it is important to become familiar with the types of assessment scores that are included on the report. At varying levels, student performance is described by scale scores, performance levels and percent correct. State, district and school level information is also provided in relevant

sections of the Student Performance Report to help parents understand how their child's performance compares to other students.

Scale Scores

When the points a student earns on an assessment are placed on a common scale, the student's score becomes a scale score. Scale scores adjust for slight differences in difficulty on versions of the assessment that can vary slightly from student to student within a year (referred to as forms of the assessment) or between school years (referred to as administrations). Scale scores allow for comparisons of assessment scores, within a particular grade and subject area, across administrations. As an example, a student who receives a score of 475 on one form of the 7th grade social studies assessment is expected to score a 475 on any form of the assessment. Scale scores maintain their meaning and can be compared across years. A student who scores 650 on 8th grade science in 2015 will demonstrate the same level of mastery of concepts and skills as an 8th grade science student who scores 650 in 2014. For CMAS science and social studies, the scale scores cannot be used to compare student performance across grades (e.g., grade 4 to grade 7) or subject areas (e.g., science to social studies).

Scale scores for the CMAS science and social studies assessments range from 300 to 900. Scale Scores are reported for the overall test, content standards and Scientific Inquiry/Nature of Science (referred to as "Reporting Categories"), and Item type.

Performance Levels

Scale Scores are used to determine a student's performance level for the overall assessment. Each performance level describes a range of scores at the overall assessment level (i.e., science or social studies). The range of scores in each performance level were recommended by a group of Colorado educators and adopted by the Colorado State Board of Education. Performance levels describe the concepts and skills that students are expected to demonstrate at each of the levels. The grade level concepts and skills related to each performance level are listed on Page 4 of the Student Performance Report. The four cross-grade and content area performance levels are Distinguished Command, Strong Command, Moderate Command, and Limited Command. Performance Level Descriptors for each grade level and content area are included in Appendix A of this document.

Students in the top two performance levels, Distinguished Command and Strong Command, are considered on track to being college and career ready in the content area of science or social studies. Although the Moderate Command or Limited Command performance levels indicate students in these levels may need academic support to successfully engage in further studies in the content area, it will be important for conversations to occur between parents and educators to determine whether the

school as a whole has made a complete transition to the new standards. Schools that have not fully transitioned to the new standards may have a number of students who score at the lowest two levels. A focus on the school level science or social studies program may be appropriate.

Percent Correct

Percent correct refers to the number of points a student earned out of the total number of points possible within a reporting category. The percent correct indicator can only be used to compare performance of the individual student to the average district and average state performance on the specific set of items being considered. Some groups of items may be more difficult than other sets of items; so unlike the scale score, the percent correct indicator cannot be compared across groups of items or across school years. Percent correct scores are provided for Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs). PGCs and GLEs are described more fully later in this guide.

Sample CMAS Student Performance Report

A sample grade 8 Student Performance Report is displayed at the end of this section on pages B-9 to B-12. Each page of the sample report is included individually. The sample report includes the same type of information that is included on all of the science and social studies reports. The information below describes each part of the report. To learn more about each part of the Student Performance Report, match the white letters in black circles from the sample report to the information included with the corresponding letters on the following pages.

General Information (Refer to Page 1 of the Student Performance Report)

A. Identification Information

The top of the Student Performance Report lists your child's name, part of the state student identification number (SASID), birthdate, school and district.

B. Test Date

The season and year your child took the assessment is indicated.

C. Subject Area

The subject area of your child's assessment is identified (either science or social studies).

D. Grade Level

The grade level of your child's assessment is indicated.

Overall Assessment Scores (Refer to Page 1 of the Student Performance Report)

E. Explanation of Overall Performance

A brief explanation of the overall assessment results is given to help you understand the information provided in the box below the explanation.

F. Your Child's Overall Scale Score and Performance Level

Your child's overall scale score (the number between 300 and 900) and performance level (Distinguished Command, Strong Command, Moderate Command or Limited Command) are provided. The scale score and performance level included in this part of the report represent your child's overall performance on the assessment in the content area (science or social studies), Grade level, and content area specific performance level descriptors providing the concepts and skills students are typically able to demonstrate at each level may be found on the last page of the report.

G. Graphical Representation of Overall Performance: Scale Score and Performance Level by Student, School, and District

Your child's scale score is indicated by a large diamond on the graph. The arrows to the left and right of the diamond indicate the range of scores your child would likely receive if the assessment was taken multiple times.

The average scale scores at the school, district, and state levels are identified to the left of the graph and are indicated by smaller diamonds on the graph. By comparing the location of the diamonds, you can see how your child performed in comparison to the average student in their school, district, or the state. If your child's score diamond is to the right of the school, district or state average diamond, then your child performed better than that group's average. If your child's diamond is to the left of the school, district or state diamond, then on average, that group performed better than your child.

The dotted lines on the graph show the lowest scores needed to achieve Moderate Command, Strong Command, and Distinguished Command performance levels. The scale scores representing each of those scores are indicated on the bottom of the graph.

Subscale Performance (Refer to Page 1 of the Student Performance Report)

H. Explanation of Subscale Performance

In this part of the report, your child's performance is presented by individual

reporting categories. Information to help you understand the graphical representation in this section is included.

I. Reporting Category Descriptions

Reporting categories include the standards for social studies (history, geography, economics and civics) and for science (physical science, life science, and earth systems science). Science also includes Scientific Investigation and the Nature of Science as a reporting category. Descriptions of the reporting categories from the Colorado Academic Standards (CAS) are included in this section of the report.

J. Subscale Scores

Subscale scores indicate how your child performed in each reporting category. Like the overall science and social studies scale scores, subscale scores range from 300 to 900 and can be compared across school years. Average subscale scores are also provided for your child's school and district.

K. Graphical Representation of Subscale Performance by Student, School, and District

The graphical representation of subscale performance shows how your child performed in each reporting category. Your child's performance is represented by a large diamond on the graph. The arrows around your child's diamond show the range of scores that your child would likely receive if the assessment was taken multiple times.

The graphical representation also shows how your child performed in comparison to other students in your child's school, district, and the state. Performance of students in the school and district are represented by smaller diamonds. If your child's score diamond is to the right of the school or district average diamond, then your child's scale score was higher than the school or district average scale score. If your child's diamond is to the left, then your child's scale score was lower than the school or district average.

The shaded areas of the graph represent the performance of about 70% of students in the state. If your child's score diamond is to the right of the shaded area, your child's performance is considered relatively strong in that area in comparison to other students in the state. If your child's score diamond is to the left of the shaded area, your child's performance is considered relatively weak in that area in comparison to other students in the state. These categories are based on the state performance for the current year and can change from year to year.

L. Document Process Number

The document number located in the bottom-right corner of the report is a unique

number that is assigned to your child's record by the testing contractor.

Performance by Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs) (Refer to Page 2 of the Student Performance Report)

M. Explanation

Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs) are important parts of the Colorado Academic Standards. PGCs represent the concepts and skills students need to master in order to be college and career ready by the time of graduation. GLEs are grade-specific expectations that indicate that students are making progress toward the PGCs. This section of the report describes performance with percent correct for PGCs and GLEs.

N. Graph Key

The graph key includes the explanatory text for the bars in the Percent Correct graph: student's performance, district average and state average.

O. Standard, PGC, and GLE

Descriptions of the Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs) that were included on the assessment are listed under each standard.

P. Points possible

This number shows the total points possible for each Prepared Graduate Competency (PGC) and Grade Level Expectation (GLE) on the assessment.

Q. Graphical Representation of Percent Correct

The graph shows the percentage of items that were answered correctly out of the total number of items for each Prepared Graduate Competency (PGC) and Grade Level Expectation (GLE). When looking at the shaded bars in the graph, you can compare your child's performance to the average district and state performance. Keep in mind that there are relatively few points associated with each PGC or GLE. A student's bar can look much longer or much shorter based on getting a single correct or incorrect item-response.

The graph for the Grade Level Expectation (GLE) is blank when Prepared Graduate Competencies (PGCs) have only one associated Grade Level Expectation (GLE) because the information is the same for both the GLE and PGC.

Remember, percent correct score information cannot be compared across PGCs, GLEs, or years.

Performance by Item Type (Refer to Page 3 of the Student Performance Report)

CMAS assessments include selected-response and constructed-response items. Selected-response items require students to choose the correct answer(s) from options provided. Sometimes these are referred to as multiple choice items. In the CMAS computer-based assessments, these can also include technology-enhanced items referred to as drag-and-drop and hot spot. Constructed-response items require students to develop their own answers to questions.

R. Selected-Response Scale Score

Your child's scale score for selected-response items is shown. The arrows to the left and right of diamond indicate the range of scores your child would likely receive if the assessment was taken multiple times. You can compare your child's scale score with the average scale scores for selected-response items for your child's school, district, and the state. Your child's school and district can compare next year's groups of students to this year's students by looking at selected-response scale scores. This information can be used to support school and district program and instructional improvement decisions.

S. Constructed-Response Scale Score

Your child's scale score for constructed-response items is shown. The arrows to the left and right of diamond indicate the range of scores your child would likely receive if the assessment was taken multiple times. You can compare your child's scale score with the average scale scores for constructed-response items for your child's school, district, and the state. Your child's school and district can look at next year's groups of students and compare them to this year on the constructed-response scale score. This information can be used to support schools and district program and instructional improvement decisions.

T. Graphical Representation of Selected-Response and Constructed-Response Scale Scores

A graphical representation of your child's scale score is provided. The large diamond on the graph represents your child's scale score. The arrows around your child's score diamond show the range of scores that your child would likely receive if the assessment was taken multiple times. The smaller diamonds represent the average scale scores of your child's school, district, and the state. If your child's score diamond is to the right of the school, district or state average diamond, then your child performed better than that group's average. If your child's diamond is to the left of the school, district or state diamond, then on average, that group performed better than your child.

Performance Level Descriptions (Refer to Page 4 of the Student Performance Report)

U. Performance Level Descriptions

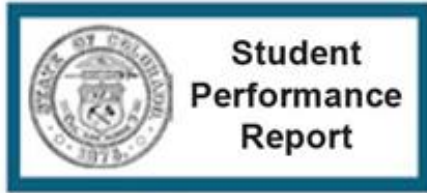
Specific grade level and content area descriptions have been developed for each of the four CMAS performance levels:

- Distinguished Command
- Strong Command
- Moderate Command
- Limited Command

Your child's report will reflect the performance level descriptions specific to the assessed grade level and content area. These performance level descriptors describe the specific concepts and skills that students in each performance level can typically demonstrate for your child's assessed grade level and content area. Performance level descriptors for each grade level and content area are included in Appendix A of this document.

Students in the top two performance levels, Distinguished Command and Strong Command, are considered on track for being college and career ready in the content area of science or social studies.

Sample CMAS Student Performance Report – Page 1



Colorado Measures of Academic Success

Student: FIRSTNAME LASTNAME

SASID: *****6789 Birthdate: 05/23/2003
 School: EXAMPLE MS (1234)
 District: EXAMPLE District (1234)

A

B

Spring 2014

Science

C

D

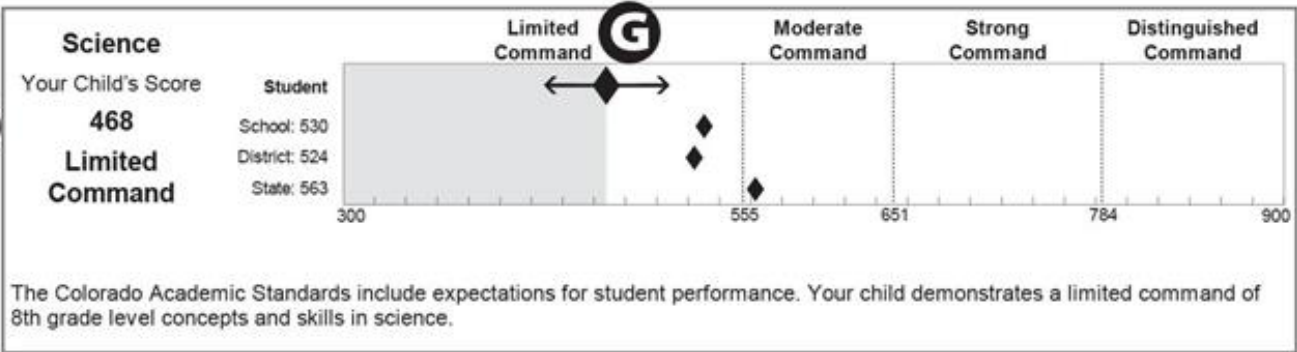
Grade 8

This score report provides information about your student's performance on the Colorado Measures of Academic Success (CMAS) Science Assessment.

- Your student's performance is represented by a scale score. Scores are placed on a scale so that student performance can be compared across years.
- School, district and state averages are provided so that you can compare your student's performance to the performance of others.
- Scores are represented by diamonds. The arrows around the student's diamond show the range of scores that your student would likely receive if the assessment was taken multiple times.
- Dotted lines show where the range of scores is divided into performance levels. Descriptions of the performance levels can be found at the end of this report.

E

F



Subscale Performance

- The shaded areas in the table below represent approximately 70% of student scores across the state.
- Scores outside of the shaded area indicate a weakness or a strength compared to the state.

H

Reporting Category Description	Subscale Score	Potential Relative Weakness	Typical	Potential Relative Strength
Physical Science Students know and understand common properties, forms, and changes in matter and energy.	366 533 502	Student: 481	481	715
Life Science Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.	479 511 532	Student: 477	477	716
Earth Systems Science Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	516 524 521	Student: 481	481	717
Scientific Investigation and the Nature of Science Students understand the processes of scientific investigation and design, conducting and evaluating, as well as communicating about, such investigations. Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world.	488 473 455	Student: 480	480	718

Purpose

This report describes your child's mastery of the Colorado Academic Standards in science.

More information on the CMAS assessment program: www.cde.state.co.us/assessment

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L

Sample CMAS Student Performance Report – Page 2

Colorado Measures of Academic Success

Science

Performance by Prepared Graduate Competencies (PGCs) and Grade Level Expectations (GLEs)



• Within each standard, PGCs are identified. PGCs represent the concepts and skills that students need to master in order to be postsecondary and workforce ready.

• GLEs are grade-specific expectations that indicate a student is making progress toward the PGCs.

• The figure below shows the percentage of items that your student answered correctly for each PGC represented in the grade. If there is more than one GLE for a PGC, the percentage of items your student answered correctly by GLE is also provided.



Student's performance
 District average
 State average



Standard, PGC, and GLE

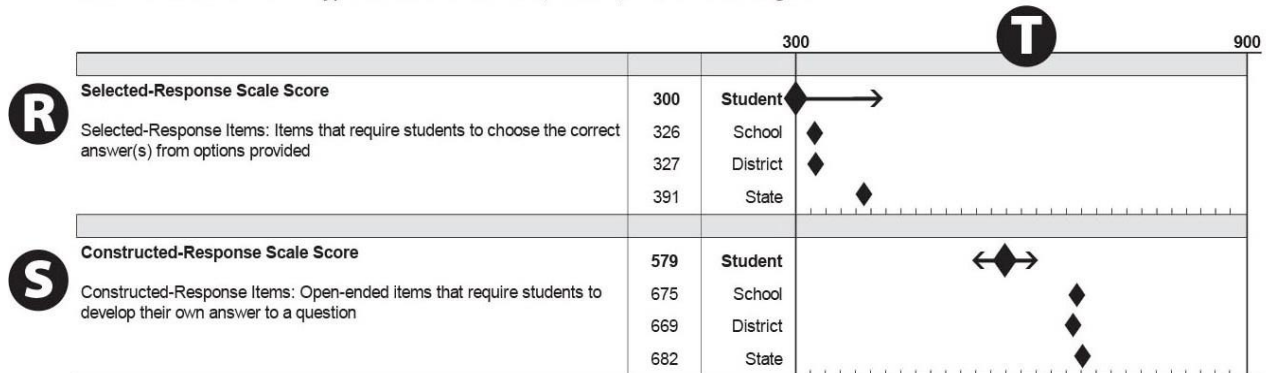


Standard, PGC, and GLE	Points Possible	Percent Correct*
		0% 25% 50% 75% 100%
Physical Science		
PGC 1: Observe, explain, and predict natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects	7	0
GLE 1: Identify and calculate the direction and magnitude of forces that act on an object, and explain the results in the object's change of motion		
PGC 2: Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable	14	14
GLE 2: There are different forms of energy, and those forms of energy can be changed from one form to another – but total energy is conserved	7	14
GLE 4: Recognize that waves such as electromagnetic, sound, seismic, and water have common characteristics and unique properties	7	14
PGC 3: Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions	7	14
GLE 3: Distinguish between physical and chemical changes, noting that mass is conserved during any change	7	14
Life Science		
PGC 1: Explain and illustrate with examples how living systems interact with the biotic and abiotic environment	11	9
GLE 1: Human activities can deliberately or inadvertently alter ecosystems and their resiliency		
PGC 2: Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment	13	23
GLE 2: Organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation		
Earth Systems Science		
PGC 1: Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system	13	23
GLE 1: Weather is a result of complex interactions of Earth's atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models	7	43
GLE 2: Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location	6	0
PGC 2: Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet	14	29
GLE 3: The solar system is comprised of various objects that orbit the Sun and are classified based on their characteristics	7	29
GLE 4: The relative positions and motions of Earth, Moon, and Sun can be used to explain observable effects such as seasons, eclipses, and Moon phases	7	29

* Percent correct scores cannot be compared across years because individual items change from year to year. They also cannot be compared across GLEs and PGCs because the number of items and the difficulty of items may not be the same.

Performance by Item Type

CMAS assessments are made up of selected-response and constructed-response items. The figure below shows the student's scale score for each item type in relation to school, district, and state averages.



Science Performance Level Descriptions

Students demonstrate mastery of science concepts and 21st century skills aligned to the Colorado Academic Standards at various performance levels. The performance level descriptors are organized in a manner that assumes students demonstrating higher levels of command have mastered the concepts and skills within the lower levels. For example, a student at moderate command also masters the concepts and skills of limited command.

At Distinguished Command, a student typically can

- design an investigation to predict the movement of an object by examining the forces applied to it;
- use models to predict amounts of energy transferred;
- analyze data and models to support claims about genetic reproduction and traits of individuals;
- use observations and models to develop and communicate a weather prediction; and
- evaluate scientific theories and investigations that explain how the solar system was formed.

At Strong Command, a student typically can

- use mathematical expressions and appropriate information from sources to describe the movement of an object;
- analyze different forms of energy and energy transfer using tools;
- construct an experiment to show mass is conserved;
- investigate the characteristics and behaviors of waves using models, technology, and basic rules of waves;
- analyze human impact on local ecosystems;
- use mathematics to predict the physical traits and genetic makeup of offspring; and
- relate tides, eclipses, lunar phases, and seasons to the motion and positions of the Sun, Earth, and the Moon, using the basic rules of the solar system.

At Moderate Command, a student typically can

- analyze speed and acceleration of moving objects;
- describe different forms of energy and energy transfer;
- use a variety of sources, including popular media and peer-generated explanations, to investigate and describe an environmental issue;
- analyze data and historical research for various weather conditions and compare to historical data for that date and location; and
- investigate and ask testable questions about Earth's different climates using various techniques.

At Limited Command, a student typically can

- distinguish between physical and chemical changes;
- recognize the relationship between pitch and frequency in sound;
- identify human activities that alter the ecosystem;
- recognize that genetic information is passed from one generation to the next;
- compare basic and severe weather conditions and develop an action plan for safety; and
- use tools and simulations to explore the solar system.

For more information about the standards included in this assessment, please visit the Colorado Department of Education's website at www.cde.state.co.us/standardsandinstruction