

# MCA SCIENCE BENCHMARK REPORT "HOW TO" QUICK GUIDE

During the 2020–21 school year, educators and students experienced significant and profound changes in teaching and learning, as well as social and emotional well-being. It is important to keep this in mind when interpreting assessment results.

The MCA benchmark report is a guidance tool educators can use to learn about school- or district-level performance on each benchmark from the Minnesota Academic Standards. The Minnesota Academic Standards identify the knowledge and skills that all students strive to achieve in a content area; these standards are divided into one or more benchmarks which provide details about what students are taught in that content area.

Benchmark performance is calculated by comparing students' **observed performance** on test content aligned to a benchmark to the **expected performance** of the "Meets" achievement level cut score for a benchmark at the school or district.

For the technical details of the benchmark report calculations, refer to *Appendix A: Benchmark Report Calculations Resource* in the [Technical Manual for Minnesota's MCA and MTAS Assessments](#) (MDE website > Districts, Schools and Educators > Teaching and Learning > Statewide Testing > Technical Reports).

## Report Considerations

Benchmark reports are created by grade and subject for Reading, Mathematics, and Science MCA.

The **Science MCA** is a fixed-form assessment, so for the current year, all students are administered the same items that count for their score.

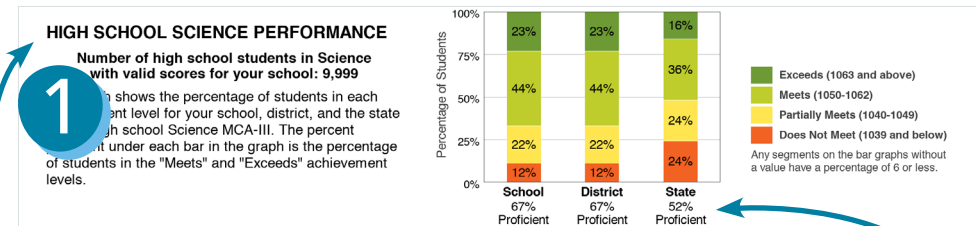
- All tests meet the "blueprints" or requirements in the test specifications, which describe how the standards are assessed on the test and in what proportions. However, not all benchmarks are assessed each year on the Science MCA.
- Benchmarks not assessed are noted on the report.

Due to COVID-19, there was very limited testing in 2020 and no benchmark reports were produced for 2020. Benchmark reports from 2019 are available.



For more information about benchmark reports, refer to the [Benchmark Report Interpretive Guide](#) or [Understanding the Benchmark Report Video](#), available on PearsonAccess Next (PearsonAccess Next > Reporting Resources > Additional Reporting Resources).

## Sections of the Benchmark Report



### 1. Overall performance, including:

The **number of students** with a valid, reportable score at the organization level for the grade and subject combination of the report.

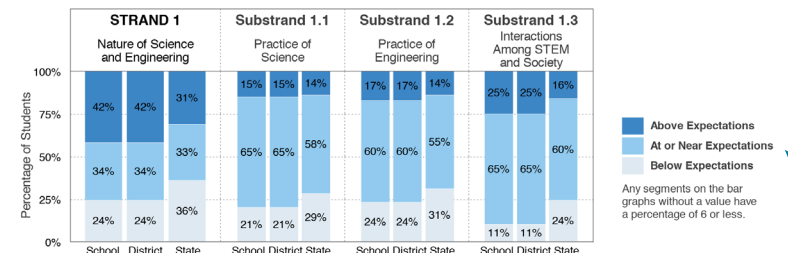
An **achievement level bar graph** at the school, district, and state level, with the percentage of students at each achievement level.

The **percent proficient**, shown under each bar graph, is the combined percent of students at the "Meets" and "Exceeds" achievement levels.

### HIGH SCHOOL SCIENCE PERFORMANCE BY STRAND AND SUBSTRAND

For the High School Science MCA-III, the strand and substrand performance levels are reported as: Below Expectations, At or Near Expectations, or Above Expectations. The strand and substrand performance levels are determined by comparing the school performance to the state expectation at the "Meets" achievement level.

The graphs below show the percentage of students in each performance level for the strand and each substrand calculated by aggregating the individual student strand and substrand performance levels at your school, at your district, and at the state level.



### 2. Strand and substrand performance, including:

Content area **strand and substrand names** and **performance level percentages** at the school, district, and state level.

**Performance level categories** include:

Below Expectations, At or Near Expectations, and Above Expectations.

**Expectation** is defined as the school's performance on each strand/substrand compared to the "Meets" performance level cut score.

## HIGH SCHOOL SCIENCE PERFORMANCE BY BENCHMARK

School performance on each benchmark is compared at the "Meets" achievement level. Performance on each benchmark is calculated by comparing school performance on a benchmark to the expected performance on a benchmark that would be achieved at the "Meets" achievement level cut score.

School performance on this benchmark is **less than** the "Meets" achievement level.
 School performance on this benchmark is **similar to** the "Meets" achievement level.
 School performance on this benchmark is **greater than** the "Meets" achievement level.
 \* less than 20 student responses on a benchmark

### STRAND 1: THE NATURE OF SCIENCE AND ENGINEERING

#### SUBSTRAND 9.1.1: THE PRACTICE OF SCIENCE

Compared to "Meets" Achievement Level	Benchmark
6	Standard 9.1.1.1
7	Understand that science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review. <i>Benchmark 9.1.1.1.4 is not assessed on the MCA-III.</i>
+	9.1.1.1.1 Explain the implications of the assumption that the rules of the universe are the same everywhere and these rules can be discovered by careful and systematic investigation.
≈	9.1.1.1.2 Understand that scientists conduct investigations for a variety of reasons, including: to discover new aspects of the natural world, to explain observed phenomena, to test the conclusions of prior investigations, or to test the predictions of current theories.
≈	9.1.1.1.3 Explain how the traditions and norms of science define the bounds of professional scientific practice and reveal instances of scientific error or misconduct. For example: The use of peer review, publications and presentations.
≈	9.1.1.1.5 Identify sources of bias and explain how bias might influence the direction of research and the interpretation of data. For example: How funding of research can influence questions studied, procedures used, analysis of data, and communication of results.
≈	9.1.1.1.6 Describe how changes in scientific knowledge generally occur in incremental steps that include and build on earlier knowledge.
≈	9.1.1.1.7 Explain how scientific and technological innovation—as well as new evidence—can challenge portions of, or entire accepted theories and models including, but not limited to: cell theory, atomic theory, theory of evolution, plate tectonic theory, germ theory of disease, and the big bang theory.

- Benchmark performance description**
- Three performance symbols**  
specific to the benchmark report used to represent school or district performance on each benchmark, including **less than**, **similar to**, or **greater than** the "Meets" achievement level.  
A fourth symbol, an asterisk (\*) indicates results were not available as there were less than 20 student responses for that benchmark.
- Strand and substrand number and titles.**
- Minnesota academic standard code reference and description.**
- Benchmark performance, benchmark code, and description.**  
For science, the five-digit code (i.e., 3.1.3.3) lists, in order, the grade (9), strand (1), substrand (1), standard (1), and benchmark (5).  
Grades 5 and 8 benchmark reports have benchmark codes numbered for multiple grades (i.e., standards for grade 5 test include benchmarks that start with 3, 4 and/or 5).  
High school science benchmark reports have benchmark codes that start with 9 for grade 9, though instruction may occur outside of grade 9 in grades 10, 11, or 12.

## Caution When Interpreting the Benchmark Report

Benchmark performance indicators and symbols **do not** correspond to overall achievement levels for Science MCA (i.e., Does Not Meet, Partially Meets, Meets, or Exceeds the Standards), and the color/shape of each symbol does not reflect benchmark difficulty.

Frame any interpretation within the context of the school or district environment. External information about the curriculum, instructional practices, and data from other classroom assessments is critical to making appropriate inferences from the data in this report.

## Using the Benchmark Report in Your Classroom, School, or District

The MCA Benchmark Reports are an additional resource educators can use to evaluate and compare performance on benchmarks at the school, district, and state levels on the current year's test. Teachers and district staff can use benchmark report data as a starting point for discussions about strengths and gaps in curriculum.

### Guiding questions when reviewing and discussing benchmark reports:

- Are the students that completed the assessment representative of the total student population at your school or district?
- If instruction shifted to remote learning, what did virtual learning look like in your school? For example, were certain benchmarks taught asynchronously while others were taught synchronously?
- Due to the pandemic, were certain benchmarks emphasized this year or delayed?
- What do you notice about the benchmark data? What surprises you?
- How does the data compare with what you saw in the classroom?
- What additional information do you have about student mastery of the benchmarks?
- What may be some reasons for the benchmarks that have symbols indicating performance above the "Meets" achievement levels?
- What may be some underlying causes for benchmarks below the "Meets" achievement level?
- Are there additional emerging themes in all the information?
- What are your next steps after reviewing your benchmark data?

### Additional Benchmark Resources

View the **Achievement Level Descriptors** for Reading, Mathematics, and Science on the Testing 1,2,3 website. (Testing 1,2,3 site > Plan and Teach > Success Criteria)

View the **Frameworks for the Minnesota Science & Math Standards** (<https://stemtc.scimathmn.org/>)

View the **MCA test specifications** (MDE website > Districts, Schools and Educators > Teaching and Learning > Statewide Testing > Test Specifications)

View the MDE **Testing 1,2,3** educator website (<https://testing123.education.mn.gov>)

View the **Minnesota Academic Standards** (MDE website > Districts, Schools and Educators > Teaching and Learning > Academic Standards (K-12))