

High School Implementation of the Next Generation Science Standards (NGSS)

Frequently Asked Questions

Why are changes being made to the science program?

- In 2018, the Maryland State Department of Education (MSDE) updated regulations that include changes to graduation requirements in science. These changes require that students must receive three credits of Next Generation Science Standards (NGSS) aligned instruction, which engages in the application of science and engineering practices, the [crosscutting concepts](#), and the disciplinary core ideas including earth/space science, life science, physical science (chemistry and physics), engineering and technology, aligned to the Maryland High School Assessment for Science (MISA). MCPS began NGSS roll-out implementation in 2013 with Biology, 2015 with Chemistry, and 2017 with Physics.

How has MCPS addressed the science requirements for graduation?

- In MCPS, graduation requirements will continue to include three credits in science (NGSS-aligned) courses, one of which must be life science and one of which must be physical science. Additionally, students graduating in June 2021 will be required to pass the [MISA](#).
- The secondary science curriculum has been developed to ensure that all standards, also known as performance expectations (PEs), have been embedded in three well-designed NGSS core content areas (biology, chemistry and physics), each with earth/space science performance expectations strategically incorporated. Science Advanced Placement (AP) courses and International Baccalaureate (IB) courses also satisfy the science requirements for graduation.

What are the recommended course options?

- The pathway for students is NGSS Biology, NGSS Chemistry and NGSS Physics. These courses provide opportunity for students to succeed in mastering all NGSS expectations.
- Students prepared to take an AP/IB course may choose one of three pathways; the [High School Science Course Pathways chart](#) shows various pathways approved by the Office of Curriculum and Instructional Programs.

What other courses are NGSS-aligned to satisfy graduation requirements?

- See [High School Science Course Pathways chart](#) for examples.

How does a school decide which pathways to offer their students?

- Multiple measures should be in place; student interest, readiness and science goals should be considered. Equitable access to rigor which includes all NGSS standards should also be considered.

What is the High School Maryland Integrated Science Assessment (HS MISA)?

- The High School Maryland Integrated Science Assessment (HS MISA) is the MSDE-required science assessment that all students are required to take and pass by year 2021; it is aligned to the Next Generation Science Standards. The integrated nature of the assessment means that test items

will include concepts from life science, physical science (chemistry and physics), and earth and space science.

- The HS MISA consists of five “40-minute” sessions. In each of the sessions, students will read information and analyze data about two separate phenomena and respond to items about each. One of those items will be a constructed response item, and the other items will be a combination of selected responses, fill-in-the-blanks, matching, and other technology-enhanced item types. More detail about the format of the MISA, as well as practice tests, can be found [here](#).

When are students given the opportunity to master the standards MSDE has identified as the targets for MISA?

- The MCPS Secondary Science Office worked with classroom teachers for several years to develop courses fully aligned to all NGSS standards. These courses are NGSS Biology, NGSS Chemistry and NGSS Physics.
- All of the Performance Expectations (PEs) in the NGSS are distributed among the three core courses (Biology, Chemistry and Physics) and the AP/IB equivalents. The PEs associated with Earth/Space Science are incorporated into the three core courses.

When is the MISA given and why?

- Students take the HS MISA in the year they are enrolled in their third NGSS-aligned course. If the student is completing their third NGSS-aligned course during their sophomore year, they will take the HS MISA in May. If the student is completing their third NGSS-aligned course during their junior year, they will take the HS MISA in January.

What is considered a passing score on the HS MISA to meet the graduation requirement?

- The passing score for the HS MISA has yet to be determined by MSDE. At present, MSDE has indicated that these scores will be released in November 2019.

Which graduating class must pass the HS MISA in order to fulfil their State graduation requirement?

- The Class of 2021 is the first group of students expected to take the fully operational MISA in their junior year, January 2020. Exceptions include students in accelerated programs that may have taken the MISA in their sophomore year.
- Students take the MISA after completing the necessary coursework that provides opportunity to master the content that will be assessed.

If a student passes an AP or IB assessment, does she or he still need to take the MISA?

- Presently, the state of Maryland has not approved exempting students from the MISA even with passing scores from AP or IB assessments.

Which concepts on the HS MISA will students be expected to show proficiency?

- There are specific standards that will be assessed in four content areas; **biology, chemistry, physics, and earth and space science**. There are 67 standards or “performance expectations;” of these, the state has selected a subset of the standards to guide current testing.

Is Physics a required course?

- The NGSS Physics course was designed to provide students an opportunity to master the content in Physical Science and Earth and Space Science traditionally associated with Physics. While success in this class will support success on the MISA, the physics course is one of many options to fulfill the NGSS requirement; see [High School Science Course Pathways chart](#).

Which courses satisfy the science credit graduation requirement?

- Per the 2019-2020 *MCPS High School Course Bulletin*, students must take three NGSS credits, including one life science (NGSS-BC) and one physical science (NGSS-PC) credit. The third science credit can be obtained from any course with the NGSS designation.

Where can I go for more information about NGSS and the High School MISA?

- The Maryland State Department of Education (MSDE) [website](#) provides additional information about the structure of the MISA and its content. A listing of all the standards in the NGSS are provided [here](#).

Montgomery County Public Schools High School Science Course Pathways Updated December 2018			
Core Pathway			
Grade 9	Grade 10	Grade 11*	Grade 12
NGSS Biology	NGSS Chemistry	NGSS Physics	Advanced Placement/International Baccalaureate (AP/IB) Science Science Elective
Alternate Pathway 1			
Grade 9	Grade 10*	Grade 11	Grade 12
NGSS Choice: Biology/Physics	NGSS Choice Biology/Chemistry/Physics NGSS Choice Biology/Chemistry/Physics	AP/IB Science	AP/IB Science or Science Elective
Alternate Pathway 2			
Grade 9	Grade 10	Grade 11*	Grade 12
NGSS Biology	NGSS Chemistry or AP Science	AP/IB Science **(with NGSS modules)	AP/IB Science or Science Elective
Alternate Pathway 3			
Grade 9	Grade 10	Grade 11*	Grade 12
NGSS Physics or AP Physics 1 **(with NGSS modules)	NGSS Chemistry or AP Chemistry **(with NGSS modules)	NGSS Biology or AP Biology **(with NGSS modules)	AP/IB Science or Science Elective
*Indicates students have completed the course requirements to take the MISA during the grade level identified. Also indicates students have covered performance expectations. **Indicates the inclusion of NGSS performance expectations for MISA preparation will be included.			