

FAQs

How the physics curriculum differs between applied physics and CP physics?

Different levels of Science class offering in 9th grade?

What level of math is required for this class?

- The MHS program of studies lists the specific differences. The levels are structured based on competency with mathematical reasoning, degree of scaffolding, and summative assessment options.

Teacher qualifications?

Are teachers trained specifically in their subject area to instruct using the modeling method?

How are teachers prepared for this instructional approach?

- NJ Physics or Physical Science Certification
- Modeling Methods Instructional Workshop - (3 week course)
- Participation in Physics Collaborative Learning Teams

How this will allow my son to understand physics in a dynamic and memorable way?

Are physics concepts introduced with book and then applied in modelling?

How does this differ from traditional physics that most other schools use (pros and cons)?

Will the students be given the math equations needed to complete their assignments?

What challenges do students typically face and how are they addressed?

- Modeling instruction is a National Science Foundation recognized best-practice in science education
- Guided-inquiry instruction develops scientific models that mirror scientific thinking
 - Develop skill at scientific thinking, you develop skill in making and using scientific models.
- Reassessment opportunities allow students to continue learning experience after initial assessment
- The physics classes employ a variety of resources as references for the course.
- The textbook is a reference, it is not the curriculum and units are introduced through a paradigm lab (referenced during teacher breakout sessions).
- The courses take advantage of digital media and online resources.
- Modeling vs. Traditional instruction is supported by educational research (see Presentation Slides for comparison)
- Students will develop models starting with a paradigm lab and work collaboratively to develop various representational tools. The mathematical representations (equations) are developed from empirical data. Students will need to understand this representational tool and are not given equations in most situations.
- Students generally find the most significant adjustment to be the shift in instructional models. The learning environment is not passive and students need to rigorously engage to experience the most benefit from the approach.

Have any SIGNIFICANT changes been made to the Physics program since 2011-2012 (when my son was a freshmen)?

Are all assessments (including standardized tests) aligned with this method of instruction?

How will we know that students are getting complete information about each section regardless of the teacher.

Learning objectives for the physics curriculum.

How effective has this method proved to be since inception?

- The program has and continues to evolve. Objectives detailed in course curriculum maps.
- The Physics CLTs have developed common unit assessments for all levels of physics, for all units.
- New and multiple summative assessments have been implemented.
- All physics instructors have been trained in the modeling methods of instruction.
- The differentiation between Honors and CP physics is more distinct. Additional layers of scaffolding have been added to the CP course.
- The MHS Physics program has utilized pre/post assessments consistently since 2009. The data indicates substantial gains in student learning and exceeds data collected from students in traditional instructional settings. [See 12/16/2014 BOE presentation.](#)

Everyone talks about Physics being the toughest transition to make when student enters high school...How this program is solving that issue? How student can better prepare for the physics program?

- The transition is challenging for many students. This is the first time students in differentiated levels of science which influences the class dynamics.
- MHS and UMS continue to collaborate on Physics instructional units.
- Work hard at the end of 8th grade during physics units
- Seek additional support early and often. Students should take full advantage of study hall resources and after school help available each day T-Th.
- Participate in class discussions and be prepared for class. Write down questions and shift from a mind-set of "taking notes" to a mind-set of "making notes".
- Try to see science models everywhere. The course is not about equation memorization, but recognizing core science models and using representational tools to describe how a phenomena fits the appropriate scientific model.
- Each year a group of 9th grade students is organized as the Physics Student Advisory Group. The group represents classmates and has been a significant resource for recognizing and implementing change initiatives.
- Smaller parent meetings will be held this spring as a follow-up to this meeting, 8th grade parent orientation, and the formal presentation made to the BoE on 12/16/14.

How are students placed in the Physics {Honors} program?

How does the recent 8th grade physics pre-assessment test affect their placement? If they did horribly, is this an indication that they will struggle with Physics CP (worried about the level of math)?

How much of this information is shared with the current HS Physics teachers so they are prepared to adapt their lessons to make sure that all students feel confident in their Physics class?

What is the current breakdown in number of students that take CP, Honors and AP Physics during their Freshman year?

How are they assessed on their readiness, ability and effectiveness of using this approach?

- The MHS Science Department relies on teacher recommendations for course placement.
- The MHS Science Department does not have prerequisites for course levels
- If a student wishes to select a course that does not align with the teacher recommendation, students would need to complete the course waiver request form
- The math diagnostic assessment is a key factor in the teacher recommendation process. MHS staff have full access to this data, allowing them to be aware of specific mathematical indicators for each student.
- 14-15 Physics Enrollment
 - General (58)
 - Physics "CP" (153)
 - Honors Physics (187)
 - AP Physics (0) - this is a calculus based course

Types of support and/or help available for the average student

How do we help our students if they need it?

How can non- science graduate parents help the children who wish to have career in science and STEM related fields?

How does the science program capture students interest and motivate them to pursue the sciences?

Will this class prepare my child for college level physics or are additional physics classes needed ? (And are they offered at MHS)

What support will be offered to kids beyond the classroom?

Is there anything we can do to prepare over the summer break?

Do you know if any parents had to get special tutors?

- The MHS physics team arranges after-school help sessions so that a physics instructor is available each day T-TH.
- Teachers are approachable during study hall and may schedule individual/small group appointments with instructional staff.
- Parents can help children regardless of science background. Physics teachers are able to provide an assortment of questioning strategies that move beyond "what did you do in physics". Reach out to your child's instructor and they will serve as an excellent resource in this regard.
- The MHS Science enrollment and graduation data suggests that MHS students are prepared to enter STEM programs in college and report significant advantages in scientific reasoning skills as compared to peers. A focus on understanding and application as opposed to memorization is often cited as a benefit.

- Some students do complete a formal preparation program before a course, but it is not assumed or required.
- Montgomery offers a summer science program through SOAR. [It is anticipated that the SOAR Summer Program Registration will be available in late February or early March.](#)
- Some parents do hire special tutors. It is recommended that students take full advantage of the services provided by the school as a primary support. Teachers are available after school and many times during study hall to help with academic work in the sciences.

What do they take Sophomore year after getting through this class?

- After Physics in 9th grade, 10th grade students take a course in Chemistry.
- Students may select the level of chemistry they desire regardless of the level of physics. For example, choosing CP Physics in 9th grade does not preclude a student from taking Honors Chemistry in 10th grade.
- The only requirement is that students may not take a biology or environmental before completing physics and chemistry.
 - Possible course sequence (Physics, Honors Chemistry, AP Chemistry, Biology)
 - Not a possible sequence (Honors Physics, AP Biology, Chemistry)