Physics: Freshman, Accelerated, and AP Physics I

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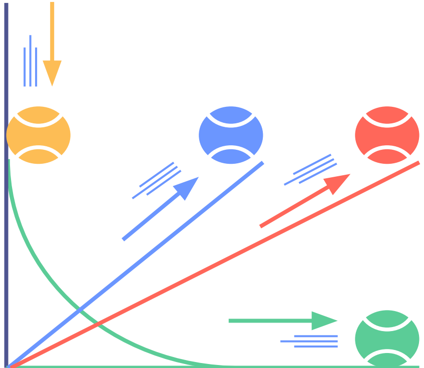
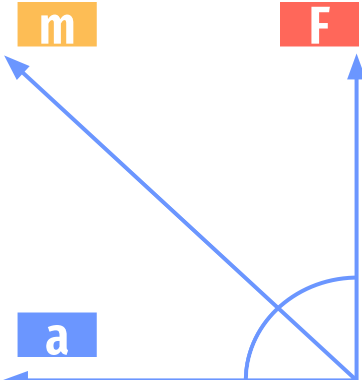




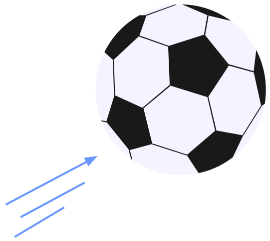
Summary of Work

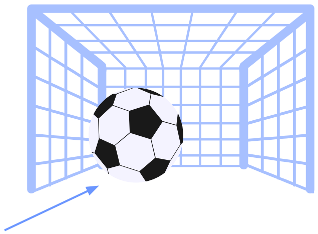
Curriculum Work So Far:

- Discussed the goals for students in the 9-12 Science program and steps to achieve those goals.
- Mapped out the current reality of the course
- Discussed and explored the NGSS standards
- Developed enduring understandings, essential questions, and student learning goals in alignment with the Missouri Learning Standards for Science. The enduring understandings and essential questions that drive the course are listed below

Scope and Sequence

1. Balanced Forces
2. Constant Velocity
3. Balanced Forces
4. Unbalanced Forces
5. Energy and Waves
6. Work, Power, Efficiency
7. Electricity





Science and Engineering Practices(Enduring Understandings)

These practices describe how scientists and engineers actively engage in the acquisition of evidence-based knowledge and the solving of problems through prototyping.

Students need to be able to ask questions as a scientist would and, define problems as an engineer would. They need to be able to build their own models, conduct their own investigations, and engage in independent analysis and thinking. Crucially, they need to be able to reach explanations and solutions on their own, generate findings from evidence, and acquire information by themselves – without having it provided directly to them in a traditional knowledge transfer model.

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using math and computational thinking
6. Constructing an explanation (for science) and designing a solution (for engineering)
7. Engaging in an argument stemming from evidence
8. Obtaining, evaluating, and communicating information

Essential Questions

- What factors affect force?
- What factors affect inertia?
- What is the relationship between an object's position and change in time?
- What does the slope of a position-time graph represent?
- What is the relationship between the net force and acceleration on an object?
- What is the effect on an object's motion when forces are not balanced?
- How are work and energy related?
- How are series and parallel circuits similar and different?
- How are waves related to energy?

Physics vs Accelerated Physics: What’s the Difference?

Accelerated Physics will cover more topics at a greater depth and faster pace than Physics. Students taking Accelerated Physics should have a strong understanding of basic algebra. Trigonometry and advanced mathematical techniques will be taught and used throughout the course. It is highly recommended that students taking Geometry or Honors Geometry or higher enroll in Accelerated Physics. Students in Geometry should enroll in Accelerated Physics if they are comfortable with the pace and mathematical requirements. Students in Algebra should enroll in Physics.

AP Physics I

AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore these topics: kinematics, dynamics, circular motion and gravitation, energy, momentum, simple harmonic motion, torque and rotational motion, electric charge and electric force, DC circuits, and mechanical waves and sound.

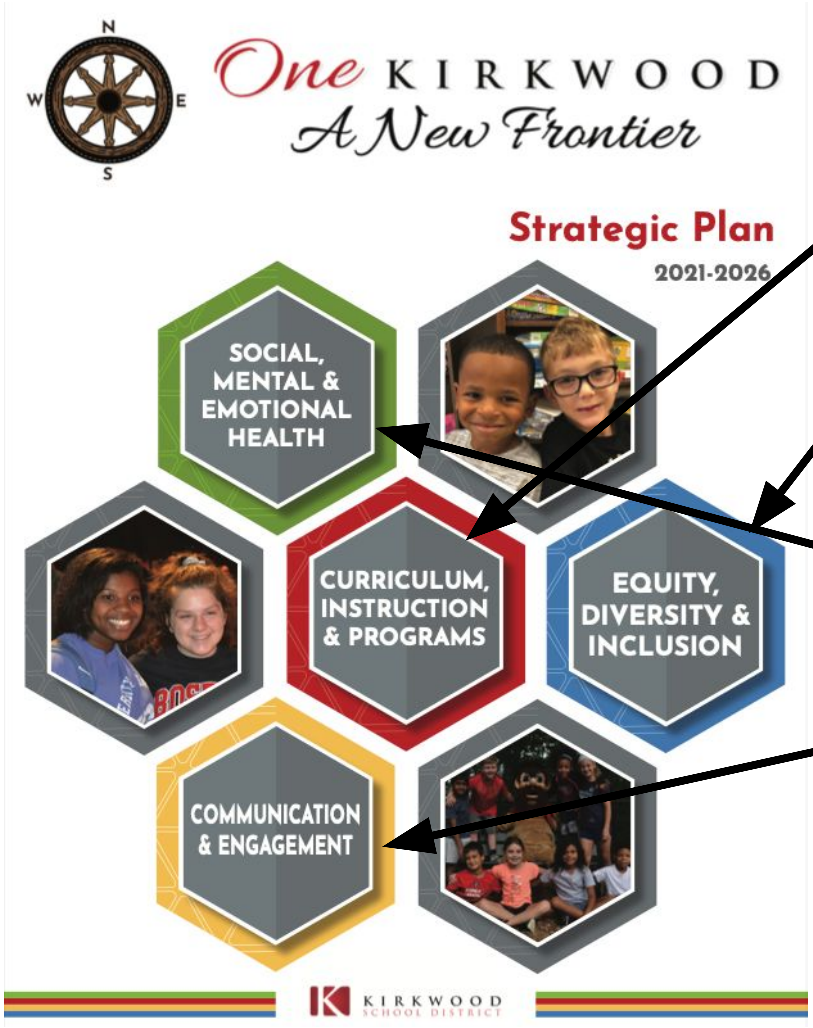
Unit 1: Kinematics
Unit 2: Dynamics
Unit 3: Circular Motion and Gravitation
Unit 4: Energy
Unit 5: Momentum
Unit 6: Simple Harmonic Motion
Unit 7: Torque and Rotational Motion

AP Physics I changes

AP Physics 1

Course Changes

- 8 units instead of 7. Unit 8: Fluids is moving from AP Physics 2 to AP Physics 1.
- Adding connections between rotational and translational motion.
- Adding specific learning objectives referencing power.
- Adding equations of motion for objects in simple harmonic motion.
- Removing specific links between the learning objectives and the science practices. In the revised course framework, any learning objective can be tested with any science practice, which allows a greater range of questions to be written to the new framework.



The Physics curriculum…

- aligns the SEP across all grade levels.
- focuses on diverse perspectives and inclusion of all students
- builds respect of and a sense of belonging to community and beyond.
- seeks to provide learning beyond classroom.

KIRKWOOD SCHOOL DISTRICT

Thought Exchange

Physics Curriculum Thought Exchange

Accelerated Physics Thought Exchange

AP Physics I Thought Exchange