PROPOSAL TO ADOPT A TEXTBOOK

Proposal Request Information
Prior to filling out this form, please read the Textbook Adoption Proposal Checklist with pertinent policies regarding textbook adoption.

FOR DISTRICT USE ONLY FINAL COMMITTEE RECOMMENDED APPROVAL GRADE LEVELS:	9-12

Section I
To be filled out by requesting educator:

Ia. REQUESTOR AND REVIEW TEAM INFORMATION

School	Legend High School	
Date	8/19/2024	
Requesting Educator	Richard Miller	
Email address	rmiller6@dcsdk12.org	
Phone number	303-387-4601 (LHS Library Media Center)	
Proposal Review Team Member	**Reviewer's Name**	**Contact Information - email**
District Coordinator	Tyson Emborg	temborg@dcsdk12.org
IT Representative	Joel Boeckmann	jnboeckmann@dcsdk12.org
Colleague	Stephanie Riddle	slriddle@dcsdk12.org
Parent	Christie Beermann	bcbeermann@msn.com

Ib. BOOK INFORMATION

Title of proposed text	University Physics Vol 1 University Physics Vol 2 University Physics Vol 3
Author (s)	Moebs, Ling, Sanny, et al
Publisher	OpenStax
Edition	2nd
ISBN number	Vol 1 - **978-1-947172-20-3** Vol 2 - **978-1-947172-21-0**

	Vol 3 - **978-1-947172-22-7**
Copyright date	Jul 23, 2024
Course and/or subject area in which textbook will be used	AP Physics C
Grade level(s)	9-12
Total cost for purchasing the textbooks? See Checklist for Required Process	Free, open access online textbook
Dates the textbook information was displayed at the school and posted on the school's website (2 week min.)	8/20/2024-9/20/2024
Date the textbook was communicated to the School Accountability Committee?	9/11/2024

Ic. RATIONALE

College Board requires access to a textbook, either digital or physical, for all AP classes. At this time, Douglas County School District does not appear to have any approved books for use in the AP Physics 1 or AP Physics C curricula. These texts were selected because they meet the rigorous standards set forth by College Board and are included on their accepted texts lists. In addition to being approved by the entity that licenses AP materials, these books can be purchased as physical copies for between $40 and $100 (less than half the price of most other texts) or accessed online for free.

Id. ALIGNMENT WITH DCSD'S GUARANTEED AND VIABLE CURRICULUM

Please write a detailed description of how the textbook **aligns to DCSD's Curriculum - Colorado Academic Standards (CAS) and Essential Skills:**

- SC.HS.1.1.b. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.
  - *Volume 2, Unit 2 covers electricity and magnetism. This includes Coulomb's Law, potential energies due to electronic interactions, and the effects of electromagnetic fields on charged particles such as atoms or molecules.*

- SC.HS.1.1.c. Develop a model to illustrate that the release or absorption of energy from a chemical system depends upon the changes in total bond energy.
  - *Volume 3 covers light and its interaction with matter, which is one of the principal ways that bond energies are affected.*

- SC.HS.1.2.e Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
  - *Volume 3 covers light and light/matter interactions which requires and expands upon an understanding of the conservation of mass-energy.*
  - *Volume 2 Unit 1 covers thermodynamics and ideal gasses, which requires and expands upon an understanding of the conservation of mass-energy.*

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SC.HS.1.4.a Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.

- *Volume 1 Unit 1 covers Newtonian Mechanics, this includes Newton's laws of motion (e.g. Newton's 2nd Law) and motion at constant acceleration in 1-dimension and 2-dimensions (which are a special case of Newton's 2nd Law).*

- SC.HS.1.4.b Use mathematical representations to support the claim that the total momentum of a system is conserved when there is no net force on the system.
  - *Volume 1 Unit 1 has chapters that cover linear momentum and rotational momentum. A sub-topic includes discussion of conservation of momentum and problem solving using conservation of momentum. This is expanded by the impulse-momentum theorem in the same unit, which allows students to create mathematical representations that will enable them to perform the same analyses when a net external force is acting on a system.*

- SC.HS.1.4.c Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
  - *Volume 1 Unit 1 covers Forces and Newton's Laws, Momentum and Impulse, and Work-Energy. These concepts are crucial for designing, evaluating, and regining such a*

device.

· SC.HS.1.5.a Use mathematical representations of Newton's Law of Gravitation and Coulomb's Laws to describe and predict the gravitational and electrostatic forces between objects.

- o *Volume 1 Unit 1 Chapter 13 covers Newton's Law of Universal Gravitation, Newton's Universal Gravitational Constant, and the qualitative and quantitative effects of changes to distance and mass.*
- o *Volume 2 Unit 2 Chapter 5 Covers Coulomb's Law and electrostatic interactions. Furthermore Volume 2 Unit 2 Chapters 6, 7, 11, and 12 cover Gauss' Law, Electric Potential, Magnetic Forces and Fields, and Sources of Magnetic Fields, respectively. These 5 chapters contain the knowledge necessary to evaluate the electrostatic forces and interactions between objects and fields.*

· SC.HS.1.5.b Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electrical current.

- o *Volume 2 Unit 2 Chapters 5, 6, 9, 12, and 13 cover the following topics respectively; (5) Electrical Charges and Fields, (6) Gauss' Law, (9) Current and Resistance, (12) Sources of Magnetic Fields, and (13) Electromagnetic Induction.*
- o *Chapters 5, 6, and 9 provide the background information necessary to fulfill this standard.*
- o *Chapter 12 directly discusses that moving charges (such as current) and moving electric fields result in a magnetic field. There is also a brief introduction to changing magnetic fields that cause a current.*
- o *Chapter 13 directly discusses how motion of charges or electric fields results in a magnetic field and a changing magnetic field results in a current. This phenomenon is known as induction. This chapter also discusses the applications of induction in electrical circuits (inductance/electromotive forces)*

· SC.HS.1.5.c Communicate Scientific and technical information about why the molecular level structure is important in the function of designing materials.

- o *Volume 1 Unit 1 contains many diagrams and discussions about the roll of molecular forces and structures during collisions, rotational motion, and linear motion. E.g., A rigid rotating body is composed of material that does not deform due to chemical bonds, a rigid body will not deform during a linear collision because the strength of molecular and intermolecular bonds is greater than the impulse generated during a collision.*

· SC.HS.1.6.a Create a computational model to calculate the change in energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.

- *Volume 1, Unit 1, Chapters 7 and 8 cover the following topics: (7) Work and Kinetic Energy and (8) Potential Energy and Conservation of Energy. These two chapters collectively discuss Conservation of Energy, which allows students to create a model to calculate the change in energy of a component of a system when the net change of energy is zero. Furthermore, these chapters collectively discuss the Work-Kinetic Energy Theorem and the Work-Energy Theorem, which extended Conservation of Energy to include systems that will have energy entering and exiting the system.*

· SC.HS.1.6.b Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and the energy associated with the relative position of particles (objects).

- *Volume 1, Unit 1, Chapter 8 includes information necessary to model and illustrate energy on a macroscopic scale that depends on motion (Kinetic Energy) and position (Potential Energy). A brief but incomplete discussion on loss of energy to heat is also included.*
- *Volume 1, Unit 1, Chapter 13 extends the discussion of position dependent energies to include fields and Newton's Law of Universal Gravitation. This allows students to develop and use models of position dependent energies that are not near the surface of Earth.*
- *Volume 1, Unit 2 discusses Harmonic Oscillators and the flow of energy from motion dependent to position dependent.*
- *Volume 2, Unit 1 discusses Thermodynamics and Ideal Gasses, which allows a student to develop models that include heat energy by extending the knowledge in Volume 1, Unit 1, Chapter 8.*
- *Volume 2, Unit 2 discusses Electricity and Magnetism, which allows a student to extend their models to the positional energies associated with electromagnetic fields, charged particles, and Coulombic interactions.*
- *Volume 3 discusses briefly and somewhat incompletely the effects of light and radiative emission on the energies of a system due to moving charges, oscillation (positional energies), and can be easily extended to include chemical energies in bonds.*

· SC.HS.1.6.c Design, build, and refine a device that works within the given constraints to convert one form of energy to another.

- *Volume 1, Unit 1, Chapters 7 and 8 cover topics necessary to design, build, and refine such a device using mechanical energy.*
- *Volume 2, Unit 2 covers topics necessary to extend a student's knowledge such that the device can include electromagnetic energies.*
- *Volume 3 covers topics necessary to extend a students' knowledge such that the device can include chemical energies.*

· SC.HS.1.7.a Create a computational model to calculate the change in energy of one component in a system when the change in energy of the other component(s) and energy flows

in and out of the system are known.

- o *Volume 1, Unit 1, Chapters 7 and 8 discuss the Conservation of Energy, the Work-Kinetic Energy Theorem, and the Work-Energy Theorem. During this discussion it is made clear to students that in systems where the total energy is not conserved, the total energy of the Universe is always conserved through the change of energy from one form to another or the loss of work-energy to heat-energy.*

· SC.HS.1.7.b Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components of the system.

- o *Volume 2, Unit 1 covers Thermodynamics which provides a student the necessary knowledge of heat-energy flow on a macroscopic and microscopic level. This includes a discussion of isothermal processes, isochoric processes, isobaric processes, thermal equilibrium and the process of reaching thermal equilibrium (equilibriation).*

· SC.HS.1.8.a Develop and use a model of two object interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interactions.

- o *Volume 2, Unit 2 covers Electricity and Magnetism which gives the student knowledge of charged pair interactions, magnetic and electrical field interactions, and charged particle interactions with electromagnetic fields. The discussions in this volume and unit include discussion of objects that interact in 1-, 2-, and 3-dimensions. The discussions in this volume and unit include force interactions, as well as the resulting motions of particles and energies (or change in energies).*

· SC.HS.1.9.a Design, build, and refine a device that works within the given constraints to convert one form of energy into another form of energy.

- o *Volume 1 Unit 1 covers Newton's Laws of Motion and Newton's Law of Universal Gravitation, which includes a discussion on forces and work-energy. Knowledge of these concepts allow a student to build such a device that converts mechanical energies.*
- o *Volume 1 Unit 2 covers Harmonic Oscillators, which includes a discussion that*
- o *Volume 2 Unit 2 covers Electricity and Magnetism, which includes a discussion on Coulombic Forces and Energy that will allow a student to extend their knowledge from Volume 1 Unit 1 to include electromagnetic energies.*
- o *Volume 3 covers Light and Optics, which includes a discussion and demonstration that energy, in the form of photons, can be converted to heat, chemical energy, or kinetic energy (current).*

· SC.HS.1.9.b Plan and conduct an investigation that the transfer of thermal energy when two components of different temperature are combined with in a closed system results in a

more uniform energy distribution among the components in the system.

- *Volume 2 Unit 1 covers thermodynamics including the second law of thermodynamics and the process of equilibration.*

· SC.HS.1.10.a Use mathematical representations to support a claim regarding relationships among frequency, wavelength, and speed of waves traveling in various media.

- *Volume 3 covers light and optics, which discusses the effects of different media on electromagnetic waves and the effects of interfaces between these media.*

· SC.HS.1.11.a Evaluate claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described by either a wave model or a particle model, and that for some situations one model is more useful than the other.

- *Volume 3 covers waves and optics which discusses the importance of modeling electromagnetic radiation as waves, rays, and particles.*

SECTION II: Review Team Information

Each review team member will complete an individual section for a formal review of the textbook based on your stakeholder perspective. All members of the review team **MUST review** the proposed textbook prior submission to the Curriculum, Instruction and Assessment Director.

IIa. EVALUATION of textbook (to be completed by requesting educator)

The proposed textbook...	**Y/N**	**Examples/Justification** Please be specific and provide examples if applicable
is appropriate for the following grade level(s)	Y	Contains no offensive materials and is approved by College Board.
develops essential knowledge and skills	Y	Gives examples, explanations, and graphics that assist learning.
provides breadth and depth of content	Y	Contains all core content knowledge required in an AP Physics C course.
allows students to create meaning and make relevant connections to other knowledge and experience	Y	Contains many examples marked as applicable to various subjects such as biology or technology
the information in the text includes a variety of cultural perspectives.	Y	It discusses the physics in a culturally appropriate way that is intended to fit the needs of future scientists and engineers.
the text has been reviewed in regard to respecting gender, ethnic and racial uniqueness, similarities and interdependence.	Y	Problems, examples, and any talk of individuals is well varied and any diagram of people represents a diverse selection of skin-tones, names, and other identifying features.
the text reflects the current research in the content area.	Y	It reflects many of the current thinking strategies for the content, but current research on this area of physics is mostly closed.
Recommend textbook for adoption		Yes

IIb. EVALUATION of Book (to be completed by District Coordinator)

The proposed textbook...	**Y/N**	**Examples/Justification** Please be specific and provide examples if applicable
is appropriate for the following grade level(s)		These materials are appropriate for the High School level.
develops essential knowledge and skills		These materials help students in the field develop essential knowledge and skills aligned with academic standards and the expectations for this Advanced Placement course.
provides breadth and depth of content		These materials provide an incredible breadth and depth of content in line with the rigorous expectations of the subject matter.
allows students to create meaning and make relevant connections to other knowledge and experience		These materials allow for multiple avenues for students to create meaning and make relevant connections to other knowledge and experiences. This includes frequent opportunities for students to check their understanding, and apply their understanding where appropriate.
the information in the text includes a variety of cultural perspectives.		When appropriate these materials incorporate a variety of cultural perspectives.
the text has been reviewed in regard to respecting gender, ethnic and racial uniqueness, similarities and interdependence.		These materials have been reviewed in regard to a respect for gender, ethnic and racial uniqueness, similarities and interdependence.
the text reflects the current research in the content area.		These materials reflect the current research in the content area.
aligns with proposed connections to DCSD curriculum (Colorado Academic Standards, Essential Skills)		These materials align with the Colorado Academic Standards and Essential Skills. They also reflect the outlined criteria specified by College Board.
Recommend textbook for adoption		Yes

IIc. EVALUATION of textbook (to be completed by a colleague)

The proposed textbook...	**Y/N**	**Examples/Justification** Please be specific and provide examples if applicable
is appropriate for the following grade level(s)	Y	Yes, the text is age appropriate and contains only scientific information about Physics.
develops essential knowledge and skills	Y	The text covers the essential concepts and mathematical processes that are essential for the understanding of Physics.
provides breadth and depth of content	Y	The text provided a thorough exploration of College Level Physics.
allows students to create meaning and make relevant connections to other knowledge and experience	Y	Extensive examples and opportunities for students to check their understanding are provided in this text.
the information in the text includes a variety of cultural perspectives.	Y	This is a straightforward science text that will be approachable from all cultural perspectives.
the text has been reviewed in regard to respecting gender, ethnic and racial uniqueness, similarities and interdependence.	Y	Yes. I have no concerns in this area. This text is respectful to all genders and cultures.
the text reflects the current research in the content area.	Y	Because this is an e textbook, the most up to date information and research is provided.
aligns with proposed connections to DCSD curriculum (Colorado Academic Standards, Essential Skills)	Y	This text is highly aligned with the Colorado Academic Standards and the standards expected in the college level course.
Recommend for adoption		Yes

IId. EVALUATION of textbook (to be completed by Parent)

The proposed textbook...	**Y/N**	**Examples/Justification** Please be specific and provide examples if applicable
is appropriate for the following grade level(s)	Y	College preparatory
develops essential knowledge and skills	Y	Covers all anticipated topics for introductory Physics course
provides breadth and depth of content	Y	Between all three texts, very comprehensive coverage of physics topics, although Volume 1 is sufficient for introduction
allows students to create meaning and make relevant connections to other knowledge and experience	Y	Photographs used in the text give perspective on real life application
the information in the text includes a variety of cultural perspectives.	Y	I found multiple examples that have different perspectives
the text has been reviewed in regard to respecting gender, ethnic and racial uniqueness, similarities and interdependence.	Y	I found no examples of discriminating text.
Recommend for adoption		Yes

IIe. EVALUATION of textbook (to be completed by IT Representative)

The proposed textbook...	**Y**	
meets privacy act requirements	Y	
vendor has signed *Data Protection Addendum*	N	
Recommend for adoption		Yes

SECTION V: Signatures/Approvals

Va.

Does the evaluating ***Educator*** recommend adoption of this textbook?	YES	NO
Date Oct 30 2024 Evaluating Educator Signature Richard Miller	☑	

Vb.

Does the evaluating ***Colleague*** recommend adoption of this textbook?	YES	NO
Date Oct 30 2024 Evaluating Colleague Signature Stephanie Riddle	☑	

Vc.

Does the evaluating ***Parent #1*** recommend adoption of this textbook?	YES	NO
Date Oct 28 2024 Evaluating Parent (#1) Signature Christie Beermann	☑	

Vd.

Does the evaluating ***IT Representative*** recommend adoption of this textbook?	YES	NO
Date Oct 29 2024 Evaluating IT Representative Signature Joel Boeckmann	☑	

Ve.

Does the evaluating Requesting Educator's ***Administrator*** recommend adoption of this textbook?	YES	NO
Date Oct 28 2024 Administrator Signature Jason Jacob	☑	

Vf.

Does the ***District Coordinator*** certify that the information on this form accurately reflects the process followed at the site.	YES	NO
Date Oct 28 2024 District Coordinator Signature Tyson Emborg	☑	

Vg.

Does the ***Curriculum, Instruction and Assessment Director*** support adoption of this textbook?	YES	NO
Date Oct 28 2024 CIA Director Signature Erica Mason	☑	

Vh.

Does the ***DCSD Cabinet Member*** support adoption of this textbook?	YES	NO
Date Oct 28 2024 DCSD Cabinet Member Signature Matt Reynolds	☑	

SECTION VI: Superintendent's Approval

SUPERINTENDENT'S APPROVAL

Does the ***Superintendent*** approve adoption of this textbook?	YES	NO
Date _____ Superintendent Signature _____		

SECTION VII: Board of Education Approval

BOARD OF EDUCATION APPROVAL

Does the ***Board of Education*** approve adoption of this textbook?	YES	NO
Date _____ Board of Education Signature _____		

OFFICE USE

	DATE	INITIALS
Approved textbook list updated (including recommended grade level)		
Approved form with BOE signatures scanned to CIPG folder on District server		