TRANSITION GUIDE

College Physics 2e.

OpenStax College Physics 2e
Transition Guide

College Physics 2e was revised to improve accuracy, currency, relevance and responsiveness. The most significant changes involve the expansion of the narrative to include more contributors to the field and more connections with other disciplines.

The following list is designed to aid faculty in their incorporation of the new and revised material. In addition to these changes, the authors and editors have also made errata corrections, image improvements, inclusivity modifications, and other edits for clarity.

Most chapters have a new Critical Thinking at the end of each problem set. These were placed at the end in order to avoid renumbering; however, the topics or concepts covered may be covered anywhere in the chapter. In addition, many problems were updated for more accuracy or inclusivity; some of those changes are captured below, but not every problem change is recorded.

Chapter 1

- Introduction
    - Added content regarding Mohammad M. Atalla and Dawon Kahng's invention of MOSFETS
- Section 1.1
    - In example of GPS, added information about Gladys West (covered in more detail in a later chapter)
    - In feature on Scientific Method, added contributions of Ibn Al-Haytham
- Section 1.3
    - Removed PhET Exploration on Estimation

Chapter 2

- Problems
    - Changed problem 11 to incorporate more inclusive language

Chapter 3

- Section 3.2
    - Correction: In paragraph below Figure 3.18, change both instances of 50.0 to 50.8 and both instances of 7.0 to 5.47
- Problems
    - Changed problem 22 to incorporate more inclusive language

Chapter 4

- Section 4.8
    - Table 4.1: Two changes: In row 3, the weak nuclear force, change the approximate relative strength from 10^-13 to 10^-6. In the bottom row, change the Range from <10^-15m to infinity symbol.
    - Update and enhanced coverage of LIGO and added coverage of black hole discoveries

Chapter 5

- Problems
    - Corrections: Problems 20 and 22 changed to surface area to cross section area

Chapter 6

- Section 6.5
    - Added contributions of Émilie du Châtelet in achieving acceptance of gravitation theory.
- Problems
    - Correction: Problem 21 – Removed first portion (a) and realigned subsequent portions.

Chapter 7

- Introduction:
    - Added experiments conducted by Willem ‘s Gravesande and Émilie du Châtelet
- Section 7.9
    - Significant currency updates regarding global energy use, national statistics, goals.
    - Overhaul of table 7.6 on energy use by nation.
    - Added information about new energy sources, economic impacts,
- Problems
    - Changed problems 24, 47, 54, and 69 to be more inclusive and considerate

Chapter 10

- Section 10.5
    - Removed PhET on Solar System

Chapter 11

- Section 11.7
    - Changed terminology in discussion and example of Figure 11.23 to hydrostatic weighing device
    - Removed PhET on Buoyancy
- Section 11.8
    - Replaced Figure 11.30 (bronchial tubes and related structures) with more detailed version.

Chapter 13

- Introduction
    - Image and narrative regarding Nithin Abraham's work on contaminant absorption
- Section 13.4
    - Correction to Figures 13.23 and 13.24 – replace "velocity" with "speed."
- Problems
    - Correction/replacement to problem 25 for clarity and accuracy

Chapter 14

- Introduction
    - Added opening image and discussion regarding Eunice Newton Foote's experiments to establish the temperature trapping behavior of certain gasses.
- Section 14.2
    - Example 14.12 replaced most units for greater accuracy
    - Table 14.1 – added values to table for clarity
- Section 14.7
    - Added contributions of Eunice Newton Foote to greenhouse effect explanation.
    - Added overview of Mária Telkes' work in the development of solar heating and cooking technology.
- Problems
    - Problem 33 – added clarification about thermal conductivity of ceramics

Chapter 17

- Section 17.2
    - Added contributions of Richard Dixon Oldman and Inge Lehmann regarding study of earthquake waves to understand the composition of earth's core.
- Section 17.6
    - Replaced figures 17.38 and 17.40 with higher quality illustrations.

Chapter 18

- Section 18.6
    - Added discussion of Ernest Everett Just's discovery of membrane charge changes – "wave of negativity."
    - Added a subsection on Electricity and Wound Healing, including research by Purdue University researchers on electrical stimulation after surgery.
- Problems
    - Changed problem 32 to improve inclusivity.

Chapter 20

- Section 20.7
    - Added image of EKG node placement on body

Chapter 24

- Section 24.2
    - Take home experiment – replaced activity regarding television antennas with one about cell phones and radios
- Section 24.3
    - Added background on UV radiation detection in space based on George Robert Curruthers' spectrograph on the Apollo 16 mission.
    - Updated discussion of the ozone layer and the Antarctic ozone hole, including an updated image.
    - Added discussion of additional CFC contributors based on Susan Solomon's research
    - Added contributions of Arthur B. C. Walker to electromagnetic waves in space.
    - Added coverage of James Webb telescope
- Section 24.4
    - Added PhET activity on radiation.

Chapter 25

- Section 25.5
    - Added Al Farisi's experiments on water droplets, also mention Theodoric of Frieberg.

Chapter 26

- Introduction
    - Added image and discussion of electron microscopy related to the SARS-COVID-19 virus.
- Section 26.1
    - Added background on early theories of vision, including those held by Euclid and Plotlemy as well as determinations made by Al-Haytham.
- Section 26.2
    - Added Donna Strickland's and Gérard Mourou's development of chirped lasers for use in vision correction.
- Section 26.3
    - Added detailed illustration of rods and cones; replaced image of cone sensitivity with a more detailed version.
- Section 26.4
    - Added background on Pratibha L. Gai's invention of environmental transmission electron microscope, and updated photos and art
- Problems
    - Improved problems 15 and 18

Chapter 27

- Introduction
    - Replaced intro photo with photo of Katherine Burr Blodgett using a device
- Section 27.7
    - Added contributions of Agnes Pockels regarding thin films
    - Added contributions of Katherine Burr Blodgett and Irving Langmuir

Chapter 28

- Introduction
    - Added background on relativity impacts on GPS systems and Gladys West's work on developing and programming algorithms to ensure accuracy in measurements leading to GPS.

Chapter 30

- Section 30.5
    - Added mention of Stickland's and Mourou's usage of gratings to produce chirped laser.

Chapter 31

- Section 31.4
    - Added contributions of Chien-Shiung Wu regarding beta decay

Chapter 32

- Section 32.1
    - Added discussion of radioimmunoassay and contributions of Rosalyn Sussman Yalow and Solomon Berson.

Chapter 34

- Section 34.4
    - Expanded coverage of Vera Rubin's discoveries regarding spiral galaxies and their impact on the understanding of dark matter.