College Physics Release Notes 2020

Release Number

3 2 1

Page Count Difference

In the latest edition of *College Physics* there is a page count increase from 1416 pages to 1566 pages due to errata changes and the introduction of a new design.

Errata:

Below is a table containing submitted errata, and the resolutions that OpenStax has provided for this latest text.

Location	Detail	Resolution Notes	Error Type
Chapter 01 Appendix C	Update to revise the definitions of several fundamental physical constants that were adopted May 2019.	Revise as indicated.	General/pedagogical suggestion or question
Chapter 01 Table 1.2	The Value column in Table 1.2 has a footnote [1] which states: "See Appendix A for a discussion of powers of 10." There is no discussion of powers of 10 in Appendix A. However, there is a discussion under the heading of Metric Prefixes on the preceding page. Suggest removing the footnote from the table.	This footnote will be removed.	General/pedagogical suggestion or question
Chapter 01.3 Accuracy, Precision, and Significant Figures	The text says "The precision of a measurement system is refers to"	Delete the "is" before refers.	Typo
Chapter 01.4	In Example 1.4, the first sentence states: "The U.S. federal deficit in the 2008 fiscal year was a little greater than $10 trillion." The easiest solution is to change deficit to debt and greater to less. A quick check on wikipedia gives the deficit and debt in a convenient form for 2008 here: https://en.wikipedia.org/wiki/2008_United_States_federal_budget I was suspicious of the order of magnitude of the figure in the text, as, to my memory, $10 Trillion is roughly the current *debt* (not deficit) of the U.S. I could not find any sources for a $10 trillion deficit in 2008. I first found a report from the Congressional Budget Office giving the 2009 deficit as "The Treasury recently reported that the federal government recorded a total budget deficit of $1.4 trillion in fiscal year 2009, about $960 billion more than the deficit incurred in 2008."	Revise this sentence to "The U.S. federal debt in the 2008 fiscal year was a little less than $10 trillion."	Other factual inaccuracy in content

Chapter 02	If we define the upward direction as positive, then a = −g = −9.8 m/s2 , and if we define the downward direction as positive, then a = g = 9.8 m/s2 -->The upward direction should be negative and not positive for the value of a to be -g.	Revise "If we define the upward direction as positive..." to "If we define the upward direction as negative..."	Typo
Chapter 02 Kinematics, Problems & Exercises 64	If Figure 2.64 represents the position vs time, there is no way that Figure 2.65 can represent the velocity vs time. In particular, for the period from 15 to 20 sec Figure 2.64 shows a constant velocity, whereas 2.65 shows a continually increasing velocity. Both cannot be correct. As a result of the original erratum (1823) question #61's wording was updated in the ISM which now does not match the book. Please review and advise in detail on what changes need to be made to resolve this report and the ISM discrepancy.	Figure 2.65 will be updated. The wording in the solution manual will be updated.	Other factual inaccuracy in content
Chapter 02 Problem #50	Part b of the question asks how long the kangaroo is in the air. The answer given is the time the kangaroo takes to reach a height of 2.50m after leaving the ground. This number should be doubled to calculate the total time in the air.	The solution manual will be updated.	Incorrect answer, calculation, or solution
Chapter 02 Problem #66	The solution for the acceleration graph and the corresponding table of values is completely incorrect. The acceleration at the points where the velocity changes is infinite. The velocity is shown as jumping instantly from one value to another (at least within the resolution of the graph.) It would be ok to say that the acceleration is not truly infinite but is just very large, but the solution states that the acceleration is simply the change in the velocity in units of m/s^2. I would suggest that the acceleration plot should not be asked for in the question, and instead the students can be asked to just evaluate the acceleration inside the time intervals during which velocity is constant (and the answer would be 0) and then the question could ask something qualitative about the moments at which the velocity changes, along the lines of "Can you say something about the acceleration at the moments at which the velocity changes?" and the answer should be something like.. "Since the velocity changes instantly, the acceleration would have to be infinite at exactly 2s, 3s, 5s. We should think off this as an approximation. The acceleration is very large and negative at 2s, and very large and positive at 3s and 5s."	Revise question 66 to "Figure 2.68 shows the position graph for a particle for 5 s. (a) Draw the corresponding Velocity vs. Time graph. (b) What is the acceleration between 0 s and 2 s? (c) What happens to the acceleration at exactly 2 s?"	Incorrect answer, calculation, or solution
Chapter 02 Problem 60	On graph of Position vs. Time, position is given in meters. However, the table accompanying this graph, gives the position in kilometers	The solution manual will be updated to change "km" to "m" in the table.	Incorrect answer, calculation, or solution

Chapter 02 Problems at the end of the chapter.	p. 93 The graphical analysis problems. It is too hard to read the position values in order to do the calculations for instantaneous velocity. Also in the instructors manual, for # 66, the answer for acceleration at 3 s should be 5. (I think.) Finally, numbers 60 and 61 use the same graph, which appears to have a constant velocity, but the problem asks you to find two values. I find this whole section confusing.	Revise the question stem for problem 66 to "Figure 2.68 shows the position graph for a particle for 6 s. (a) Draw the corresponding Velocity vs. Time graph. (b) What is the acceleration between 0 s and 2 s? (c) What happens to the acceleration at exactly 2 s?" Our reviewers determined there are no issues with problems 60 and 61.	General/pedagogical suggestion or question
Chapter 02.5	the question doesn't really specify the direction so either a or b should be valid. if possible +- sign would be really good for this equation (±)	Add the following to the end of the question stem: "Assume the positive direction is downward."	General/pedagogical suggestion or question
Chapter 02.7	It is really unclear that this question is expecting you to finish the sentence. its highest point, ____. would make more sense It might be better if it is said instead of `its acceleration is +9.8 ms^-2`, `its magnitude of acceleration is 9.8 ms^-2` - same for velocity	Revise the question to: A baseball is thrown straight up. Which statement describes the ball at its highest point?	General/pedagogical suggestion or question
Chapter 02.7 Question # 54	In the sentence So now we have 3 equations in 3 unknowns (v_B,t_BOT, and v_0), t_BOT should be changed to t_TOP.	This will be updated in the solution manual.	Typo
Chapter 02.8	Starting at 2.8 in the doc, the figure numbers do not match up with the figure numbers in the book.	The figure references will be updated.	Typo
Chapter 02.8 Figures 2.49 and 2.66	"Figure 2.49 has no alt text (look for ""A U.S.""). Same for Figure 2.66 (look for ""must""). Moved to a different book because there are issues in college physics webview (Numbered figures in solutions that mess up the numbering in some sections because solutions aren't in webview)"	Alt text will be added to these two figures.	General/pedagogical suggestion or question
Chapter 03 Question 46	In the "Using the equation" there is a typo it lists V sub y twice, the second one should be V sub 0, y	This will be updated.	Typo
Chapter 04 Problem 7	The answer in the solution guide results from using a different value for thrust from that written in the problem. The problem says to use 24,000 N for the magnitude of thrust, but the solution guide uses 26,000 N. The correct answer that's consistent with the text of the problem is 11 m/s^2 rather than 12 m/s^2. Or if you want to leave the solution guide alone, change the text of the problem to involve a thrust of 24,000 N.	Revise to 2.6 × 10^4.	Incorrect answer, calculation, or solution
Chapter 04 Student Solution #33	Change sum F_y= 0 with sum F_y=F_app and remove the F_app force from free body diagram. As drawn it seems that F_app is a third force exerted on the tooth, but only the two tension forces are exerted	The diagram in this question will be updated.	Incorrect answer, calculation, or solution

	on the tooth. Alternatively, add an additional force to the free body diagram labeled something like F_jaw- meaning the force of the jaw that resists the force of the braces but this force should be due north and then the sum F=0 is correct. "Step 3: Given T = 25.0 N, find Fapp . Using Newton's laws gives Σ Fy = 0, so that the applied force is due to the y -components of the two tensions:"		
Chapter 05.1	"to to" should be "to" in "... the gel that couples the transducer to the skin also serves to to lubricate ..."	Delete the repeated "to".	Typo
Chapter 05.2 and 05.3	Chapter 5.2 has the same PhET as chapter 5.3; however, chap. 5.3 is the updated HTML5 version. Should 5.2's phet be updated to the HTML5 version, replaced, or deleted all together?	Delete the PhET simulation in Chapter 5.2.	Other
Chapter 05.3 Figure 5.15	In figure 5.15, the labels on the axes are swapped. To be consistent with the text (and how stretching works) the tendons length cannot be reduced by increasing the force. The horizontal axis should be labeled Delta L, and the vertical axis should be labeled F, so that the tendon stretches "easily at first when a force is applied, but offer a much greater restoring force for a greater strain" as described in the text, and then eventually offers less force in the failure region as "individual fibers begin to break". Compare to Figure 3.B in J Exp Biol. 2012 Oct 15; 215(20): 3552–3558.	This figure will be updated.	Other factual inaccuracy in content
Chapter 06 Figure 6.8	Vector V1 shown in the triangle is not pointing the same direction as vector V1 on the circle so the change in velocity vector does not appear to point in the direction of the center of the circle.	This figure will be updated to reposition the green triangle.	Other
Chapter 07.8	"Figure 7.27 A pulse oxymeter is an apparatus that measures the amount of oxygen in blood. Oxymeters can be used to determine a person's metabolic rate, which is the rate at which food energy is converted to another form." As far as I've heard, a pulse oxymeter measures oxygen saturation in the blood. To get metabolic rate you need to measure the O2 and CO2 in exhaled breath.	Revise the second sentence in this caption to "A knowledge of oxygen and carbon dioxide levels indicates a person's metabolic rate, which is the rate at which food energy is converted to another form."	Other factual inaccuracy in content
Chapter 08 #10 solution	"(d)The boxer's head recoils much faster than the body, since its mass is smaller. To knock someone out it is much more effective to hit them in the head than in the torso." The first sentence is fine. But the second implies that knocking someone out only needs a minimum change in velocity. What if someone is hit hard on top of the head?	This will be updated in the solution manual.	Incorrect answer, calculation, or solution

Chapter 10 #28	It should have started with KE-rot + KE-linear = PE-grav	The solution manual will be updated to "KE_rot + KE_trans = PE_grav".	Incorrect answer, calculation, or solution
Chapter 10 Problem #15 part b	The units in the answer key are simply wrong, although the calculations are otherwise correct. The acceleration should be in m / s^2, rather than in m/s.	The solution manual will be updated.	Incorrect answer, calculation, or solution
Chapter 10.4 Figure 10.16 caption	The caption to Figure 10.16 concludes, "The flywheel's energy can then be used to accelerate, to go up another hill, or to keep the bus from going against friction." It's not at all clear what is meant by "from going against friction." I think the caption could better read, "... or to keep the bus from slowing down due to friction or air resistance." Or even just remove the word "from"	Revise the end of the caption to "...keep the bus from slowing down due to friction."	General/pedagogical suggestion or question
Chapter 11 overview	The heading on the chapter 11 overview page says "Fluid Statistics" instead of "Fluid Statics."	Our reviewers accepted this change.	Typo
Chapter 11.8 Example 11.11	I am a physicist (Ph D LSU 1967) and tutor college and high school students in my retirement. I believe there is a mistake in Example 11.11 Surface Tension: Pressure Inside a Bubble in the on-line Openstax AP Physics book. The last sentence in the Discussion states that "if a hole were to be made in the bubble, …, and the pressure inside the bubble would increase to atmospheric pressure." Since the calculated pressure in the example was the gauge pressure (5.56 mm Hg), then if a hole were to be made in the soap bubble would the gauge pressure not reduce to zero and the absolute pressure not reduce to 760 mm Hg? Case #30914	Revise the discussion section of Example 11.11 to "Note that if a hole were to be made in the bubble, the air would be forced out, the bubble would decrease in radius, and the gauge pressure would reduce to zero, and the absolute pressure inside would decrease to atmospheric pressure (760 mm Hg)."	Incorrect answer, calculation, or solution
Chapter 14.2	In example 14.2, Q is calculated to be 7.35x10^6. When it is substituted below, it reads as 7.35x10^5. This results in the given answer of 9.2 rather than 92.	Revise "7.35 × 10^5 J" to "7.35 × 10^6 J" and revise "9.2" to "92".	Incorrect answer, calculation, or solution
Chapter 14.3 Figure 14.8	In the lower left corner of the graph the temperature rises by 20 degrees C for added energy per unit mass of about 40 cal/g. So the slope is about 0.5, indicating a specific heat for ice of about 2. cal/(g degreeC). The slope should be greater for ice than for liquid water, not less. The portion of the plot for steam should also be steeper than for liquid water.	This figure will be updated.	Other factual inaccuracy in content
Chapter 16 Problem #16.11.71	The statement of the problem says there is a circular spot of diameter 2.00 mm, but the solution treats uses radius 2.00 mm. The answer is thus off by a factor of 4. Next, part b asks the students to compare their calculated intensity with the intensity of sunlight, which the text gives as 700 W/m^2, but that the solution manual misquotes as 1 W/m^2. Finally, part b asks students to compare two intensities and to discuss the	The solution manual will be updated to address these issues.	Incorrect answer, calculation, or solution

	implications of the intensity difference, finally telling students to "Note how your answer depends on the time duration of the exposure." One can compare intensities without reference to time duration; if you want them to compare time required to deliver a set amount of energy you should ask them to calculate the time.		
Chapter 16 Problem #16.5.35	In part b of problem 16.5.35, students are asked to calculate how much a rope (with known force constant) stretches if mountain climber free falls for h=2.00 meters before the rope "runs out of slack." The solutions manual simply takes the change in gravitational potential energy from falling 2.00 meters and puts it into the spring (mgh=1/2kx^2). This neglects that the climber continues to lose gravitational potential energy as the rope stretches after "running out of slack." The correct equation to solve would be mg(h+x) = 1/2kx^2. In part c, students are asked how their answers change if the rope is doubled in length. My students were not equipped to answer this question on their own -- I had to walk them through the idea that a rope under a given tension expands a certain fraction of its original length, so that if a rope's length is doubled it stretches twice as far, indicating that the force constant has in effect been halved. I think part c should be removed from the question or become its own question, with more guidance included. Is there even a discussion of springs in series in the text?	Add the following to the end of part (b): "Ignore the energy the climber gains as the rope stretches." Delete part (c).	Incorrect answer, calculation, or solution
Chapter 16 Problem 41	The solution to problem #41 is listed at 9% when it should be 5.91%. A decrease of 3% would change the amplitude by a factor of .97. PE = 1/2kx^2 = 1/2k(.97x^2) = .9409 PE Thus changing PE by a factor of .9409 or 94.09% From 100% to 94.09% would be a decrease of 5.91%	The solution manual will be updated.	Incorrect answer, calculation, or solution
Chapter 16.2	First paragraph: Space needed between frequency and f. Second equation: unit cycle/sec should be replaced by cycle/s. Probably in Tutor the same issues as in the textbook regarding the abbreviation for second here: equation (16.9), Section 24.1 last sentence, Table 32.3,	Revise to add a space between Frequency and f, and replace sec with s.	Typo
Chapter 17.2	Just above the table of speeds in table 17.1 there is a very misleading statement that "The greater the density of a medium, the slower the speed of sound." But then it is in apparent contradiction to the table of values. I suggest clarifying this with something like: "Within the same medium, higher density slows sound	Revise "This observation is analogous to the fact that the frequency of a simple harmonic motion is directly proportional to the stiffness of the oscillating object. The greater the density of a medium, the slower the	Other factual inaccuracy in content

	waves however in general higher density mediums will have faster sound waves."	speed of sound. This observation is analogous to the fact that the frequency of a simple harmonic motion is inversely proportional to the mass of the oscillating object." to "For materials that have similar rigidities, sound will travel faster through the one with the lower density because the sound energy is more easily transferred from particle to particle."	
Chapter 18.1	In this page it explains that static electricity may ignite oxygen. Oxygen is not flammable. I'm concerned that the authors of the textbook would write such a thing, and also concerned that it was not noticed by anybody else reviewing this piece of scientific educational material. Thanks for your time, Dennis	Revise the sentence beginning "Attendants in hospital operating rooms..." to "Attendants in hospital operating rooms must wear booties with a conductive strip of aluminum foil on the bottoms to avoid creating sparks which may ignite flammable anesthesia gases combined with the oxygen being used."	Other factual inaccuracy in content
Chapter 18.1 Figure 18.6	"she receives a excess of positive charge". We spend a lot of time talking about the electrons as the mobile charge carrier, and this language (receives) can be misunderstood as protons jumping to the person. A suggested modification would be "When this person touches a Van de Graaff generator, some electrons are attracted to the generator resulting in an excess of positive charge, ..."	Revise the first sentence in the caption to "When this person touches a Van de Graaff generator, some electrons are attracted to the generator, resulting in an excess of positive charge, causing her hair to stand on end."	General/pedagogical suggestion or question
Chapter 18.7 Problem #46	In the ISM all charges are -1.00 \mu C but q_c and q_d should be +1.00 \mu C. Also, in the solution for (a), the negative and positive charges are switched.	The solution manual will be revised.	Incorrect answer, calculation, or solution
Chapter 19.1 Figure 19.2	Figure 19.2 states twice that the change in PE = change in KE. To be consistent there needs to be a negative sign on one side or the other or this needs to be stated as the absolute value of each side is equal.	This figure will be updated.	Other factual inaccuracy in content
Chapter 20 solution manual problem 20-14	all the text seems correct (all the values shown) except the final value, for which I get 6.47e-4 m/s (about 2x the listed answer)	The solution manual will be updated.	Incorrect answer, calculation, or solution

Chapter 20.2 Problem 21	The answer to #21 is listed as 350V when it should be 3.5V. The outlined work is correct, but the wrong answer is given. The book states: V IR (2.50 10−2 A)(140 Ω)=350 V When (2.50e-2)(140) = 3.5	The solution manual will be updated.	Incorrect answer, calculation, or solution
Chapter 22 problems	(Sorry! I previously submitted this with the WRONG chapter. This should be in Chapter 22.) Problem #74 describes a particle moving at 6x10^-7 m/s -- much slower than is reasonable. This produces much lower than reasonable voltages and unreasonable radii for the charges in the magnetic field. You could simply change that speed to be 10^6 m/s or something like that.	Revise "6.00 × 10^−7 m/s" to "6.00 × 10^6 m/s" in the question stem. The solution manual will also be updated.	Incorrect answer, calculation, or solution
Chapter 22.4	The 'b' should be capitalized, i.e., 'B'.	Our reviewers accepted this change.	Typo
Chapter 23 ISM Problem 101	part d: resonance freq * ? 1/(2*pi*sqrt(80e-6*100e-6)) 1779.406358542943 NOT 56.3 kHz	The solution manual will be updated.	Incorrect answer, calculation, or solution
Chapter 23.1	On the second to last sentence of the first paragraph, two words are combined into one ("emfthat"). They should be separated to read "emf that".	I have corrected this typo in webview. The changes will be picked up in the PDF on the next release.	Typo
Chapter 25 problem #12b	The problem assumes that the horizontal distance to the diver's apparent image is the same as the real distance. I believe it is more complicated than than. Unless that issue is covered in the text, I would drop part b of this problem.	Figure 25.53 will be updated. Also revise "incidence" to "refraction" in part a, and add the following sentence to the end of part b: "Assume the diver and the diver's image are the same horizontal distance from the normal."	Incorrect answer, calculation, or solution
Chapter 26.5 Problem 35	problem suggests a 3 m focal length eyepiece is a possible thing ...3 cm or 3 mm would be possible. Also I doubt that any modern telescope with a 5 m focal length would have eyepieces ...the great 40 foot would be an ancient example	Revise "3.00 m" to "3.00 cm".	Other factual inaccuracy in content
Chapter 27.7 Example 27.6	The n for air is written is 100, when it should be 1.00	Revise n_1 = 100 to n_1 = 1.00.	Typo
Chapter 28.2 Simultaneity And Time Dilation	Various issues with presentation of the Simultaneity section. See attachment.	This section will be updated.	General/pedagogical suggestion or question
Chapter 28.6 Example 28.8	Part B of Example 28.8: Typo in the mass- 9.00*10^-31kg was used for mass, but it should be 9.11*10^-31kg.	Our reviewers accepted this change.	Typo

Chapter 29.7, Figure 29.25b	Open Stax College Physics section 29.7, Figure 29.25b Based on the text that references this figure, it should be labeled as photons rather than protons, both in the label under the image and in the figure caption. Submitted by Customer Support on behalf of user. Case number 00031599	Revise "protons" to "photons" in the figure caption and figure.	Typo
Chapter 31.2 Question 4	Part a asks "The applied voltage sweeps the ions out of the gas in 1.00μs 1.00 μs. What is the current?" In the solution the number of charges get multiplied by 2, taking into account that electrons and positively charged ions are created and used to determine the total current. In Section 31.2, this concept is not covered and it could be assumed that only the electrons collected at the center wire are responsible for the current - not using the factor two in the calculation.	In the text before Figure 31.9, revise "...tube produces free ion pairs that are attracted to the wire..." to "...tube produces free ion pairs (each pair consisting of one positively charged particle and one negatively charged particle) that are attracted to the wire...". This should clarify what is needed for the question.	General/pedagogical suggestion or question
Chapter 32.2	In the section titled "Problem-Solving Strategy", Step 5 says to use the definition of the gray (Gy), but mistakenly shows the unit sievert (Sv): "... use the definition that 1 Sv = 1 J/kg". It should instead say "... 1 Gy = 1 J/kg".	Revise the last sentence in Step 5 to "To calculate the dose in Gy use the definition that 1 Gy = 1 J/kg." Also revise the first sentence in Step 6 to "To calculate the dose in mSv, determine the RBE (QF) of the radiation."	Typo
Chapter 34, Section 1 and Summary	The Hubble constant is a velocity per distance, not times distance. The value should be 20 km/s per Mly (which would be 20 km/s / Mly). It is listed as 20 km/s * Mly, which will be read as 20 (km/s) * Mly, implying the Mly is in the numerator of the units, which it is not. As written it is unclear the Mly should be in the denominator of the units. This error was previously submitted but was not corrected. To verify the value and how it is typically written please refer to the OpenStax Astronomy Textbook	This section will be revised to clarify the units.	Other factual inaccuracy in content