**OpenStax Coach ConceptGuidelines**

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# Product Information

OpenStax, a nonprofit organization affiliated with Rice University, has published several college textbooks as part of an open educational resource (OER) series of web-based textbooks. These textbooks are available online via the Connexions platform, in traditional printed and bound copies, and in PDF format. Openstax is now looking to make these books available thought a new platform called Tutor. Tutor is highly interactive platform in which content is presented in small pieces and interspaced with assessment items. Answers provided by the student to these items determine which content is presented next.

The goal of the Concept Coach project is to develop a series of assessment questions based on the existing learning objectives of various Openstax textbooks so that they can be offered through Tutor. The scope of this project is to develop multiple choice assessment items for 3 College Textbooks : *Principles of Economics, Anatomy & Physiology, and Introduction to Sociology* .

# Writer Guidelines

Question Writers should review all material contained in these *Guidelines*.

**Originality and Competitors**

Content developed for every component of every item MUST be original. Please see the “[Originality, Plagiarism, and Copyright Infringement](#_Originality,_Plagiarism,_Copyright)” section in these guidelines for more information.

**Question types**

For this project, the writers will:

* Convert existing open response assessment items to multiple choice by writing distractors and rationales. These items are at DOK2 level.
* Develop multiple-choice conceptual items at DOK2 level for specified learning objectives.

**Conceptual Questions** are defined here as higher-order questions that require students to understand underlying ideas behind concepts or principles; synthesize, transfer, or adapt knowledge to new contexts; identify underlying concepts to recognize which algorithm to invoke; analyze information to select relevant data; justify a choice; and/or predict/explain why or how something happens, etc.

Questions developed for this project will reinforce core concepts, skills, and examples, particularly those that are often misunderstood or that provide foundational knowledge, from each section of each textbook. Questions will not be quantitative in nature, e.g., **no calculators should be required**, and the point of a question should not be to demonstrate student can plug figures into equations. Questions will **not require art** or art creation.

Questions developed by writers ***must*** fit our proprietary **“free-form” multiple-choice** format. See the “[Free Form Multiple Choice questions](#_Multiple_Choice_Guidelines)” and the “[General Assessment Best Practices](#_General_Assessment_Best)” section in this document for a detailed description, with examples.

**Question components**

Each question will contain the following components:

* *The Question*: which comprises relevant introductory text and the question stem
* *Correct Answer*: the correct answer choice letter
* *Detailed Solution:* the correct answer text.
* *Multiple-Choice Options:* which shall include high-quality distractors (i.e., plausible incorrect choices and no erroneous options)
* *Rationales:* explaining why the correct answer choice is correct, and/or why distractors are incorrect; shall enable student to reinforce correct knowledge and correct misconceptions
* *Question metadata*, which includes the **tags** described below.

Tags:

* Unique ID: Writers/Editors **DO NOT NEED TO CREATE NEW UNIQUE IDS**
* Learning Objective Code: We have created codes for the learning objectives in the programs. The list of codes and learning objectives is included in each discipline worksheet. These tags include the book, chapter, section, and learning objective number.
* Type-tags: existing items have been coded depending on where they appear in the book. NEW ITEMS CAN BE TAGGED AS “Concept-Coach”
* Question characteristic: All new items will be conceptual.
* Location tag: All new items are tutor-only.
* Depth of Knowledge. e.g., [DOK2]
* Blooms level. e.g., [blooms-2]
* Time-Duration (short: less than 5 mins; medium: between 5 and 10 mins; long: more than 10 mins) to indicate an estimate of time to complete. e.g., [M]
* Questions will be tagged by Display-Type. See the “[Free Form Multiple Choice questions](#_Free_Form_Multiple)” for information on this tag.

**Converting items to Multiple Choice**

There are a number of existing open response items that need to be converted to multiple choice. This process consists of writing distractors and rationales for each distractor written. It may involve adjusting the language of the open response assessment item to be sure it works BOTH as open and multiple choice item.

Item conversion will be carried out directly on an excel spreadsheet where the item and its tags are already included.

**Developing new items:**

There are a number of learning objectives in these programs that are not currently being assessed. The items developed to assess these learning objectives should be at the DOK2 level. We have prepared a template in word where new items can be developed. In this template, the tags that do not need to change (e.g Type-tag: Concept Coach) have been already included and there are drop-down menus for most of the ones needed.

# Accuracy Reviewer Guidelines

The task of the accuracy reviewers is to make necessary, objective improvements to the assessment items regarding their scientific correctness. Accuracy reviewers will particularly focus on options and rationales provided to open response items that have been converted to multiple choice. The goad is to ensure items are reviewed for correctness and that answers fully correspond with the questions. Review and revisions will be carried out directly on the excel sheet where the items are.

# Reviewer Guidelines

The task of the reviewers is to provide candid opinions about the assessment items. Please follow these reviewer steps in order to provide us with feedback that will help us improve this resource.

* **Review** these instructions so you understand the type of items we need to develop.
* **Review the learning objective** the item is aligned to so you understand what the item should address.
* **Read the item and** **enter your comments directly into the Word doc.** You can use Microsoft Word’s commenting tools (in the “Review” menu).
* **Please focus on the *content*** of the assessment items. These items will be edited at a later stage; please do not concern yourself with any editorial matters (grammar, punctuation, formatting) *unless they impact the accuracy of content.*

# Editor/Copyeditor Guidelines

Editors/copyeditors should review all material contained in these *Guidelines*.

Editors will review the assessment items after they have been written, reviewed by TWO experts in the subject matter, and revised based on this feedback. Editors will ensure that the assessments items are:

* accurate and appropriate for a college audience
* address the learning objective they are aligned to, and
* follow the style and format within these guidelines.

If the items are ready to be released, editors/copyeditors should remove all tracked changes and comments from the doc.

It the items need to go back to the writer, editors should use Track Changes, including comments for queries or requests, so that the Writer can refer to them, address them and use as reference to apply to subsequent chapters. Queries and requests should be as specific as possible so Writers can address them accurately.

If there is uncertainty about the accuracy or need for a revision, the Editor/Copyeditor can contact W&N so we can reach out to the Content Lead for editorial guidance. In general, once a comment has been addressed, please remove it from the text.

# Question Development Process

All questions and metadata will be developed in the templates in Word; Writers may develop all items for a single batch in a single document.

Stage 1: Writing

At this stage, the writer will begin writing the assessments in Word in alignment with the learning objectives using the assigned Openstax textbook. The writing stage includes revisions to address feedback from two reviewers and feedback from an editor/copyeditor. The Writer is also expected to address any issues that arise from the originality report and fact checks. To proceed with writing, the Writer will be supplied with the following:

* Project Guidelines (this document)
* A list of learning objectives with codes
* A PDF of the book can be downloaded at Openstax.com

Stage 2: Review

To ensure questions are high-quality and acceptable to subject area practitioners, questions will go be rigorously reviewed by two subject matter experts who will ensure that they are clear, accurate, address the proper DOK level, and are aligned with the assigned course objectives.

After this review, the assessments will be returned to the writer if corrections/revisions are needed.

Stage 3: Editing/Copyediting

The assessments will then undergo a second review by an editor who will make sure all feedback has been applied as needed and will prepare the item for release. If revisions are needed, the assessments will be given back to the writer until they are ready for release.

# File Naming, Submission

Please use the following naming convention when submitting manuscripts:

CNX150034\_COURSENAME\_Batch\_INITIALS

So, for example, if assessments are developed for Economics, Batch 2 and were developed by Jane Doe and reviewed by Bob Smith, the first drafts of the manuscript would be named as follows:

* CNX\_Economics\_Batch02\_JD (from writer)
* CNX\_Economics\_Batch02\_JD\_BS (from reviewer)

Once files are ready to submit, they should be uploaded to the following FTP site:

Username:  connex150034

Password:   Rockrose2050!

Host:   wnftp.wordsandnumbers.com

You will find that folders that match the workflow stages have been created to move the files through the process in a clear manner. Once a file is posted to its appropriate folder, please alert [Michelle Tweed](mailto:Michelle%20Tweed%20) (mtweed@wordsandnumbers.com) so we can move it to the next stage of the process. Below is a summary of the workflow steps:

1. First draft from Writer - to reviewers.
2. First draft reviewed- back to writer (if no comments, please save in folder 3)
3. Second draft from Writer – to editor.
4. Second draft edited – back to writer (if no comments, please save in folder 6)
5. Third draft from Writer – to editor
6. Clean version – ready to be released

# Originality, Plagiarism, and Copyright Infringement

**Originality**

Because many of the tenets of physics are widely accepted, we expect that Writers will be able to produce original work. At the same time, texts in this discipline regularly need to refer to classic and contemporary research and to provide relevant real-life examples. References to other work and real-life examples should always be cited. Whether quoted verbatim or paraphrased direct “pick up” from other texts must be cited. All text that that is not cited is considered unoriginal work and will not be acceptable to W&N. All sources must be cited as in-line citations.

Please keep these points in mind and if you have any questions about what constitutes plagiarism, please ask for clarification from W&N prior to submission. Some further clarification for emphasis:

* Do not use any text verbatim from any source unless you are citing that source.
* Any verbatim text from another source must appear in quotation marks and must be cited.
* Closely paraphrased passages must be cited.
* Please reword or rephrase definitions in the most accurate and original way possible.
* Be sure to cite sources for facts that are not common knowledge in the physics discipline.
* Specific data, data sets, and direct quotations MUST be cited.
* Sources must be of an authoritative scholarly nature (e.g., Wikipedia is off-limits)
* You may not use a competing text or other textbook as a source unless it has a CC-BY license.
* Writers should always strive to cite research from its ORIGINAL source, not as quoted in secondary material.

If you have any questions about what constitutes originality, what will meet W&N’s originality standards, or what might constitute plagiarism or copyright infringement, please contact W&N immediately for clarification. W&N cannot accept or pay authors for work that we identify as potential plagiarism. If you need more time to produce original content, alert W&N prior to submitting.

**Plagiarism**

Using uncited text from another source is unethical and violates your contract with W&N. It fails to meet W&N’s originality standards and is plagiarism, which can result in legal action.

**Copyright Infringement**

If a Writer uses a significant amount of text from a resource that is not public domain or CC-BY (and cited as such) without obtaining permission, this is not only plagiarism, but also copyright infringement, and it is illegal. This includes using a Writer’s own previously published work, the copyrights to which are likely owned by another entity.

# Multiple Choice Guidelines

**Free Form Multiple Choice questions**

This section describes “free-form” multiple-choice questions and “simple” multiple-choice questions in further detail.

|  |
| --- |
| A **“free-form” multiple-choice question** is a multiple-choice question that is shown to a student in two separate steps:  Step 1: *System displays only the question stem*. Student inputs a free-form answer.  Force equals \_\_\_\_\_\_\_\_\_\_\_\_ times acceleration.  Step 2: *System then reveals the multiple-choice options* and student selects the answer from the list.  Force equals \_\_\_\_\_\_\_\_ times acceleration.   1. mass 2. distance 3. velocity 4. none of the above |

**Important: Not all multiple-choice questions can be displayed as a free-form multiple-choice. To count as a free-form multiple-choice question:**

* A student must be able to understand the question without viewing the multiple-choice answer choices. Example: “Which of the following is a measure of temperature?” cannot be asked in a free-form multiple-choice format, because the student cannot answer without viewing the answer choices.
* The question stem/introductory text must not contain the answer choices. Example: These questions do not work because the question stem/introductory text contain the answer choices: True/False questions, Yes/No questions, “Jane wants to decrease the tension on the rope. Should she add an apple or remove an apple from the bag?”
* A student who initially did not know how to answer the question stem might recognize the answer once the answer-choices were revealed
* Question might ask student to provide an explanation or description in their answer
* A free-form multiple-choice works equally well as a “free-form” or a “simple” multiple-choice.

|  |
| --- |
| A “**simple” multiple-choice question** is a multiple-choice question that is shown to a student in one step:   1. *System displays both the question stem and answer choices.* Student selects the answer from the list.   Which of the following is a measure of temperature?   1. Kelvin 2. Fahrenheit 3. Celsius 4. Maxwell |

**Simple multiple-choice questions are appropriate in rare/limited circumstances, i.e., those when the writer believes the most effective way to reinforce a concept is via a simple multiple-choice question. The following are characteristics of simple multiple-choice questions:**

* True/false and yes/no questions, as well as any questions in which the question stem/introductory text contain the answer choices
* Questions in which a student must see both the question stem and the answer choices to respond

**Stem**

Multiple choice items can be either closed-stem or open stem:

*Closed-stem items:*

Closed stem items have a question as their stem. Please add qualifiers to aid students in selecting the correct answer e.g. “Which best describes…”. Do not use italicized or bolded emphasis words as they will not transfer over to the OpenStax platform. The first letter of each answer choice is always capitalized for closed-stem items. Answer choices should only have a period if they are complete sentences.

*Open-stem items:*

Use open stems to avoid excessive repeated wordiness in the answer choices. Open stem items are denoted by putting a line and a period at the end of the stem, as shown in the example below and in the sample items:

This is an open stem item because \_\_\_\_\_\_\_\_.

Because the period is given in the sentence, open-stem answer responses do not need a period. The first letter of open-stem answer choices are not capitalized unless they are a proper noun.

Please also note the following for multiple choice stems:

* Spec

**Answer Options**

* Only one option must be the correct or best answer (no multiple keys).
* Options should be as clear and concise as possible.
* All options should be appropriate, plausible, and logical answers to what is being asked (i.e., no throwaway distractors).
* No one option should visually stand out from the others in terms of length, wording, etc.
* All options should address the stem in the same manner (i.e., if the stem is a question, all the options should be answers. If the stem is an incomplete sentence, all the options should complete the sentence). In addition, each option should have parallel wording to prevent an option from standing out simply because it has a different sentence structure or phrasing than the other options.
* Key words from the stem should not appear in the options or should be distributed equally among the options.
* Options should not include “all of the above,” “none of the above,” “either A or B,” “I don’t know,” or similar constructions.
* Options should not contain absolute qualifiers (e.g., “never” or “always”) and should avoid negative wording.
* Options should not include only one positive or one negative choice.

1. Options should be presented in length order when a sentence or phrase, alphabetically if a word and numerically if a number.

**Rationales**

Rationales provide the misconceptions, misunderstandings, or miscalculations a student may have made when selecting an incorrect answer choice.

* We DO NOT need to state which choices are correct versus incorrect in the rationales– the computer platform will automatically do that. Just start right in with the explanation.
* For correct answers, include an explanation of why the correct answer is correct, in case students selected it by chance.
* For incorrect answers, explain why the answer is wrong, but do not give the correct answer away fully in the rationale. For example, a good rationale for a math-based question would be: “This is the answer you get if you multiply by 4 rather than by 3.”

# General Assessment Best Practices

A well written assessment item meets two main criteria:

* ALL students who have mastered the relevant content or skills will answer correctly.
* Students who have not mastered the relevant content or skills will answer incorrectly.

After receiving the results of an assessment, a teacher should have a clear and complete understanding of what students do and do not know. Poorly written items invalidate assessments. Students who know the material might perform poorly, while students who do not know the material might perform well.

Items should:

* be clearly aligned to intended standard/objective/node/sub-skill,
* be grade-appropriate for content, skill, concept, and vocabulary/language.
* include complete and accurate source documentation where used.
* include real scenarios when a context is required.

Items will not infringe on content copyrights, or plagiarize content, or rely on trademarks or pop-culture references.

**Language**

Besides grade appropriateness in vocabulary/language, items need also to minimize language complexity or bias. This includes avoiding:  
Unfamiliar vocabulary (outside the discipline)

* Multi-meaning words (both within and outside of the discipline)
* Idiomatic phrases or figurative language
* Homonyms  
  Long noun phrases
* Perfect tense (e.g. “have been,” “will have been”)
* Formal syntax (e.g., “at which location”)
* Overly complex or unnecessary contextual information

To avoid potential sources of bias and stereotyping, items should avoid:  
Regional and geographic differences in language use and topic familiarity

* Assumptions about individuals based on age, gender, ethnicity, cultural, religion, socio-economic status, occupation, etc.
* Patronizing views of other cultural groups
* Be sensitive of economic differences when writing items; for example, do not ask about saving for an $80-video game.

Items should use precise mathematical language:

* Comparisons: Numbers are not lower or higher, they are lesser or greater.
* Use what and which appropriately in questions. "What" implies that there is only one possible answer. For example, “What is the value of x?” (numerical answers), but “Which expression represents the value of x?” (algebraic answers).
* An "amount" is a quantity that cannot be counted. A “number” is a quantity that could be counted.
* Decimals: A decimal is a number that has digits to the right of the decimal point, such as 21.35.
  + The decimal point is the period between the ones place and the tenths place.
  + Refer to the digits in the tenths place, hundredths place, etc. as "digits to the right of the decimal point.”
  + Do not refer to digits as "decimals".
  + Always include two decimal places for dollar amounts.
* Coordinate Plane: Axes don't have signs; the coordinates have signs on different sides of the axes.
* Equations and Expressions
  + You cannot multiply terms, because terms are separated by addition or subtraction.
  + When an expression is simplified, like terms are grouped together and the GCF is factored out.
  + When an expression is expanded, the distributive property is applied to each term within the parentheses.

Other General Style Notes:

* Refer to grades with ordinal numbers instead of cardinal numbers, i.e. "sixth grade" instead of "grade six".
* Use active voice. Passive sentences can be confusing.
* The abbreviation for inches is "in.", not "in".
* Use "multiply by" instead of "multiply to".
* Keep language short and clear. Keep sentences short and simple.