

2005 ITEM WRITING MANUAL



A whole new vision in testing

TABLE OF CONTENTS

1. INTRODUCTION.....	4
PURPOSE OF THIS MANUAL.....	4
BASIC PSYCHOMETRIC TENETS	4
Reliability.....	4
Validity	4
Job-relatedness.....	4
FOCUS ON COMPETENCE	4
LEVELS OF MEASUREMENT	5
STANDARDS.....	5
2. THE EXAMINATION CONSTRUCTION PROCESS.....	6
3. GUIDELINES FOR WRITING ITEMS	8
CONCEPTUALIZING THE ITEM	8
GENERAL FEATURES.....	8
Central concept.....	8
Clear, concise content.....	8
Acronyms and abbreviations	9
Technical terms.....	9
Level of competence for safe practice.....	9
Job-related situation or context	9
Authoritative reference source	9
GENERAL FORMAT	9
ITEM STEM	10
Direct question	10
Generic nouns.....	10
Definitive verb	11
Object of the action	11
Realistic scenarios or case data.....	11
Positive job situations.....	11
KEY	11
Expert consensus.....	11
Linkage to reference source.....	12
DISTRACTORS.....	12
Common misconceptions and errors.....	12
True but not relevant to case data or scenario.....	12
ORGANIZATION OF KEY AND DISTRACTORS	13
Nonoverlapping response options.....	13
Logical or numeric order of key and distractors	13
Parallel construction.....	14
EXAMPLES OF ITEM STRUCTURES	14

ALTERNATIVE FORMATS.....	16
Factored response options.....	16
Yes/No response options with rationale.....	16
4. COMMON PROBLEMS AND SOLUTIONS	18
INCOMPLETE STATEMENT	18
OVERLAPPING RESPONSE OPTIONS	19
NO CENTRAL CONCEPT, TRUE/FALSE.....	19
KEY AND DISTRACTORS ARE DISSIMILAR.....	20
EXTRANEOUS CLUES TO CORRECT ANSWER.....	21
NEGATIVELY WORDED ITEM.....	21
ALL OF THE ABOVE	22
NONE OF THE ABOVE	23
KEY IS EXCESSIVELY LONG	23
STEPS OF A PROCESS.....	24
WHAT TO DO	24
REPETITIVE INFORMATION IN THE KEY AND DISTRACTORS	25
INCORRECT FACTORING.....	26
TEACHING MATERIAL	27
PERSONAL PRONOUN “YOU”	27
5. REVIEWER’S CHECKLIST	29
OVERALL QUALITY	29
ITEM CONSTRUCTION	29

1. INTRODUCTION

PURPOSE OF THIS MANUAL

This manual provides some basic tools to persons responsible for development of new examination items or for review of existing examination items. As a brief guide, the manual does not present everything important that could be said about constructing examinations and should be used as an adjunct to formal training in this area.

The manual assumes that items are based upon well-formulated content specifications. Good content specifications are essentially an outline of examination content that details specific subject matter areas to be assessed and the proportion of items to be devoted to each area. Content specifications should be based on a thorough analysis of practice and should identify the competencies that are most important to effective practice.

BASIC PSYCHOMETRIC TENETS

There are three basic psychometric tenets that underlie well-formulated examinations:

Reliability

Examinations should produce similar results from administration to administration. In other words, the scores from a group of candidates taking an examination today should not be substantially different than those of a group of like-qualified candidates taking a similar examination next month.

The quality of the items and the length of the examination can influence reliability. Examinations that have too few items or a number of flawed items can negatively affect reliability.

Validity

The validity of a test concerns what the test measures and how well it does so. Valid examinations should measure job-related knowledge and skills important to practice.

Job-relatedness

Job-relatedness is a necessary component of validity (content validity) that ensures that examinations assess candidates' abilities to apply their knowledge and skills to job-related situations. Generally speaking, this type of validity can be established through a formal practice analysis and through expert consensus of subject matter experts.

FOCUS ON COMPETENCE

Examinations should focus on the competencies necessary for safe practice rather than trivial material, overly specific information, or business practices that ensure success in the marketplace. One way to ensure that the examinations

are written at the appropriate level of difficulty is to obtain assistance from new practitioners throughout the examination development process.

LEVELS OF MEASUREMENT

Items should be developed to measure the ability of candidates to apply their knowledge and skills. Haladyna (1999)¹ proposes a model to assist item writers in developing items that focus on job-related settings. If the item is job-related, the level of measurement achieved by that item can assess how candidates predict outcomes from facts, concepts, principle and procedures; evaluate the merits of facts, concepts, principles, and procedures according to a criterion; and problem solve after analyzing facts, concepts, principles and procedures.

STANDARDS

The Standards for Educational and Psychological Testing (1999) ² (hereafter called the Standards) are the professional testing standards for examination programs. The psychometric and legal communities apply the Standards as benchmarks to evaluate the legal defensibility of examination programs. The Standards address such aspects of examination programs such as practice (job) analysis, content specifications, examination administration, examination scoring, and score reporting. The Standards are widely used as benchmarks to evaluate the psychometric efficacy of examination programs.

¹ Haladyna, T. M. (1999). Developing and validating multiple-choice test items (2nd Ed). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

² American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. Standards for educational and psychological testing. Washington, DC: American Educational Research Association.

2. THE EXAMINATION CONSTRUCTION PROCESS

The process of constructing an examination involves a thorough review of practitioner duties and competencies, application of content specifications and critical review of the items. One of the keys to development of a psychometrically sound examination is formal training of subject matter experts (SMEs) in the development of items for the examination. The training should be conducted by persons experienced in constructing items for examinations.

Several components are present in quality examination programs:

- Rationale. The rationale defines the purpose of the program. What does the program want to accomplish? What is the value of the examination to prospective stakeholders?
- Subject matter experts. The practitioners who serve as SMEs should represent all aspects of practice, e.g., ethnicity, tenure, practice specialty.
- Practice analysis. A practice analysis, also called occupational analysis or job analysis, is a systematic process designed to identify the critical job duties and knowledge required for effective job performance. The results of the practice analysis are used to develop the content specifications for the examination.
- Content specifications. The content specifications, also called an examination outline, test blueprint, or test plan, specify the duties and competencies that candidates are expected to perform or know at the time of examination. Typically, content specifications are structured into subject matter areas that are weighted proportionally to their importance to practice.
- Item development and review. There are no shortcuts for producing quality items. Item writers develop items according to prescribed formats and link the content of items to the content specifications. Item reviewers critique and revise the items in terms of job relevance and importance, expected level of competence, and overall clarity. An item bank is created to store the pool of items. All items must be linked to an authoritative reference source, e.g., book, statutes, regulations, professional publications.
- Examination publication. A focus group of SMEs selects the items from the item bank for the examination and assembles an examination that conforms to the content specifications.
- Cut score. The cut score, or passing standards, refers to the level of performance required for passing an examination. The level of performance in the occupation or profession should depend upon the knowledge and skills necessary for competent practice and should not be adjusted to regulate the number of candidates passing the examination.

- Examination administration. There should be standardized procedures to administer the examination in a secure setting to ensure that candidates receive the same examination under the same conditions.
- Evaluation procedures. An examination program would not be complete without some mechanism to evaluate and re-evaluate its efficacy. Such procedures include statistical analysis of results, and, re-evaluation of development and administrative processes and procedures. The evaluation procedures are helpful in evaluating how well the test satisfies the purpose for which it was designed.

3. GUIDELINES FOR WRITING ITEMS

CONCEPTUALIZING THE ITEM

The examination development process emphasizes careful development of specific ideas for items before beginning the process of item writing. Good planning can significantly improve the odds that items will survive critical review. After reviewing the content specifications, SMEs select knowledge to define the content of the question, and select a task that will serve as the context for that knowledge.

The following issues should be considered when conceptualizing items:

- Necessary knowledge. What knowledge does a competent practitioner need to possess in order to perform the task? The knowledge statements in the content specifications may be stated very generally, so item writers may need to identify specific examples of each knowledge.
- Situations and purposes. In what situations or for what purpose are these job duties and competencies performed? What aspects of practice are most important to the job setting? Item writers may need to list conditions that are necessary or that are associated with performance of the task.
- Practical aspects. Can one correct answer and three plausible incorrect options be developed from the selected task or knowledge? If the correct answer seems too obvious or simplistic, item writers should rethink the focus of the item so that it can achieve the purpose of the examination.
- Occupational relevance. What concepts have the most relevance to effective practice of profession or occupation? If the concepts are nice to know or overly academic, item writers should rethink the relevance of the concepts so that the content of the item is relevant to effective practice.

GENERAL FEATURES

Central concept

The item should concentrate on a central concept rather than trying to assess several competencies in a single item.

Clear, concise content

Each item should be clearly and concisely stated so that candidates can focus on the content of the question rather than how it is worded. If an item includes only that content which is necessary to convey the central idea of the item stem, a qualified candidate will be able to anticipate the answer to the item stem before reading the key and distractors.

Acronyms and abbreviations

If acronyms and abbreviations are used, all candidates should be able to understand them. For example, if specific names of items are used, the name should be the generic class or category. Likewise, if a type of procedure is used, the most common name should be used.

Technical terms

If technical terms are used, all candidates should understand them regardless of their practice specialty or work setting.

Level of competence for safe practice

The items should be commensurate with the competencies of a person who can demonstrate competence required for practice. In most cases, the competence should be consistent with a person who has already fulfilled all the eligibility requirements to sit for the examination. For some professions, candidates must possess advanced degrees and extensive experience before qualifying to sit for the examination.

Job-related situation or context

Items that focus on application of knowledge and skills, or analysis of information in a job-related situation or context can assess a candidate's ability to process information and draw conclusions for a given scenario.

Authoritative reference source

The key in each item must be linked to current technical books, professional publications, legal statutes and regulations that are widely available to candidates.

GENERAL FORMAT

There are four components of a multiple-choice item. They are the item stem, the key, the distractors, and the object of the action. Each item should follow rules of Standard English grammar and punctuation.

- The item stem is a direct question that begins with an interrogative word such as what, which of the following, why, or how.
- The key (*) is the response option that is correct answer.
- The distractors are the response options that are incorrect but plausible to the unprepared candidate. Distractors should address existing practices, procedures, or methods in order to force candidates to eliminate a distractor through logical deduction.
- The object of the action describes where the action is directed to or to whom the action is directed at. The object of the action is helpful in clarifying the focus of the item stem.

Example of a multiple-choice item:

Which of the following fertilizers contains the highest percentage of nitrogen?

<INTERROGATIVE> <GENERIC> <ACTION> <OBJECT OF THE ACTION>
 <NOUN> <VERB>

- A. 5-10-5 <DISTRACTOR>
- B. 10-6-4 <DISTRACTOR>
- C. 16-16-16 <DISTRACTOR>
- * D. 20-20-20 <KEY>

ITEM STEM

Direct question

Item stems should be direct questions that begin with an interrogative word and contain a generic noun, definitive action verb, and an object of the action. The interrogative words in the item stem determine the phrasing of the key and the distractors.

Other formats, such as the incomplete statement format appear similar; however, direct question formats are preferred because they produce items that are clear, easy to read, and easy to understand.

- WHAT should be used when there is a finite set of possible responses. Use of WHAT implies that all or almost all of the possible responses are provided in the item and that the candidate should select the response that is correct.
- WHICH OF THE FOLLOWING should be used in conjunction when there is a large universe of responses. Use of the interrogative WHICH OF THE FOLLOWING implies that a subset of the possible responses are provided and that the candidate should select the best option of the responses given.
- WHY indicates that there are reasons for actions or procedures.
- WHEN implies that the key and distractors are time intervals or conditions.
- HOW indicates the manner in which procedures, techniques or actions are performed.

Generic nouns

Generic nouns classify the response options and facilitate parallel construction. Examples of generic nouns include methods, techniques, procedures, conditions, situations, tests, materials, properties, criteria, factors, and characteristics.

All response options for the item should belong to the same descriptive category. Items that begin with WHAT or WHICH OF THE FOLLOWING must have a generic noun to clarify what class or category of things that the interrogative word refers to.

It is essential to use generic nouns early on in the item formulation process. Proper selection of a generic noun will simplify the item writing process because the focus of the item stem, key and distractors is clear and easily understood.

Definitive verb

Verbs such as MUST, SHOULD, WOULD, CAN, and WILL indicate that there is only one correct answer or a single best answer and force the candidate to approach the item from a job-related perspective.

Object of the action

To the extent possible, each item should have an object of the intended action specified by the action verb. The object of the action clarifies the intent of the item stem and focuses the content of the item.

Realistic scenarios or case data

The scenario and case data presented in the item stem should be representative of common situations that occur on the job and that result in decisions or judgments. Some professions include diagrams, graphics, or tables of information in the scenario that are consistent with what candidates would encounter on the job. Scenarios and case data provide the most direct assessment of candidates' knowledge and skills.

Example of a scenario:

A 26-year-old woman who was recently involved in an automobile accident was referred by her physician. She is unable to sleep, has headaches and nightmares, and has lost her appetite. What diagnosis characterizes the woman's symptoms?

Example of case data:

An audiologist conducts an assessment of an elderly client's hearing. Results indicate that the client's SRT is 40 dB, the MCL is 70 dB, and the UCL is 80 dB. Which of the following instruments should be selected for this client?

Positive job situations

Items should be phrase in positive terms rather than negative ones. The focus should be on what the candidate should be doing rather than what the candidate should not be doing. Negative phrasing such as CANNOT, NOT, or EXCEPT can be confusing for candidates and makes it difficult for candidates to generate the correct answer.

KEY

Expert consensus

Subject matter experts should agree that the key is the only correct answer. The key should require judgments and decisions that only a practitioner can make, not a layperson.

Linkage to reference source

The key in each item must be linked to an authoritative reference source such as professional technical books, professional publications, or legal statutes and regulations that are widely available to candidates. The reference source can be an interpretation of a passage, chapter, or statute that experts can agree upon. By relying on an interpretation rather than verbatim restatement of text, the item encourages candidates to think about the premise of the correct answer rather than memorizing overly specific facts.

Refrain from including references to experimental treatments, unsubstantiated theories or controversial opinions. An appropriate reference is usually based on scientific research studies and can be used as a standard textbook in a vocational or university degree program. Appropriate professional publications include standards or codes such as material specifications, diagnostic handbooks (e.g., CRC tables, Uniform Building Code, Diagnostic and Statistical Manual [DSM], ASTM material standards).

Example of reference citations:

Kelly, M., & Wise, J.A. (2002). *Constructing multiple-choice items* (3rd ed.). Albany, NY: Sharp Publications, Inc.

US Health and Safety Code (2002), Title 70, Section 100(C)(1), Administration.

DISTRACTORS

Common misconceptions and errors

Some of the best distractors are based upon common misconceptions and errors that could occur if candidates are not knowledgeable or skilled with specific subject matter.

True but not relevant to case data or scenario

Distractors can also be based upon true facts that do not pertain to the case data or scenario presented in the item stem. Resist the temptation to create distractors that are obviously wrong or humorous because they are “throwaway” options for the candidate.

ORGANIZATION OF KEY AND DISTRACTORS

Nonoverlapping response options

The key and distractors should be distinct and nonoverlapping of each other. If the key and distractors are scaled units they should be separated by equal intervals of the chosen unit of measure. The words minimum or maximum can make the key and distractors distinct.

Example of nonoverlapping choices:

What is the maximum number of days that employees have to claim out-of-pocket expenses on an in-state travel claim?

- A. 30 days
- B. 60 days
- C. 90 days
- D. 120 days

Logical or numeric order of key and distractors

The key and distractors should be physically arranged in ascending order of length, amount or size.

Example of numeric order:

- A. 2 miles
- B. 3 miles
- C. 5 miles
- D. 7 miles

Example of ascending length:

- A. White
- B. Sawtooth
- C. Narrow band
- D. Speech spectrum

Parallel construction

The key and distractors should be similar in grammatical construction, length, and complexity. An unprepared candidate could easily guess the correct answer if it is the longest response option.

Parallel construction includes verb tenses, types of materials, number of technical concepts, and diagnostic classifications in both the key and distractors.

EXAMPLES OF ITEM STRUCTURES

Methods, procedures, techniques, or conditions

The examples below demonstrate well-constructed item stems and response options (key and distractors). A generic noun is included in the examples for WHAT and WHICH OF THE FOLLOWING to clarify the intent of the interrogative.

What type of suction procedure can be performed on acne-prone skin?

- * A. Spot
- B. Light
- C. Strong
- D. Pulsating

Which of the following tools is essential for installing electric circuits in existing walls?

- * A. Fish tape
- B. Cable ripper
- C. Wire strippers
- D. Lineman's pliers

Why should a preliminary strand test be performed prior to applying permanent haircolor?

- A. To identify hair condition
- * B. To determine processing time
- C. To identify natural level and tone
- D. To determine the need for color correction

In what circumstance can a therapist deny a patient access to treatment records?

- A. The therapist has been using experimental techniques.
- B. The therapist is treating a minor whose parents contracted for the service.
- C. The therapist is under investigation by authorities for professional misconduct.
- * D. The therapist believes that there is risk of adverse consequence to the patient.

How a procedure is performed

How should nicotine stains be removed from fingertips?

- A. By rubbing with heated salt
- B. By soaking in dish detergent
- C. By gently dabbing with vinegar
- * D. By lightly buffing with a pumice stone

Premise/consequence

A client, whose hair has been treated with a metallic tint, requests a bleach service. What effect results if bleaching product is applied without pretreating the hair?

- * A. Dullness
- B. Off-shades
- C. Brassiness
- D. Excessive darkness

Case scenario/solution/conclusion

A hilly, grassy yard with poor surface drainage is 60 feet from the back of a single family home. The soil is mostly clay. Which of the following strategies will improve drainage and function of the area?

- A. Install drain pipe and replant the site with native shrubs and plants
- B. Remove the grass, install landscape fabric, and top with shredded mulch
- C. Thin areas of dense vegetation and install concrete steps and walkways
- * D. Amend the soil and regrade the site to create separate patio and planting areas

ALTERNATIVE FORMATS

Factored response options

Factored response options can increase the difficulty of the item if the intent of the item is to assess the candidate's ability to discriminate amongst a series of factors in the key and distractors.

Begin by generating a list of factors that could be considered in combination. If the key has two choices, generate four factors. If the key has three choices, generate six factors. Common words are listed first so that the candidate can clearly identify the factors that are repeated.

The general structure for a two-factor response option is: 1-2, 1-3, 4-2, 4-3. Similarly, the structure for a three-factor response option is: 1-2-3, 1-2-4, 5-6-3, 5-6-4.

Example of a two-factor item

Which of the following conditions indicate the common cold?

- * A. Delayed onset fever (1) and coughing (2)
- B. Delayed onset fever (1) and muscle aches (3)
- C. Rapid onset fever (4) and coughing (2)
- D. Rapid onset fever (4) and muscle aches (3)

Example of a three-factor item:

Which of the following conditions indicate the common cold?

- * A. Delayed onset fever (1), sore throat (2), coughing (3)
- B. Delayed onset fever (1), sore throat (2), muscle aches (4)
- C. Rapid onset fever (5), nasal congestion (6), coughing (3)
- D. Rapid onset fever (5), nasal congestion (6), muscle aches (4)

Yes/No response options with rationale

There are a number of instances, particularly with content pertaining to law and ethics, where a desirable format for the item stem is "What procedure should be followed and why?" and the response options could be phrased "Yes (with an explanation)" and "No (with an explanation)."

Example of yes/no with underlying rationale:

A 10-year-old child reveals to his psychotherapist that he was molested by a friend's father a month ago. The child also reveals fantasies of killing his pet dog. Should the psychotherapist report the alleged abuse and why?

- A. Yes; the psychotherapist is mandated to report suspected abuse to a child protective agency.
- * B. Yes; the psychotherapist is mandated to report suspected abuse to a law enforcement agency.
- C. No; the psychotherapist should gather more information from the child's friend and the friend's family.
- D. No; the psychotherapist has insufficient information to substantiate a claim of reasonable suspicion prior to reporting the abuse.

4. COMMON PROBLEMS AND SOLUTIONS

All item writers inevitably write several drafts of items during the item writing process. Item writers should not get discouraged. The task of item writing actually becomes easier once common problems are identified and corrected.

Not all items have to be based on case data or scenarios. Yet item writers should avoid writing items that ask for simple recall of isolated facts. A common cause of items that assess simple recall is an item writer's reliance on the verbatim text in a reference source for a task or knowledge.

Qualifiers (first, best, most, worst, least) should be avoided because they could imply one person's opinion rather than the consensus of experts.

Absolutes (all, none, always, never) tend provide clues to the correct answer, thereby making the item easier for testwise candidates, and reduce the power of the test to distinguish between those who are qualified to practice and those who are not.

Negatives (not, except) should be avoided because it may be not clear what the item is asking for despite the fact that a correct answer exists. Double negatives, or use of not in the item stem and not in the key and distractors, are particularly troublesome because the items are difficult and confusing. As with absolutes, negatives reduce the power of the test to distinguish between those who are qualified to practice and those who are not.

INCOMPLETE STATEMENT

This format may not differ from the direct question format in terms of appearance and length; however, the direct question format reduces the time spent reading through the item stem to determine the premise of the question.

Original

The chemical treatment that can prevent corrosion in high pressure boilers is:

- * A. Chromate
- B. Octadecylamine
- C. Cyclohexylamine
- D. Aminomethylene propanol

Revised

Which of the following chemical treatments can prevent corrosion in high pressure boilers?

- * A. Chromate
- B. Octadecylamine
- C. Cyclohexylamine
- D. Aminomethylene propanol

OVERLAPPING RESPONSE OPTIONS

The response options (key and distractors) should be distinct such that one option is not embedded in another. In the original item, the correct answer (2 years) is embedded within option C (3 years) and option D (4 years). By using the words “minimum” or maximum,” each option is separate from each other.

Original

How often should the pressure of dry chemical fire extinguishers be checked?

- A. Annually
- * B. Every 2 years
- C. Every 3 years
- D. Every 4 years

Revised

What is the maximum period permitted between pressure checks of dry chemical fire extinguishers?

- A. 1 year
- * B. 2 years
- C. 3 years
- D. 4 years

NO CENTRAL CONCEPT, TRUE/FALSE

The item stem asks the candidate to evaluate each response option (key and distractor) to determine if it is true or false. If there is no central concept, candidates have difficulty grasping the intent of the item stem because the options appear to be isolated facts. The revised item focuses directly on essential factors determining the potential for erosion.

Original

Which of the following statements regarding erosion is true?

- A. Erosion can result in flooding.
- B. Erosion can kill root systems of plants.
- C. Erosion is associated with heavy rainfall.
- * D. Erosion is the result of concentrated water flows over the terrain.

Revised

What factor is essential in determining the potential for erosion on terrains with steep slopes?

- A. Soil type
- B. Water table
- * C. Surface topography
- D. Evapotranspiration rate

KEY AND DISTRACTORS ARE DISSIMILAR

In the original item, options A, B, and C are products, and D is a procedure. The distractors in the revised item are all skin care products.

Original

Which of the following skin care products can exfoliate dead cells from facial skin?

- A. Astringents
- B. Sulfur masks
- * C. Alphahydroxy acids
- D. Microdermabrasion

Revised

Which of the following skin care products can exfoliate dead cells from facial skin?

- A. Packs
- B. Astringents
- C. Sulfur masks
- * D. Alphahydroxy acids

EXTRANEOUS CLUES TO CORRECT ANSWER

In the original item, candidates are given a clue to the correct answer because the word “ground” appears in both the item stem and the key. In the revised item, the item stem has been rewritten to eliminate the clue.

Original

What device should be installed in an outdoor electrical circuit to provide protection against electrical shock in the event that the ground side of the circuit becomes open?

- A. Inverter
- B. Transformer
- C. Circuit breaker
- * D. Ground-fault interrupter

Revised

What device can prevent electrical shock from outdoor electrical circuits?

- A. Inverter
- B. Transformer
- C. Circuit breaker
- * D. Ground-fault interrupter

NEGATIVELY WORDED ITEM

There are two problems with negatively worded items (“not”). First, candidates have difficulty understanding what the item is asking for. Second, the intent of the item focuses on recognizing that the correct answer is unrelated to the other three options rather than a specific issue. The revised item has been rewritten to focus the item on what materials should be used for decks and fences.

Original

Which of the following materials should NOT be used for decks and fences?

- * A. Pine
- B. Teak
- C. Cedar
- D. Redwood

Revised

Which of the following materials should be used for decks and fences?

- A. Fir
- B. Oak
- C. Pine
- * D. Redwood

ALL OF THE ABOVE

In the original item, option D (“all of the above”) offers a testwise candidate a clue to the correct answer because more than one option is known to be correct. In the revised item, the response has been limited to a single answer, and the distractors are rewritten so that they are incorrect.

Original

Which of the following courses is required for initial licensure as a psychologist?

- A. Human sexuality
- B. Spousal/partner abuse assessment
- C. Alcohol/chemical substance dependency
- * D. All of the above

Revised

Which of the following courses is required for initial licensure as a psychologist?

- A. Child development
- B. Psychopharmacology
- C. Statistics and research design
- * D. Alcohol/chemical substance dependency

NONE OF THE ABOVE

In the original item, option D (“none of the above”) can confuse the candidate because the key conflicts with the positive premise of the item stem (“is recommended”). In the revised item, the distractors have been rewritten so that candidates can logically eliminate three of the four options.

Original

Which of the following products is recommended to polish acrylic tub enclosures?

- A. Alkaline solvent
- B. Powdered cleanser
- C. Citrus-based cleanser
- * D. None of the above

Revised

Which of the following products is recommended to polish acrylic tub enclosures?

- A. Turpentine
- B. Liquid cleanser
- * C. Fiberglass cleaner
- D. Rubbing compound

KEY IS EXCESSIVELY LONG

The key in the original item is clearly the most detailed answer that contains clues (“grounded”) to the correct answer. The item stem in the revised item contains most of the content and the correct answer is now parallel in length and complexity with the distractors. The revised item offers candidates an opportunity to evaluate each choice, rather than directing them to the longest choice.

Original

Why should resistance between a physiograph and the grounded side of a power outlet be measured before attaching electrodes to human subjects?

- A. To calibrate the electrodes
- B. To select the correct electrolyte paste
- C. To determine the power requirements of the physiograph
- * D. To ensure that ground circuits are intact and dangerous voltages do not exist between the physiograph and the ground

Revised

Why should resistance between a physiograph and the grounded side of a power outlet be measured before attaching electrodes to human subjects?

- A. To calibrate the electrodes
- B. To select the correct electrolyte paste
- C. To determine power requirements of the physiograph
- * D. To assess the integrity of the circuits on the physiograph

STEPS OF A PROCESS

Each item should be focused on a single concept rather than individual steps of a process or procedure. For a number of processes and procedures, there may be no set order of steps. The revised item focuses directly on the process of removing dead cuticle.

Original

A client requests a basic manicure. What procedure should be performed first?

- A. Trim cuticle with nippers
- * B. Loosen cuticle with a pusher
- C. Apply cuticle cream with thumb
- D. Apply cuticle solvent with a cotton swab

Revised

What procedure should be performed to remove dead cuticle adhering to the nail?

- A. Trim cuticle with nippers
- * B. Loosen cuticle with a pusher
- C. Apply cuticle cream with thumb
- D. Apply cuticle solvent with a cotton swab

WHAT TO DO

The original item provides no direction as to what the candidate is expected to know. The physician can perform any one of these procedures yet the intent of the item is to assess knowledge of emergency room procedures. The revised item directs the candidate to consider the four options and determine which option is a required part of an emergency treatment protocol.

Original

A patient presents at an emergency room with rapid heart rate, shallow pulse, and eczema. What should the physician do?

- A. Administer analgesics
- B. Establish a patent airway
- C. Apply topical anesthetics
- * D. Administer antihypertensives

Revised

A patient presents at an emergency room with rapid heart rate, shallow pulse, and eczema. What procedure must be included in the treatment protocol?

- A. Administration of analgesics
- B. Establishment of a patent airway
- C. Application of topical anesthetics
- * D. Administration of antihypertensives

REPETITIVE INFORMATION IN THE KEY AND DISTRACTORS

In the original item, the phrase “vital signs” appears in key and distractors. The revised item eliminates the repetitive phrase and simplifies the item by including “vital signs” in the item stem.

Original

Which of the following data must be collected as part of a patient record?

- * A. Vital signs and weight
- B. Vital signs and activity level
- C. Vital signs and radiographs
- D. Vital signs and appetite level

Revised

In addition to vital signs, which of the following data must be collected as part of a patient record?

- * A. Weight
- B. Activity level
- C. Radiographs
- D. Appetite level

INCORRECT FACTORING

Incorrect factoring is a common problem faced by novice item writers. The goal of factoring is to minimize guessing by presenting multipart options, however, if an item is incorrectly factored, candidates can guess the correct answer because one or two components of the correct answer are known. Factoring achieves this goal by organizing like components such that no component appears only once.

In the original item, components of the multipart options are scattered, e.g., “drilling rate” appears in options A and C, “rock/soil/sediment descriptions” appears in options A and B, “make and model of drilling rig” appears in options B and D, and “well completion methods” appears in options C and D. Some of the components appear only once.

In the revised item, like components are organized similarly in pairs such that the last component in the pairs (“well location,” “rock/soil/sediment descriptions”) are positioned as the third element.

Original

Which of the following data should be included in field notes for the drilling phase of a well construction project?

- A. Pumping rate, drilling rate, well completion methods
- * B. Changes in water level, drilling rate, rock/soil/sediment descriptions
- C. Well completion methods, make and model of drilling rig, well location
- D. Equipment breakdowns, make and model of drilling rig, rock/soil/sediment descriptions

Revised

Which of the following data should be included in field notes for the drilling phase of a well construction project?

- A. Changes in water level, drilling rate, well location
- * B. Changes in water level, drilling rate, rock/soil/sediment descriptions
- C. Pumping rate, make and model of drilling rig, well location
- D. Pumping rate, make and model of drilling rig, rock/soil/sediment descriptions

TEACHING MATERIAL

The original item contains superfluous words that provide information that could give unprepared candidates an advantage. The revised item assumes that eligible candidates are familiar with the definition of construction drawings, and eliminates the teaching material.

Original

Construction drawings are the documents that provide construction specifications to the contractor. What data must be specified in all construction drawings?

- * A. Scale
- B. Drawing title
- C. Symbol legend
- D. Project location map

Revised

What data must be specified on all construction drawings?

- * A. Scale
- B. Drawing title
- C. Symbol legend
- D. Project location map

PERSONAL PRONOUN “YOU”

In the original item, use of the personal pronoun “you” implies that the item is soliciting a personal choice of building materials, rather than a choice that is supported by an authoritative reference. The objective of an item is to solicit what candidates’ knowledge of building materials used in practice.

Original

You have a situation where you are asked to design a retaining wall system. Assume that the slope is located near a river. What type should you use?

- Brick
- Wood
- * Concrete block
- Poured concrete

Revised

What type of retaining wall system can be used to contain slopes near river banks?

- A. Brick
- B. Wood
- * C. Concrete block
- D. Poured concrete

5. REVIEWER'S CHECKLIST

Subject matter experts and psychometricians can provide the expertise to critically review each item for content errors and construction flaws.

OVERALL QUALITY

- Quality of central problem. Is the central problem relevant to job situations that could realistically occur on the job? Does the central problem address practical issues important to the occupation?
- Readability. Is the readability of the item suitable for the candidates being tested?
- Linkage to content specifications. Does the question pertain to a specific task and knowledge in the content specifications? Is the overall content appropriate for the scope of practice?
- Level of difficulty. Is the difficulty level of the item appropriate for assessment of the desired level of competence?
- Key and distractors are relevant to item stem. Do the key and distractors respond to the generic noun in the item stem?
- Professional perspective. Is the item free of offensive cultural, gender-related, or ethnic stereotypes? Is the item free of overly specific jargon?

ITEM CONSTRUCTION

- Irrelevant material. Is there excessive material presented in the item stem, key or distractors that could be stated more concisely? Is the item free of instructional (teaching) material?
- Generic noun. Do interrogative words such as WHAT or WHICH OF THE FOLLOWING have generic nouns to clarify the intent of the item stem?
- Single key. Is there more than one correct answer? Are one or more of the distractors embedded within the key?
- Inclusive or exclusive answers. Does the item contain a response option that includes all or none of the choices, e.g., all of the above, none of the above?
- Qualifiers, absolutes, negatives. Does the item contain qualifiers (first, best, most), absolutes (all, none, always, never) or negatives (not, except, worst, least)?
- Parallel construction. Is the length and complexity of the key and distractors similar?
- Plausibility of distractors. Is the content of the distractors plausible?

- Clue words. Are there direct or indirect clues to the correct answer?
- Reference source. Is there an authoritative, published reference for the item stem and correct answer? Is the reference current?