

Overview:

2010-2011 Science Test Specifications

Introduction

The primary purpose of Oregon's Test Specifications and Blueprints is to provide the consistency necessary for the development and administration of the Oregon Assessment of Knowledge and Skills (OAKS). OAKS provide critical data for Oregon's accountability system which meets Peer Review Requirements of No Child Left Behind. All students in grades 3 through 8 are required to take the reading and mathematics assessments. All students in grades 5 and 8 are required to take the science assessment, and those in grades 4 and 7 take the writing assessment. In high school, reading, writing, mathematics, and science are required assessments.

OAKS is also one way for students to demonstrate proficiency in the Essential Skills of reading, writing, and mathematics, which will be necessary for earning a high school diploma beginning with graduating seniors in 2011-2012. In addition, English Language Proficiency Assessment (ELPA) is required for non-English speaking students until they acquire enough skills in English to exit the program. Social Sciences is an optional assessment.

Test specifications provide guidelines for item writers, who are typically Oregon teachers, on what content may be tested and how items must be written. These specifications lead to test blueprints that outline test design and the number of questions to be tested in each score reporting category (SRC). The Test Specifications and Blueprints document is an important resource, not only for item writers and reviewers, but for educators administering OAKS and the general public who are interested in understanding the content and format of test items.

Background

The purposes of the Oregon Statewide Assessment Program are (1) to provide information on individual student achievement on performance standards set by the State Board of Education at grade and benchmark level; (2) to provide information for federal NCLB requirements and for policy decisions by the legislature, the governor, the State Board of Education, and local school districts; (3) to support instructional program improvement efforts; and (4) to inform the public about student achievement in Oregon schools.

The Oregon Statewide Assessment is different from national, norm-referenced tests used in many districts and states. The Oregon Statewide Assessment is a criterion-referenced assessment based on the Oregon Content Standards. As a result, the types of scores produced from the Oregon Statewide Assessment are somewhat different from those produced by national, norm-referenced tests.

Oregon educators contribute to the test development and alignment process by serving on advisory committees called Content and Assessment Panels. Stakeholders in these committees are involved in each phase of the development of these specifications to

assure that they accurately and clearly explain the overall design of the test and describe the specific content that might appear on the test to measure the knowledge and skills described in the content standards.

Oregon's knowledge and skills test questions use a multiple choice format, with each item having a single correct answer and three incorrect answers. A computer scans the "fill-in-the-bubble" answer sheets (Braille only) or electronically collects scores. The results are scored against the answer key to produce a raw score. The raw score is converted to a scale score called a Rasch unit or RIT score. Students receive a scale score based on the number of questions answered correctly compared to the total number of questions on the form—taking into account the difficulty of the questions. Students are not penalized for guessing.

The content of the science specifications reflects the skill expectations outlined in the Content Standards adopted by the State Board of Education for implementation beginning in the 2002-03 school year. These standards were developed, in part, to correlate to the skills assessed on the science portion of the National Assessment of Educational Progress and align with the National Science Standards. As a result, Oregon uses similar terminology in its descriptions of the science score reporting categories and subcategories (listed later in this document).

Statewide and Local Assessments

Statewide assessments are multiple choice tests of knowledge and skills that are developed and scored by the state. Local assessments include performance assessments that may be scored using statewide scoring guides that are administered and scored at the local level. Local assessments **are not included** in state accountability reports, e.g. AYP reports.

Braille Paper/Pencil Administration

On Oregon's science knowledge and skills Paper/Pencil tests there one wide range test is given at:

- grade 5-Benchmark 2 (content instructed at grades 4 and 5),
- grade 8-Benchmark 3 (instructed at grades 6, 7 and 8), and
- grade 10-High School level (instructed at grades 9 and 10).

Electronic Administration

On the science knowledge and skills OAKS online tests, there are multiple opportunities to participate in fully-adaptive testing. In this format, the accuracy of the student responses to questions determines the next item or set of items the student will see. Students are allowed to preview test questions if a set of questions link to a specific graphic or stimulus. Having the tests fully adaptive allows for more precision in measurement and less frustration for the students.

Electronic administration of the science test for each grade tested includes up to three test opportunities in English or English-Spanish formats. An online practice test of sample items is available for students who may need practice using a scrollbar and to view the full length of stimuli presented with item sets or modules.

Criteria for Science Test Questions in 2010-11

Item Specifications

Oregon Assessment of Knowledge and Skills (OAKS) is a multiple choice statewide assessment scored by the state. It is a required assessment that provides the base for the accountability system. .

Criteria for All OAKS Test Questions

Test items must

- be appropriate for students in terms of grade-level difficulty, cognitive complexity, reading level, interests and experience.
- be free of age, gender, ethnic, religious, socioeconomic, or disability stereotypes or bias.
- provide clear and complete instructions to students.

Graphics Criteria

Graphics are used in OAKS to provide both necessary and supplemental information. Some graphics contain information that is necessary for answering the question, while other graphics illustrate or support the context of the question.

- Graphic displays, their corresponding items and answer choices will appear on the same page of the test booklet or on the same screen for online items.
- Shading and color will be minimized. It will be used to make a figure's size, shape or dimensions clear, and not solely for artistic effect.

Item Style and Format Criteria

- Test items will be in the form of questions - or sentences that require completion.
- Each item will have three or four answer choices. Students will be told in the test directions to choose the best answer from among the choices.
- Answer choices will be arranged one of three ways beneath the test item: vertically, horizontally, or in two columns (i.e., A and B in the left column, C and D in the right column).
- Neither "None of the above" nor "All of the above" will be used as one of the four answer choices. "There is not enough information to tell" is an allowed answer choice, but infrequently used.
- Test items may be worded in the negative ("Which of these is NOT ..."), but this structure will be used rarely and only when it offers substantial advantages for the item construction.
- Items should be free of absolute wording, such as "always" and "never," and have qualifying words (e.g., least, most, except) printed in small caps for emphasis.
- Masculine pronouns should NOT be used to refer to both sexes. Plural forms should be used whenever possible to avoid gender-specific pronouns (e.g., instead of "The student will make changes so that he . . .," use "The students will make changes so that they. . .").
- An equal balance of male and female names should be used including names representing different ethnic groups.

- Test items aligned to standards may contain extraneous information.
- Side-by-side English-Spanish and English-Russian test items are used on Paper/Pencil tests; stacked English-Spanish test items are used on electronic tests for the English-Spanish OAKS.
- Each Score Reporting Category will have items with a range of difficulty and complexity levels.
- Each test item will measure only one Score Reporting Category
- New item types are under development and are computer scored constructed response. New Item Type Practice tests are available on OAKS online at <http://www.oaks.k12.or.us/students.html> . It is required to use a compatible browser such as Mozilla Firefox.

Criteria for SCIENCE Test Questions

Various types of questions will be included in the science test. Selections will align with three Score Reporting Categories (SRC):

- **Physical Science (SRC 2)** Understand structures and properties of matter and changes that occur in the physical world;
- **Life Science (SRC 3)** Understand structure, functions, and interactions of living organisms and the environment; and
- **Earth and Space Science (SRC 4)** Understand physical properties of the Earth, how those properties change and Earth's relationship to other celestial bodies.

The Test Items

- Each test item will measure only one Score Reporting Category. The number of items in a test form will measure each of the three reporting categories equally (33%).
- Each Score Reporting Category will have items with a range of difficulty levels. This range of difficulty will be approximately the same across reporting categories.
- Test items are designed to be appropriate for students in the assigned benchmark in terms of reading level, interests, and experience.
- Test items will be stated in the clearest manner possible.

Criteria for SCIENCE Modules

A portion of each test will be incorporated into modules. A module is defined as a stimulus containing scientific information, accompanied by two to four knowledge and skills questions or items. The remaining items on each test will be stand-alone knowledge and skills items. Students will not refer to additional material when answering those questions.

- The stimulus for each module will vary in length, format and character. It could be one or a combination of any of the following: data table, diagram, chart, drawing, photo or reading text.

- Each Knowledge and Skills test item within a module will measure only one Score Reporting Category (SRC)-Physical Science, Life Science, or Earth and Space Science. Within a module, though, items may measure more than one SRC.
- Each stimulus will be free of age, gender, and other bias, as evaluated by the Oregon Assessment Sensitivity Panel.
- Although the stimulus for each module will provide scientific information, students will be required to draw on prior knowledge to answer many of the items. In other words, there may not be sufficient information in the stimulus to answer all the test questions associated with it. The stimulus may simply provide a context for some test questions.
- Each module will often include a title, which will serve to identify the accompanying items as a set.
- Computer score constructed response items include graphics and formats that require multiple answers within one item. Multiple graphics are presented in a legend and/or palette that may need to be manipulated or constructed.

Weighting of Score Reporting Categories

The chart below shows the score reporting categories for each of the benchmark levels and the percentage of questions on a given test form that assess that category. For example, at grade 5 (Benchmark 2), 33% of the items on a test assess Physical Science, which equals about 15 items on a 45-item test.

Score Reporting Category	Percent of Questions on Test		
	Benchmark 2; Grade 5	Benchmark 3; Grade 8	HS; Grades 9-12
Physical Science	33%	33%	33%
Life Science	33%	33%	33%
Earth and Space Science	33%	33%	33%

Physical Science

Students understand structures and properties of matter and changes that occur in the physical world, including matter, force and energy.

Life Science

Students understand the structure, functions and interactions of living organisms and the environment, including organisms, heredity, diversity and interdependence.

Earth and Space Science

Students understand physical properties of the Earth, how those properties change and the Earth's relationship to other celestial bodies, including the dynamic Earth, Earth in space and the universe.