

# Section 1. Test Construction and Administration

## Test Development

### *Planning*

Planning for the test development process began with the creation of the Mod-HSA blueprints and item modification/development plans for each content area. MSDE content specialists collaborated with Maryland educators, both special education and content area experts, to develop a plan for modifying and developing content for the modified assessments. The HSA item bank was reviewed to determine how well the available item pool could be modified to meet the item requirements of the Mod-HSAs and blueprint requirements as identified across the CLGs. Items, passages, and stimuli identified as modifiable were revised according to item plans, using such modifications as reducing the number of response options from 4 to 3, the simplification of language and graphics, grouping of text within longer passages, and the repetition of critical passage text within an item. When deficits in the pool of modifiable items were identified, additional items were developed by MSDE and its collaborative partners.

### *Test Specifications and Design*

The basic test design was defined by MSDE and provided to Educational Testing Service (ETS).

As noted in the Introduction, two Mod-HSA forms per content area were developed for the May 2008 administration. Each field test form contained 94 to 99 items each. The forms included two comparable 50-item sets of items designed to meet the content requirements for the future operational Mod-HSA forms. In addition, sets of 20 to 25 additional items were included to administer along with the 50-item forms. These sets were also balanced in terms of content, and were included to give MSDE flexibility when choosing the final operational items. Finally, each field test form contained a set of 24 common HSA items designed to serve as an external anchor for linking purposes.

The blueprints for the 50-item test design are presented below under the heading, Test Specifications. The basic test design provided information based on specified expectations and the distribution of the number of items for each reporting category. How the specific items were placed throughout the forms was left to the collaborative efforts of the ETS and MSDE content specialists. Construction of the operational forms was based on test blueprints approved by MSDE.

### *Item Type*

The Mod-HSAs consist of SR items only. Each of the four content areas, Algebra, Biology, English, and Government, contained 50 operational items worth a total of 50 points.

### *Item Modification, Development, Review, and Revision*

MSDE oversaw the initial item modification and development. MSDE content and special education specialists worked with Maryland educators to modify existing HSA items and to develop new items written specifically for the Mod-HSA program. These items underwent review and revision at MSDE prior to their submission to ETS for inclusion in the new Mod-HSA item bank.

Once received by ETS, all items were uploaded into the item bank and all graphics and stimulus materials were revised as requested. At this point, all items underwent a series of editorial reviews in accordance with the following procedures:

- Items were edited according to standard rules developed in conjunction with MSDE.
- Items were reviewed for accuracy, organization, comprehension, style, usage, consistency and fairness/sensitivity.
- Item content was reviewed to establish whether the item measured the intended Goal-Expectation-Indicator-Assessment Limit.
- Verification was made that copyright and/or trademark permissions had been obtained for any materials requiring permissions.
- Internal reviews were conducted and historical records established for all version changes.

After ETS performed the required internal reviews, item revision recommendations were submitted to MSDE for their review. Any associated stimulus material, graphic, and/or art was provided as well as information regarding the Goal-Expectation-Indicator-Assessment Limit that each question addressed.

MSDE performed a final review of the items and provided feedback to ETS content specialists. The edits were incorporated into the items. The items were then prepared for review by the Content and Bias/Sensitivity Review Committees.

The Content Review and Bias/Fairness Review Committees, selected by MSDE, conducted the final round of reviews. These committees were composed of diverse groups of Maryland educators. The demographics of the Content Review Committees are summarized in Table 1.1.

Table 1.1 Demographics of Content Review Committees by Content Area

Content Area	Gender		Ethnicity		
	Male	Female	African American	Caucasian	Other
Algebra	5	6	2	8	1
Biology	2	4	0	6	0
English	0	6	2	4	0
Government	3	6	2	7	0

The Bias/Fairness Review Committee consisted of one male and nine females; the ethnic composition included two African Americans, six Caucasians, one Hispanic and one Asian.

These committees reviewed each item to ensure that the content: a) accurately reflected what was taught in Maryland schools; b) correctly matched the intended CLG indicator; and c) did not unfairly favor or disadvantage an individual or group. A total of 699 items were reviewed across all four content areas. Of these items, eight (0.01%) were rejected by the Bias/Fairness Review Committee. One hundred and fifty-nine items were accepted with edits (22.7%). In total, the two committees accepted a total of 532 (76.1%) of the 699 Mod-HSA test items

Upon completion of this final round of reviews, MSDE and ETS content specialists conducted another side-by-side meeting to evaluate reviews by the Content Review Committees and the Bias/Fairness Review Committee. The ETS content specialists then made any necessary final edits to the items and/or revisions to the accompanying graphics. The items that survived this process were then eligible for placement on the Mod-HSA forms.

### **Test Specifications**

Tables 1.2 to 1.5 indicate the distribution of items within each reporting category associated with each item type: Mod-HSA items from the 50-item sets, additional Mod-HSA items, and the HSA linking sets. The forms for Algebra, Biology, English, and Government consisted of three sessions administered within a single sitting. Sessions were separated by a short break.

Table 1.2 Algebra Blueprint

<b>ALGEBRA</b>			
<b>Reporting Category</b>	<b>Number of Mod-HSA Items in 50-Item Set</b>	<b>Number of Mod-HSA Field Test Items</b>	<b>Number of HSA Linking Items</b>
Expectation 1.1 The student will analyze a wide variety of patterns and functional relationships using the language of mathematics and appropriate technology	13	5 - 6	6
Expectation 1.2 The student will model and interpret real-world situations, using the language of mathematics and appropriate technology.	16	9 -10	8
Expectation 3.1 The student will collect, organize, analyze, and present data.	11	4 - 5	5
Expectation 3.2 The student will apply the basic concepts of statistics and probability to predict possible outcomes of real-world situations.	10	5 - 6	5
<b>TOTAL</b>	<b>50</b>	<b>25</b>	<b>24</b>

Table 1.3 Biology Blueprint

<b>BIOLOGY</b>			
<b>Reporting Category</b>	<b>Number of Mod-HSA Items in 50-Item Set</b>	<b>Number of Mod-HSA Field Test Items</b>	<b>Number of HSA Linking Items</b>
Goal 1 Skills and Processes of Biology	10	3	5
Expectation 3.1 Structure and Function of Biological Molecules	8	2 - 3	4
Expectation 3.2 Structure and Function of Cells and Organisms	8	2	4
Expectation 3.3 Inheritance of Traits	9	6 - 8	4
Expectation 3.4 Mechanism of Evolutionary Change	6	2 - 4	3
Expectation 3.5 Interdependence of Organisms in the Biosphere	9	3 - 4	4
<b>TOTAL</b>	<b>50</b>	<b>21</b>	<b>24</b>

Table 1.4 English Blueprint

<b>ENGLISH</b>			
<b>Reporting Category</b>	<b>Number of Mod-HSA Items in 50-Item set</b>	<b>Number of Mod-HSA Field Test Items</b>	<b>Number of HSA Linking Items</b>
1: Reading and Literature: Comprehension and Interpretation (RC) Includes the following indicators: 1.1.1; 1.1.2; 1.1.3; 1.2.1; 1.3.3; 3.2.2	13	5 - 6	8
2: Reading and Literature: Making Connections and Evaluation (RE) Includes the following indicators: 1.1.4; 1.2.2; 1.2.3; 1.2.4; 1.2.5; 1.3.5; 4.1.1; 4.2.1	13	4	6
3: Writing - Composing (WC) Includes the following indicators: 2.1.1; 2.1.4; 2.2.1; 2.2.2; 2.2.3; 2.2.5; 2.3.1; 2.3.3; 4.3.1	13	4 - 7	6
4: Language Usage and Conventions (WL) Includes the following indicators: 3.1.3; 3.1.4; 3.1.6; 3.1.8; 3.3.1; 3.3.2	11	4 - 6	4
<b>TOTAL</b>	<b>50</b>	<b>20</b>	<b>24</b>

Note: Information about the referenced indicators can be found in the Maryland Core Learning Goals for English. The HSA Core Learning Goals documents can be found on the Maryland School Improvement website at <http://www.mdk12.org/assessments/standards/9-12.html>.

Table 1.5 Government Blueprint

<b>GOVERNMENT</b>			
<b>Reporting Category</b>	<b>Number of Mod-HSA Items in 50-Item set</b>	<b>Number of Mod-HSA Field Test Items</b>	<b>Number of HSA Linking Items</b>
Expectation 1.1 The student will demonstrate understanding of the structure and functions of government and politics in the United States	14	5	7
Expectation 1.2 The student will evaluate how the United States government has maintained a balance between protecting rights and maintaining order.	12	7	6
Goal 2 The student will demonstrate an understanding of the history, diversity, and commonality of the peoples of the nation and world, the reality of human interdependence, and the need for global cooperation, through a perspective that is both historical and multicultural.	8	4	4
Goal 3 The student will demonstrate an understanding of geographic concepts and processes to examine the role of culture, technology, and the environment in the location and distribution of human activities throughout history.	7	3	3
Goal 4 The student will demonstrate an understanding of the historical development and current status of economic principles, institutions, and processes needed to be effective citizens, consumers, and workers.	9	6	4
<b>TOTAL</b>	<b>50</b>	<b>25</b>	<b>24</b>

### **Item Selection and Form Design**

For the May 2008 administration, the MSDE and ETS content specialists worked together to create the field test forms. The Mod-HSA items included in these forms were balanced in terms of content, and were included to give MSDE flexibility in determining the final operational set of items.

The 24 items in the external anchor sets were embedded within the field test forms for each content area in groups of 6 to 8 items within each section of the test. Care was taken to place the HSA items in approximately the same position within the Mod-HSAs as

when these items were originally field tested and parameters were established. More details about the equating design are provided in Section 4.

The general steps completed during the test construction process were:

1. For each content area, both forms were constructed simultaneously to provide the best opportunity to construct parallel forms.
2. Test developers were careful to ensure that the item selections met all content specifications, including matching items to the test blueprint, distribution of keys, and avoidance of clueing<sup>2</sup> or clanging<sup>3</sup>.
3. After the 50-item base forms were selected, additional item sets of 20 to 25 items were selected, resulting in 70 to 75 item forms. While the base form and additional item sets were not originally constructed to meet psychometric criteria, they were constructed to meet content criteria. The additional item sets were embedded throughout the base form.
4. External anchor sets of 24 items, representing the Mod-HSA blueprint, were then selected from the HSA item bank. These items, referred to as linking items, were selected to meet content and psychometric criteria. The linking items were embedded in groups of 6 or 8 across the Mod-HSA items, resulting in test forms of 94 to 99 total items.

The test construction process resulted in two field test forms per content area, each containing 94 to 99 items, depending on the subject. Following the administration and review of item analyses, MSDE made a final decision on the set of 50 items to comprise the operational forms for the present and future administrations. These 50 items were selected based on the blueprint and psychometric criteria defined for the Mod-HSA program. The remaining Mod-HSA items and corresponding statistics were sent to the item bank.

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<sup>2</sup> Clueing refers to information within a passage, stimulus, item, graphic, or other test component that allows respondents to select/construct the correct answer to one or more items in an assessment without the knowledge and/or skill targeted by the item.

<sup>3</sup> Clanging occurs when an identical or resembling word(s) appears in both the item stem and one or more item distractors.