

Summary of End-of-Course Standard-Setting Activities for the Missouri Department of Elementary and Secondary Education (DESE)—November, 2008

This report is a summary of the procedures used and results of the standard-setting activities conducted for MO End of Course (MO EOC) assessments on November 3, 4, and 5, 2008. These activities applied to three of the state's End-of-Course (MO EOC) assessments—Algebra I, English II, and Biology. These three MO EOC assessments were administered operationally for the first time during the 2008–2009 school year.

The three sessions were planned and facilitated by Questar Assessment, Inc., a subcontractor to Riverside Publishing. Questar's most-experienced facilitators, Michael Beck, Sheila Potter, and Martha Caswell, ran the standard-setting workshops. All have facilitated standard-setting sessions for multiple clients in the past for both elementary-level and high-school assessments. Riverside Publishing provided two psychometricians. In addition, a Riverside Publishing project manager was present for the entire session to assist DESE or panelists with logistics issues. Also, a representative of Riverside Publishing's content-development group was present in each of the three sessions to serve as a resource for any content-related questions.

A total of forty-six panelists participated in the sessions: fourteen in English II, fifteen in Algebra I, and seventeen in Biology. One to three members of each panel had participated in the earlier standard-setting session for other Missouri assessments; others were new participants to a standard-setting activity. The significant majority of panelists had not been members of any of the assortment of committees for MO EOC development activities. More than one-half of each panel was active classroom teachers in the subject of the session; several other panel members were other professional educators, such as administrators or curriculum coordinators. One or two members of each panel were business professionals with expertise in the field..

Panels used the same performance labels as were used with previous high school MAP assessments: Advanced, Proficient, Basic, and Below Basic. A significant early activity of the standard-setting sessions involved the panelists in fine-tuning the achievement-level descriptors (ALDs) for each assessment. As a starting point for this activity, panelists were provided with draft ALDs in the appropriate content area. As suggested by the TAC, DESE conducted preliminary ALD development sessions prior to standard setting. Standard-setting panels fine-tuned these draft ALDs during the first day of their sessions. Panelists also had as resources a copy of each MO EOC assessment blueprint and the appropriate Course Level Expectations (CLEs). The Questar facilitators used all of these materials to lead each panel into an extended discussion and elaboration of the desired ALDs. Panels used these ALDs throughout the standard-setting session as a reference to their recommendations. In addition, they made appropriate, though generally minor, revisions and refinements in these descriptors during the sessions and again at the end of the sessions.

All standard-setting sessions involved three rounds of panel recommendations, consistent with the procedures used for establishing performance standards for previous Missouri assessments. Between the first and second rounds of the panels' work, panels were given item-difficulty data for their consideration. Since no operational data was available in November, these item data were of necessity derived from the

2008 field test of these assessments. Panelists were appropriately cautioned about the limitations of such data.

Prior to the last round of ratings for the sessions, panelists saw statewide impact data for the assessments as they were constituted. These were intended to serve as an anchor for the panelists' recommendations. Obviously, again these data were based on projected statewide score distributions generated from the field-test data. Here too, panelists were cautioned about relying too much on the data, although we consider the data to provide "lower-bound" estimates of the eventual statewide results, given the likely negative effect of a stand-alone field test on student effort. Despite the limitations of field-test data for this activity, we believe that providing even the tentative data was desirable both to mirror procedures used for establishing standards for previous Missouri assessments and to provide panelists with an "external reality check" on their evolving recommendations. Earlier TAC discussions confirmed the use of this statewide impact data.

The specific methodology used for the standard-setting activities was a modified Angoff procedure, as recommended by the state's TAC. The strongest argument for this method was the fact that only field-test data were available for use at the time of standard setting. This would have made suspect the sequencing of items in the ordered-item booklet required by the Bookmark, or "Item Mapping," procedure that has been used for previous Missouri standard setting. The Angoff procedure is a well-recognized and heavily researched method for establishing student performance standards for tests such as the EOC. Since it does not require the availability of item data, it was deemed the method of choice for these sessions.

The MO EOC assessments are composed primarily of selected-response (multiple-choice) items. However, each assessment contains several points (4 points each for Algebra I and English II, 20 points for Biology) derived from hand scored open ended items.. For these items, panelists were asked to judge the mean score obtained by the borderline student in each performance category.

The EOC Spring 2009 operational form was the form on which panelists made their judgments. We selected this form from the several available operational forms because it is the form that will be most widely used statewide.

The process used required panelists to read each item in the test booklet, consider the content standard assessed and the cognitive challenge posed by the item, and then estimate the percent of borderline Proficient students who will answer the item correctly. Panelists then made like estimates for borderline Basic and Advanced students, then moved to the next item in the booklet to make comparable decisions. This activity repeated for each item in the operational test. Item-difficulty data was provided to panels prior to the second round of judgments; anticipated statewide impact data was shared prior to the final round of judgments. All of these methodological events are consistent with typical modified Angoff activities.

Panelists were clearly told that their work was purely advisory to DESE, which will then consider these recommendations and select the final cut scores for each assessment.

Outline of Specific Session Activities

The appended Session Agenda (Appendix A) provides an outline of the specific elements of the panel sessions, along with a general guide as to the time devoted to each activity. The sessions were conducted holding closely to the indicated times. Major session components are summarized below. Note that identical processes—in fact, the same slides and scripts—were used in all three concurrent sessions to minimize any inter-session differences related to “facilitator” or “session” variance.

We arbitrarily conceive of the sessions as being made up of essentially nine distinct elements:

1. General Process Overview. Three separate activities took place during the first 90 minutes of the 3-day session. First, Michael Muenks, Coordinator of Curriculum and Assessment for DESE, oriented the panelists to the MO EOC program and briefly outlined the session purpose and intended outcomes.

The second activity was a brief general overview of “What Is Standard Setting?” Michael Beck led this session for all panelists to ensure common understanding across all panelists of the fundamental elements of the process. Included here was a brief overview of the *general* process of establishing student performance standards, ground rules for how this activity occurs, and some general recommendations of key elements to focus on when attempting to recommend standards. Panelists were told during this portion of the session that their work was advisory to DESE. This general overview of the standard-setting process was expanded upon individually by each facilitator after the panels broke into their content-specific groups.

The final introductory activity was a general overview of Achievement-Level Descriptors (ALDs) and their importance to the overall process. Sheila Potter from Questar provided this information. Since the panels were reviewing, editing, and expanding upon draft versions of the ALDs provided by the state, it was critical that they undertook this task seriously and that they understood the critical role of ALDs in the standard-setting process. Following this activity, panels divided into the three content-specific groups, where all remaining work for the sessions took place.

2. Preview/“Take” the Assessments. Upon reconvening in the content-area subgroups, panelists first introduced each other and signed DESE-provided security agreements. Following a continuation and extension of the overview of the process in which they would engage, they then reviewed the operational test form on which they later recommended standards. For this activity, panelists had access to the test-administration procedures, the actual test content, and all relevant scoring materials. The actual spring 2009 operational tests were used for this activity. Field-test items that were included in these forms were removed from the booklets seen by the panelists. Since they were “live” materials, facilitators stressed the confidentiality of all of the items.

The primary purpose of the activity was to familiarize panelists with the actual, complete assessment content prior to beginning the standard-setting judgments. Following this review of the tests, each panel spent a short time reacting to the assessment content—difficulty, sources of challenge, scoring issues, and general and specific reactions. This exercise provided panelists, especially those not previously familiar with the assessments, with a mental “set” concerning the concrete definition of *Proficient* as conveyed in the assessments.

3 . Discuss and Fine-Tune Achievement-Level Descriptors (ALDs). All three panels began this activity with a review of the draft ALDs for the particular content area of concern. These draft ALDs were developed through DESE-led sessions conducted several weeks prior to standard setting by separate panels of Missouri educators. The ALD review activity was highly interactive, with panelists suggesting changes and other refinements, both substantive and editorial, to the draft ALDs. The essential task was to itemize concrete/specific performance-related behaviors indicating performance at the Advanced, Proficient, Basic and Below Basic levels in the content area. The activity was a “brainstorming” one in which each panel member’s ideas were recorded and considered without expecting consensus. Panel suggestions were written on the draft ALDs, a copy of which was given to each panelist, or on chart paper displayed around the room. These pages, along with the DESE-provided drafts, were later referred to by panelists throughout the actual judgment activities. We devoted nearly 2 hours to this activity in the draft schedule for the sessions. The thoroughness of the ALD-refinement activities and the extent to which the panelists individually and as a group internalize these ideas significantly impacts the soundness of the subsequent standard-setting activities.

At the conclusion of the standard-setting sessions, DESE collected the panelist recommendations for ALD revisions for consideration in the wording of the final ALDs for the assessments.

4. Orientation to the modified Angoff procedure. The final activity leading to the first round of committee judgments was an orientation to the specific task of carrying out a modified Angoff standard-setting process. Included in this overview was a reminder to focus on the *threshold* of performance in each category, a review of what each performance descriptor means, a reminder to focus on MO EOC students statewide, etc. While the MO EOC assessments will yield four categories of student performance, “cuts” are made at only three locations in the distribution. Panels were guided to understand the process of making three determinations of the percent of borderline students who will answer each (multiple-choice) item correctly. Given the open-ended item(s) in each assessment, special care was taken to ensure that panelists understood how to make analogous judgments for each of these items. Panelists were reminded that their judgments were anonymous and that it was important that they work independently and maintain security of the materials.

Panelists indicated their judgments on specially designed scannable rating sheets developed for each test. These rating sheets listed item percent-correct values for each item (mean scores for constructed-response items); panelists simply circled three such values to indicate the percents-correct (or mean score) for borderline students in each performance category.

The above four steps completed the first day of the sessions. Our experience has shown that devoting extensive time to the process of discussing ALDs and to orienting and training the judges for the activity of recommending standards does much to minimize panelist confusion and maximizes panelist understanding and agreement.

Day 2 began with an overview of the previous day’s activities and outcomes.

The next activity of the day involved panelists taking a short, five-item multiple-choice “qualifying test” concerning the standard-setting procedures they were about to use. A copy of this instrument is provided in Appendix B. These questions were used to review the assessed aspects of the process to ensure understanding of all panelists of the importance of the ALDs and selected important elements of the modified Angoff procedure.

Each panel then returned to the modified Angoff procedure, with judges carrying out a mini-session of ratings using a practice test of five multiple-choice items and a performance item with score points comparable to that on the operational test. Items used for this activity were released Grade 4 NAEP Mathematics items, selected to distance the practice exercise from the content area and grade levels of the EOC assessments. This exercise provided panels an opportunity to practice the mechanical aspects of the modified Angoff judgment process and procedures for recording their recommendations prior to beginning work on the “real” test. The practice test enabled facilitators to check on panelists’ understanding of the mechanics of the technique and corresponding recording of judgments. The practice judgments were reviewed on a group basis by discussing the range of judgments made about each item.

Panelists took about 20 minutes to complete this practice activity. After this, facilitators led a review of the practice activity, seeking judgments from each panelist to ensure their understanding of the mechanical and judgment-marking aspects of the modified Angoff procedure. Following completion of the practice exercise, panelists were asked to complete and sign a form indicating that they understood the information they had received and discussed and that they felt prepared to make their Round 1 judgments. All panelists so indicated.

5. Round 1 of Judgments. Day 2 continued with the panelists independently making initial, “Round 1” judgments of item-by-item performances that together define Advanced, Proficient, Basic, and Below Basic. At this stage, panel work was anonymous (via judge numbers known only to Riverside Publishing staff) and independent. Any panelist questions during this stage were asked of the facilitator. The first round of judgments for this activity required approximately 60 minutes of the typical panelist, depending on content area. However, there was no time limit for this activity; individual panelists required as much as almost 90 minutes to complete their judgments. Our observation has been that some panelists are still struggling at this time to understand the task, thus requiring more time to make their judgments; others simply work more deliberately. Panelists left the room for lunch as they completed their Round 1 judgments, recorded their judgments on the provided judgment forms, and submitted their written recommendations.

Panelists were told to read and make performance judgments about each successive item in the test booklet. When reading the item, panelists were to consider the underlying Course Level Expectation (CLE) being assessed, the task(s) required of the student, its difficulty, and its importance. Then they were instructed to decide what percent of students taking this assessment who perform at a minimally Proficient level in this content area should be able to answer Item 1 correctly. Panelists then decided what percent of minimally Advanced students would answer Item 1 correctly. Finally, they made a comparable decision concerning minimally Basic achievement in this content area, and indicated this percent. (We recommended the sequence of judgments of Proficient, Advanced, and Basic, as we believe it focuses the attention on the most important cut, Proficient. In addition, once the Proficient recommendation is made, panelists have a clearer, more defined range of values to consider for the other two cuts.) The panelists then moved on to each successive item in the booklet, making the same three sets of judgments about each item. For the constructed-response item(s), panelists indicated the average item score of minimally performing students at each level. Care was taken to train the panelists to give equal consideration to score points that come from selected-response and performance portions of the assessments.

6. Feedback and Discussion of Round 1 of Judgments. The afternoon began with an overview of the results of Round 1. Riverside Publishing psychometricians prepared graphic displays of the Round 1 results for panelist inspection and consideration. The first data display was a table showing all three cuts determined individually by panelist. The second such display graphed all three cut scores (Basic, Proficient, and Advanced) in terms of the raw-score cut recommended by each panelist. This is a bar-graph display of all panelists' sets of judgments on a single graph. Samples of these two displays are shown in Appendix C. Note that these displays are anonymous; that is, the Judge Numbers shown on these graphs are unknown to fellow panelists. These graphic displays of the Round 1 recommendations were used as the foundation for a discussion of the procedures used by the panelists in coming up with their interim recommendations, both individually and as a group. Panelists were cautioned not to rely overmuch on the data displays or to simply adjust their later ratings to align with the central tendency displayed on the Round 1 graphs.

Using the Round 1 results, facilitators then led an extended discussion of the Round 1 judgments. Most of the work at this time focused on the interim judgments of panelists at an individual test item level, both multiple-choice and open-ended. Given the length of the MO EOC assessments, it was possible to discuss with each panel all of the individual items. All panelists were actively involved in the discussion to permit facilitators to gauge whether or not the panelists had indicated the item percent values that they intended, that the reasoning processes they followed in making their judgments were consistent with good practice, and that the mechanics of indicating recommendations were clearly understood. Throughout these discussions, facilitators continually focused on the key elements of the standard-setting process: establishing the *threshold* of each cut, projecting the cuts for a *statewide* population of these students, and focusing on the particular *course* and *performance level* of the target populations and on correct modified Angoff standard-setting thought and mechanical judgment-marking processes.

These discussions were full-panel discussions, not carried out in subgroups. This permitted facilitators to ensure that all panelists understood the process and carried out the judgment process correctly. It also ensured (much like a jury activity) that all panelists had the opportunity to hear each of their peers' comments before making their later recommendations. This phase of the process consumed 100–120 minutes, depending on the session; facilitators permitted discussion to continue until they perceived that all panelists were prepared to make their second round of judgments.

Following a thorough discussion of the initial cut recommendations, panelists reviewed statewide "item difficulty" data in the form of item *p* values. These data were of necessity field-test difficulty data collected during the 2008 field test of the MO EOC assessments. (For performance-based items, the provided "difficulty" data were the average item scores.) Panelists were told the source of these data (the 2008 statewide field test) and clearly told that the data were to be used as each panelist deemed appropriate. We instructed panelists that these data were relevant but not critical to the activity of establishing performance standards.

Prior to making Round 2 judgments, panelists again completed a short form indicating that they understood the discussions and procedures and were prepared to make Round 2 recommendations. Again, all so indicated.

7. Round 2 of Judgments/Recommendations. After panelists clearly understood the meaning of the item-difficulty data, Round 2 of judgments took place. Judges again worked independently to make a second set of judgments for each item on their

assessment. Judges were free to maintain their Round 1 judgments or to revise them for one or more items as deemed appropriate. Prior to beginning this round of judgments, panelists were again reminded of the key elements of the process, and they were focused specifically once more on the ALDs for their assessment. Again there was no time limit, although this round required significantly less time than did Round 1 because most panelists more clearly understood the judgment process. In addition, they were increasingly familiar by this point with the specific items upon which they were making the judgments. Further, many panelists began to make some or all of their Round 2 item-based decisions during the discussion of Round 1 results.

As panelists completed their Round 2 judgments and recorded these recommendations on their judgment forms, they submitted these forms and were free to leave for the day. All materials used for the sessions remained in the rooms, which were padlocked for the day.

8. Round 2 Feedback and Discussion. **Day 3** began with an overview of the outcomes of the Round 2 work. Activities at this stage were very similar to, although more focused than, the presentation and discussion following Round 1. Panelists again saw graphic displays of their judgments. These displays were used to guide another discussion of specific items. Discussion remained focused on the cognitive task(s) underlying the particular item/activity/score point, not on a statistical judgment concerning the interim cut score recommendations.

Following this discussion, we provided panelists with anticipated/estimated “statewide impact data,” that is, the percentages of students statewide whose performance would likely be labeled Below Basic, Basic, Proficient, or Advanced were the panels’ Round 2 judgments to be adopted. The panels’ median Round 2 judgments were used to convey this information. Again, judges were told that the impact data were relevant to, but not the essential aspect of, establishing student performance standards. This cautionary information was especially important in the case of MO EOC as the data were not grounded in an operational administration of the assessments. Judges were free to consider and either use or dismiss these data in making their final judgments.

As soon as facilitators were comfortable that all panelists were prepared to make their final recommendations, Round 3 took place. Again all judgments were made anonymously and independently. Panelists made their final recommendations of the cut scores to be used for each of the categories: minimally Basic, minimally Proficient, and minimally Advanced.

9. Round 3 of Judgments, Meeting Evaluation, and Final Inspection of ALDs. Panelists were given unlimited time to complete their Round 3/final recommendations, although most panelists completed their judgments within 20 minutes. All panelists clearly understood that only the Round 3 judgments “counted” as their recommendations, and that the three rounds were not combined in any way to form the proposed cuts.

Immediately following the final recommendations, panelists completed a written evaluation of the process, requesting their opinions of the success of each major element of the meeting, the salience of various possible elements in making their judgments, their comfort with and confidence in their judgments on a round-by-round basis, and other comments they wish to make concerning the sessions. A copy of this evaluation is provided in Appendix D. The panelists evaluations are provided in Appendix D.

After completing the evaluation, individual panelists went to lunch. Following lunch, each panel was provided information concerning their Round 3 judgments. The final

task of the session was to reconvene the panels for a short period after lunch for a final review of the ALDs. Since the panels had just finishing using and applying these ALDs to an operational test, it was useful to give them a final opportunity to fine-tune or revise the statements prior to their departure. After approximately 30–40 minutes of discussion, panelists were dismissed with DESE’s appreciation.

Session Results by Panel and Round

Appendix E provides copies of the feedback information provided to panelists following each round of ratings, including the results from Round 3, the final recommendations. Selected data from these graphs and tables are summarized below for ease of cross-round and cross-content area comparison.

Table 1 summarizes the median recommendation of the panelists by round and content area. Questar typically recommends that clients use the *median* recommendation as the best indicator of a panel’s judgment as the median would not be impacted by a significant outlier. In the case of these assessments, as a review of the Appendix E tables indicates, however, for all of these assessments and cuts, medians and means agree within a single rounded raw-score point. Therefore, the choice of a measure of central tendency for these panels will not markedly impact the resulting cut scores.

TABLE 1

**Median Recommended Cut Scores by Content Area & Round
Missouri EOC Assessments**

	Content Area								
	Algebra I			Biology			English II		
CUT*:	BB - B	B - P	P - A	BB - B	B - P	P - A	BB - B	B - P	P - A
Round 1	13	23	32	20	35	48	16.5	24.5	32
Round 2	13	23	31	19	34	46	16.5	25.5	33
Round 3/Final	13	22	31	18	32	45	15.5	24	33

No. Points Possible 39 55 39

*BB=Below Basic, B=Basic, P=Proficient, A=Advanced

As the Table 1 data indicate, the panels *as a whole* did not markedly change their typical recommended cut scores across the three rounds of judgments. This does not indicate that individual panelists made the same recommendations across rounds. In fact, across the nine sets of judgments between rounds (3 content areas x 3 cut scores), the mean changes were –0.5 between Rounds 1 and 2, –1.0 between Rounds 2 and 3, and –1.5 between Rounds 1 and 3. (The median change between any pair of rounds was 0.) Individual panelists changed their round-to-round recommendations by as much as 17 raw-score points. The mean absolute value of changes made (across performance categories and panels) were 1.5 between Rounds 1 and 2, 1.9 between Rounds 2 and 3, and 2.6 between Rounds 1 and 3.

As is typically the case with standard-setting activities conducted over multiple rounds, the standard deviations of panelists' recommendations shrunk across rounds. These data are illustrated by round in the Appendix E bar graphs as well as statistically in the tabled results. This is an indication both of increasing levels of panelist understanding of the process and of inter-panel agreement based on group discussions that take place subsequent to each round of ratings. While panelists clearly came closer to their peers in judging the most appropriate cut scores, even in Round 3—not unexpectedly—there was still a fair amount of spread in the recommended scores. That variability is especially notable in the Biology assessment; however, this assessment is significantly longer than the others, thus at least partially accounting for the larger Round 3 variability.

Standard errors of the median judgments were computed for all cut scores across tests. In no case did the Round 3 standard error reach a whole raw-score unit. Most were lower than one-half of a raw score point. Therefore, the final median judgments are viewed as being highly stable. These standard errors are, of course, a function of the relatively small standard deviations and sizable panel sizes.

Table 2 summarizes the *projected* statewide percents of students whose EOC scores will fall in each of the four performance categories. These data are based on the 2008 field-test results and are viewed as “lower-bound” estimates of the likely statewide results that will be obtained at the end of the 2008–9 school year.

TABLE 2

Projected Statewide Percents of Students Scoring in the Various Performance Categories on the EOC Assessments, 2008–9

Assessment	Performance Category			
	Below Basic	Basic	Proficient	Advanced
Algebra I	18%	38%	33%	11%
Biology	12%	39%	39%	10%
English II	15%	31%	39%	16%

Given that these projections are based on field-test data derived from an arguably unmotivated sample and that they represent projected first-year results, DESE considers these anticipated results to be reasonable and well within the bounds of “expectancy.” DESE plans to review the panels’ recommended cut scores in late spring, following the scoring of a representative sampling of tests, to reconsider the cuts in light of operational data. It is possible that panel recommendations will be revised slightly at that time.

APPENDIX A—Session Agenda

MISSOURI EOC ACHIEVEMENT LEVEL-SETTING AGENDA

Capitol Plaza Hotel and Convention Center
Jefferson City, Missouri—November 3–5, 2008

(*NOTE:* Times are approximate)

Monday, November 3rd

MORNING

7:30–8:30	Registration and Breakfast
8:30–9:15	Welcome, Introductions, Logistics, and Overview of Missouri’s EOC Assessments (DESE)
9:15–9:35	Overview of the Three Days of Sessions (Questar Assessment)
9:35–10:00	Introduction to Achievement-Level Descriptors (ALDs) (Questar Assessment)
10:00–10:15	Break
10:15–11:15	Setting Performance Standards—General Process
11:15–12:15	“Experience” the Assessments
12:15–1:30	Lunch

AFTERNOON

1:30–3:15	Definitions and Description of Performance Standards
3:15–3:30	Break
3:30–4:30 Methodology	Orientation to the Specific Standard-Setting
4:30–4:45	Questions & Dismissal for the Day

Tuesday, November 4th

MORNING

7:30–8:30	Breakfast
8:30–9:15	Review of Day 1 Activities and Discussions
9:15–10:15	Preparation for Round 1 of Judgments
10:15–10:30	Break
10:30–12:00 (or until completion)	First Round of Judges' Recommendations
12:00–1:15	Lunch

AFTERNOON

1:15–1:45	Review of Round 1 Issues and Problems
1:45–3:15	Feedback & Discussion of Round 1 Judgments
3:15–3:30	Break
3:30–3:45	Preparation for Round 2 Judgments
3:45–5:00 (or until completion)	Round 2 of Judges' Work

Wednesday, November 5th

MORNING

7:45–8:45	Breakfast
8:45–9:45	Review of Round 2 Judgments
9:45–10:00	Break
10:00–10:45	Preparation for Final Judgments
10:45–12:30 (or until completion)	Final Round of Judgments & Evaluation
12:30–1:15	Lunch

AFTERNOON

1:15–2:15	Final review of ALDs & Session Wrap-up
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APPENDIX B—Session “Pretest” for Judges

EOC Assessment: E A B

Judge # _____

Pre-Standard-Setting Self-Evaluation Assessment for Judges of the Missouri EOA Assessments (PSSSEAJMEOCA)

Directions: Circle the letter next to your answer for each item. *Don't copy from your neighbor; he/she hasn't been listening very closely.*

- 1. Why are the Achievement Level Descriptors such an integral part of the standard-setting process?**
 - A. They provide an anchor that gives concrete meaning to the terms Basic, Proficient, and Advanced.**
 - B. All students at a given performance level should possess all critical behaviors and understandings listed in the ALDs.**
 - C. They define all of the items that are contained on the EOC.**
 - D. They summarize all of the elements of the Course-Level Expectations for the course.**

- 2. Which of these statements about standard setting is TRUE?**
 - A. Panelists should use their best judgment to make their recommendations, but should rely more on various data to be provided during the sessions.**
 - B. While the EOC assessments are given statewide, judges should make recommendations based on the unique characteristics of *their* districts since other panelists will focus on other district types.**
 - C. A judge who concludes that the “proper” cut score for Proficient is 24 should make a final recommendation of 22 or 23 to account for errors that are present in any assessment.**
 - D. Judges must consider both the “stem” *and* answer options in multiple-choice items in deciding for the percent of students who should answer correctly.**

- 3. Joe the Judge decided that about 50% of the typical Proficient children in Missouri taking the EOC assessment should answer Item 32 correctly. He coded 50% under Proficient on his Rating Form. What error did he make?**
- A. He should have coded 45% since some percent of special-needs students will take the assessment.**
 - B. He should have considered *barely* Proficient, not *typical* Proficient, students.**
 - C. He should reconsider his judgment, as 50% correct couldn't possibly be considered Proficient.**
 - D. He made no error here. This was the correct procedure.**

- 4. Judge Jan reviewed the performance event for her EOC and decided that the average score of borderline Proficient students should be a 2 out of 4. What should she enter on her Rating Form?**

- A. 50%, , since 2 out of 4 is 50%**
- B. 2.5, since she decided that 2 was the minimum acceptable score**
- C. 1.5, since the minimum expected score should be somewhat lower than the average score**
- D. 2, since her judgment is that 2 should be the average score of the target group**

- 5. Which of these sets of “Angoff” judgments for a multiple-choice item appears to be *improper* and why?**

	<u>Below Basic/Basic</u>	<u>Basic/Proficient</u>	<u>Proficient/Advanced</u>
A.	25%	35%	40%
B.	80%	90%	100%
C.	50%	50%	55%
D.	40%	75%	95%

- A. A, because these are very low expectations for a multiple-choice item.**
- B. B, because it is unrealistic to expect students to score this well on a multiple-choice item.**
- C. C, because the judge doesn't expect higher-classified students to perform any better on the item than lower-classified students.**
- D. D, because the increase in percents across the three groups is probably unrealistically large.**

APPENDIX C – SAMPLE FEEDBACK FORMS

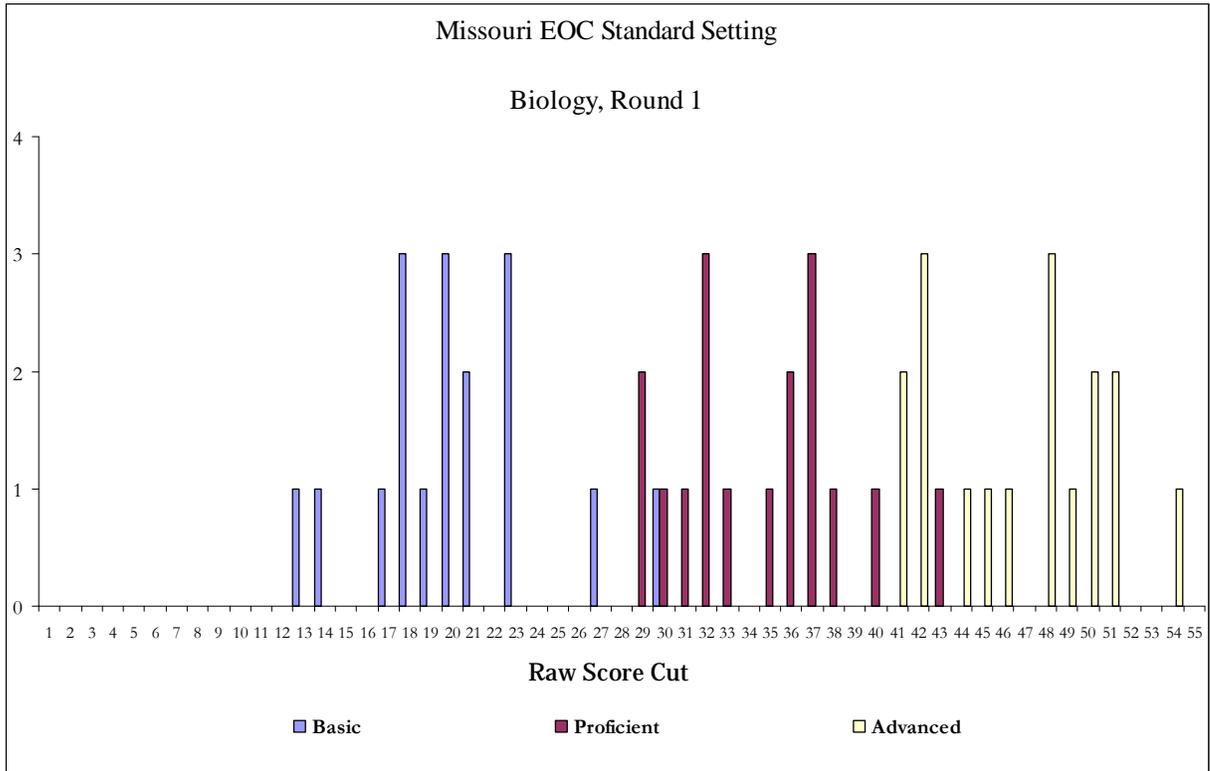
Standard Setting for the Missouri EOC Assessment

Algebra

Round 1 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
A311	16	29	35
A232	10	26	36
A321	13	25	34
A112	13	23	31
A233	17	22	26
A313	12	19	24
A211	12	20	32
A122	13	23	33
A312	13	23	34
A222	16	25	32
A333	18	25	32
A123	19	28	33
A121	13	24	33
A322	12	21	27
A213	11	21	31

Median Rating:	13.0	23.0	32.0
Average Rating:	13.87	23.60	31.53
Standard Deviation:	2.58	2.73	3.26
Lowest Rating:	10	19	24
Highest Rating:	19	29	36
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	15	15	15



APPENDIX D—SESSION EVALUATION

**Missouri End-of-Course Standard-Setting
EVALUATION FORM**

This form contains six sections, five of which ask for feedback on specific aspects of this standard-setting meeting. The last section asks for general reactions to the standard-setting meeting. Please fill out each of these sections as completely as possible in order to provide information that will help in the improvement of similar meetings in the future. Your identification number is used for analysis purposes only. Your responses to these questions will be held in strict confidence and will be analyzed in conjunction with those of the other judges who participated in this meeting.

Judge's I.D. (optional) _____

Section I: Opening Training Sessions

The following statements seek your judgments about the Opening Sessions for the Missouri End-of-Course standard-setting meeting. Please circle the value on the scale under each statement that best characterizes your judgment.

1. The Opening Sessions provided adequate background information about the Missouri End-of-Course assessments.

5	4	3	2	1
Completely		Somewhat		Not at all

2. The topics covered in the Opening Sessions were appropriate to providing a context for my role in this meeting.

5	4	3	2	1
Completely		Somewhat		Not at all

3. The content of the Opening Sessions was:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

4. The organization of the Opening Sessions was:

5	4	3	2	1
Very good		Acceptable		Very poor

The following statements also seek your judgments about the Opening Sessions for the Missouri End-of-Course standard-setting meeting. Please write your responses to each prompt on the lines provided.

5. Were there questions or concerns that were not answered or addressed in the Opening Sessions? Please indicate these below. (Use reverse side for additional space.)

6. What was most helpful about the Opening Sessions?

7. Please use the space below to provide additional comments concerning the adequacy, appropriateness, usefulness, or organization of the Opening Sessions.

Section II: Discussing *Proficient* Performance

The following statements seek your judgments about the discussions of *Proficient* performance as they relate to Missouri's End-of-Course assessments. Please circle the value on the scale under each statement that best characterizes your judgment.

8. The activities used to help operationalize *Proficient* performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

9. By the end of the activity, my conception of *Proficient* performance was:

5	4	3	2	1
Very well formed		Moderately Well Formed		Not Well Formed

The following statement also seeks your judgments about the discussions of *Proficient* performance as they relate to Missouri's End-of-Course assessments. Please write your responses to each prompt on the lines provided.

10. Please use the space below to provide additional comments concerning the activities around operationalizing *Proficient* performance for Missouri's End-of-Course assessments.

Section III: Discussing *Basic* Performance

The following statements seek your judgments about the discussions of *Basic* performance as they relate to Missouri's End-of-Course assessments. Please circle the value on the scale under each statement that best represents your judgment.

11. The activities used to help operationalize *Basic* performance were:

5	4	3	2	1
Very useful		Somewhat useful		Not useful

12. By the end of this activity my conception of *Basic* performance was:

5	4	3	2	1
Very well formed		Moderately Well Formed		Not Well Formed

The following statement also seeks your judgments about the discussions of *Basic* performance as they relate to Missouri's End-of-Course assessments. Please write your responses to each prompt on the lines provided.

13. Please use the space below to provide additional comments concerning the activities around operationalizing *Basic* performance for Missouri's End-of-Course assessments.

Section IV: Discussing *Advanced* Performance

The following statements seek your judgments about the discussions of *Advanced* performance as they relate to Missouri’s End-of-Course assessments. Please circle the value on the scale under each statement that best represents your judgment.

14. The activities used to help operationalize *Advanced* performance were:

5	4	3	2	1
Very useful	Somewhat useful		Not useful	

15. By the end of this activity my conception of *Advanced* performance was:

5	4	3	2	1
Very well formed	Moderately Well Formed		Not Well Formed	

The following statement also seeks your judgments about the discussions of *Advanced* performance as they relate to Missouri’s End-of-Course assessments. Please write your responses to each prompt on the lines provided.

16. Please use the space below to provide additional comments concerning the activities around operationalizing *Advanced* performance for Missouri’s End-of-Course assessments.

Section V: Item Rating Activities

The following statements seek your judgments about the item rating activities as they relate to the Missouri End-of-Course standard-setting meeting. Please circle the value on the scale under each statement that best represents your judgment.

17. Using the sample items to prepare for the actual item rating was:

5	4	3	2	1
Very helpful	Somewhat helpful		Not helpful	

18. The explanation of the item data during the sample item portion of the training was:

5	4	3	2	1
Very helpful	Somewhat helpful		Not helpful	

19. The Item Rating Form was:

5	4	3	2	1
---	---	---	---	---

25. I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of *Basic* performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

26. I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of *Advanced* performance.

5	4	3	2	1
To a great extent		To some extent		Not at all

27. I believe that this standard-setting meeting has produced recommended cut scores that are defensible.

5	4	3	2	1
To a great extent		To some extent		Not at all

28. I feel that this standard-setting meeting has produced recommended cut scores that would generally be considered as reasonable.

5	4	3	2	1
To a great extent		To some extent		Not at all

The following statements seek your judgments about the overall processes and procedures used during the Missouri End-of-Course standard-setting meeting. Please write your responses to each prompt on the lines provided.

29. Please provide any comments you wish to share regarding the quality of assistance provided by the standard-setting staff.

30. Please provide any additional comments you wish to share regarding the overall meeting.

APPENDIX E—Session Results by Round & Content Area

Standard Setting for the Missouri EOC Assessment Algebra

Round 1 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
A311	16	29	35
A232	10	26	36
A321	13	25	34
A112	13	23	31
A233	17	22	26
A313	12	19	24
A211	12	20	32
A122	13	23	33
A312	13	23	34
A222	16	25	32
A333	18	25	32
A123	19	28	33
A121	13	24	33
A322	12	21	27
A213	11	21	31

Median Rating:	13.0	23.0	32.0
Average Rating:	13.87	23.60	31.53
Standard Deviation:	2.58	2.73	3.26
Lowest Rating:	10	19	24
Highest Rating:	19	29	36
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	15	15	15

Standard Setting for the Missouri EOC Assessment Biology

Round 1 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
B213	18	32	49
B312	18	33	50
B112	14	29	42
B231	20	37	48
B311	20	31	42
B321	13	29	41
B223	20	37	48
B232	23	36	45
B322	23	36	48
B233	19	32	42
B131	23	35	46
B211	30	43	51
B212	21	30	41
B122	17	37	50
B332	21	40	54
B113	18	32	44
B111	27	38	51

Median Rating:	20.0	35.0	48.0
Average Rating:	20.29	34.53	46.59
Standard Deviation:	4.08	3.85	3.94
Lowest Rating:	13	29	41
Highest Rating:	30	43	54
Number of Items:	46	46	46
Points Possible:	55	55	55
Number of Raters:	17	17	17

Standard Setting for the Missouri EOC Assessment English II

Round 1 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
E211	16	27	34
E231	18	24	32
E232	18	24	30
E121	17	25	33
E223	18	23	30
E233	18	25	33
E331	13	26	31
E123	14	29	33
E311	18	29	35
E221	16	22	26
E313	10	23	32
E113	24	30	33
E222	13	20	27
E332	16	22	31

Median Rating:	16.5	24.5	32.0
Average Rating:	16.36	24.93	31.43
Standard Deviation:	3.18	2.87	2.44
Lowest Rating:	10	20	26
Highest Rating:	24	30	35
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	14	14	14

Standard Setting for the Missouri EOC Assessment

Algebra

Round 2 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
A122	13	21	33
A321	14	25	33
A121	12	23	32
A222	14	23	30
A322	13	21	27
A211	13	20	33
A333	16	25	32
A213	11	21	31
A312	12	23	31
A112	14	21	29
A123	16	25	31
A233	9	21	30
A311	14	27	34
A313	18	22	27
A232	11	23	35

Median Rating:	13.0	23.0	31.0
Average Rating:	13.33	22.73	31.20
Standard Deviation:	2.18	1.95	2.26
Lowest Rating:	9	20	27
Highest Rating:	18	27	35
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	15	15	15

Standard Setting for the Missouri EOC Assessment Biology

Round 2 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
B232	22	34	43
B212	21	30	42
B321	14	27	39
B211	28	42	51
B322	22	36	47
B233	16	30	42
B332	18	34	47
B112	12	27	45
B131	25	35	46
B223	16	34	47
B122	18	39	50
B311	22	32	42
B213	18	31	46
B231	19	35	46
B111	26	38	51
B312	19	35	49
B113	15	28	43

Median Rating:	19.0	34.0	46.0
Average Rating:	19.47	33.35	45.65
Standard Deviation:	4.23	4.09	3.36
Lowest Rating:	12	27	39
Highest Rating:	28	42	51
Number of Items:	46	46	46
Points Possible:	55	55	55
Number of Raters:	17	17	17

Standard Setting for the Missouri EOC Assessment English II

Round 2 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
E331	12	26	31
E113	16	30	33
E121	17	26	33
E123	14	28	33
E211	15	25	33
E221	17	25	30
E222	13	21	28
E223	18	24	30
E232	17	23	29
E233	19	26	33
E311	16	27	34
E313	13	24	32
E332	18	24	33
E231	19	27	33

Median Rating:	16.5	25.5	33.0
Average Rating:	16.00	25.43	31.79
Standard Deviation:	2.20	2.16	1.78
Lowest Rating:	12	21	28
Highest Rating:	19	30	34
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	14	14	14

Standard Setting for the Missouri EOC Assessment

Algebra

Round 3 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
A312	13	23	31
A122	12	20	31
A211	13	21	32
A232	10	20	31
A112	13	21	29
A121	12	21	32
A322	13	22	30
A313	13	23	29
A321	14	24	32
A311	14	25	32
A233	12	21	30
A333	15	24	32
A123	14	24	31
A213	12	21	32
A222	14	23	30

Median Rating:	13.0	22.0	31.0
Average Rating:	12.93	22.20	30.93
Standard Deviation:	1.18	1.56	1.06
Lowest Rating:	10	20	29
Highest Rating:	15	25	32
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	15	15	15

Standard Setting for the Missouri EOC Assessment Biology

Round 3 Ratings Summary

Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
B223	18	35	46
B232	19	32	46
B322	20	35	46
B111	20	34	48
B213	20	32	45
B332	15	30	46
B211	11	28	40
B212	15	30	40
B321	14	27	40
B131	20	35	45
B312	18	33	47
B231	19	32	46
B112	12	27	46
B311	20	32	45
B233	15	30	40
B113	15	30	44
B122	14	29	43

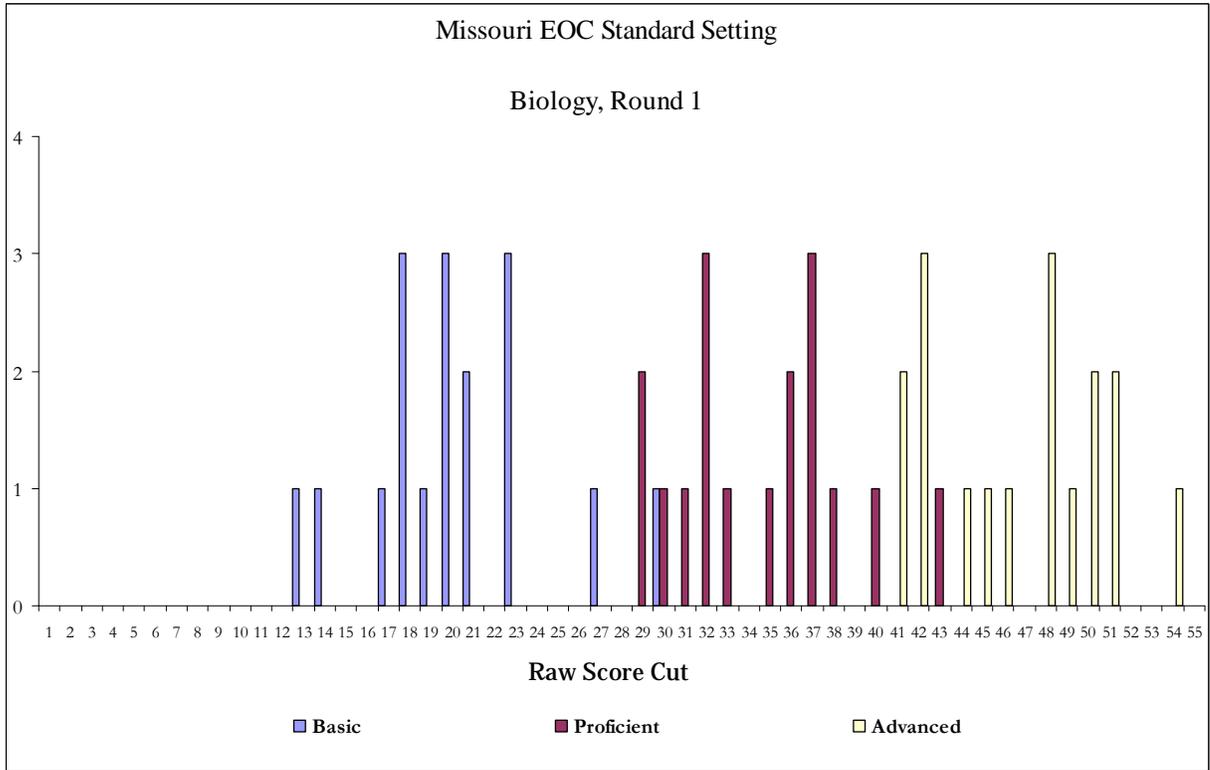
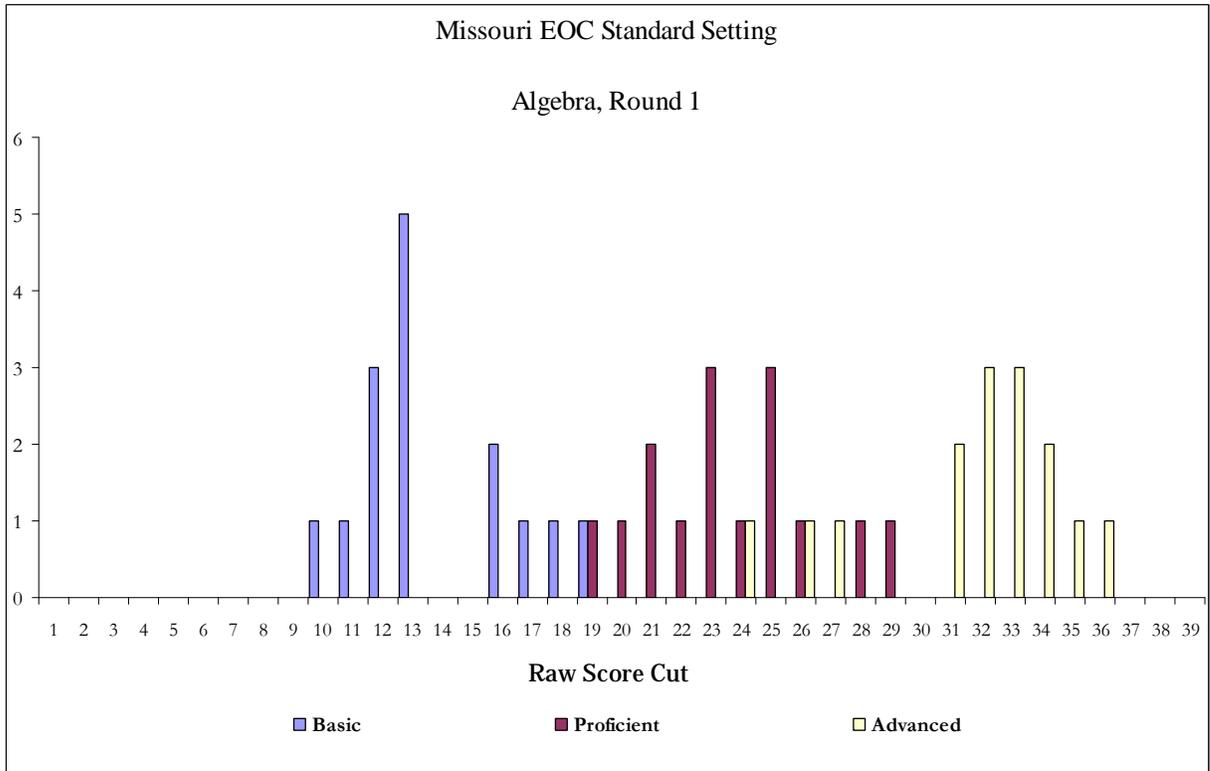
Median Rating:	18.0	32.0	45.0
Average Rating:	16.76	31.24	44.29
Standard Deviation:	2.96	2.58	2.61
Lowest Rating:	11	27	40
Highest Rating:	20	35	48
Number of Items:	46	46	46
Points Possible:	55	55	55
Number of Raters:	17	17	17

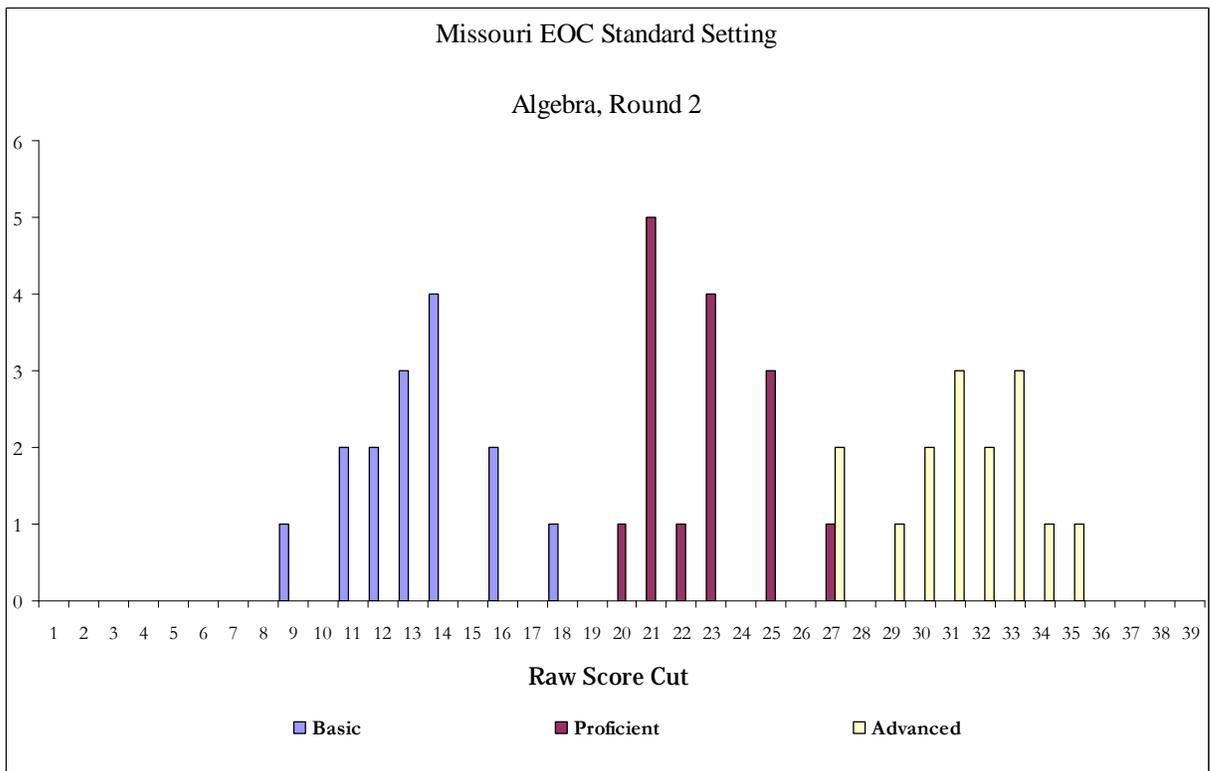
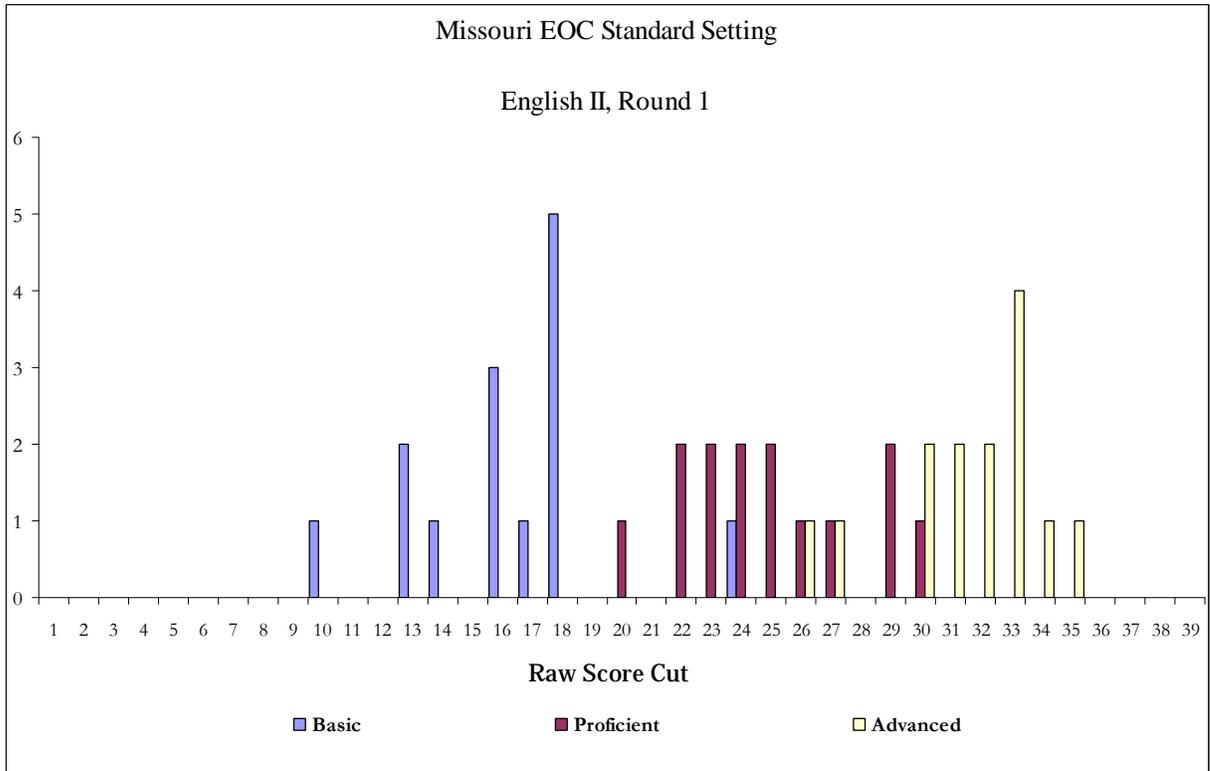
Standard Setting for the Missouri EOC Assessment English II

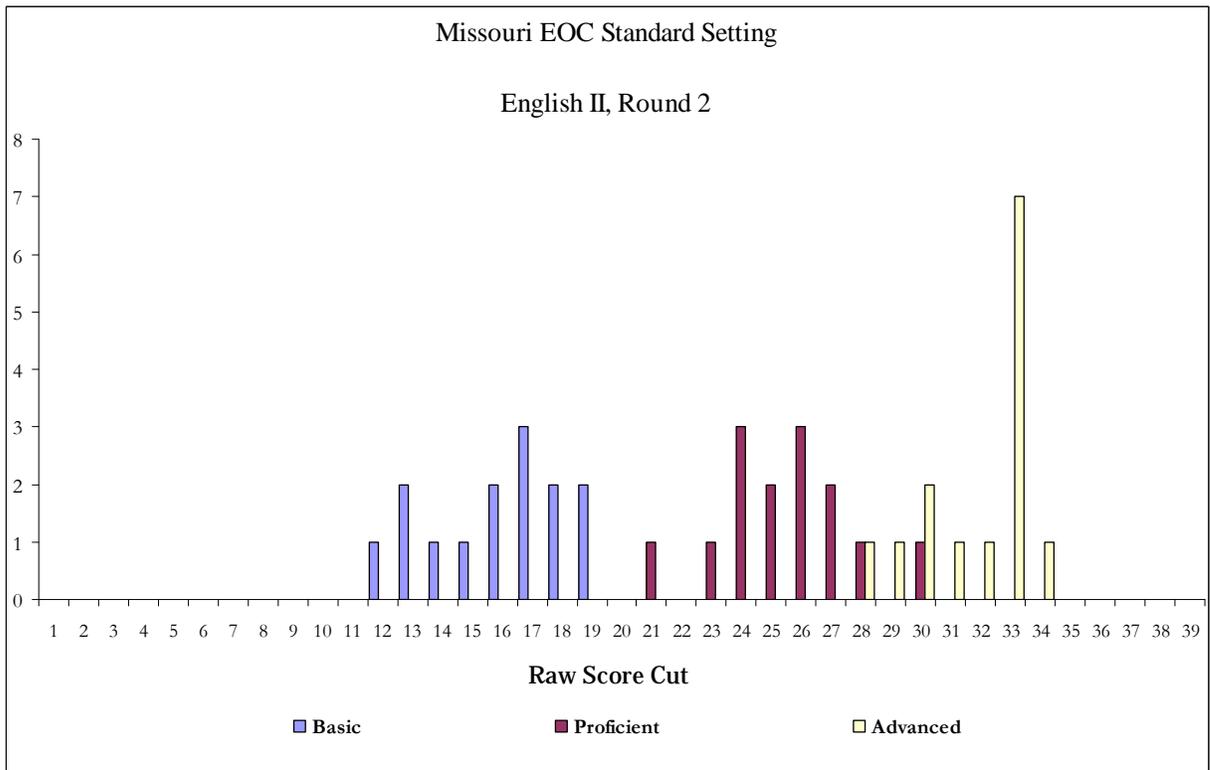
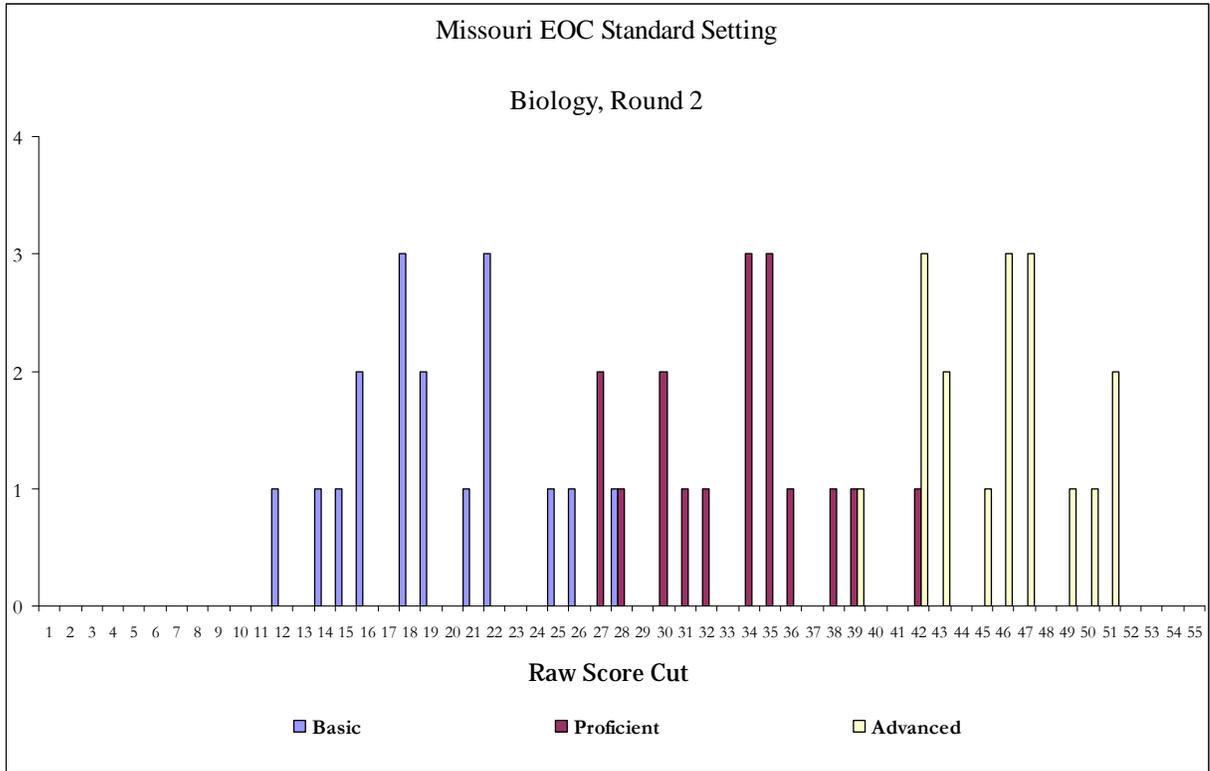
Round 3 Ratings Summary

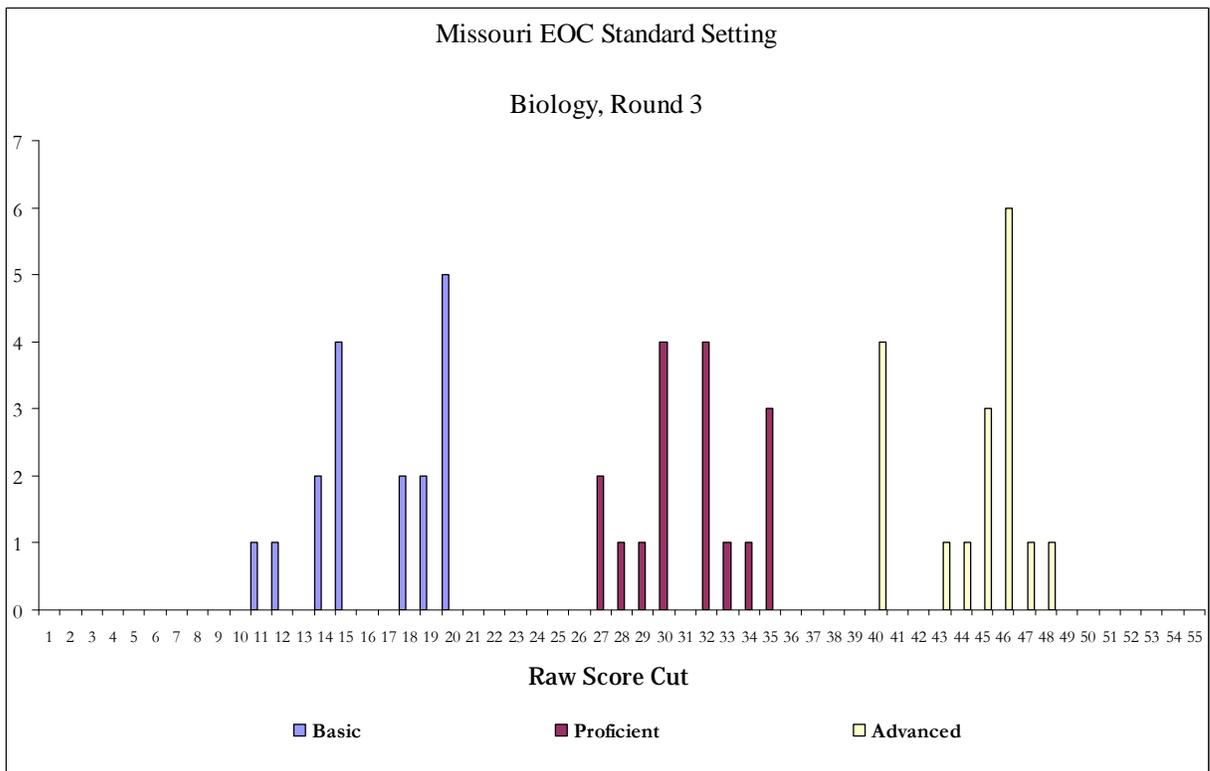
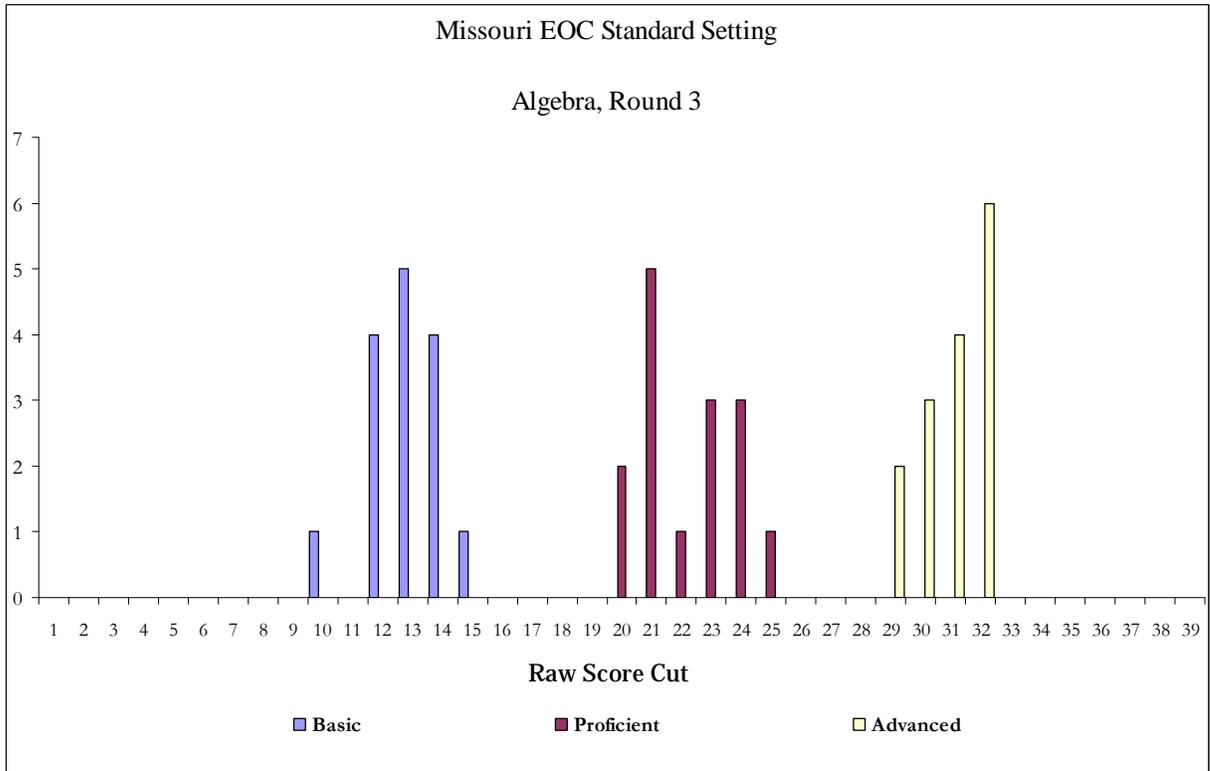
Rater	Individual Rater Cut Scores		
	Basic	Proficient	Advanced
E311	15	23	34
E232	15	24	33
E233	16	24	33
E222	14	23	31
E331	14	24	33
E223	16	24	33
E211	15	24	33
E121	15	24	34
E123	15	24	33
E221	16	24	33
E231	16	24	33
E113	16	24	33
E313	16	25	34
E332	16	24	33

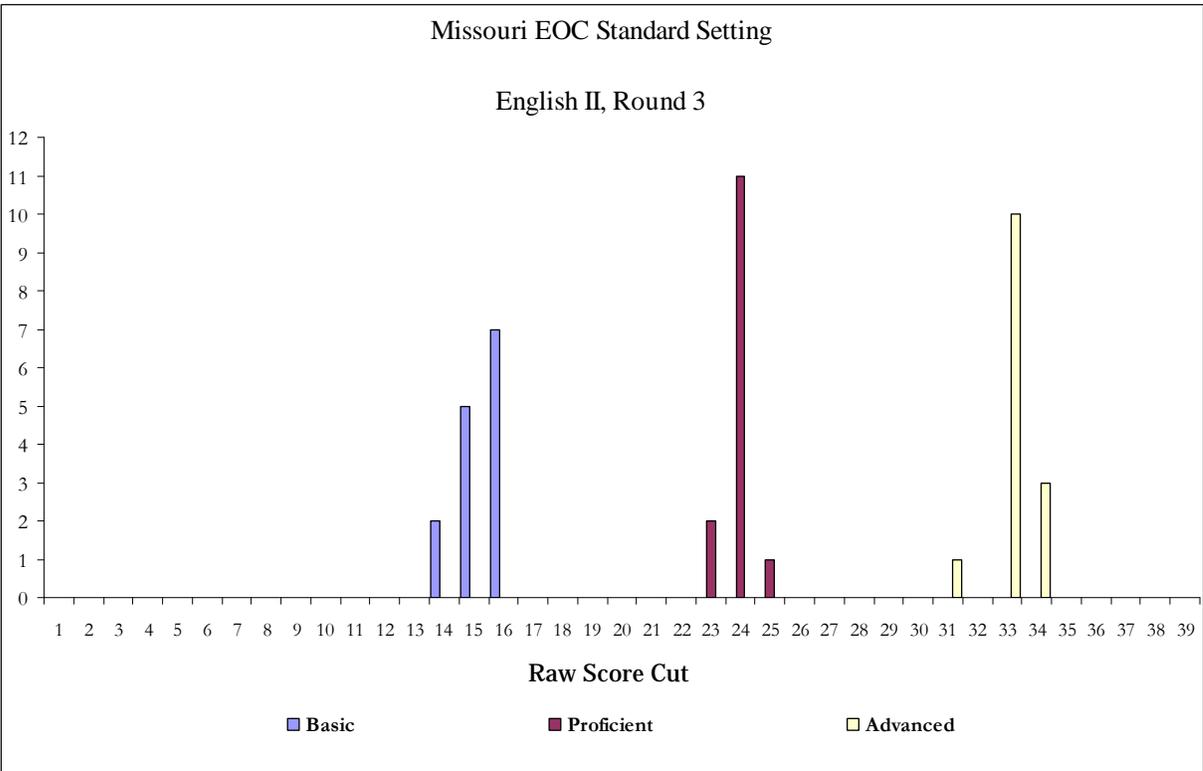
Median Rating:	15.5	24.0	33.0
Average Rating:	15.36	23.93	33.07
Standard Deviation:	0.72	0.46	0.70
Lowest Rating:	14	23	31
Highest Rating:	16	25	34
Number of Items:	36	36	36
Points Possible:	39	39	39
Number of Raters:	14	14	14

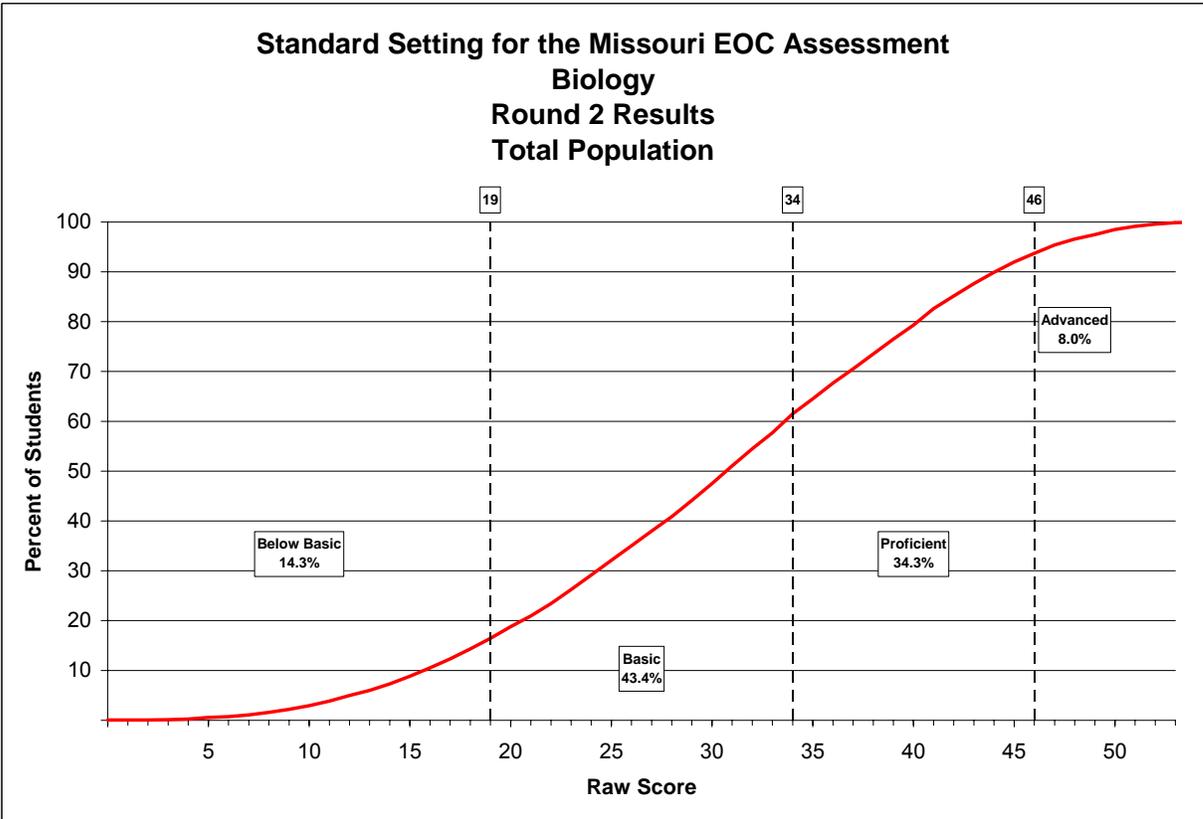
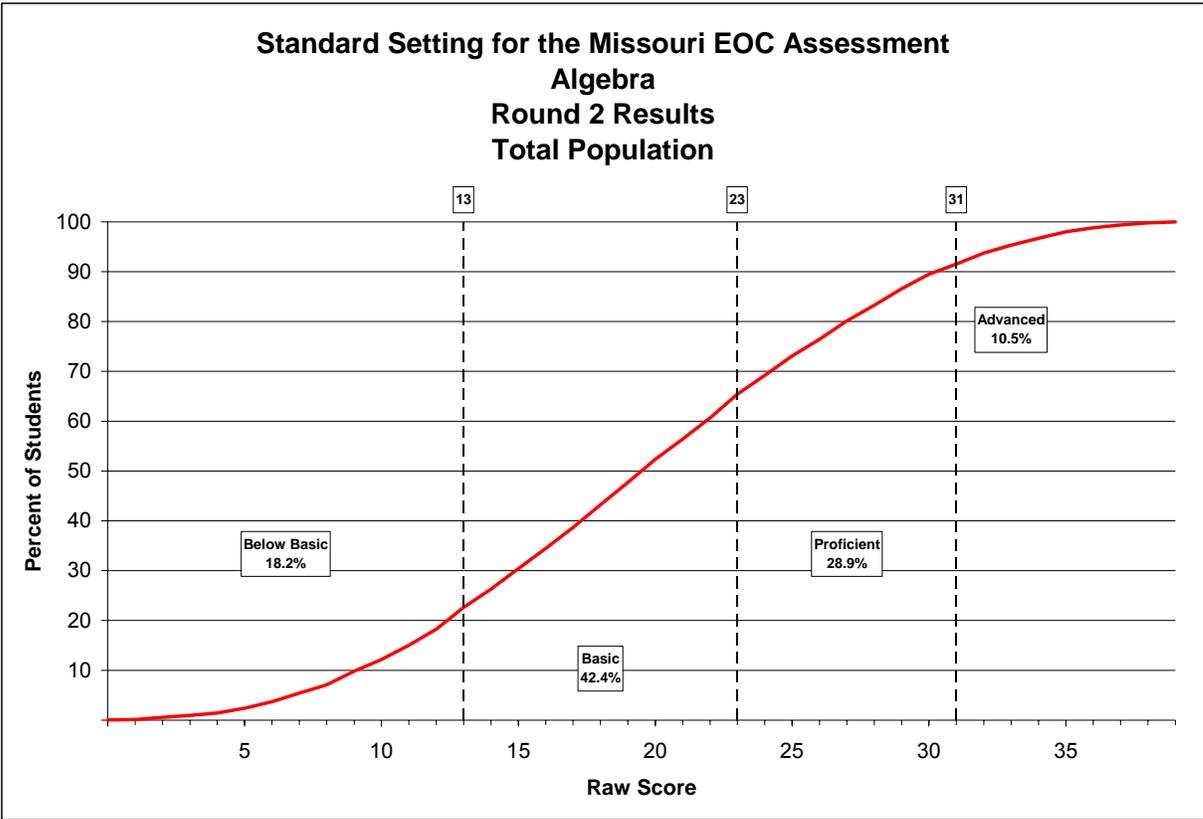




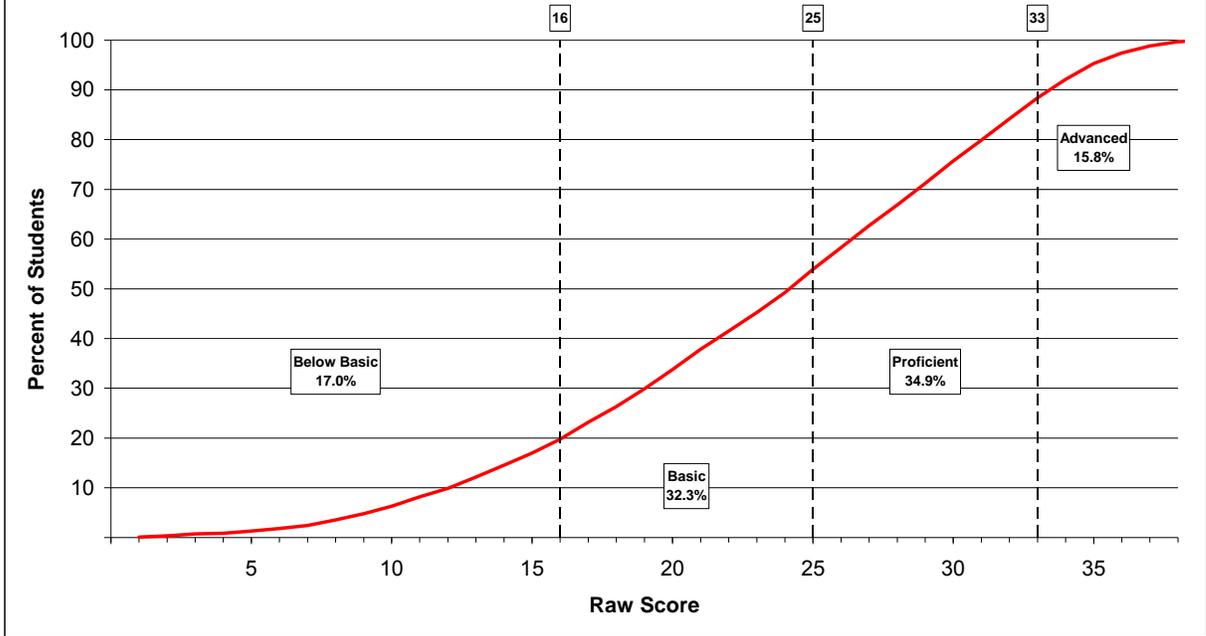


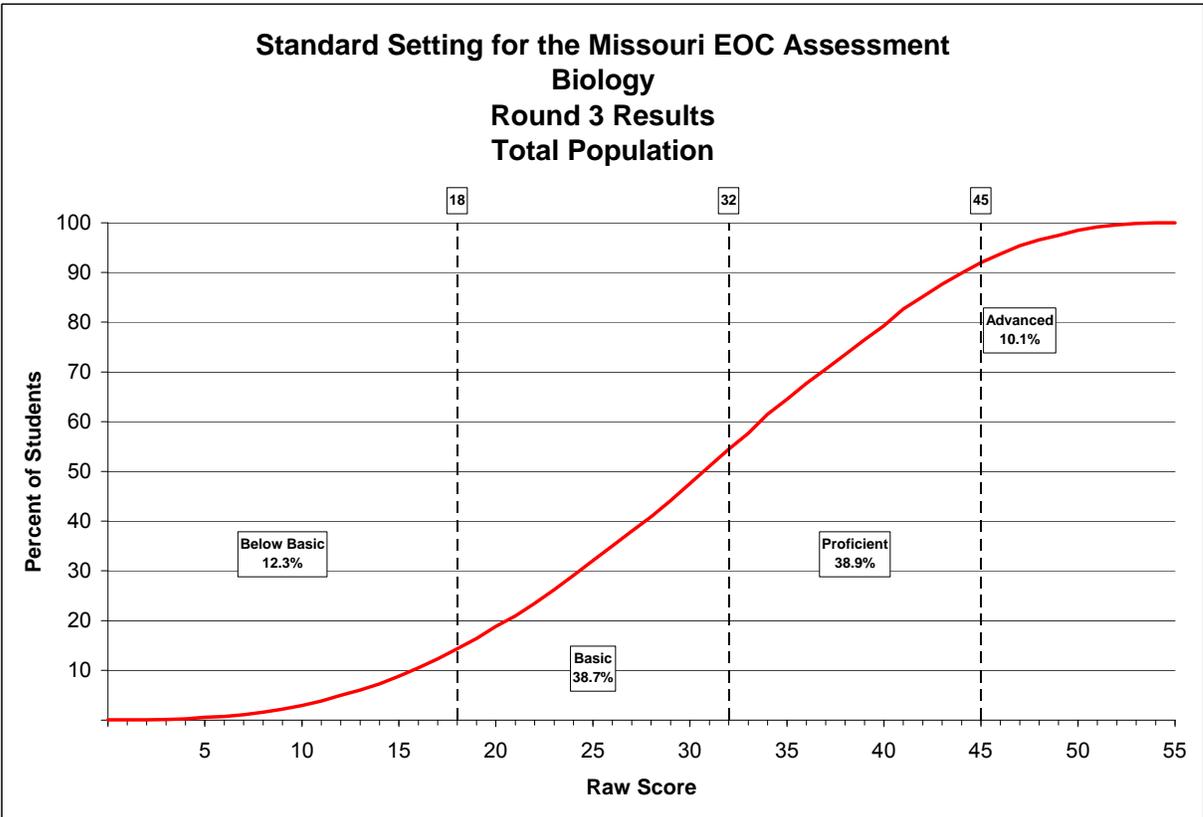
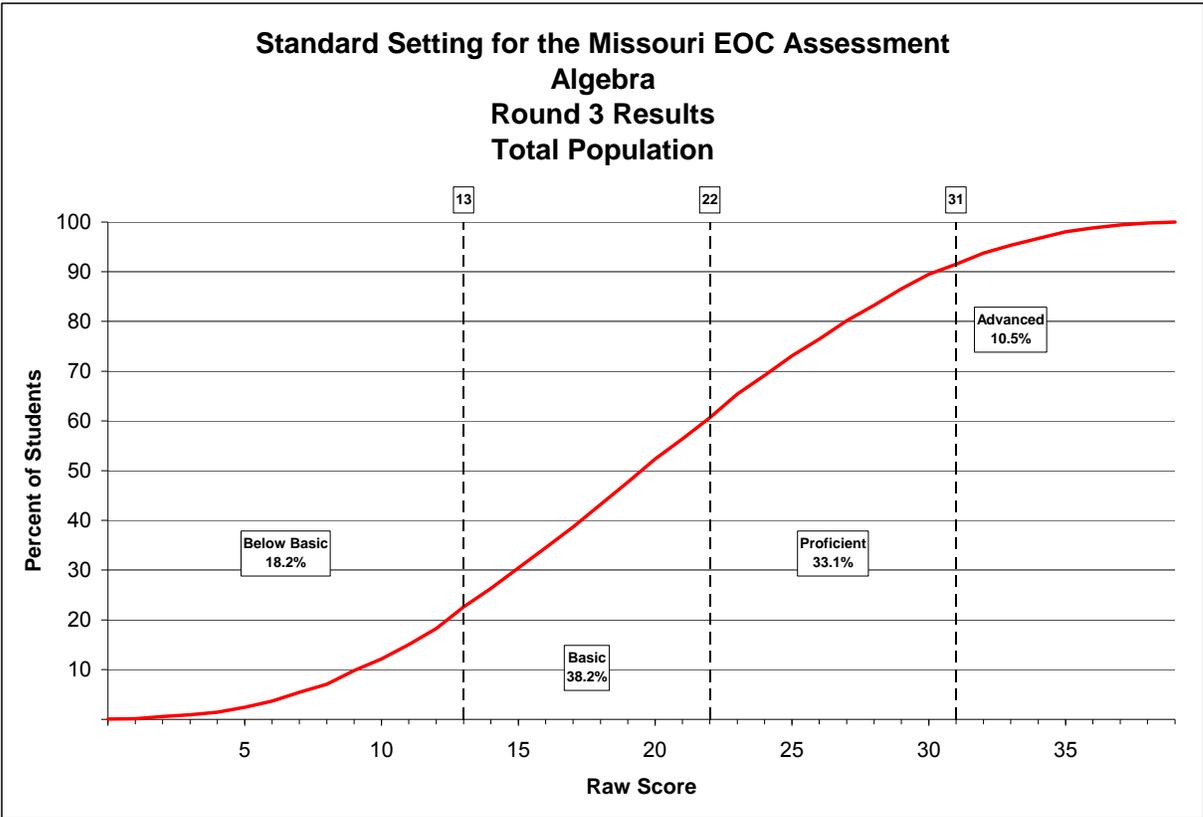




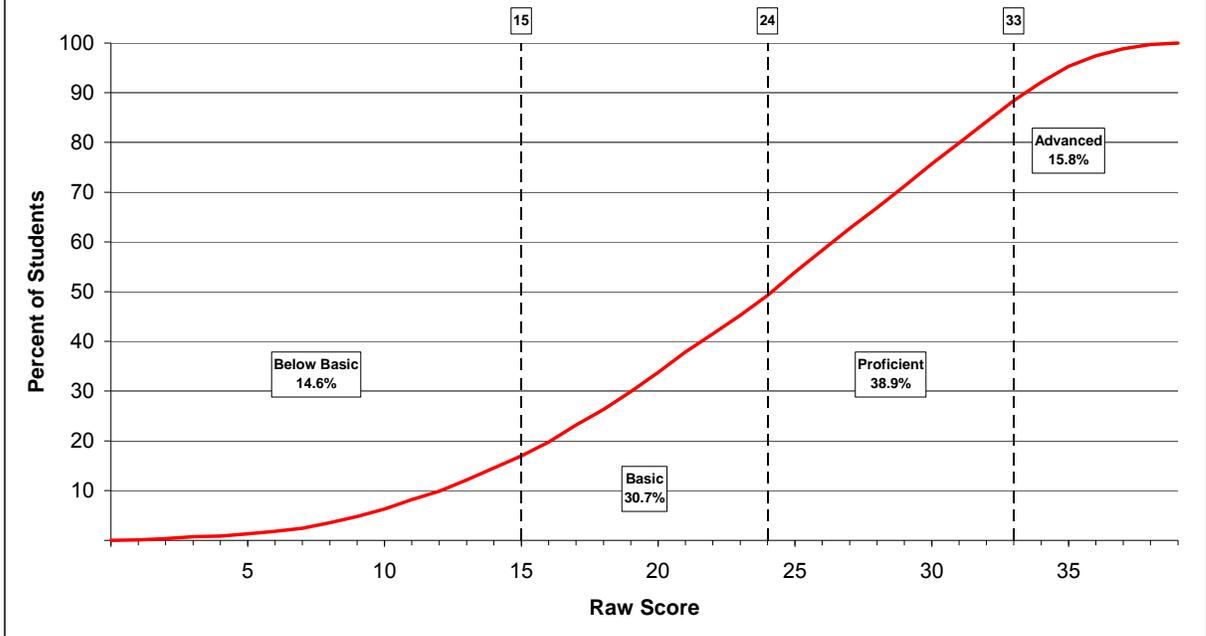


**Standard Setting for the Missouri EOC Assessment
English
Round 2 Results
Total Population**





**Standard Setting for the Missouri EOC Assessment
English
Round 3 Results
Total Population**



APPENDIX F
SESSION EVALUATION RESULTS

**Missouri End-of-Course Standard Setting
 EVALUATION FORM**

This form contains six sections, five of which ask for feedback on specific aspects of this standard-setting meeting. The last section asks for general reactions to the standard-setting meeting. Please fill out each of these sections as completely as possible in order to provide information that will help in the improvement of similar meetings in the future. Your identification number is used for analysis purposes only. Your responses to these questions will be held in strict confidence and will be analyzed in conjunction with those of the other judges who participated in this meeting.

Judge's I.D. (optional) _____

Section I: Opening Training Sessions

The following statements seek your judgments about the Opening Sessions for the Missouri End-of-Course standard setting meeting. Please circle the value on the scale under each statement that best characterizes your judgment.

1. The Opening Sessions provided adequate background information about the Missouri End-of-Course assessments.

5 4 3 2 1

Completely Somewhat Not at all

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	10	67%	5	36%	6	35%
4	3	20%	8	57%	11	65%
3	2	13%	1	7%	0	0%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.5	.74	4.3	.61	4.4	.49

* Percents may not sum to 100% due to rounding.

2. The topics covered in the Opening Sessions were appropriate to providing a context for my role in this meeting.

5	4	3	2	1
Completely	Somewhat			Not at all

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	9	60%	8	57%	7	41%
4	4	27%	4	29%	10	59%
3	2	13%	2	14%	0	0%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.5	.74	4.2	.76	4.4	.51

* Percents may not sum to 100% due to rounding.

3. The content of the Opening Sessions was:

5	4	3	2	1
Very useful	Somewhat useful			Not useful

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	8	53%	2	14%	3	18%
4	4	27%	11	79%	11	65%
3	3	20%	1	7%	3	18%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.3	.82	4.1	.47	4.0	.61

* Percents may not sum to 100% due to rounding.

4. The organization of the Opening Sessions was:

5
4
3
2
1

Very good
Acceptable
Very poor

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	8	53%	3	21%	2	12%
4	4	27%	9	64%	9	53%
3	1	7%	1	7%	6	35%
2	2	13%	1	7%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.2	1.08	4.0	.78	3.8	.66

* Percents may not sum to 100% due to rounding.

The following statements also seek your judgments about the Opening Sessions for the Missouri End-of-Course standard setting meeting. Please write your responses to each prompt on the lines provided.

5. Were there questions or concerns that were not answered or addressed in the Opening Sessions? Please indicate these below. (Use reverse side for additional space.)

6. What was most helpful about the Opening Sessions?

7. Please use the space below to provide additional comments concerning the adequacy, appropriateness, usefulness, or organization of the Opening Sessions.

Section II: Discussing *Proficient* Performance

The following statements seek your judgments about the discussions of *Proficient* performance as they relate to Missouri’s End-of-Course assessments. Please circle the value on the scale under each statement that best characterizes your judgment.

8. The activities used to help operationalize *Proficient* performance were:

5	4	3	2	1
Very useful	Somewhat useful		Not useful	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	8	53%	5	36%	4	24%
4	4	27%	7	50%	9	53%
3	3	20%	2	14%	4	24%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.3	.82	4.2	.70	4.0	.71

* Percents may not sum to 100% due to rounding.

9. By the end of the activity, my conception of *Proficient* performance was:

5	4	3	2	1
Very well formed	Moderately Well Formed		Not Well Formed	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	9	60%	8	57%	7	41%
4	5	33%	3	21%	8	47%
3	1	7%	3	21%	2	12%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.5	.64	4.4	.84	4.3	.69

* Percents may not sum to 100% due to rounding.

The following statement also seeks your judgments about the discussions of *Proficient* performance as they relate to Missouri’s End-of-Course assessments. Please write your responses to each prompt on the lines provided.

10. Please use the space below to provide additional comments concerning the activities around operationalizing *Proficient* performance for Missouri’s End-of-Course assessments.

Section III: Discussing *Basic* Performance

The following statements seek your judgments about the discussions of *Basic* performance as they relate to Missouri’s End-of-Course assessments. Please circle the value on the scale under each statement that best represents your judgment.

11. The activities used to help operationalize *Basic* performance were:

5	4	3	2	1
Very useful	Somewhat useful			Not useful

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	7	47%	5	36%	2	12%
4	6	40%	5	36%	10	59%
3	2	13%	4	29%	5	29%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.3	.72	4.1	.83	3.8	.64

* Percents may not sum to 100% due to rounding.

Section IV: Discussing *Advanced* Performance

The following statements seek your judgments about the discussions of *Advanced* performance as they relate to Missouri's End-of-Course assessments. Please circle the value on the scale under each statement that best represents your judgment.

14. The activities used to help operationalize *Advanced* performance were:

5	4	3	2	1
Very useful	Somewhat useful		Not useful	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (16)**	%
5	6	40%	6	43%	3	19%
4	6	40%	7	50%	9	56%
3	3	20%	1	7%	4	25%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.2	.77	4.4	.63	3.9	.68

* Percents may not sum to 100% due to rounding.

** One panelist did not respond to this question

15. By the end of this activity my conception of *Advanced* performance was:

5	4	3	2	1
Very well formed	Moderately Well Formed		Not Well Formed	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (16)**	%
5	8	53%	7	50%	4	25%
4	5	33%	7	50%	10	63%
3	2	13%	0	0%	2	13%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.4	.74	4.5	.52	4.1	.62

* Percents may not sum to 100% due to rounding.

** One panelist did not respond to this question

The following statement also seeks your judgments about the discussions of *Advanced* performance as they relate to Missouri’s End-of-Course assessments. Please write your responses to each prompt on the lines provided.

16. Please use the space below to provide additional comments concerning the activities around operationalizing *Advanced* performance for Missouri’s End-of-Course assessments.

Section V: Item Rating Activities

The following statements seek your judgments about the item rating activities as they relate to the Missouri End-of-Course standard setting meeting. Please circle the value on the scale under each statement that best represents your judgment.

17. Using the sample items to prepare for the actual item rating was:

5	4	3	2	1
Very helpful	Somewhat helpful		Not helpful	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	9	60%	6	43%	9	53%
4	4	27%	5	36%	4	24%
3	1	7%	1	7%	4	24%
2	1	7%	1	7%	0	0%
1	0	0%	1	7%	0	0%
Mean, Sd	4.4	.91	4.0	1.24	4.3	.85

* Percents may not sum to 100% due to rounding.

18. The explanation of the item data during the sample item portion of the training was:

5 4 3 2 1

Very helpful Somewhat helpful Not helpful

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	6	40%	8	57%	8	47%
4	7	47%	5	36%	3	18%
3	2	13%	1	7%	6	35%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.3	.70	4.5	.65	4.1	.93

* Percents may not sum to 100% due to rounding.

19. The Item Rating Form was:

5 4 3 2 1

Very easy to use Somewhat easy to use Not at all easy to use

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	8	53%	9	64%	9	53%
4	6	40%	5	36%	7	41%
3	0	0%	0	14%	1	6%
2	1	7%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.4	.83	4.6	.50	4.5	.62

* Percents may not sum to 100% due to rounding.

20. The information provided prior to each round of rating was:

5	4	3	2	1
Very useful	Somewhat useful		Not useful	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	10	67%	8	57%	8	47%
4	4	27%	5	36%	9	53%
3	1	7%	1	7%	0	0%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.6	.63	4.5	.65	4.5	.51

* Percents may not sum to 100% due to rounding.

21. My level of understanding of the tasks I was to accomplish for each round was:

5	4	3	2	1
Very good	Acceptable		Very poor	

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (14)	%	Count (17)	%
5	14	93%	7	50%	13	76%
4	0	0%	6	43%	2	12%
3	1	7%	1	7%	2	12%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.9	.52	4.4	.65	4.6	.70

* Percents may not sum to 100% due to rounding.

26. I feel that this standard-setting meeting provided me an opportunity to use my best judgment in selecting and revising estimates for a recommended standard of *Advanced* performance.

5 4 3 2 1

To a great extent To some extent Not at all

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (13)**	%	Count (17)	%
5	11	73%	9	69%	7	41%
4	2	13%	4	31%	9	53%
3	2	13%	0	14%	1	6%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.6	.74	4.7	.48	4.4	.61

* Percents may not sum to 100% due to rounding.

** One panelist did not respond to this question

27. I believe that this standard-setting meeting has produced recommended cutscores that are defensible.

5 4 3 2 1

To a great extent To some extent Not at all

	Algebra I*		English II*		Biology*	
	Count (15)	%	Count (13)**	%	Count (17)	%
5	9	60%	10	77%	10	59%
4	5	33%	1	8%	6	35%
3	1	7%	2	15%	1	6%
2	0	0%	0	0%	0	0%
1	0	0%	0	0%	0	0%
Mean, Sd	4.5	.64	4.6	.77	4.5	.62

* Percents may not sum to 100% due to rounding.

** One panelist did not respond to this question

APPENDIX G – DRAFT ALD’s

Missouri End-of-Course Assessment Achievement Level Descriptors – DRAFT

English II

Advanced: Students performing at the Advanced level on the Missouri-End-of-Course Assessment consistently demonstrate a thorough understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate higher level skills in reading processes, in responding to both fiction and nonfiction texts, and in writing effectively. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a range of strategies to comprehend and interpret a variety of texts, demonstrate a thorough understanding of literary forms, and consistently apply different strategies for accessing and summarizing information. They follow a writing process to compose well developed and organized papers for a variety of audiences and purposes while consistently and correctly applying the rules and conventions of Standard English.

Reading – In fiction and nonfiction, a student can

- Determine vocabulary meaning;
- Analyze the main idea and evaluate supporting details;
- Make sophisticated connections – compare, contrast, evaluate;
- Evaluate text features;
- Analyze complex figurative language and literary techniques;
- Draw insightful conclusions;
- Summarize and paraphrase ideas and information;
- Analyze story components and theme;
- Analyze literary elements;
- Evaluate reasoning, inferences, and sources;
- Evaluate proposed solutions;
- Evaluate accuracy and adequacy of evidence;
- Utilize organizational patterns;
- Evaluate the author’s point of view, viewpoint/perspective, and/ or purpose;
- Evaluate the author’s tone.

Writing

A student is able to write across genres a paper that

- Contains a strong controlling idea, along with an effective beginning, middle, and end;
- Uses paragraphing effectively;
- Progresses in a logical order and uses and uses cohesive devices effectively;
- Addresses the topic clearly and provides specific and relevant details, reasons, and examples;
- Uses precise, vivid language in sentences that are clear and varied in structure;
- Effectively uses writing techniques;
- Shows complexity, freshness of thought, and individual perspective;
- Shows an awareness of audience and purpose;
- Contains few errors in Standard English and spelling

A student is able to consistently and correctly apply the conventions of capitalization, punctuation, and standard usage.

Proficient: Students performing at the Proficient level on the Missouri-End-of-Course Assessment demonstrate an understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills in reading processes, in responding to both fiction and nonfiction texts, and in writing effectively. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They follow a writing process to compose well developed and organized papers for a variety of audiences and purposes while correctly applying the rules and conventions of Standard English.

Reading – In fiction and nonfiction, a student can

- Determine vocabulary meaning;
- Identify the main idea and supporting details;
- Make connections – compare, contrast, evaluate;
- Analyze text features;
- Analyze figurative language and literary techniques;
- Draw accurate conclusions;
- Summarize and paraphrase ideas and information;
- Analyze story components and theme;

- Analyze literary elements;
- Analyze reasoning, inferences, and sources;
- Analyze proposed solutions;
- Analyze evidence and use of information;
- Utilize organizational patterns;
- Analyze author’s point of view, viewpoint/perspective, and/or purpose;
- Analyze the author’s tone

Writing

- A student is able to write across genres a paper that
 - Contains a controlling idea, along with a clear beginning, middle, and end;
 - Uses paragraphing appropriately;
 - Progresses in a generally logical order and uses cohesive devices;
 - Addresses the topic and provides details, reasons, and examples;
 - Uses precise language in sentences that are clear in structure;
 - Uses writing techniques;
 - Shows some complexity, freshness of thought, and/or individual perspective;
 - Shows awareness of audience and purpose;
 - contains some errors in Standard English and spelling.
- A student is able to apply the conventions of capitalization, punctuation, and standard usage correctly.

Basic: Students performing at the Basic level on the Missouri-End-of-Course Assessment demonstrate an incomplete understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills inconsistently in reading processes, in responding to both fiction and nonfiction texts, and in writing. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information. They may follow a writing process to compose papers while inconsistently applying the rules of Standard English.

Reading – In fiction and nonfiction, a student can

- Determine vocabulary meaning;
- Identify the main idea and major details;
- Make simple connections – compare, contrast;
- Identify text features;
- Identify figurative language and literary techniques;
- Draw simple conclusions;
- Summarize and paraphrase basic ideas and information;
- Identify characters, plot, setting, and basic theme;
- Identify basic literary elements;
- Make simple inferences;
- Identify proposed solutions;
- Determine reliability of information;
- Identify organizational patterns
- Identify author’s purpose; and point of view

Writing

- A student is able to write across genres a paper that
 - Contains an idea, though it may lack focus, along with a beginning, middle, and end;
 - Shows evidence of paragraphing
 - Progresses generally in a somewhat logical order and may use cohesive devices;
 - Addresses the topic but relies on generalities rather than specifics;
 - May use imprecise language in sentences that are generally clear in structure;
 - May lack writing techniques;
 - May lack complexity, freshness of thought, and individual perspective,
 - Shows some awareness of audience and purpose
 - Contains errors in Standard English and spelling that may be distracting
- A student inconsistently applies the conventions of capitalization, punctuation, and standard usage

Below Basic: Students performing at the Below Basic level on the Missouri-End-of-Course Assessment demonstrate little understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills inconsistently and/or incorrectly in reading processes, in responding to both fiction and nonfiction texts, and in writing. Students scoring at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They may not follow a writing process to compose papers and/or incorrectly apply the rules and conventions of Standard English.

Reading – In fiction and nonfiction, a student can

- Determine vocabulary meaning;
- Identify the main idea and some details;
- Make simple connections;
- Identify simple text features;
- Identify figurative language;
- identify characters, plot and setting;
- determine literal meaning;
- identify point of view

Writing –

A student is able to write across genres a paper that

- May contain an unfocused idea and may lack a beginning, middle, and/or end;
- May lack evidence of paragraphing
- Does not progress in a logical order and lacks cohesion;
- May address the topic but lacks details;
- May use imprecise language in sentences that may be unclear in structure;
- Shows little evidence of writing techniques;
- Lacks complexity, freshness of thought, and individual perspective
- Shows little or no awareness of audience or purpose;
- Contains repeated errors in Standard English and spelling that are distracting.

A student incorrectly applies the conventions of capitalization, punctuation and standard usage.

Algebra I

Advanced: Students performing at the Advanced level on the Missouri Algebra I End-of-Course Assessment demonstrate a thorough understanding of the course level expectations for Algebra I. They demonstrate these skills in algebraic relationships. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a wide range of strategies to solve problems and demonstrate a thorough understanding of important mathematical content and concepts.

Algebraic Relationships – Using algebraic relationships, a student can

- Generalize patterns using explicitly or recursively defined functions
- Describe the effects of parameter changes on exponential growth/decay and quadratic functions including intercepts
- Use symbolic algebra to represent and solve problems that involve quadratic relationships including equations and inequalities
- Describe and use algebraic manipulations, including factoring and apply properties of exponents to simplify expressions
- Use and solve equivalent forms of quadratic equations
- Use and solve systems of linear inequalities with 2 variables
- Analyze quadratic functions by investigating rates of change, intercepts, and zeros

Proficient: Students performing at the Proficient level on the Missouri Algebra I End-of-Course Assessment demonstrate an understanding of most course level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to solve problems and demonstrate understanding of important mathematical content and concepts.

Number and Operations – Using numbers and operations, a student can

- Compare and order rational and irrational numbers, including finding their approximate locations on a number line
- Use real numbers and various models, drawings, etc. to solve problems

Algebraic Relationships – Using algebraic relationships, a student can

- Generalize patterns using explicitly or recursively defined linear functions
- Compare and contrast various forms of representations of patterns
- Compare the properties of linear and nonlinear functions
- Describe the effects of parameter changes on linear functions including intercepts
- Use symbolic algebra to represent problems that involve linear relationships including equations and inequalities
- Describe and use algebraic manipulations, including rules of integer exponents to simplify expressions
- Use and solve equivalent forms of absolute value and linear equations

- Use and solve systems of linear equations with 2 variables
- Identify quantitative relationships and determine type(s) of functions that might model the situation to solve the problem
- Analyze linear functions by investigating rates of change, intercepts, and zeros

Data and Probability – Using data and probability, a student can

- Determine the distributions of the outcome of an experiment
- Use appropriate graphical representations of data
- Given one-variable quantitative data, display the distribution and describe its shape
- Apply statistical methods to measures of center to solve problems
- Given a scatter plot, determine an equation for a line of best fit
- Make conjectures about possible relationships between 2 characteristics of a sample on the basis of scatter plots of the data

Basic: Students performing at the Basic level on the Missouri Algebra I End-of-Course Assessment demonstrate an incomplete understanding of the course level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to solve problems and demonstrate some understanding of important mathematical content and concepts.

Number and Operations – Using numbers and operations, a student can

- Compare and order rational numbers, including finding their approximate locations on a number line

Algebraic Relationships – Using algebraic relationships, a student can

- Generalize patterns using recursively defined single operation functions
- Compare the properties of linear functions
- Use symbolic algebra to solve problems that involve linear relationships including equations and inequalities
- Describe and use algebraic manipulations, including order of operations to simplify expressions
- Use equivalent forms of linear equations
- Use and solve systems of linear equations with 2 variables

Data and Probability – Using data and probability, a student can

- Formulate questions and collect data about a characteristic

Below Basic: Students performing at the Below Basic level on the Missouri Algebra I End-of-Course Assessment demonstrate a limited understanding of the course level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. Students scoring at the Below Basic level use very few strategies to solve problems and demonstrate a limited understanding of important mathematical content and concepts.

Number and Operations – Using numbers and operations, a student can

- Compare and order rational numbers

Algebraic Relationships – Using algebraic relationships, a student can

- Identify a function as linear or nonlinear
- Use symbolic algebra to solve problems that involve 2 step linear equations

Data and Probability – Using data and probability, a student can

- Identify the sample space of an experiment
- Select appropriate graphical representation of data
- Determine measures of center

Biology

Advanced: Students performing at the Advanced level on the Missouri End-of-Course Assessment consistently demonstrate a thorough understanding of the course level expectations for Biology. They demonstrate these skills in...

In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a range of strategies to...

Characteristics and Interactions of Living Organisms – A student can

- List of skills here
- Apply the law of conservation of mass and energy to a biochemical process
- Classify different ways to store energy and describe the transfer of energy in a food web
- Relate structure of organic compounds to their role in living systems
- Predict the movement of molecules across a selectively permeable membrane needed for a cell to maintain homeostasis
- Compare and contrast process used in movement of molecules across a semi permeable membrane--taking energy use into consideration
- Predict patterns of inheritance using Mendelian genetics, including sex-linked, in a monohybrid cross
- Relate the expression of genetic diseases in offspring to the genetic makeup of the parents

Changes in Ecosystems and Interactions of Organisms with Their Environments – A student can

- List of skills here
- Predict how populations within an ecosystem may change in response to changes in abiotic or biotic factors
- Predict the impact of changes within in food chain on energy use and flow
- Explain how natural selection is related to environmental changes or species adaptations
- Predict local and global effects on environmental resources when given a scenario describing a natural phenomena

Scientific Inquiry – A student can

- List of skills here

- Use quantitative data to calculate results
- Communicate information from investigations in data tables and appropriate graphical forms
- Identify and justify constants and variables in a repeatable scientific investigation
- Design a repeatable multi-step scientific investigation
- Gather evidence in qualitative and quantitative forms
- Determine how technological advances can affect real-world situations
-

Proficient: Students performing at the Proficient level on the Missouri End-of-Course Assessment demonstrate an understanding of the course level expectations for Biology. They demonstrate these skills in ...

In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to...

Characteristics and Interactions of Living Organisms – A student can

- List of skills here
- Explain(?) cell differentiation
- Explain the chemical and physical interactions between organelles as they carry out life processes
- Explain interrelationships between photosynthesis and respiration
- Determine factors that affect the processes of photosynthesis and respiration
- Explain how enzymes affect chemical reactions
- Explain homeostasis and its effect on cellular activities
- Identify the causes of mutations in DNA and explain the possible effects on the organism
- Describe transcription and translation in DNA]identify steps in the processes of mitosis and meiosis
- Explain the advantages and disadvantages of sexual and asexual reproduction within a population
- Describe diploid and haploid chromosome number
- Explain how daughter cells compare to the original parent cell (heredity information and number)
- Describe how new genetic combinations result in new heritable characteristics

- Explain how genotypes contribute to phenotypic variation within a species

Changes in Ecosystems and Interactions of Organisms with Their Environments –

A student can

- List of skills here
- Identify and explain limiting factors (abiotic and biotic) that may affect carrying capacity
- Explain the impact of a natural environmental event may have on the diversity of different species in an ecosystem
- Explain the impact of human activity may have on the diversity of different species in an ecosystem
- Describe energy flow in a food web
- Explain the natural and/or human factors that may lead to the extinction of a species
- Identify the evidence found in the fossil records to support relationship among species over time

Scientific Inquiry – A student can

- List of skills here
- Formulate a testable hypothesis
- Identify constants and variables in an investigation
- Determine scientific conclusion based on observations
- Use patterns to extrapolate data to form conclusions
- Identify factors required to make investigative results reliable
- Analyze quantitative data
- Design scientific investigations consisting of at least three steps
- Identify technology used to collect data to increase scientific knowledge
- Explain why accurate records and replications are essential for experimental creditability
- Calculate percent and ratios from sets of data
- Communicate procedures and results of investigations
- Explain the importance of peer review of scientific findings

Basic: Students performing at the Basic level on the Missouri End-of-Course Assessment demonstrate an incomplete understanding of the course level expectations for Biology. They demonstrate these skills inconsistently in...
In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to...

Characteristics and Interactions of Living Organisms – A student can

- List of skills here
- Identify and describe cell structures and functions
- Define organelles by their functions
- Describe the equation for photosynthesis and respiration
- Identify that the carbon that organisms use for growth comes from the carbon dioxide in the air (this probably needs a better word than growth, but this is a huge misconception that needs to be addressed)
- Explain how water is important to cells
- Use a punnet square to show a simple monohybrid cross

Changes in Ecosystems and Interactions of Organisms with Their Environments –

A student can

- List of skills here
- Describe interactions between organisms in a predator/prey relationship.
- Explain how interactions within an ecosystem maintain balance
- Define carrying capacity of a population within an ecosystem
- Describe how a natural environmental event impacts diversity in an ecosystem
- Describe how human caused change impacts the diversity in an ecosystem
- Construct a simple food web
- Define species in terms of the ability to mate and reproduce
- Describe similarities in DNA between species
- Describe how adaptations may have provided a population an advantage for survival
- Explain how environmental factors can be agents of natural selection

Scientific Inquiry – A student can

- List of skills here
- Select appropriate investigation methods
- Use data to formulate an explanation
- Calculate average/mean for sets of data
- Identify possible effects of errors in data collection and calculations
- Identify and describe how scientific explanations have changed over time or as a result of new evidence (strand 8?)

Below Basic: Students performing at the Below Basic level on the Missouri End-of-Course Assessment demonstrate little understanding of the course level expectations for Biology. They demonstrate these skills inconsistently and/or incorrectly in... Students scoring at the Below Basic level inconsistently use some strategies to...

Characteristics and Interactions of Living Organisms – A student can

- List of skills here
- Identify that all organisms progress through life cycles
- Identify that all organisms are made of cells
- Identify that water is important to cells (life?)
- Identify that all living organisms have DNA
- Identify that DNA carries inherited information

Changes in Ecosystems and Interactions of Organisms with Their Environments –
A student can

- List of skills here
- Use a model to show that populations interact in an ecosystem
- Identify examples of adaptations resulting from natural selection

Scientific Inquiry – A student can

- List of skills here
- Identify a valid conclusion in an experiment
- Use simple tools to measure length, mass, and volume
- Communicate basic information from an experiment
- Construct a simple graph of independent variable versus dependent variable from given data

- Identify how humans impact the environment (strand 8)
- Identify one impact of technology on an environmental factor (also strand 8)

APPENDIX H - FINAL ALD's

Missouri End-of-Course Assessment Achievement Level Descriptors English II

Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri English II End-of-Course Assessment consistently demonstrate a thorough understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate higher-level skills in reading processes, in responding to both fiction and nonfiction texts, and in writing effectively. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a thorough understanding of literary forms, and consistently apply different strategies for accessing and summarizing information. They follow a writing process to compose well-developed and organized papers for a variety of audiences and purposes, while consistently and correctly applying the rules and conventions of Standard English.

Raw Score Cut: 33-39

Scale Score Cut: 225-250

Proficient: Students performing at the Proficient level on the Missouri English II End-of-Course Assessment demonstrate an understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills in reading processes, in responding to both fiction and nonfiction texts, and in writing effectively. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They follow a writing process to compose well-developed and organized papers for a variety of audiences and purposes, while correctly applying the rules and conventions of Standard English.

Raw Score Cut: 24-32

Scale Score Cut: 200-224

Basic: Students performing at the Basic level on the Missouri English II End-of-Course Assessment demonstrate an incomplete understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills inconsistently in reading processes, in responding to both fiction and nonfiction texts, and in writing. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply few strategies for accessing and summarizing information. They may follow a writing process to compose papers while inconsistently applying the rules and conventions of Standard English.

Raw Score Cut: 15-23

Scale Score Cut: 180-199

Below Basic: Students performing at the Below Basic level on the Missouri English II End-of-Course Assessment demonstrate little understanding of the skills and processes identified in the Course Level Expectations for English II. They demonstrate these skills inconsistently and/or incorrectly in reading processes, in responding to both fiction and nonfiction texts, and in writing. Students scoring at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. They may not follow a writing process to compose papers and/or incorrectly apply the rules and conventions of Standard English.

Raw Score Cut: 0-14

Scale Score Cut: 100-179

Achievement Descriptors

Advanced

Raw Score Cut: 33-39

Scale Score Cut: 225-250

Reading — In both fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Analyze the main idea and evaluate supporting details
- ✓ Make sophisticated connections — compare, contrast, evaluate
- ✓ Evaluate text features
- ✓ Analyze complex figurative language and literary techniques
- ✓ Draw insightful conclusions
- ✓ Summarize and paraphrase complex ideas and information
- ✓ Analyze literary elements
- ✓ Evaluate reasoning, inferences, and sources
- ✓ Evaluate proposed solutions
- ✓ Evaluate accuracy and adequacy of evidence
- ✓ Evaluate organizational patterns
- ✓ Evaluate the author’s point of view, viewpoint/perspective, and purpose
- ✓ Evaluate the author’s tone

Writing — A student is able to write across genres a paper that

- ✓ Contains a strong controlling idea, along with an effective beginning, middle, and end
- ✓ Uses paragraphing effectively
- ✓ Progresses in a logical order and uses cohesive devices effectively
- ✓ Addresses the topic clearly and provides specific and relevant details, reasons, and examples
- ✓ Uses precise, vivid language in sentences that are clear and varied in structure
- ✓ Effectively uses writing techniques
- ✓ Shows complexity, freshness of thought, and individual perspective
- ✓ Shows a clear awareness of audience and purpose
- ✓ Contains few errors in Standard English and spelling
- A student is able to consistently and correctly apply the conventions of capitalization, punctuation, and standard usage.

Proficient

Raw Score Cut: 24-32

Scale Score Cut: 200-224

Reading — In both fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and supporting details
- ✓ Make connections — compare, contrast, analyze
- ✓ Analyze text features
- ✓ Analyze figurative language and literary techniques
- ✓ Draw accurate conclusions
- ✓ Summarize and paraphrase ideas and information
- ✓ Analyze literary elements
- ✓ Analyze reasoning, inferences, and sources
- ✓ Analyze proposed solutions
- ✓ Analyze evidence and use of information
- ✓ Analyze organizational patterns
- ✓ Analyze the author's point of view, viewpoint/perspective, and purpose
- ✓ Analyze the author's tone

Writing — A student is able to write across genres a paper that

- ✓ Contains a controlling idea, along with a clear beginning, middle, and end
 - ✓ Uses paragraphing appropriately
 - ✓ Progresses in a generally logical order and uses cohesive devices
 - ✓ Addresses the topic and provides details, reasons, and examples
 - ✓ Uses precise language in sentences that are clear and show some variety in structure
 - ✓ Uses writing techniques
 - ✓ Shows some complexity, freshness of thought, and/or individual perspective
 - ✓ Shows awareness of audience and purpose
 - ✓ Contains some errors in Standard English and spelling
- A student is able to apply the conventions of capitalization, punctuation, and standard usage correctly.

Basic

Raw Score Cut: 15-23

Scale Score Cut: 180-199

Reading — In fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and major details
- ✓ Make simple connections — compare, contrast
- ✓ Identify text features
- ✓ Identify figurative language and literary techniques
- ✓ Draw basic/simple conclusions
- ✓ Summarize and paraphrase basic ideas and information
- ✓ Identify basic literary elements
- ✓ Make simple inferences
- ✓ Identify proposed solutions
- ✓ Determine reliability of information
- ✓ Identify organizational patterns
- ✓ Identify author's purpose and point of view
- ✓ Identify author's tone

Writing — A student is able to write across genres a paper that

- ✓ Contains an idea, though it may lack focus, along with a beginning, middle, and end
 - ✓ Shows evidence of paragraphing
 - ✓ Progresses generally in a somewhat logical order and may use cohesive devices
 - ✓ Addresses the topic but relies on generalities rather than specifics
 - ✓ May use imprecise language in sentences that are generally clear in structure
 - ✓ May lack writing techniques
 - ✓ May lack complexity, freshness of thought, and individual perspective
 - ✓ Shows some awareness of audience and purpose
 - ✓ Contains errors in Standard English and spelling that may be distracting
- A student inconsistently applies the conventions of capitalization, punctuation, and standard usage

Below Basic

Raw Score Cut: 0-14

Scale Score Cut: 100-179

Reading — In fiction and nonfiction, a student can

- ✓ Determine vocabulary meaning
- ✓ Identify the main idea and some details
- ✓ Make simple connections
- ✓ Identify simple text features
- ✓ Identify figurative language
- ✓ Identify characters, plot, and setting
- ✓ Determine literal meaning
- ✓ Identify point of view

Writing — A student is able to write across genres a paper that

- ✓ May contain an unfocused idea and may lack a beginning, middle, and/or end
 - ✓ May lack evidence of paragraphing
 - ✓ Does not progress in a logical order and lacks cohesion
 - ✓ May address the topic but lacks details
 - ✓ May use imprecise language in sentences that may be unclear in structure
 - ✓ Shows little evidence of writing techniques
 - ✓ Lacks complexity, freshness of thought, and individual perspective
 - ✓ Shows little or no awareness of audience or purpose
 - ✓ Contains repeated errors in Standard English and spelling that are distracting
- A student incorrectly applies the conventions of capitalization, punctuation, and standard usage.

Missouri End-of-Course Assessment Achievement Level Descriptors Algebra I

Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri Algebra I End-of-Course Assessment demonstrate a thorough understanding of the course-level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a wide range of strategies to solve problems and demonstrate a thorough understanding of important mathematical content and concepts.

Raw Score Cut: 31-39

Scale Score Cut: 225-250

Proficient: Students performing at the Proficient level on the Missouri Algebra I End-of-Course Assessment demonstrate an understanding of most course-level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies to solve problems and demonstrate an understanding of important mathematical content and concepts.

Raw Score Cut: 22-30

Scale Score Cut: 200-224

Basic: Students performing at the Basic level on the Missouri Algebra I End-of-Course Assessment demonstrate some understanding of the course-level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies to solve problems and demonstrate some understanding of important mathematical content and concepts.

Raw Score Cut: 13-21

Scale Score Cut: 177-199

Below Basic: Students performing at the Below Basic level on the Missouri Algebra I End-of-Course Assessment demonstrate a limited understanding of the course-level expectations for Algebra I. They demonstrate these skills in number and operations, algebraic relationships, and data and probability. In addition, students scoring at the Below Basic level use very few strategies to solve problems and demonstrate a limited understanding of important mathematical content and concepts.

Raw Score Cut: 0-12

Scale Score Cut: 100-176

Achievement Descriptors

Advanced

Raw Score Cut: 31-39

Scale Score Cut: 225-250

Algebraic Relationships — Using algebraic relationships, a student can

- ✓ Generalize patterns using explicitly or recursively defined functions
- ✓ Describe the effects of parameter changes on exponential growth/decay and quadratic functions, including intercepts
- ✓ Use symbolic algebra to represent and solve problems that involve quadratic relationships, including equations and inequalities
- ✓ Describe and use algebraic manipulations, including factoring, and apply properties of exponents to simplify expressions
- ✓ Use and solve equivalent forms of quadratic and absolute value equations
- ✓ Identify quantitative relationships and determine type(s) of functions that might model the situation to solve a problem, including quadratic and exponential growth/decay
- ✓ Use and solve systems of linear inequalities with two variables
- ✓ Analyze quadratic functions by investigating rates of change, intercepts, and zeros

Proficient

Raw Score Cut: 22-30

Scale Score Cut: 200-224

Number and Operations — Using numbers and operations, a student can

- ✓ Compare and order rational and irrational numbers, including finding their approximate locations on a number line
- ✓ Use real numbers and various models, drawings, etc. to solve problems

Algebraic Relationships — Using algebraic relationships, a student can

- ✓ Generalize patterns using explicitly or recursively defined linear functions
- ✓ Compare and contrast various forms of representations of patterns
- ✓ Compare and contrast the properties of linear and nonlinear functions
- ✓ Describe the effects of parameter changes on linear functions, including intercepts
- ✓ Use symbolic algebra to represent problems that involve linear relationships, including equations and inequalities
- ✓ Describe and use algebraic manipulations, including rules of integer exponents, to simplify expressions
- ✓ Use and solve equivalent forms of absolute value and linear equations
- ✓ Use and solve systems of linear equations with two variables
- ✓ Identify quantitative relationships that can be modeled by linear functions to solve a problem
- ✓ Analyze linear functions by investigating rates of change, intercepts, and zeros

Data and Probability — Using data and probability, a student can

- ✓ Use appropriate graphical representations of data
- ✓ Given one-variable quantitative data, display the distribution and describe its shape
- ✓ Apply statistical methods to measures of center to solve problems
- ✓ Given a scatter plot, determine an equation for a line of best fit
- ✓ Make conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data

Basic

Raw Score Cut: 13-21

Scale Score Cut: 177-199

Number and Operations — Using numbers and operations, a student can

- ✓ Compare and order rational numbers, including finding their approximate locations on a number line

Algebraic Relationships Using algebraic relationships, a student can

- ✓ Generalize patterns using recursively defined single-operation functions
- ✓ Compare the properties of linear functions
- ✓ Use symbolic algebra to solve problems that involve linear relationships, including equations and inequalities
- ✓ Describe and use algebraic manipulations, including order of operations, to simplify expressions
- ✓ Use equivalent forms of linear equations

Data and Probability — Using data and probability, a student can

- ✓ Determine the sample space of an experiment
- ✓ Formulate questions about a characteristic which include sample spaces and distributions

Below Basic

Raw Score Cut: 0-12

Scale Score Cut: 100-176

Number and Operations — Using numbers and operations, a student can

- ✓ Compare and order rational numbers

Algebraic Relationships — Using algebraic relationships, a student can

- ✓ Identify a function as linear or nonlinear
- ✓ Use symbolic algebra to solve problems that involve two-step linear equations

Data and Probability — Using data and probability, a student can

- ✓ Identify the sample space of an experiment
- ✓ Select appropriate graphical representations of data
- ✓ Determine measures of center

Missouri End-of-Course Assessment Achievement Level Descriptors Biology

Achievement Levels

Advanced: Students performing at the Advanced level on the Missouri End-of-Course Assessment demonstrate a thorough understanding of the course-level expectations for Biology. They demonstrate these skills in addition to understanding and applying the skills at the Proficient level, students scoring at the Advanced level use a range of strategies.

Raw Score Cut: 45-55

Scale Score Cut: 225-250

Proficient: Students performing at the Proficient level on the Missouri End-of-Course Assessment demonstrate an understanding of the course-level expectations for Biology. They demonstrate these skills in addition to understanding and applying the skills at the Basic level, students scoring at the Proficient level use a range of strategies.

Raw Score Cut: 32-44

Scale Score Cut: 200-224

Basic: Students performing at the Basic level on the Missouri End-of-Course Assessment demonstrate a partial understanding of the course-level expectations for Biology. They demonstrate these skills in addition to understanding and applying the skills at the Below Basic level, students scoring at the Basic level use some strategies.

Raw Score Cut: 18-31

Scale Score Cut: 177-199

Below Basic: Students performing at the Below Basic level on the Missouri End-of-Course Assessment demonstrate a limited understanding of the course-level expectations for Biology. They demonstrate these skills in addition to students scoring at the Below Basic level use very few strategies and demonstrate a limited understanding of important Biological content and concepts.

Raw Score Cut: 0-17

Scale Score Cut: 100-176

Achievement Descriptors

Advanced

Raw Score Cut: 45-55

Scale Score Cut: 225-250

Characteristics and Interactions of Living Organisms — A student can

- ✓ Predict the movement of molecules across a selectively permeable membrane needed for a cell to maintain homeostasis
- ✓ Compare and contrast process used in movement of molecules across a semi-permeable membrane, taking energy use into consideration
- ✓ Predict patterns of inheritance, using Mendelian genetics, in a monohybrid cross

Changes in Ecosystems and Interactions of Organisms with Their Environments — A student can

- ✓ Predict how populations within an ecosystem may change in response to changes in abiotic or biotic factors
- ✓ Predict the impact of changes within in a food chain based on energy use and flow
- ✓ Explain how natural selection is related to environmental changes or species adaptations

Scientific Inquiry — A student can

- ✓ Use quantitative data to calculate results
- ✓ Communicate information from investigations in data tables and appropriate graphical forms
- ✓ Identify and justify constants and variables in a repeatable scientific investigation
- ✓ Design a repeatable multi-step scientific investigation
- ✓ Recognize it is not always possible, for practical or ethical reasons, to control some conditions (e.g., when sampling or testing humans, when observing animal behaviors in nature)

Proficient

Raw Score Cut: 32-44

Scale Score Cut: 200-224

Characteristics and Interactions of Living Organisms — A student can

- ✓ Identify cell differentiation
- ✓ Explain the chemical and physical interactions between organelles as they carry out life processes
- ✓ Explain interrelationships between photosynthesis and respiration (reactant and product only)
- ✓ Determine factors that affect the processes of photosynthesis and respiration (excludes light intensity)
- ✓ Identify homeostasis and its effect on cellular activities
- ✓ Identify the causes of mutations in DNA and explain the possible effects on the organism
- ✓ Describe the chemical and structural properties of DNA
- ✓ Recognize that DNA codes for proteins, which are expressed as the heritable characteristics of an organism
- ✓ Compare the processes of mitosis and meiosis (excludes identification of steps)
- ✓ Explain the advantages and disadvantages of sexual and asexual reproduction within a population
- ✓ Identify diploid and haploid chromosome number
- ✓ Explain how daughter cells compare to the original parent cell
- ✓ Explain how genotypes contribute to phenotypic variation within a species

Changes in Ecosystems and Interactions of Organisms with Their Environments — A student can

- ✓ Identify and explain limiting factors (abiotic and biotic) that may affect carrying capacity
- ✓ Describe how a natural environmental event impacts diversity in an ecosystem
- ✓ Explain the impact human activity may have on the diversity of different species in an ecosystem
- ✓ Predict the energy flow in a food web
- ✓ Explain the natural and/or human factors that may lead to the extinction of a species
- ✓ Given a scenario describing an environmental change, hypothesize why a given species was unable to survive

Scientific Inquiry — A student can

- ✓ Formulate a testable hypothesis
- ✓ Identify constants and variables in an investigation
- ✓ Determine the appropriate tools and techniques to collect, analyze, and interpret data
- ✓ Determine scientific conclusion based on observations
- ✓ Identify factors required to make investigative results reliable
- ✓ Analyze quantitative data
- ✓ Design scientific investigations consisting of at least three steps
- ✓ Explain why accurate records and replications are essential for experimental credibility (includes peer review)
- ✓ Communicate procedures and results of investigations

Basic

Raw Score Cut: 18-31

Scale Score Cut: 177-199

Characteristics and Interactions of Living Organisms — A student can

- ✓ Identify and describe cell structures and functions
- ✓ Define organelles by their functions
- ✓ Explain how water is important to cells
- ✓ Use a Punnett square to show a simple monohybrid cross

Changes in Ecosystems and Interactions of Organisms with Their Environments — A student can

- ✓ Explain how interactions within an ecosystem maintain balance
- ✓ Explain the nature of interactions between organisms in predator/prey relationships and different symbiotic relationships (i.e., mutualism, commensalisms, parasitism)
- ✓ Define carrying capacity of a population within an ecosystem
- ✓ Identify how adaptations may have provided a population an advantage for survival
- ✓ Identify the impact a natural environmental event may have on the diversity of different species in an ecosystem
- ✓ Explain how environmental factors can be agents of natural selection
- ✓ Explain the importance of reproduction to the survival of a species

Scientific Inquiry — A student can

- ✓ Select appropriate investigation methods (techniques only)
- ✓ Use data to formulate an explanation
- ✓ Calculate average/mean for sets of data
- ✓ Identify possible effects of errors in data collection and calculations

Below Basic

Raw Score Cut: 0-17

Scale Score Cut: 100-176

Characteristics and Interactions of Living Organisms — A student can

- ✓ Identify that all organisms progress through life cycles
- ✓ Identify that all organisms are made of cells
- ✓ Identify that water is important to cells
- ✓ Identify that all living organisms have DNA
- ✓ Identify that DNA carries inherited information

Changes in Ecosystems and Interactions of Organisms with Their Environments — A student can

- ✓ Describe interactions between organisms in a predator/prey relationship
- ✓ Use a model to show that populations interact in an ecosystem
- ✓ Identify examples of adaptations resulting from natural selection

Scientific Inquiry — A student can

- ✓ Identify a valid conclusion in an experiment
- ✓ Use simple tools to measure length, mass, and volume
- ✓ Communicate basic information from an experiment
- ✓ Construct a simple graph of independent variable versus dependent variable from given data

APPENDIX I – POWER POINT PRESENTATION

Standard Setting Overview

Missouri
Algebra I, Biology & English II
EOC Assessments

November, 2008

Setting Performance Standards

- *Who's Involved?* State and contractor roles
- *Why Questar?* Who's facilitating? Our role
- *Why you?* Individually & collectively:
You are the *experts*.
You *represent* various audiences.

Session Outline - Day 1

- I. What is "standard setting" - in general and for the EOC Assessments?
- II. Describe the performance "categories"; refine achievement level descriptors (ALDs)
- III. Review & discuss the actual EOC test;
- IV. The "Angoff procedure" – how it works

Setting Performance Standards

- *Who's Involved?* State and contractor roles
- *Why Questar?* Who's facilitating? Our role
- *Why you?* Individually & collectively:
You are the *experts*.
You *represent* various audiences.
You are *judges*, not psychometricians.
You are *advisors*, not policy makers

Setting Performance Standards

- *Who's Involved?* State and contractor roles
- *Why Questar?* Who's facilitating? Our role:
Not content experts, but facilitators

Groundrules

NO DISCUSSIONS about the *EOC* program or its underlying content standards

OR

Groundrules

NO DISCUSSIONS about the EOC program
OR

- why to set standards
- the philosophy of educational assessment
- why these particular tasks/assessments
- why a particular procedure is being used

What IS Standard Setting?

- another frame of reference to interpret test scores ("how good is good"?)
- a routine, daily activity

Groundrules

NO DISCUSSIONS about the EOC program
OR

- why to set standards
- the philosophy of educational assessment
- why these particular tasks/assessments
- why a particular procedure is being used

Confidentiality of all materials & discussions.

What IS Standard Setting?

- another frame of reference to interpret test scores ("how good is good"?)
- a routine, daily activity
- true "criterion-referencing"

Groundrules

NO DISCUSSIONS about the EOC program
OR

- why to set standards
- the philosophy of educational assessment
- why these particular tasks/assessments
- the fairness of assessing special students
- why a particular procedure is being used

Confidentiality of all materials & discussions.

All discussions should be **as a group**.

What IS Standard Setting?

- another frame of reference to interpret test scores ("how good is good"?)
- a routine, daily activity
- true "criterion-referencing"
- a semi-quantitative, semi-standardized, socio-political judgment process

What IS Standard Setting?

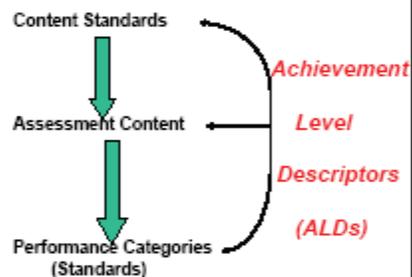
- just a frame of reference for test scores
- a routine, daily activity
- true “criterion-referencing”
- essentially, a judgment process

• **NOT** “science”!

Advice on Setting Standards

- Set demanding, but *attainable* standards

Critical Elements of An Assessment System



Advice on Setting Standards

- Set demanding, but *attainable* standards
- What “*should be*” probably shouldn’t disregard what “*is*”

4 Keys to Being a Great Judge:

1. **Judgments** vs. Data
2. “**Should**” vs. “**Will**”
3. Consider **ALL Missouri** students who took this EOC assessment
4. Think of **threshold** students, not *all* who are Proficient

Advice on Setting Standards

- Set demanding, but *attainable* standards
- What “*should be*” probably shouldn’t disregard what “*is*”
- Focus on **concrete** behaviors, skills, responses

Advice on Setting Standards

- Set demanding, but *attainable* standards
- What “*should be*” probably shouldn’t disregard what “*is*”
- Focus on *concrete* behaviors, skills, responses
- (for *M-C items*) Item difficulty resides in the answer choices, not the item “stem”

Missouri EOC Achievement-Level Setting

English II
End-of-Course Assessment
November 3—5, 2008

Advice on Setting Standards

- Set demanding, but *attainable* standards
- Don’t disregard what “*is*”
- Focus on the *concrete*
- (for *M-C items*) Item difficulty resides in the answer choices, not the item “stem”
- (for *constructed-response items*) Judge the *response quality*, not the task difficulty.

“Housekeeping”

- Security Forms
- Judges’ Numbers
- Break and lunch locations
- General agenda for the day

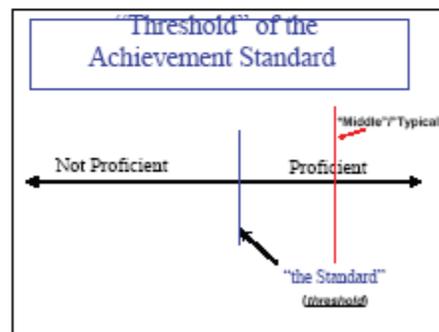
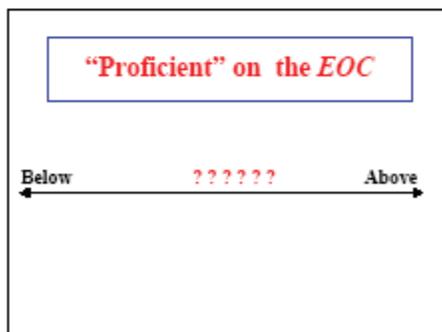
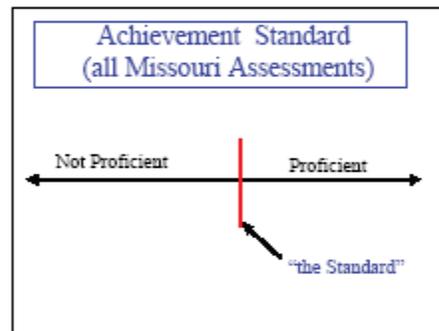
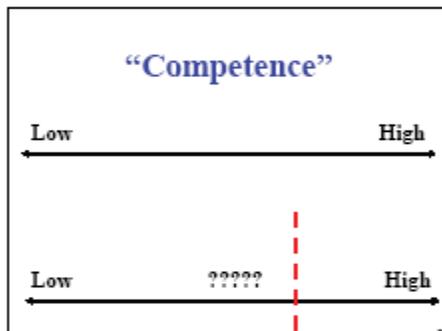
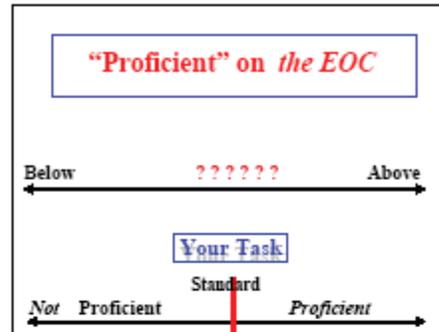
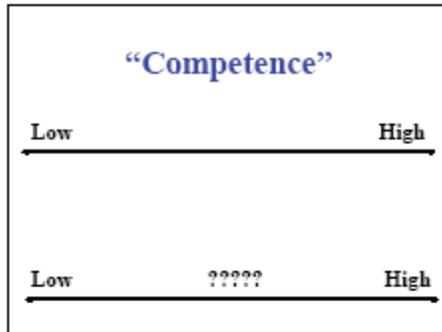
Advice on Setting Standards

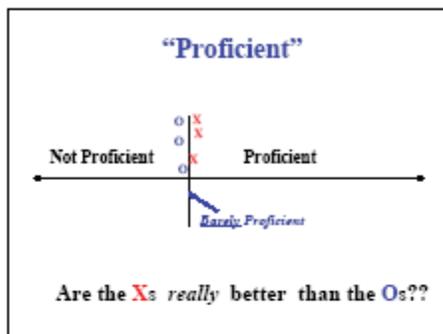
- Set demanding, but *attainable* standards
- What “*should be*” shouldn’t disregard what “*is*”
- Focus on the *concrete*
- Remember the type of item you’re judging

Use your best judgment !!

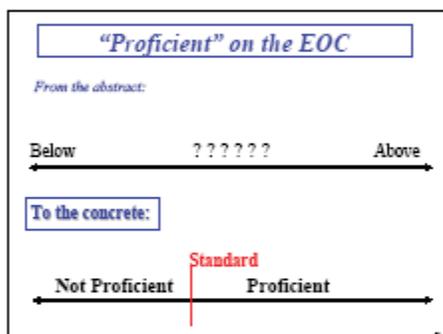
Session Outline - Day 1

- I. What is “standard setting” - in general, and for the EOC Assessments?
- II. Describe the performance “categories”; refine Achievement Level Descriptors (ALDs)
- III. Review & discuss the actual EOC test
- IV. The “Angoff procedure” – how it works



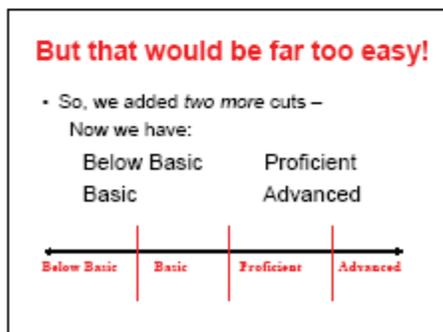


- Achievement Level Descriptors
ALDs**
- Start with the “labels”:
1. **Below Basic**
 2. **Basic**
 3. **Proficient**
 4. **Advanced**



Problem:

What do these *general*
descriptions of achievement levels
mean concretely for EOC
students in each content area?



- Key Elements of the ALDs**
- **Advanced**
 - Demonstrate thorough understanding
 - Demonstrate higher-level skills
 - Consistently apply a variety of strategies
 - **Proficient**
 - Demonstrate understanding of skills and processes
 - Use a range of strategies
 - **Basic**
 - Demonstrate incomplete understanding
 - Demonstrate skills inconsistently
 - Use some strategies
 - **Below Basic**
 - Demonstrate little understanding
 - Demonstrate skills inconsistently or incorrectly
 - Use few strategies

Don't Forget the Assessment !

Why? Standards are set on the actual EOC assessments, not *in general*!

What to do? "Be" a student
Think about each item / task

Think about: Skill(s) / behaviors / expectations tapped
Basic, Proficient, Advanced
"Threshold" students

ASK: *How well* SHOULD a student who is **JUST barely Proficient** be able to do this?

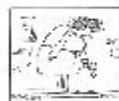
Achievement Level Descriptors ALDs – Your Task

- Action verbs, e.g., determine, analyze, evaluate, utilize, identify, compare, describe, etc.
- Qualifiers, e.g., adjectives and adverbs that describe:
 - Differences in amount (*most, some, few, etc.*)
 - Degree of
 - understanding (*thorough, partial, etc.*)
 - frequency (*consistently, rarely, etc.*)
 - effectiveness (*highly, moderately, somewhat*)

Now that you've seen the "tasks"...
let's debrief.

- Return to the general descriptors.
- Think about the tasks and items on the assessment.
- Which activities seemed to be hard (Advanced?) and easy (Basic)?

These are the grounding of your work to establish standards. The descriptions "define" the categories and should *anchor* your judgments.



Key Elements of the ALDs

- **Advanced**
 - Demonstrate thorough understanding
 - Demonstrate higher-level skills
 - Consistently apply a variety of strategies
- **Proficient**
 - Demonstrate understanding of skills and processes
 - Use a range of strategies
- **Basic**
 - Demonstrate incomplete understanding
 - Demonstrate skills inconsistently
 - Use some strategies
- **Below Basic**
 - Demonstrate little understanding
 - Demonstrate skills inconsistently or incorrectly
 - Use few strategies

Achievement Level Descriptors ALDs – Your Task

- ALDs probably should be *broader* than any specific assessment.
- ALDs should be *descriptive*, not definitional.
- ALDs "anchor" the standards, as they describe the behaviors of students whose performances "fit" each category

Describe the assessed students *concretely*

Beginning with the *Proficient* category, describe the assessed students concretely.

What do they know? What can they do?

What skills do they possess in order to demonstrate this behavior?

What does the skill look like?

What are examples?

What behaviors/actions "fit" a certain category?

"Angoff" – What to Do ?

- Read each (MC) item in the test. Think about what is assessed/required.
- Conceptualize 100 "just barely" *Proficient* students all across the state who took this EOC.
- For each item, decide what percent of "barely *Proficient*" students should answer correctly.

"Angoff Procedure" for Setting Performance Standards

- A way, not *the* way to establish performance standards
- Recommended by the state's TAC
- Preferred procedure when statewide data are not available
- Requires judgments about each item on the assessment

"Angoff" – What to Do ?

- For each item, decide what percent of "barely *Proficient*" students should answer correctly.
- Repeat the decision for "barely *Advanced*" and "barely *Basic*."
- After making the 3 judgments about an item, move to the next item.

"Angoff Procedure" for Setting Performance Standards

- For each test item, simply judge the percent of students in each performance category who should answer correctly.
- You can expect NO students to answer correctly, all students, or somewhere in between.
- In general – *maybe without exception?* – you should expect *Basic* students to perform less well than *Proficient* students, and less well yet than *Advanced* students.

"Angoff" – What to Do ?

- Read each (MC) item in the test. Think about what is assessed/required.
- Conceptualize 100 "just barely" *Proficient* students all across the state who took this EOC.
- For each item, decide what percent of the "barely *Proficient*" students should answer correctly.
- Repeat the decision for "barely *Basic*" & "barely *Advanced*." Move to the next item.
- The 100 kids in each group aren't identical in skill/background/instruction and don't all know the same things, so the decision can't be all-or-none.

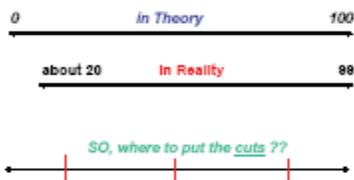
“Item Difficulty” Values

- The values you’re going to work with are often termed “*p*-values.”
- They’re the proportion of students answering the item correctly.
- Let’s look at what these values “mean.”

Judgments for the Constructed-Response Item

- The *mechanics* differ, but the *intent* is the same – how should *borderline* students do?
- Think of the same 100 “threshold” students at each performance level.
- Decide what their **AVERAGE SCORE** should be on the constructed-response item rubric.

“Item Difficulty” Values



What About the Constructed-Response Item?

- Think of the same 100 “threshold” students at each performance level.
- Decide what their average score should be on the writing prompt (0-4).
- For example, perhaps you expect the following averages:

<u>Basic</u>	<u>Proficient</u>	<u>Advanced</u>
1.0	2.5	3.5

Judgments for the Constructed-Response Item

- The English II EOC assessment includes one constructed-response (CR) item – a writing prompt.
- Making your judgments for this item differs from the process used for the MC items.
- How to “judge” this item:

What About the Constructed-Response Item?

- Think of the same 100 “threshold” students at each performance level. Decide what their average score should be on the constructed-response item.
- E.g, perhaps you expect the following averages:

<u>Basic</u>	<u>Proficient</u>	<u>Advanced</u>
1.0	2.5	3.5
- Enter these averages on your Rating Sheet.

Session Overview - Day 2

- I. Review Day 1 activities and outcomes.
- II. Practice the Angoff procedure.
- III. Round 1 of independent judgments
- IV. Feedback & discussion of Round 1
- V. Round 2 ratings -- *reconsider* Round 1

ISSUES:

Should / Ought

What *just* separates "Below Basic" from "Basic"?

Basic from "Proficient"?

Proficient from "Advanced"?

Threshold Students

All Assessed EOC Students in Missouri

Practice Activity: What to Do?

Think about:

The *item* – what’s measured, intentionally or not?

The *curriculum* – Is this taught? Will it be?

The *performance category* – what does it mean?

Threshold students

How students *should* perform. What % should answer this item correctly

Record *three* judgments about each item.

Jot down any notes, questions, reactions as you work.

"Rules" for Ratings

- Anonymity
- Independence
- Don't persevere -- Make a best guess.
- Find the "neighborhoods"; then refine.

Reminders for Round 1

- In a group of 100 students, all of whom are just *barely* Proficient, how many *should* answer this item correctly?
- Don't think of a "clearly Proficient" student. Focus on the cut score, and someone who *barely* makes it into the category. Above the cut, but *just* above – at the threshold.
- Remember the ALDs – they're your anchors.

Marking Your Judgments

- For MC items –
 - What percent of *barely* Proficient students should answer this item correctly?
- For CR items –
 - What should be the average score of *barely* Proficient students on this scale?
- Then, ask the same questions of *barely* Advanced and *barely* Basic.

Marking Your Judgments

- Record your Judge Number.
- For MC Items, bubble in 3 numbers per row/item.
Just Proficient, just Advanced, just Basic.
- For CR Item, remember - judge average performance by students in each category.
- If you change your mind, erase completely.
- Double check your form before turning it in.

Are these data helpful?

- Sorta. What's the issue??
- Small samples. *More importantly*, from a field test. However, it's all we have.
 - Data tell how students *DID* perform.
 - Data CANNOT tell how students SHOULD perform, NOR how those who demonstrate a particular level of competence perform.

ISSUES:

Should / Ought
What *just* separates "Below Basic" from "Basic"?
Basic from "Proficient"?
Proficient from "Advanced"?
Threshold Students
All Assessed EOC Students in Missouri

Why Reratings?

- You are now a *different* judge.
- Consider the judgments & views of your peers.
- Goal: NOT "consensus," but *reflection*

YOU ARE NOW a better judge, because you are a better-informed judge.

Discuss the Preliminary Ratings

- **WHY** ????
- Hearing from your peers helps you to:
 - become more comfortable with your judgments -- both the *how* and *where*.
 - reconsider your earlier judgments.

Reratings: What to Do?

1. Reflect on earlier ratings – yours & peers.
2. Reflect on the discussions we have had.
3. Consider expanding the "zones" around your earlier judgments.
4. Reconsider each judgment –how well *should* a barely Basic/Proficient/Advanced student *do* on this item?

Session Overview -- Day 3

- I. Round 2 feedback & discussion
- II. *Real* ratings & session evaluation
- III. Final review of the ALDs

Thanks for your all
your hard work, your
patience, your many
contributions, and
your generous gift of
time!

"How do I know if I'm *right*?"

- *There is no "right."*
- Did you keep in mind:
 1. "*Should*"?
 2. The *threshold* student?
 3. What "*Below Basic*," "*Basic*," "*Proficient*" & "*Advanced*" mean?
 4. *All* assessed students for this EOC?
 5. The discussions you've had?

Preparing for & Completing Round 3

- This is the only set of judgments that count, so *take your time*.
- When you finish *and* check your judgments,
 - turn in: your Rating Form – to **Me**
 - your Evaluation Form – to **DESE**
- Leave at your place:
 - All* papers you received/used here

APPENDIX J - LETTERS

D. Kent King
Commissioner of Education



P.O. Box 480
Jefferson City, MO 65102-0480
<http://dese.mo.gov>

Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

August 18, 2008

Name
Address
City, MO ZIP

Dear _____,

In 2008-2009, Missouri students completing coursework in Algebra I, English II, and Biology will take statewide end-of-course assessments. These assessments, which replace MAP testing for high school students, will fulfill Missouri's high school testing requirements as outlined in federal No Child Left Behind Legislation. The enclosed "Questions & Answers" document provides additional information about end-of-course assessments.

An important part of incorporating end-of-course assessments into Missouri's statewide assessment program is determining the achievement levels that describe student performance. For more than a decade, both educators and business professionals throughout the state have been instrumental in determining the knowledge, skills and competencies that Missouri's young people should be able to demonstrate. We will continue to involve Missouri citizens in assessment development as we go about the important task of setting achievement levels for new end-of-course assessments. Each of the three "achievement level setting panels" for end-of-course assessments (one for Algebra I, one for English II, and one for Biology) will consist of approximately 15 individuals. The majority of panelists will be classroom teachers; however, each panel will also include business professionals that have expertise in the content areas being assessed. **These panels will convene for an Achievement Level Setting Conference on November 3-5, 2008.** The specific location for the conference has not yet been determined; however, it will be held in mid-Missouri.

We are asking for your help in ensuring that we assemble achievement level setting panels that are knowledgeable and reflective of Missouri's diverse population. Enclosed with this letter is a form to nominate professional leaders from your community to participate in the achievement level setting activities. These nominations will create a large pool from which we will select final panelists. Selected panelists for each content area will be representative of the state's demographic characteristics and geographic make-up.

If you are interested in nominating an individual(s) to serve as a panelist, please refer to the enclosed "Guidelines for Non-School Employee Panelist Nomination". In order to submit nominations for the

August 20, 2008

Dear Colleague in Education,

In 2008-2009, Missouri students will begin taking end-of-course assessments in Algebra I, English II, and Biology. These assessments, which replace MAP testing for high school students, will fulfill Missouri's high school testing requirements as outlined in federal No Child Left Behind Legislation. Just as we have determined achievement levels for MAP assessments in recent years, we will need to define student performance on end-of-course assessments as Below Basic, Basic, Proficient or Advanced.

To accomplish this important task, we will conduct an Achievement Level Setting Conference with the assistance of our contractors for end-of-course assessment development, Riverside Publishing and Questar Assessment. This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. The panel for each end-of-course assessment will consist of 15-18 members. Within each panel, a minimum of 50 percent of the panelists will be classroom teachers. At least half of the remaining panelists will be non-teacher educators (administrators, curriculum specialists, etc.) with knowledge of the appropriate content area. Each panel will also include non-school employees (parents, business professionals, etc.) with expertise in the appropriate content area. Because you have the opportunity to work with excellent educators, as well as members of communities throughout the state, we are asking for your input in assembling achievement level setting panels that are knowledgeable and reflective of Missouri's diverse population.

Enclosed with this letter are forms for you to nominate individuals to serve on end-of-course assessment achievement level setting panels. These nominations will be placed into a large pool from which we will select final panelists. Selected panelists will be representative of the state's demographic characteristics and geographic make-up. **The End-of-Course Assessment Achievement Level Setting Conference will be held on November 3-5, 2008. Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.**

If you are interested in nominating an individual(s) to serve as a panelist, please refer to the enclosed "Guidelines for Panelist Nomination". In order to submit nominations for the achievement level setting panels, you must complete the enclosed form(s) according to the specified guidelines. You may photocopy the appropriate form if you would like to submit more than one nomination. **Nomination forms must be postmarked or faxed on or before September 15, 2008, to be considered for panel selection. Return address and fax number are printed on the forms.**

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are available for all three days of the conference. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated (by their employer, school district, etc.) will receive a stipend of \$150 for each full day of work. School districts will be reimbursed for the cost of substitutes for participating classroom teachers.

We will notify all panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time. Thank you for your assistance in this important endeavor. Please feel free to contact the Assessment Section at 573-751-3545 if you have any questions.

Sincerely,

Stan Johnson, Assistant Commissioner
Division of School Improvement

Enclosures: Guidelines for Panelist Nomination
Classroom Teacher Nomination Form
Non-Teacher Educator Nomination Form



Missouri Department of Elementary and Secondary Education

— *Making a positive difference through education and service* —

August 15, 2008

TO: RPDC Directors
FROM: Michael Muenks, Coordinator, Curriculum and Assessment
RE: End-of-Course Assessment Achievement Level Setting

As you know, Missouri students will take end-of-course assessments in Algebra I, English II, and Biology for the first time in 2008-2009. From November 3-5, DESE's Assessment Section will conduct an achievement level setting conference with the assistance of Riverside Publishing and Questar Assessment to determine the scores that will be used to define student performance as Below Basic, Basic, Proficient or Advanced. (Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.)

This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. We anticipate including at least two post-secondary education representatives on each of the three panels.

I am requesting your assistance in identifying teacher educators or other post-secondary educators that have expertise in the appropriate course content to serve as panelists. Nomination guidelines are enclosed. If you would like to nominate an individual to serve as a panelist, please complete the enclosed form and return it to the Assessment Section no later than September 15, 2008 (mailing address and fax number are printed on the form).

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are available for all three days of the conference. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated by their employer will receive a stipend of \$150 for each full day of work. We will notify all panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time.

Enclosures: Guidelines for Post-Secondary Educator Panelist Nomination
Non-Teacher Educator Nomination Form



Missouri Department of Elementary and Secondary Education

— Making a positive difference through education and service —

August 20, 2008

Dear School Administrator,

In 2008-2009, Missouri students will begin taking end-of-course assessments in Algebra I, English II, and Biology. These assessments, which replace MAP testing for high school students, will fulfill Missouri's high school testing requirements as outlined in federal No Child Left Behind Legislation. Just as we have determined achievement levels for MAP assessments in recent years, we will need to define student performance on end-of-course assessments as Below Basic, Basic, Proficient or Advanced.

To accomplish this important task, we will conduct an Achievement Level Setting Conference with the assistance of our contractors for end-of-course assessment development, Riverside Publishing and Questar Assessment. This conference will provide an opportunity for panels of educators and other individuals to discuss course-level expectations for each applicable course and to review assessment items to determine the appropriate "cut scores" for each achievement level. The composition of the achievement level setting panels and the expertise of panelists are critically important to this process. The panel for each end-of-course assessment will consist of 15-18 members. Within each panel, a minimum of 50 percent of the panelists will be classroom teachers. At least half of the remaining panelists will be non-teacher educators (administrators, curriculum specialists, etc.) with knowledge of the appropriate content area. Each panel will also include non-school employees (parents, business professionals, etc.) with expertise in the appropriate content area. Because you have the opportunity to work with excellent educators, as well as members of your community, we are asking for your input in assembling achievement level setting panels that are knowledgeable and reflective of Missouri's diverse population.

Forms for you to nominate classroom teachers, non-teacher educators and non-school employees to serve on end-of-course achievement level setting panels, along with guidelines for panelist nomination, are posted on the DESE website at <http://www.dese.mo.gov/divimprove/assess/>. These nominations will be placed into a large pool from which we will select final panelists. Selected panelists will be representative of the state's demographic characteristics and geographic make-up. **The End-of-Course Achievement Level Setting Conference will be held on November 3-5, 2008. Specific location for the conference has not yet been determined, but it will be held in mid-Missouri.**

If you are interested in nominating an individual(s) to serve as a panelist, please complete the appropriate form(s) according to the specified guidelines and return it to the Assessment Section by mail or fax. **Nomination forms must be postmarked or faxed on or before September 15, 2008, to be considered for panel selection. Return address and fax number are printed on the forms.**

Prior to submitting nominations, please contact any individual you wish to nominate to ensure his/her interest and availability if selected to participate as a panelist. It is very important that panelists are

available for all three days of the conference. All participants will be reimbursed for travel expenses and meals not provided during the conference. Additionally, those panelists that are not otherwise being compensated (by their employer, school district, etc.) will receive a stipend of \$150 for each full day of work. School districts will be reimbursed for the cost of substitutes for participating classroom teachers. We will notify all panelists of the status of their nomination in early October. Those nominees selected to participate in the Achievement Level Setting Conference will receive further information about the conference at that time. Thank you for your assistance in this important endeavor. Please feel free to contact the Assessment Section at 573-751-3545 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Stan Johnson". The signature is written in black ink and is positioned below the word "Sincerely,".

Stan Johnson, Assistant Commissioner
Division of School Improvement

**APPENDIX K-
Final Participants**

English II Participants

Last Name	First Name	Tchr/Non-Tchr Educator/Non-School	District	Region	Rural/Urban/Suburban	Gender	Ethnicity	Expertise	Nominated by:	Title
Barth	Gail	Classroom Teacher	Rockwood	St. Louis	Suburban	F	White	RE	Kathleen Ryan	K-12 Language Arts Curriculum Coordinator
Berry	Linda	Classroom Teacher	Jefferson City	Heart of Missouri	Suburban	F	White	RE	Dawn Maddox	Director of Planning and Assessment
Carter	Maridella	Classroom Teacher	Blue Springs	Kansas City	Suburban	F	White	RE		
Cracraft	Kara	Classroom Teacher	Jackson	Southeast	Rural	F	White	RE/SpEd	Terri Fisher-Reed	Curriculum/Instruction Facilitator
Davis-Brown	Karen	Classroom Teacher	North Kansas City	Kansas City	Suburban	F	White	RE	Christine Cuintner	NEA President
Ellison	Kathryn	Classroom Teacher	Neosho	Southwest	Rural	F	White	RE	Darren Cook	Principal
Frazier	Jeannie	Classroom Teacher	Raymore-Peculiar	West Central	Rural	F	White	RE	Debra Workman	Principal
Moyers	Amanda	Classroom Teacher	St. Joseph	Northwest	Suburban	F	White	RE	Jaime Dial	Asst. Dir. Of Secondary Education
Pappas-Muyco	Angie	Classroom Teacher	Afton	St. Louis	Suburban	F	White	RE/SpEd/EL	Jeff Morris	Principal
Wilson	Kelli	Classroom Teacher	Lee's Summit	Kansas City	Suburban	F	White	RE	John Faulkenberry	Principal
Joseph	Stephanie	Classroom Teacher	Lebanon	Southwest	Rural	F	Black	RE	Tamesa Hicks	Communication Arts Chair
Pettit	Sandra	Non-Teacher Educator	SuccessLink	Heart of Missouri	Suburban	F	White		Amy Youngblood	Asst. Director
Squires	Scot	Non-Teacher Educator	Park Hill	Kansas City	Suburban	M	White	RE	Jeff Klein	Exec. Dir. of Research, Evaluation and Assessment
Nelson	Jerry	Non-Teacher Educator	Lincoln University	Heart of Missouri		M	White			
Porter	Jeff	Non-School		Heart of Missouri	Suburban	M	White		Helen Cope	Columbia Public Schools

Declined due to medical reasons less than a week prior to conference.

Declined due to death in family one day prior to conference.

Biology Participants

Last Name	First Name	Tchr/Non-Tchr Educator/Non-School	District	Region	Rural/Urban/Suburban	Gender	Ethnicity	Expertise	Nominated by:	Title
Belden	Sandra	Classroom Teacher	Carl Junction	Southwest	Rural	F	White	RE/SpEd/ELL	Georgiana McGriff	Principal
Daniels	Art	Classroom Teacher	Branson	Southwest	Suburban	M	White	RE	Chip Arnette	Principal
Ema	Timothy	Classroom Teacher	Ferguson-Florissant	St. Louis	Suburban	M	Asian/Pacific Islander	RE	Christine Cuintner	NEA President
Marler	Todd	Classroom Teacher	Jackson	Southeast	Rural	M	White	RE	Donna Shaver	Senior High Instructional Facilitator
Meyers	Jay	Classroom Teacher	St. Joseph	Northwest	Suburban	M	White	RE	Jaime Dial	Asst. Dir. Of Secondary Education
Plume	Travis	Classroom Teacher	Maries County	South Central	Rural	M	White	RE	Zachary Templeton	Principal
Probert	Pamela	Classroom Teacher	Mansfield	Southwest	Rural	F	White	RE	Kelly Brazeal	Principal
Stoecklein	Heather	Classroom Teacher	Maryville	Northwest	Rural	F	White	RE	Marilyn Rhea	Asst. Professor
Sucher	Craig	Classroom Teacher	Clayton	St. Louis	Suburban	M	White	RE	Michael Howe	Science Dept. Chairperson
Swanson	Tiffany	Classroom Teacher	Fayette	Heart of Missouri	Rural	F	White	RE	Darren Rapert	Principal
Tucker	Rebecca	Classroom Teacher	Knob Noster	West Central	Rural	F	White	RE	Margaret Anderson	Superintendent
Werr	Sandra	Classroom Teacher	North Shelby	Northeast	Rural	F	White	RE	Harold Eckler	Principal
Worthy	Olivia	Classroom Teacher	Waynesville	South Central	Rural	F	Black	RE	Gayle Lucian	Science RIF
Marshall	Blayne	Classroom Teacher	Kansas City	Kansas City	Urban	M	Black	RE	Marshall Peoples	Building Principal
Hadley	Eric	Non-Teacher Educator	Ferguson-Florissant	St. Louis	Suburban	M	White	RE	Jeffrey Spiegel	Superintendent
Hesman	Joseph	Non-Teacher Educator	Independence	Kansas City	Suburban	M	White	RE/SpEd	Kristel Barr	Principal
Scott	Mike	Non-Teacher Educator	Lincoln University	Heart of Missouri	Suburban	M	White			
Gary	Keith	Non-School		Kansas City	Urban	M	White			

Declined due to job conflict less than a week prior to conference.

Algebra I Participants

Last Name	First Name	Tchr/Non-Tchr Educator/Non-School	District	Region	Rural/Urban/Suburban	Gender	Ethnicity	Expertise	Nominated by:	Title
Barnes	Carolyn	Classroom Teacher	Saint Clair	South Central	Rural	F	White	RE	Steve Weinhold	Principal
Casagrande	Trina	Classroom Teacher	Rockwood	St. Louis	Suburban	F		RE	Patty Strauss	Mathematics Coordinator
Clover	Sheila	Classroom Teacher	Northwest	St. Louis	Suburban	F	White	RE	Kay Blount	Asst. Principal
Craft	Elaine	Classroom Teacher	Moberly	Heart of Missouri	Rural	F	White	RE	Kelly Briscoe	Principal
Fox	David	Classroom Teacher	Lee's Summit	Kansas City	Suburban	M	White	RE	John Faulkenberry	Principal
Haupt	Stephen	Classroom Teacher	Neosho	Southwest	Rural	M	White	RE	Darren Cook	Principal
Malik	Naveed	Classroom Teacher	Jefferson City	Heart of Missouri	Suburban	M	Asian/Pacific Islander	RE	Ronald Fritz	Principal
Osborne	Douglas	Classroom Teacher	Sherwood Cass	West Central	Rural	M	White	RE	Bill Stackhouse	Principal
Robinett	Jennifer	Classroom Teacher	Nixa	Southwest	Rural	F	White	SpEd	Clay Hanna	Director of Secondary Education
Snodgrass	Kim	Classroom Teacher	Hamilton	Northwest	Rural	F		RE	Tim Schieber	Principal
Donaldson	Sara	Classroom Teacher	North St. Francis County	Southeast	Rural	F	White	RE	Ryan Long	Asst. Principal
Bowers	Robert	Non-Teacher Educator	Kearney	Kansas City	Rural	M	White	RE	Randy Wepler	Principal
Jarboe	Mark	Non-Teacher Educator	Keytesville	Heart of Missouri	Rural	M	White	RE	Paul Vossler	Superintendent
Petersen	Jennifer	Non-Teacher Educator	Springfield	Southwest	Suburban	F	White	RE	Kelvin Pemperien	Dir. Of Instructional Improvement
Ray	Jane	Non-Teacher Educator	Center 58	Kansas City	Urban	F	White	RE	Sally Newell	Secondary Director