Instructional Assessment Considerations Packet

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Instructional Assessment: An Essential Tool for Designing Effective Instruction

This T/TAC William & Mary Considerations Packet describes an instructional assessment model that helps teachers match instruction to student needs. This packet describes the assessment of reading and writing skills, but the method is applicable to all academic areas.

Instructional assessment (IA) is a form of curriculum-based assessment (CBA) that is designed to assess the instructional needs of individual students to create the conditions necessary to optimize and maintain learning (Rosenfield, 1987). The purpose of IA is to (a) ensure a match between what the student knows and needs and what the teacher teaches, (b) provide corrective feedback, and (c) monitor progress (Gravois & Gickling, 2002). Instructional assessment is a set of procedures that samples skills from the student’s current curriculum to determine instructional needs. Instructional assessment is a process of data collection rather than an assessment instrument.

The instructional assessment process described in this Considerations Packet is derived from the “Gickling model” of curriculum-based assessment (Burns, 2002). The pivotal piece in this model is that the assessor maintains the student at his or her instructional level or in a comfort zone that controls the amount of challenge throughout the assessment process.

The Instructional Assessment Model
Adapted from the work of Rosenfield, Gravois, and Gickling, this instructional assessment model attributes academic difficulties to an inadequate match between what the student knows and needs, the task to be learned, and the instructional management strategies being used (Rosenfield & Gravois, 1996). In order to create an instructional match, IA attempts to answer five basic questions:

1. What does the student know?
2. What can the student do?
3. How does the student think?
4. How does the student approach what he or she is unsure of?
5. As a teacher, what do I do now? (Gravois & Gickling, 2002)
Instructional Level
In order to answer these questions, the assessment must occur on materials that are at the student’s instructional level, that is, the point at which the student has the prerequisite skills to enter the classroom curriculum and benefit maximally from instruction (Rosenfield, 1987). Assessing a student on an instructional level rather than grade level allows the student to display known skills and takes into consideration the student’s prior knowledge (Gravois & Gickling, 2002). This model attempts to deliver instructional content by controlling the amount of new learning students are expected to master (Shapiro, 1992), based on the assumption that the rate of learning is optimal when tasks remain within a narrow range of difficulty, which ensures a high degree of success. That level of challenge is defined as being only 3-5% new material (unknowns) for tasks requiring comprehension and 15-30% new material (unknown) for tasks requiring drill and practice (Gickling & Havertape, 1981). The following table further clarifies this definition of instructional level.

### Levels of Instruction

<table>
<thead>
<tr>
<th>Levels</th>
<th>Comprehension (unaided)</th>
<th>Rehearsal &amp; Practice (unaided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>98-100%</td>
<td>90-100% material known</td>
</tr>
<tr>
<td>Instructional</td>
<td>93-97%</td>
<td>70-85% material known</td>
</tr>
<tr>
<td>Frustration</td>
<td>&lt; 93%</td>
<td>Below 70% material known</td>
</tr>
</tbody>
</table>

Critical Dimensions
Each domain or content area such as reading, math, writing, and behavior consists of critical dimensions that need to be delineated and assessed. The assessor should analyze the student’s entry-level skills in these critical dimensions of the academic domain in question. For example, the critical domains in reading include the student’s comprehension of language and prior knowledge of language concepts, skills in providing answers orally, in writing or other form, word recognition, word study strategies, fluency, comprehension, and metacognitive strategies (Gravois & Gickling, 2002). Each of these areas is addressed in the following instructional assessment.

### The Six Steps for Instructional Assessment

1. **Step 1: Select material for the assessment.**
   Because a student’s listening comprehension and conceptual skills are often better than her reading skills, the assessor may begin with grade-level material, but less difficult material should also be available in case it is needed. Throughout the assessment, if the material is not on the student’s instructional level, the assessor will need to either make the material instructional through trial teaching or use material that is on a more comfortable level.
**Step 2: Develop a relationship with the student.**
The assessor must develop a relationship with the student that puts her at ease with the assessment process. The student needs to understand that this is not a “test” but a way to discover what she knows and what she can do, so that the teacher knows what to teach in order to help her become a better reader. The student needs to be assured that if she has a problem with the work, the assessor will provide help.

**Step 3: Assess the student’s skills, while ensuring an instructional match.**
This is the defining feature of instructional assessment (IA); that is, ensuring the assessment is on the student’s instructional level.

- **A. Assess prior knowledge**
The assessor explores the student’s prior knowledge and understanding of the material by reading to her and discussing a passage from the grade-level material. This is a discussion, not a 10-point quiz. Explore with the student what she remembers, by asking open-ended questions.

After reading a passage, the assessor asks the student to describe what she just read or what happened so far in the story. The assessor is basically asking the student to retell in an unaided manner what she heard. If the student misses some essential details or cannot retell the story, the assessor provides guided questions to find out what kind of assistance the student needs. In brief, the intention is to determine the extent of the student’s prior knowledge, listening skills, and oral language in relation to the grade level material.

- **Decision Point 1**
The assessor must determine if the material selected appears workable for the student with regard to listening comprehension by reflecting upon the following questions.

  1. Did the student’s responses to the listening comprehension questions indicate that the student possesses enough prior knowledge and has the necessary language concepts to comprehend the material?

  2. Did the student receive enough information through the discussion of the material with the assessor to make the material workable?

If the assessor answers “yes” to either of these questions, then the process continues to the word search. If the assessor answers “no” to either question, then the assessor will need to go to additional steps.

- **B. Assess word recognition: Word search**
The goal of the word search is to assess the student’s word recognition skills, word meaning, and sight vocabulary in order to determine if the presented material is at an instructional level.
The assessor begins by pointing to words that the student has a high probability of knowing, then intermittently pointing to words that seem more difficult. (The assessor points to 4-5 basic words that are known before pointing to an unknown word.) The student needs to be able to respond within 4-5 seconds to maintain a fairly fast pace. This assessment strategy may be used for assessing both word recognition and word meaning.

Decision Point 2
Does the student possess the word recognition and word meaning skills to comprehend the passage? If the answer is “yes,” the assessor goes on to C. If the answer is “no”, the additional steps are listed below.

Additional Steps
These steps are used when a student lacks word recognition/meaning for comprehension.

1. If the student’s sight vocabulary and prior knowledge are only slightly limited (90-93% known), the assessor may strategically teach a few of the sight words and concepts that are needed to bring the material to within an instructional zone (93% knowns). The assessor then proceeds to C, sampling listening skills.

2. The assessor could select a different passage from the same material or select material that appears to be closer to the student’s language and vocabulary level and go back to A, assessing prior knowledge.

3. The assessor might use a segment of the current passage that appears workable and move on to C.

4. The assessor may need to create transitional material based on the what the student knows or find material that is at the student’s instructional level and start at A. (Transitional material uses the student’s known words to create a story.)

C. Sample reading skills
If the material is at the student’s instructional level, the assessor asks the student to read orally from the passage. As the student reads, the assessor completes a running record and a one-minute fluency count. This can be done simultaneously or in two separate readings. The assessor records the student’s errors, number of words read in one minute, and the strategies the student employs for unknown words. The assessor will need a copy of the material on which to write. See Appendices A, B, and C for instructions on how to perform a running record, a fluency count, and a list of student strategies.

D. Assess comprehension
- The assessor asks the student to retell the story using open-ended questions. “Tell me about the story.” “Tell me more about the story.”
- If needed, the assessor proceeds to guided questions that address who, what, when, where, why, and how.
- Depending on the student’s responses, the assessor might ask the student to make a prediction or ask the student to make an inference about the story.

Decision Point 3
At this point, the assessor needs to evaluate the presence of any patterns with regard to the student’s word study skills, responding skills, and comprehension. Did the student understand fully what she read? How much assistance was required? The analysis of the sample of student performance is the most important part of this process since this will determine the intervention design. Other questions to consider in this analysis might be:
- Does the student need more background information?
- Is the student interested in the topic?
- Does the student’s fluency interfere with comprehension?

✓ Step 4. Match instruction to student needs.
Based on the assessment, the assessor needs to decide the specific reading dimension(s) that require(s) assistance. The specificity derived from the assessment should inform the instructional decision-making. (See other Considerations Packets and resources available through T/TAC concerning specific instructional strategies listed at the end of this manuscript.)

✓ Step 5. Attempt trial teaching.
The assessor provides direct instruction and remedial strategies in the specific area(s) identified and analyzes the student’s responses. For example, repeated readings or peer reading might be used to increase the student’s fluency rate.

The assessor continues to collect the data generated by the student’s performance in order to inform instructional decision-making. The data gathered in the assessment may be used as part of a baseline. The student’s responses to the teaching strategies can then be documented over time in order to evaluate progress.

Appendices
Appendices A-C describe in detail the steps for performing a running record and fluency count. Appendix D applies the instructional assessment process to the writing domain.

Conclusion
Instructional assessment examines the student’s prior knowledge of the prerequisite skills needed to master the content, evaluates the difference between what the student knows and what the student is expected to do, and analyzes the kinds of errors that the student makes (Gravois & Gickling, 2002; Rosenfield, 1987). This process can be used in all academic areas to provide the information needed to create powerful, effective remediation strategies.
Appendix A

Running Record

Have the student read orally a passage from his instructional level (determined through the word search) and record errors using the following notations:

Errors
- Omissions: Make a line (——) above each word omitted.
- Substitutions: Write the incorrect word read by the student above each mispronounced word in the text.
- Words told: Place a capital T over words the assessor provides to the student after 4-5 seconds.

Strategies
The following are not considered errors. The notations are intended to help the assessor remember strategies employed by the student when reading unfamiliar words.
- Self-corrections: Write SC if student self corrects.
- Sounding out words: Make a dotted line (----) if the student attempts to sound out a word.
- Prolonged pauses: Make a vertical line (  ) if the student pauses for more than four seconds.
- Repetitions: Make mark (           ) over repeated word(s).

Fluency
Reading fluency includes reading speed, accuracy, and the ability to read with expression and appropriate phrasing (Mather & Goldstein, 2001). Fluency assessment considers the number of words read accurately per minute. The assessor can use an unfamiliar passage for a cold reading or a familiar passage for a warm reading. The assessor may want to take both a cold and a warm reading. The steps for conducting a fluency assessment are as follows:

1. Find a passage on the student’s instructional level (93-97% words known).
2. Begin timing for one minute when the student starts to read aloud.
3. Make a mark on the page at the end of one minute but allow the student to finish reading the passage.
4. Count the total number of words read in one minute and subtract the errors to compute the words read correctly per minute (wcpm).
5. Calculate the percent of accuracy by dividing the number of words read correctly by the total number of words read in one minute.
Appendix B

Oral Reading Fluency Guideline

The following chart is based on the research of Hasbrouck and Tindal (1992) and Haager and Windmueller, (2001).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Fall WCPM*</th>
<th>Winter WCPM</th>
<th>Spring WCPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>(40)</td>
</tr>
<tr>
<td>2</td>
<td>53-82 (80)</td>
<td>78-106</td>
<td>94-124</td>
</tr>
<tr>
<td>3</td>
<td>79-107(90)</td>
<td>93--123</td>
<td>114-142</td>
</tr>
<tr>
<td>4</td>
<td>99-125</td>
<td>112-133</td>
<td>118-143</td>
</tr>
<tr>
<td>5</td>
<td>105-126</td>
<td>118-143</td>
<td>128-151</td>
</tr>
</tbody>
</table>

The following chart is based on the research of Marston and Magnosson (1988).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Silent Reading</th>
<th>Oral Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25-70 wpm</td>
<td>35-70 wpm</td>
</tr>
<tr>
<td>2</td>
<td>60-100 wpm</td>
<td>60-100 wpm</td>
</tr>
<tr>
<td>3</td>
<td>100-150 wpm</td>
<td>100-150 wpm</td>
</tr>
<tr>
<td>4</td>
<td>125-200 wpm</td>
<td>80-115 wpm</td>
</tr>
<tr>
<td>5</td>
<td>150-300 wpm</td>
<td>90-120 wpm</td>
</tr>
<tr>
<td>6</td>
<td>200-500 wpm</td>
<td>100-135 wpm</td>
</tr>
<tr>
<td>7 and above</td>
<td>200-500 wpm</td>
<td>124-160 wpm</td>
</tr>
</tbody>
</table>

* Words correct per minute (WCPM)
Appendix C

Examples of Word Recognition and Word Study Strategies

<table>
<thead>
<tr>
<th>Reading Strategies</th>
<th>Observed</th>
<th>Not Observed</th>
<th>Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rereads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sounds out words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skips words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses context clues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-corrects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skips endings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sees small words within larger ones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divides words into syllables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is unaware of errors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples of Observations of Comprehension Skills

1. **Explicit Comprehension**
   - Responds orally to literal fact questions
   - Locates a stated main idea
   - Retells major events in sequential order

2. **Implicit Comprehension**
   - Uses context to determine word meaning
   - Predicts outcomes
   - Draws conclusions

3. **Critical Thinking**
   - Can discriminate fact from fiction
   - Makes inferences from material presented
   - Compares and contrasts material from other sources

(This information is adapted from the work of Barbara Ligatti, IST teacher, Brandywine School District, Wilmington, DE.)
Appendix D

Writing Assessment Outline

Critical Dimensions
The critical dimensions to be assessed in writing include:

- Prior knowledge in the areas of oral language and reading
- Mechanics to include legibility, spelling, punctuation, capitalization, and grammar
- Written expression to include idea development, organization, language usage, elaboration, voice, purpose, audience, and syntax
- The writing process to include planning, organizing, writing, editing and revising

With young children it is also necessary to assess their developmental stage in the writing process to include pre-emergent, emergent, early writer, developing writer, and established writer.

Instructional level acquires a different meaning when it comes to writing. According to the “Gickling Model” instructional level in writing is whatever a student is able to produce. Therefore, the assessor needs to accept 80% of what a student knows in the mechanics dimension and 93% in the written expression dimension. This has particular importance when developing interventions.

✔ Step 1: Review existing samples of student writing.
   ♦ Collect a number of different samples of student writing from the classroom teacher. Be sure to have the teacher describe the directions, models (if any) and purpose (for example, persuasive, informative, declarative) for the assignment. At a minimum, the assessor needs a sample of the following:
     - Free-form writing that occurs in journal writing or when students are writing about something they know well
     - Formal writing, such as when students are asked to write about something they read

   ♦ Review samples and answer the following questions:
     - What does the student know?
     - What can the student do?
     - How does the student think?
     - How well does the present instruction match the student’s skills?

☐ Decision Point 1
Can you adequately answer the above questions or do you need more information? If you cannot answer these questions, continue to Step 2.

✔ Step 2: Develop a relationship with the child.
Step 3: Sample student performance.

Assess prior knowledge.
If the assessor is not familiar with the student’s oral language and reading skills, the assessor needs to dialogue with the student. For example, the assessor may ask the student to tell a story aloud as well as read aloud. Through discussion the assessor may want to consider differences between the student’s oral language, reading vocabulary, and written language. Reading vocabulary is often correlated with writing skills. Also, the assessor needs to note the student’s organization of thoughts, sentence structure, and syntax. Through this process, the assessor acquires a more complete picture of the student’s prior knowledge in these areas.

Throughout this assessment, dialogue between the student and assessor is vital. The assessor may also want to dialogue with the student about the student’s understanding of the writing process and perceptions about his strengths and challenges in the writing domain. Self-assessment is an important skill that should be introduced as soon as possible in the assessment process.

Sample additional writing tasks.
Depending upon the purpose for the additional samples, there are a number of ways in which the assessor may choose to have the student produce a writing sample.

- If the assessor wants to sample a form of writing that is different from the collected samples, the assessor chooses the purpose of the writing task and the nature of the task. The assessor provides a topic, story-starter, or a picture and asks the student to write a story.

- If the writing problem is related to responding to a reading assignment, the assessor may need to assess reading first.

- If the purpose is to assess written expression, the assessor may need to provide instructional supports, such as a word bank if the student is a poor speller or organizational supports for the disorganized student.

- Another option is to allow the student to choose the topic for the writing task. The assessor should discuss the topic with the student to be certain that the student is familiar with the information.

Search for strengths and areas in which the student may need more assistance in mechanics and the components of writing.
Because a good writer is also a good editor, it is important that the assessor engage the student in the evaluation of his strengths, as well as areas in which he may need assistance. See chart 1 for assistance in this analysis.

- Assessor checks with the student about his thinking process as he approaches a writing task.
- Assessor points out the student’s strengths or the knowns.
Assessor explores with the student areas that are a challenge for him.
Assessor reads the sample back to the student in order to be clear about the student’s product.
Assessor has student read his own writing in order to look at the student’s editing skills.

Table 1 - Analyzing strengths and error patterns
The following chart may be helpful in the analysis of students’ strengths and error patterns.

<table>
<thead>
<tr>
<th>Student</th>
<th>Possible Strengths</th>
<th>Error patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spelling</td>
<td>Words are correctly spelled.</td>
<td></td>
</tr>
<tr>
<td>Punctuation</td>
<td>Sentences are correctly punctuated.</td>
<td></td>
</tr>
<tr>
<td>Grammar</td>
<td>Sentence forms and types are appropriate.</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>Events are in a logical sequence.</td>
<td>There is a beginning, middle, and end.</td>
</tr>
<tr>
<td></td>
<td>Transition words are employed.</td>
<td></td>
</tr>
<tr>
<td>Idea development</td>
<td>Paragraph stays on topic.</td>
<td>Ideas relate to topic.</td>
</tr>
<tr>
<td></td>
<td>Theme is well developed.</td>
<td>Paragraph is cohesive.</td>
</tr>
<tr>
<td>Written expression</td>
<td>Descriptive language is used.</td>
<td>Figurative language is used.</td>
</tr>
</tbody>
</table>

This table is adapted from Isaacson (1996) and Howell and Morehead (1987).

Decision point 2
Depending on the student’s developmental level, the assessor may want to delve further into the process the student uses to help in the writing process. If this is the case, the assessor proceeds to Table 2. If the student is a beginning writer proceed to E.
Table 2 - Assess the use of the writing process.
The assessor may interview the student and ask him to rate himself in the following areas.

**Checklist for Writing Process**

<table>
<thead>
<tr>
<th>Student</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plan</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I choose a good topic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I read about my topic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I write down my ideas on a think sheet.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Organize</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I put similar ideas together.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I number my ideas in logical order.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Write</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I write in sentences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I needed help I….</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ask a friend</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ask the teacher</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Look in the book</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Edit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I read my first draft myself.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I mark the parts I like.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I mark the parts I want to change.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I have a friend read my first draft.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I listen to my friend’s suggestions.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Rewrite</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I make changes to my work.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I correct any errors.</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Table for writing process is adapted from Isaacson (1996).
## Table 3 - Assess the developmental stage of writing

<table>
<thead>
<tr>
<th>Developmental Stage</th>
<th>Typical Characteristics</th>
<th>Patterns of Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-emergent</td>
<td>Little or no understanding of the alphabet. Writing comprised of scribbles and unrelated letters. Beginning to develop phonemic awareness. Can dictate sentences and stories. Has an understanding of story content.</td>
<td></td>
</tr>
<tr>
<td>Emergent</td>
<td>Beginning to write unrelated sentences that include some punctuation. Forms new words by recombining phonemes. Identifies sentence components.</td>
<td></td>
</tr>
<tr>
<td>Early writer</td>
<td>Employs expanded sentences to express more complete thought. Describes the who, doing what and where. Combines simple sentences to form short paragraph.</td>
<td></td>
</tr>
<tr>
<td>Developing writer</td>
<td>Expands the three parts to five parts: who, doing what, where, when and why. Uses standard spelling more frequently. Punctuates sentences on occasion.</td>
<td></td>
</tr>
<tr>
<td>Established writer</td>
<td>Composes stories with clear beginning, middle and end. Uses compound and complex sentences. Includes a definite “voice” when writing stories. Self-edits for mechanics and content. Correct spelling of basic words.</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Fitzpatrick (1999).
Assessor answers the following questions:

- What does the student know?
- What can the student do?
- How does the student think about the writing process?
- How does instruction match the student’s skills? Where is the gap between what the student knows and what he needs to know?

Step 4. Decide the area of focus for the student’s instruction.

- Establish baseline and goals.
  The assessor may find multiple areas of need, but must prioritize the area of focus before setting a goal for the student. Writing is a developmental process that covers a broad range of skills. Because of the complexity of writing, goals need to be established that start by building upon what the student already is able to do and do not overload the student.

Step 5. Manage the instructional match.

- Trial teaching.
  If, after analyzing the student’s skills, it is apparent that there are significant problems, the assessor may want to do some trial teaching to explore strategies that will balance challenge with support. For example, if the student is a poor speller and the goal is to increase the use of descriptive words, the assessor may want to provide a word bank to the student. A student might have significant problems with legibility and need to focus less on writing and more on neatness or make use of assistive technology. Another strategy might be to have the teacher and student co-create a writing rubric to assist the student in evaluating his writing assignments.
Additional Resources:
The following Considerations Packets are available through the T/TAC website at http://education.wm.edu/centers/ttac/resources/considerations/index.php

Techniques for Active Learners, A Word about Vocabulary, and Explicit Instruction to Improve Inferential Comprehension.

Resources are available for loan through the T/TAC Library. Visit the T/TAC website at http://education.wm.edu/centers/ttac/index.php for a complete listing of materials. Select the library link on the home page and enter your selection.

References

This Considerations Packet was prepared by Denyse Doerries, October, 2002. Donni Davis-Perry updated 2015.