



Saskatchewan
Ministry of
Education



Departmental Examinations: Teacher Guide

October 2011



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Introduction

The guide contains sections with general and specific information about examinations. The specific information includes a table of specifications for each subject. Each table lists the major topics for the course of study as found in the most recent curriculum guide for that subject. Reference to pertinent sections of the guide is included.

The table also indicates the levels of thinking for questions on each topic. In general, these levels are adapted from Bloom's Taxonomy of Educational Objectives (1956). While this taxonomy describes six cognitive levels, for purposes of these tables the levels have been collapsed to four with the "higher" level including analysis, synthesis, and evaluation. When more than one level is identified for a topic, there may be questions that address each level or a combination of levels.

The marks allotted for each topic reflect the emphases or time allotments indicated in the curriculum guide. As noted, the percentage allotments may vary by $\pm 2\%$ on machine-scored examination questions and by $\pm 5\%$ on open-response examination questions.

For each course, the guide includes a prototype examination followed by a suggested answer key, and samples of student answers and marker comments for some of the larger mark questions, usually essays. These prototype examinations may be copied for teacher and student use.

Feedback from teachers about the utility of this guide and suggestions for future modifications would be appreciated. Please forward your comments to:

Registrar
Provincial Examinations, Student, and Teacher Services
Ministry of Education
128-1621 Albert Street
REGINA SK S4P 2S5

Note: The *Registrar's Handbook for School Administrators* 2011–2012 provides other information related to departmental examinations such as:

- 2011–2012 examination timetables
- 2012–2013 examination schedule
- Policy Updates and Reminders (Examinations) including curriculum implementation information, the Special Provisions policy and application form, and translated examinations information
- General Regulations including security of examinations, examination centres, and outside writing centres
- The Student Data System including data submission procedures and transcript request forms.

The *Registrar's Handbook* is available on the Ministry of Education website at:
<http://www.education.gov.sk.ca/registrarshandbook>.

Policy Updates and Reminders (Examinations)

1. Accreditation

In Grade 12 subjects in which departmental examinations are prepared, pursuant to Section 32 (4) of *The Education Regulations, 1986*, the final standing of a pupil is:

- (a) in the case of an accredited teacher, determined by the teacher, subject to clause 175 (k) of *The Education Act, 1995* (i.e., subject to policies of the board of education and school regarding student evaluation);
- (b) in the case of a pupil of a teacher who is not accredited, the pupil's composite mark;
- (c) in the case of an adult who prepares for a departmental examination by home study, determined by the mark obtained in the departmental examination (an adult is defined as 18 years of age and out of school for one year OR 19 years of age).

In cases where an accredited teacher becomes ill or goes on other leave during the semester and is replaced by a non-accredited teacher, students must write the departmental examination unless the accredited teacher has taught the majority of the course (provided the direct instruction) and returns to provide the final evaluation.

Refer to Section 3.8 of the *Registrar's Handbook* for information on teacher accreditation records.
Refer to Section 1.3.15 of the *Registrar's Handbook* for information on supplemental examinations and accreditation.

2. Mark Blend

The mark blend of 60/40 is applied to all departmental examinations (school mark/departmental examination mark).

3. English Language Arts

- To meet the two English credit requirement at the 30 level, students may continue to use any two of the four courses listed below.
 - English Language Arts A 30 (8017)
 - English Language Arts B 30 (8018)
 - English A 30 (3080)—not available after August 2001
 - English B 30 (3085)—not available after August 2001
- Differences in the literature component for old and new courses are as follows:
 - English Language Arts A 30 (8017)—focuses on Canadian voices and perspectives
 - English Language Arts B 30 (8018)—focuses on world voices and perspectives
 - English A 30 (3080)—focuses on British literature
 - English B 30 (3085)—focuses on American and Canadian literature
- In the event that a student has taken English courses that do not follow the usual pattern (i.e., has taken English Language Arts A 30 and English A 30), the prerequisite requirements can be met by courses from either the old or new curriculum.

4. Chemistry

Chemistry is an open-book examination. Any number of authorized textbooks may be used. Students' notebooks are allowed into the examination room. The laboratory manual may be included as part of the notebook. However, examinations/quizzes/prototype examinations are NOT considered to be part of a student's notebook and, therefore, are NOT allowed into the examination room. Distance Learning students are permitted to take their course lessons, but NOT their assignments, into the examination room. Effective September 2002, students may have access to a print dictionary. No other forms of a dictionary (i.e., electronic) or translation dictionaries are permitted.

5. Mathematics and Science

Mathematics and science examinations are composed entirely of multiple-choice questions and are machine-scored.

6. Calculator Use Policy

Calculators may be used in the following examinations:

- Chemistry 30 (8212)
- Physics 30 (8213)
- Mathematics A 30 (8404)
- Mathematics B 30 (8405)
- Mathematics C 30 (8406)
- Chimie 30 (8222)
- Physique 30 (8223)
- Mathématiques A 30 (8407)
- Mathématiques B 30 (8408)
- Mathématiques C 30 (8409)

Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted. Students must not bring any external support devices, such as manuals, printed or electronic cards, printers, memory expansion chips, or external keyboards to an examination. In preparation for calculator failure, students may bring extra calculators and batteries into the examination room. Communication between calculators is prohibited and calculators must not have the ability either to transmit or to receive electronic signals.

Before an examination begins, calculators must be removed from their cases and placed on the students' desks for an inspection by a mathematics or science teacher. Students must clear all programmable calculators, both graphing and scientific, of all information that is stored in memory. Cases must be placed on the floor and left there for the duration of the examination. See references to this policy in the Presiding Officers' Manual provided in the examination package and in Appendix E of the *Registrar's Handbook*.

7. Dictionary Use Policy

Print dictionaries may be used for the following examinations:

- English Language Arts A 30 (8017)
- Chemistry 30 (8212)
- Mathematics A 30 (8404)
- Mathematics B 30 (8405)
- Mathematics C 30 (8406)
- English Language Arts B 30 (8018)
- Chimie 30 (8222)
- Mathématiques A 30 (8407)
- Mathématiques B 30 (8408)
- Mathématiques C 30 (8409)

No electronic dictionaries, translation dictionaries, or any other reference materials are allowed. See references to this policy in the Presiding Officers' Manual provided in the examination package and in Appendix E of the *Registrar's Handbook*.

8. English as an Additional Language Students

English as an additional language (EAL) students must possess the academic language proficiency required to write departmental examinations. EAL students may NOT have a translation dictionary. They may use dictionaries pursuant to the Dictionary Use Policy (see Section 7).

9. Electronic Devices

All electronic devices (e.g., cellular telephones, i-pods, i-phones, etc.) must be turned off and left with the presiding officer for the duration of the examination.

10. Disturbing Content on Examination Responses

Although examinations are treated in confidence, there may be cases where a written response contains offensive and inappropriate language or suggests that the student is experiencing emotional difficulties, poses a threat to self or others, or is involved in a criminal activity. In these cases, the Ministry may refer the student's response to the appropriate authority for further action, as considered necessary or required by law.

11. Time Allotment for Departmental Examinations

Effective September 2006, ALL STUDENTS shall have the option of taking up to 30 minutes of additional time (**after** the scheduled conclusion time) to complete the departmental examination(s). Submission of a special provisions application is not required for this additional time of 30 minutes. The examination centre must remain open an additional 30 minutes to accommodate students requiring this extra time. Students with sensory disabilities, physical disabilities, acute or chronic illness, and learning disabilities requiring extended time beyond this 30-minute limit need to have a special provisions application submitted on their behalf. Presiding Officers DO NOT need to complete a *Summary of Variations from the Timetable* form for students accessing this additional 30 minutes.

12. Special Provisions Policy

Special provisions may be made in writing departmental examinations for students with intensive needs as determined by the provincial impact assessment. The special provisions must not compromise the integrity of the formally stated foundational and learning objectives. Requests for special provisions must be based on assessment of need by qualified personnel.

The special provisions that may be made include:

- extended writing time (beyond the 30 additional minutes provided to ALL students)
- use of a separate room for writing
- specially printed examination paper (e.g., large print, Braille, coloured paper)
- use of a reader and/or scribe (An audio recording of the writing session is necessary. Interpretation or clarification of terms, questions, or content cannot be provided to the student. The scribe will write the answers verbatim with the student giving direction as to the form of the answer in the case of paragraphs and essays, and the spelling of significant words.)
- use of a word processor or braille (Students are not permitted use of program utilities such as spell check, thesaurus, dictionary, or grammar check.)

Decisions regarding special provisions or considerations are made by the Office of the Registrar in consultation with the school and ministry personnel. Parents or guardians and other involved agencies may also be consulted.

Procedures

The principal must submit a formal written request (use the *Application for Special Provisions* form in Section 4 of the *Registrar's Handbook*) to arrange for a special provision or consideration for a student writing a departmental examination. The formal written request must include:

- an explanation of the student's disability. The supporting documentation substantiating the student's intensive needs as reflected in the student's personal program plan and the summative and/or diagnostic assessments are to be retained at the school. (In the case of learning disabilities, the supporting documentation should include recommendations for accommodations made by a qualified educational psychologist within the last three years.);
- an outline of the current approaches used in written examinations as identified in the student's personal program plan; and
- a description of the proposed special provision for the writing of the departmental examination.

This request must be directed to the Office of the Registrar, Provincial Examinations and Student Services, as early in the session as possible. The Registrar will notify the principal in writing of the special provisions that can be made for the student.

13. Translated Examinations

Translated examinations are available in the January, June, and August examination sessions. Schools requiring French translated examinations for the January and June sessions must pre-register students. Students who require a French translated examination in August must pre-register by contacting the Registrar's office at (306) 787-8319 immediately upon receiving their *Transcript of Secondary Level Achievement* in July.

14. Examination Appeal Procedures

Applications for rereading of departmental examination papers must be made by the student and must be made immediately following receipt of marks. The Ministry of Education reserves the right to refuse applications for appeals received later than two weeks from the postmark mailing of the *Transcript of Secondary Level Achievement*. There is no charge for appeals.

Candidates who have written a departmental examination:

- may appeal if they have received a composite score of over 42%;
- may NOT appeal more than two subjects at any examination sitting; and
- may NOT appeal if the examination was written as a supplemental.

The appeal letter, signed by the student, should contain the following information: name in full; home address; Learning ID; and subject(s)/mark(s) appealed.

The letter should be addressed (or faxed) to:

**Office of the Registrar
Ministry of Education
128-1621 Albert Street
REGINA SK S4P 2S5
Fax: (306) 787-0035**

15. Supplemental Examinations

A student may write a ministry-prepared supplemental examination to raise his/her mark in a Grade 12 subject in which a departmental examination is prepared. He/she may write any number of departmental examinations as supplementals at any of the January, June, or August sittings. As of April 9, 2009, when a student has multiple course attempts, only the highest mark attained will appear on the *Transcript of Secondary Level Achievement*. All results of multiple course attempts will be maintained on the student's unofficial profile accessed by authorized users of the Student Data System. To register for a supplemental examination contact Student Records at (306) 787-8319.

Supplemental examinations will be written for 100% of the final mark.

Candidates cannot appeal marks obtained on supplemental examinations.

Students taught a Grade 12 subject by an accredited teacher shall have the opportunity to write either a teacher-prepared comprehensive supplemental examination or a ministry-prepared supplemental examination (*The Education Regulations, 1986, Part VII, 34(2)*). Students who elect to write a teacher-prepared supplemental examination are obligated to give the teacher adequate notification of this intention. Schools are encouraged to develop policy regarding teacher-prepared supplementals, indicating the time frame in which students can request a teacher-prepared supplemental examination. Schools are urged to ensure that when setting dates for teacher-prepared supplemental examinations there is no conflict with the examination dates set for departmental examinations.

Students who elect to write a ministry-prepared supplemental examination can do so in the next available examination session. Please note: students **cannot** write a ministry-prepared supplemental examination in the same session as receiving a final mark from an accredited teacher.

16. Security of Examinations

Absolute security of all examinations must be kept by the chief presiding officers and presiding officers when handling the examination booklets. **It is unlawful to reproduce any of the items appearing on the examinations.** All surplus booklets must be accounted for and returned to the Ministry of Education. Refer to the Presiding Officers' Manual provided in the examination package or Appendix E of the *Registrar's Handbook* for detailed instructions.

The Chief Presiding Officer shall:

- ensure that departmental examinations are written only on the days specified and at the times indicated on the official timetable;
- ensure that examination centres remain open at least one hour from commencement time to allow for candidates arriving late;
- not permit a candidate to leave the examination room before the expiration of one hour from the commencement of the examination except in case of illness; and
- ensure that examination centres remain open 30 minutes beyond the official conclusion time to provide **all** students the option of taking up to 30 minutes of additional time to complete departmental examinations (see 1.3.11 of the *Registrar's Handbook*).

Examination irregularities will be investigated by the Registrar. Strict adherence to proper examination procedures will eliminate the necessity for such investigations.

In cases of a candidate violating any examination procedure, the Registrar may cancel his or her examination paper and may prohibit him or her from writing any departmental examination for a period of not more than two years (<i>The Education Regulations, 1986, Part VII, 31 (4)</i>).
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17. Inclement Weather or Emergent Situations

In the event that a student(s) is unable to write a departmental examination during the January session due to inclement weather or an emergent situation such as illness or a death in the family, the principal should contact the Office of the Registrar the day of the missed examination or as soon as possible to arrange for the student(s) to write in the March session. Students with emergent situations arising during the June session will be given the option of writing in the August session. Information to be forwarded to the Office of the Registrar includes the following:

- Name of student;
- Learning Identification Number for student(s);
- Where student(s) will be writing;
- When student(s) will be writing (refer to March and August timetables in Section 1.1.1 of the *Registrar's Handbook* for examination schedule);
- Request to blend the school and departmental mark.

The information should be faxed to the Registrar at (306) 787-0035.

Consideration of the health and safety of students is paramount in inclement weather situations. Students should be advised of the opportunity to write the departmental examination in another examination session.

18. Mark Adjustment

- A final mark of 48 or 49 will be recorded as 50 and the student will be granted credit in that subject for secondary level standing.
- Six floating marks will be applied to the mark earned by a student in any single subject at the Grade 10, 11, or 12 level if the additional marks will complete the student's Grade 12 standing under the 24 credit policy. If this procedure is not enacted by the ministry, schools should notify Student Records.

Please note that the above policy:

- ***supports using any subject at any grade level;***
- ***supports using only one subject;***
- ***will be applied at the ministry level (note: not to be applied at the school level).***
- The Ministry of Education employs a policy of scaling examination marks. Scaling never causes the student to lose marks. The procedure is one that will adjust examination marks to fall into a distribution similar to that of all teacher-submitted marks. The only marks that are ever adjusted are the marks the student obtains on the departmental examination. These procedures are used only to the benefit of the student. Scaling also ensures that the failure rate does not exceed 8% on a departmental examination.

19. Exchange Students

Exchange students seeking Saskatchewan high school credits for official transcript purposes must write the departmental examinations on the same terms as other students (i.e., exchange students are not permitted to use translation dictionaries).

General Guidelines for Writing Examinations

1. Examinations are based on the curriculum guide and the recommended resource materials. It would be helpful to provide students with a written course outline.
2. Examinations are two and one-half hours in length. Students should be prepared to use the full time allotment to complete the examination and to check their work. Effective September 2006, ALL STUDENTS shall have the option of taking up to 30 minutes of additional time (**after** the scheduled conclusion time) to complete the departmental examination(s).
3. Students should look over the entire examination before beginning to answer any of the questions. This will give them an idea of the length of the examination and the kinds of questions to expect.
4. Currently, there are two types of format used in setting departmental examinations: marker-scored and machine-scored. **Marker-scored** examinations contain some multiple-choice questions and a number of questions which require a written response. **Machine-scored** examinations are composed of 50 multiple-choice questions. The departmental examination timetables sent to each school in the province indicate the type of examination one can expect in each subject.

Machine-Scored Examinations (Biology; Chemistry; Physics; Mathematics A, B, and C)

1. Machine-scored examinations are composed of 50 multiple-choice questions. Students are asked to select the BEST answer from a list of four options and then mark their choice on a computer-marked response form.
2. Students should be advised to attempt all the questions on the examination even if they are unsure of the correct answer.
3. For questions that require calculations, students should do the calculations before looking at the possible answers. They should also check the units in calculations to ensure they match the units in the choices.
4. Students are advised to double check their answer to ensure that they have “bubbled in” the response they wanted. Be sure the response matches the number of the question.
5. Students and teachers should review the prototype examination for each subject to become familiar with the format of the examination.

Marker-Scored Examinations (English Language Arts A and B)

1. Students must know how to budget their time so that they will be able to:
 - finish within the allotted time
 - do the larger mark questions which are at the end of the examination, and
 - check over all answers before handing in their paper.There are still cases of students failing to do this.

The following is **one example** of time allocation on an ELA examination according to the marks assigned and question type:

	Marks	Time (approx.)
Section I (multiple-choice)	50	55
Section II (paragraph response)	10	15
Section III (essay)	15	25
Section IV (essay)	<u>25</u>	<u>45</u>
TOTAL	100	140 (allows 10 min. for checking)

Students should realize that it is not necessary to calculate exactly how many minutes to spend on each question. However, they should have a rough idea of how much time they will need to do the larger mark questions.

2. Students should be encouraged to attempt all questions on the examination. There are still instances when students answer only a portion of the examination. There is often more advantage to making a legitimate attempt to answer a question than to leaving it blank.
3. Students need to understand the importance of reading directions carefully. For example, in ELA, section III requires a personal response from students. In a choice question, there is no advantage to be gained by doing more than the required number of questions. If the question asks for a paragraph or an essay, answers written in point form will receive few, if any, marks.
4. If the question asks for an essay answer, then students must construct an answer in good essay form. A formal essay is a minimum of five paragraphs with an opening paragraph which states the topic or thesis, a body of at least three paragraphs which provide supporting evidence or proof, and a concluding paragraph which sums up arguments and relates to the thesis.
5. If the question asks for a paragraph answer, then students must construct an answer in good paragraph form, keeping in mind that a paragraph is more than one or two sentences.
6. Students must learn to read questions carefully to identify key words and phrases and to determine how to answer them in the most direct manner. Many students waste time writing general, rambling answers that fail to address the topic in question. The next section provides definitions of some common test item terminology found in departmental examinations.
7. Students need to remember that handwriting must be legible. Marks can be lost needlessly as a result of careless handwriting. Unless otherwise directed, all written answers must be in blue or black pen.
8. It is important for students to be aware that on marker-scored examinations (i.e., English Language Arts A and English Language Arts B) they will be asked to record their answers in several ways. Students will answer the first section of the examination on a computer-marked response form by darkening the appropriate space or “bubble” for each question.

For the remainder of the examination, space is provided in the examination booklet for students to write their responses. In the case of longer/essay responses, planning/outlining space is also provided in the examination booklet. Students must be sure to identify clearly the number of the question they are answering. They will need to use a pencil for the computer-marked response sheet and pen for the remainder of the examination.

Common Test Item Terminology

- Analyze:** Divide a concept, an event, a set of data, or a text into parts in order to explain the concept, event, data, or text.
- Critique:** Make judgements about the positive or negative aspects of something. Critical discussion may approve or disapprove or both. Example: “Which of the following statements most effectively critiques the adoption of recombinant DNA technology in agriculture?”
- Define:** Precisely state the meaning of a word, phrase, or concept. Determine the extent or boundary of something. Example: “The term ‘osmosis’ is best defined as”
- Describe:** Provide a picture or idea of something through the use of spoken or written words. Example: “Which of the following statements best describes how the addition of a catalyst affects the rate of reaction at equilibrium?”
- Evaluate:** By discussing advantages and limitations, judge the worth or value of something. Example: “Which of the following statements best evaluates the merits of the CANDU reactor?”
In math, the word “evaluate” means “find the numerical value of.”
- Explain:** Make clear or understandable, or give reasons for something. Example: “Explain why you think joy is an essential emotion for people to experience.”
- Illustrate:** Make clear or understandable by using examples. Example: “Which of the following statements best illustrates the concept of natural selection?”
- Interpret:** To judge (e.g., persons, events) in a personal way or present your thinking about something. Example: “Which of the following statements best interprets the graph showing the results of the experiment?”
- Justify:** Show good reason, or present evidence in support of a position. Example: “Justify the actions of the protagonist.”
- Prove:** Show something to be true or genuine by providing evidence or logical arguments, or in mathematics to verify the accuracy of something such as a calculation.
Example: “Prove the identity $\frac{1 + \tan^2 \theta}{2 \tan \theta} = \csc 2 \theta$.”
- Summarize:** State or express concisely, or briefly provide the main points. Example: “Which of the following statements best summarizes Hess’s Law?”
- Support or Refute:** Support means to argue in favour of something; refute means to argue against something or to prove an assertion to be in error. Examples such as illustrations, quotations, and statistics help support or refute. Example: “Canadians are a dull people. Support or refute this statement.”

Examinations: Specific Information

English Language Arts Section

1. Students may use a print dictionary. No electronic dictionaries, translation dictionaries, or any other notes or reference materials are allowed.
2. Students must know the importance of using **only** A30 material in answering A30 examination questions and **only** B30 material in answering B30 questions. They must understand that they will receive **no marks** for answers or parts of answers using A30 material on a B30 examination and vice versa or attempting to answer questions by making reference to Grade 10 or 11 material.

Neither the ELA A30 nor ELA B30 examination allows for the possibility of references to movies or films and videos.

Teachers should choose resources and selections from the ELA 30 bibliography, updates, and alternative resources that have not been suggested at previous grade levels and that pose comparable challenge to the students. If teachers are uncertain about the appropriateness of specific titles, they may wish to contact Maxine Penner at 787-2534.

In addition to the print version, the ELA bibliographies are also available on the Ministry of Education web site at www.education.gov.sk.ca/ela.

3. Students must be able to differentiate between authors according to nationality. Please note the differences in the literature component as follows:
 - English Language Arts A 30—is based on Canadian authors
 - English Language Arts B 30—is based on world authors other than Canadian.
4. Each examination will contain a reading passage with accompanying comprehension and interpretation questions. Students should have the necessary skills to deal with such questions.
5. Students must know the difference in genres. Many continue to confuse short stories with essays and novels with plays.
6. Major essay questions are at the end of the examination. Students need to know how to pace themselves when writing the examination to allow enough time for these questions. They should not waste a lot of time on one and two mark questions.
7. Students should be clear about the directions for use of three selections from shorter genres. If directions call for use of any three selections from shorter genres (short stories, essays, and/or poems), it is all right to mix and match (i.e., it is not necessary to use three poems or three essays or three short stories; students can use one of each or two of one and one of another, as long as the total equals three).
8. Students must know the difference between a formal and an informal essay. They must know that point form answers are unacceptable for essay questions and that contractions and the use of the first person are not appropriate in a formal essay.
9. The following guidelines will assist students in their development of the multi-paragraph composition:

A short essay is a minimum of three paragraphs, with an opening paragraph which states the topic or thesis, a body of one or more paragraphs which provide evidence or proof, and a concluding paragraph which sums up arguments and relates to the thesis.

The minimum length for a formal essay is FIVE paragraphs. Each paragraph should contain at least THREE sentences.

- Paragraph 1 (Introductory Paragraph) should contain an introduction to the topic or issue, a statement of the thesis, and make mention of the three points to be developed to prove the thesis. (Avoid beginning an essay with “In this essay I will . . .” For example, instead of a thesis statement such as “In the following essay, I will show how Polonius uses deception,” a better thesis statement would be “Polonius is able to use deception to his advantage in his dealings with Laertes, Ophelia, and Hamlet.”)

- Paragraph 2 should explore and develop the point mentioned first in the thesis statement. (e.g. - evidence of Polonius' use of deception in his dealings with Laertes)
- Paragraph 3 should explore and develop the point mentioned second in the thesis statement. (e.g. - evidence of Polonius' use of deception in his dealings with Ophelia)
- Paragraph 4 should explore and develop the point mentioned third in the thesis statement. (e.g. - evidence of Polonius' use of deception in his dealings with Hamlet)
- Paragraph 5 (Concluding Paragraph) should conclude and summarize the essay, state a conclusion, and comment upon the importance of that conclusion. (Avoid a conclusion which begins "In conclusion, I have now proven that Polonius . . ." Instead a conclusion might begin "Polonius has made effective use of deception. This is important in the play because . . .")

Students may wish to expand the body of the essay (i.e., paragraphs 2–4) to include more than three paragraphs, but each additional paragraph should logically follow and develop the thesis under consideration. Students should use transitional devices to show the correlation between paragraphs.

10. Students should know that the essay should be more than just a plot summary. Essays that are merely plot summaries receive low marks. Also, essays that might be prepared in advance and do not necessarily address the topic should be avoided. Students should be aware of the meaning of common words found in essay questions such as: compare, contrast, illustrate, evaluate, justify, etc. (See the section in this guide entitled "Common Test Item Terminology.") They should also be familiar with common terminology such as "protagonist/antagonist" or "point of view."
11. Students must know how to construct a paragraph answer when only one paragraph is called for. They must know how to indent and how to write an introductory sentence, add supporting details, and develop a conclusion. They must read the directions carefully and know that if they are asked to write "a" or "one" paragraph, they should not write more than one.
12. When asked to quote from the prose or poetry comprehension passages, candidates must **NOT** merely give line numbers and no actual quotations. Line numbers alone will receive no marks.
13. There are a number of sentence errors in written responses which students should learn to identify and correct:
 - run-on or comma splice
 - fragment
 - faulty coordination and subordination
 - dangling modifiers
 - faulty pronoun reference
 - subject-verb agreement
 - consistency of verb tense.
14. There are a number of grammatical and mechanical errors which are found in many students' answers. Some of these errors include:
 - word usage - e.g., "affect" and "effect"; "would of" for "would have"
 - possessives
 - spelling
 - proper names such as literary characters
 - common words (a lot, there, their, too, to, your, you're, its, it's)
 - punctuation
 - comma, apostrophe
 - titles.

English Language Arts A 30 (8017)
Table of Specifications

LANGUAGE ARTS STRANDS*	LEVELS OF THINKING				MARKS*
	Knowledge	Comprehension	Application	Higher	
<u>Multiple-Choice</u>					
Writing (Revising)	x	x	x		20
Reading	x	x	x	x	30
Subtotal					50
<u>Short Answer</u>					
Writing	x	x	x	x	10
<u>Long Answer</u>					
Writing		x	x	x	15
Writing	x	x	x	x	25
Subtotal					60
TOTAL					100

* Refer to *English Language Arts (ELA): A Curriculum Guide for the Secondary Level, April 1999*, pages 17–35 and page 49. **The ELA A 30 course is based on Canadian authors.** Note the Minimum Guide for Resource Selection and the guideline that teachers should choose resources and selections from the ELA 30 bibliography, ELA update bulletins, or alternative resources that have not been suggested at previous grade levels and that pose comparable challenge to students (page 49).

The listening, speaking, viewing, and representing strands are more appropriately assessed in the classroom. Suggestions for classroom use are available.

** Mark values for each section may vary by $\pm 2\%$ on the Multiple-Choice Section and $\pm 5\%$ on the Short and Long Answer Sections.

Students may use a print dictionary. No electronic dictionaries, translation dictionaries, or any other notes or reference materials are allowed.

Multiple-Choice Section: These questions will be worth 1–2 marks each.

Short-Answer Section: Short-answer items require a single paragraph response.

Long-Answer Section: Long-answer items may include a convincing argument using logic and persuasion, an analysis or an evaluation of a poem or short story or play. Students must be able to develop an answer on one of two topics on shorter literary selections studied (poetry, essay, short stories, one-act plays) and on one of two topics related to the longer literary selections studied (novel, full-length non-fiction work, or full-length play [two or more acts]). References to movies, films and videos are unacceptable.

In the marking of paragraphs and essays, the following are some of the guidelines that apply:

- (1) Students should ensure there is a clear thesis statement in the introductory paragraph and that the closing paragraph includes a thoughtful summary statement.
- (2) If no essay form is used, if the answer is in point form or is a blatant plot summary, or if the text selections are the wrong nationality, genre, or grade level, marks will be deducted accordingly.

Language Arts Strands:

Writing objectives tested include: introductions; thesis statements; varied methods of topic development; conclusions; evaluation of a poem, short story, or play; editorial or letter to the editor; personal essay; formal literary essay. **Revising objectives** tested include: organization, unity, coherence, emphasis, sentence clarity, word choice, mechanics (i.e., capitalization, punctuation, and spelling).

Reading objectives tested include: reading strategies (making connections, finding meaning, predicting, inferring, reflecting, and evaluating), personal or critical or creative response; recognizing major literary forms and techniques, assessing how content and organization are influenced by literary form; evaluating accuracy and usefulness of information presented; paraphrasing; identifying the effects and techniques of the author's "voice," tone, style; locating/assessing/summarizing information from a variety of sources; evaluating the extent to which a piece of writing achieves its purpose, appreciating the artistic unity of a writer's form and ideas; informed critical response; assessing an author's ideas and techniques, assessing a selection's merit as a literary work; citing appropriate evidence to support responses; comparing/contrasting/evaluating texts; recognizing and appreciating Canadian literary and cultural heritage, the multiplicity of voices and dialects in Canadian literature.

Refer to Appendix A for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

English Language Arts B 30 (8018)
Table of Specifications

LANGUAGE ARTS STRANDS*	LEVELS OF THINKING				MARKS*
	Knowledge	Comprehension	Application	Higher	
<u>Multiple-Choice</u>					
Writing (Revising)	x	x	x		20
Reading	x	x	x	x	30
Subtotal					50
<u>Short Answer</u>					
Writing	x	x	x	x	10
<u>Long Answer</u>					
Writing		x	x	x	15
Writing	x	x	x	x	25
Subtotal					60
TOTAL					100

* Refer to *English Language Arts (ELA): A Curriculum Guide for the Secondary Level, April 1999*, pages 17–35 and page 49. **The ELA B 30 course is based on world authors other than Canadian.** On page 49, note the Minimum Guide for Resource Selection and the guideline that teachers should choose resources and selections from the ELA 30 bibliography, ELA update bulletins, or alternative resources that have not been suggested at previous grade levels and that pose comparable challenge to students. The Shakespearean plays should be chosen from the English Language Arts 30 bibliography.

The listening, speaking, viewing, and representing strands are more appropriately assessed in the classroom. Suggestions for classroom use are available.

** Mark values for each section may vary by $\pm 2\%$ on the Multiple-Choice Section and $\pm 5\%$ on the Short and Long Answer Sections.

Students may use a print dictionary. No electronic dictionaries, translation dictionaries, or any other notes or reference materials are allowed.

Multiple-Choice Section: These questions will be worth 1–2 marks each.

Short-Answer Section: Short-answer items require a single paragraph response.

Long-Answer Section: Long-answer items may include a convincing argument using logic and persuasion, an analysis or an evaluation of a poem or short story or play. Students must be able to develop an answer on one of two topics on shorter literary selections studied (poetry, essays, short stories, one-act plays) and on one of two topics related to the longer literary selections studied (Shakespearean play, novel, full-length non-fiction work, or full-length play [two or more acts]). References to movies, films, and videos are unacceptable.

In the marking of paragraphs and essays, the following are some of the guidelines that apply:

- (1) Students should ensure there is a clear thesis statement in the introductory paragraph and that the closing paragraph includes a thoughtful summary statement.
- (2) If no essay form is used, if the answer is in point form or is a blatant plot summary, or if the literature selections are the wrong nationality, genre, or grade level, marks will be deducted accordingly.

Language Arts Strands:

Writing objectives tested include: prewriting and planning strategies; introductions; thesis statements; varied methods of topic development; conclusions; paraphrase and précis; evaluation of a poem, short story, play, convincing argument using logic and persuasion; analysis of a literary work. **Revising objectives** tested include: organization, unity, coherence, emphasis, sentence clarity, word choice, mechanics (i.e., capitalization, punctuation, and spelling).

Reading objectives tested include: reading strategies (making connections, finding meaning, predicting, inferring, reflecting, and evaluating), personal or critical or creative response; recognizing major literary forms and techniques, assessing how content and organization are influenced by literary form; evaluating accuracy and usefulness of information presented; paraphrasing; identifying the effects and techniques of the author's "voice," tone, style; locating/assessing/summarizing information from a variety of sources; understanding social, historical, and philosophical milieu of a selection; interpreting symbols and patterns; recognizing satire; informed critical response; assessing an author's ideas and techniques; assessing a selection's merit as a literary work; citing appropriate evidence to support responses; comparing/contrasting/evaluating texts; understanding and appreciating an international literary heritage and world perspective; developing defensible positions on individual, community, national, or world issues reflected in texts.

Refer to Appendix B for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

Sciences Section:

Biology 30 (8211) Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple-Choice</u>					
I. The Chemical Basis of Life	x	x	x	x	14
II. Cell Structure and Function	x	x	x	x	14
III. Genetics	x	x	x	x	26
IV. Animal Systems	x	x	x	x	26
V. Evolution	x	x	x	x	20
TOTAL					100

* Refer to: *Biology 20 & 30, A Curriculum Guide for the Secondary Level*, September 1992, pages 117–141.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each.

An mRNA codon wheel and table are provided with the examination.

Refer to Appendix C for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit I		Unit II		Unit III		Unit IV		Unit V	
%	#	%	#	%	#	%	#	%	#
14	7	14	7	26	13	26	13	20	10

Mark values for each section may vary by $\pm 2\%$

Chemistry 30 (8212) Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple Choice</u>					
V. Solubility and Solutions	x	x	x	x	14
VI. Energy Changes in Chemical Reactions	x	x	x	x	14
VII. Reaction Kinetics	x	x	x	x	14
VIII. Equilibrium	x	x	x	x	14
IX. Acid-Base Equilibria	x	x	x	x	22
X. Oxidation and Reduction	x	x	x	x	22
TOTAL					100

* Refer to *Chemistry 20 & 30, A Curriculum Guide for the Secondary Level*, September 1992, pages 127–167.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each as indicated in the table of specifications.

Students should supply themselves with a graduated ruler and a pencil for creating diagrams and graphs if necessary.

Students will be provided with the following tables in each examination booklet: Solubility of Common Compounds in Water, Relative Strengths of Acids in Aqueous Solutions at Room Temperature, Standard Electrode Potentials for Half-Reactions, Periodic Table, and pH Ranges of Common Indicators. A formula sheet is provided as well and is included in the prototype examination.

A scientific or graphic hand calculator is required. **All calculators must be cleared of programs.** Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, calculators capable of symbolic manipulation, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted.

The Chemistry examination is an open-book examination. Any number of authorized textbooks may be used. Students' notebooks may be allowed into the examination room. The laboratory manual may be included as part of the notebook. However, examinations/quizzes/prototype examinations are NOT considered to be part of a student's notebook and, therefore, are NOT allowed into the examination room. For this examination, Technology Supported Learning students are permitted to take their lessons, but NOT their assignments, into the examination room.

Print dictionaries may be used for this examination. Electronic dictionaries and translation dictionaries are not allowed.

Refer to Appendix D for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit V		Unit VI		Unit VII		Unit VIII		Unit IX		Unit X	
%	#	%	#	%	#	%	#	%	#	%	#
14	7	14	7	14	7	14	7	22	11	22	11

Mark values for each section may vary by $\pm 2\%$

Chemistry 30

The Chemistry examination is an open-book examination. Any number of authorized textbooks may be used. Students' notebooks are allowed into the examination room. The laboratory manual may be included as part of the notebook. However, examinations/quizzes/prototype examinations are NOT considered to be part of the student's notebook and, therefore, are NOT allowed into the examination room. Technology Supported Learning students are permitted to take their lessons, but NOT their assignments, into the examination room.

Students may use a print dictionary. No electronic dictionaries or translation dictionaries are allowed.

Students will be provided with the following tables in each examination booklet: Solubility of Common Compounds in Water, Relative Strengths of Acids in Aqueous Solutions at Room Temperature, Standard Electrode Potentials for Half-Reactions, Periodic Table, and pH Ranges of Common Indicators. A formula sheet will be provided as well.

Open-book examinations are as difficult and require as much study and preparation as traditional examinations. Sufficient time is not available during the examination for students to look up all answers in their reference materials.

Suggestions for preparing for and writing open-book examinations:

- Organize notes and materials prior to the examination.
- Be familiar with notes, texts, concepts, and problem types.
- Allocate time according to the mark distribution.
- Stress levels of learning HIGHER than factual recall, such as comprehension, application, analysis, synthesis, and evaluation.
- Make use of research skills such as using indices and tables of contents. Be familiar with the general area to which a topic belongs.
- Some questions may test for the proper number of significant figures and appropriate units for numerical answers. If the first non-significant digit is 5 or greater, round the answer up by increasing the last significant digit by one.

Rules for use of significant figures in chemical calculations:

1. An answer can never have more significant figures than appear in any one of the measurements that were used in the calculation.
Example: $0.63 \text{ mols} \times 12.01 \text{ g} \cdot \text{mol}^{-1} = 7.6 \text{ g}$. The calculator reads 7.5663. This is rounded to 7.6.
 2. Numbers derived as a result of counting are ignored when determining significant figures.
Example: $3 \text{ vials NaCl} \times 5.85 \text{ g/vial} = 17.6 \text{ g NaCl}$
 3. Leading zeros are not significant. Trailing zeros are significant.
Example: 0.00500 L has 3 significant figures, as does 5.00 mL. 500 mL has one significant figure.
 4. 6.02×10^{23} has 3 significant figures, even if written in expanded form. A bar over the digit 2 would indicate that this is the last significant figure.
- Recognize the need to use appropriate formulas to solve questions. While formulas found in the resources reduce the need for memorization, students must be familiar enough with them to be able to select them quickly when needed.
 - Terminology and symbols used in the curriculum guide will be used on the examination.

- Standard heats of formation will be symbolized as ΔH_f° and standard heats of reaction as ΔH° .
- Molarity will be expressed as $\text{mols} \cdot \text{L}^{-1}$, or $\text{mol} \cdot \text{L}^{-1}$, or M.
- The following shorthand representation may be used for electrochemical cells:

$$\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$$

anode porous cathode
 partition
- E_p = potential energy, E_k = kinetic energy
- Units must be included with numerical answers.
- Problem types used on examinations may include:
 - conversions involving ppm, ppb, $\text{g} \cdot \text{L}^{-1}$, and $\text{mol} \cdot \text{L}^{-1}$
 - serial dilution problems
 - selective precipitation problems
 - problems involving $Q = mc\Delta T$ and calorimetry
 - Hess's Law problems
 - K_{eq} problems with initial concentrations of reactants and finding the equilibrium concentrations of products
 - equilibrium concentration calculations using an ICE chart. For example:

	X	Y	Z
[Initial]			
[Change]			
[Equilibrium]			

- acid-base titrations involving excess acid or base
- K_a calculations for weak acids
- problems involving oxidation numbers
- half-cell analysis: direction of electron flow, anion and cation migration, identify anode and cathode, etc.

Sample Problems

Serial Dilutions are used to successively dilute a stock solution into several weaker solutions that change by the same factor.

In doing the calculations, the volume values do not change in the formula $M_1 V_1 = M_2 V_2$. The only value that does change is M_1 . Each calculation that is performed for a dilution will result in a new value for M_1 . This value is then used to calculate the concentration of the next diluted solution.

EXAMPLE: An $8.0 \text{ mol} \cdot \text{L}^{-1}$ stock solution of NaOH is to be diluted creating 3 different solutions using a serial dilution. Each dilution involves 150 mL of NaOH and enough distilled water to bring the total volume to 300 mL. The concentration of the three solutions are

- A. $8.0 \text{ mol} \cdot \text{L}^{-1}$, $4.0 \text{ mol} \cdot \text{L}^{-1}$, $2.0 \text{ mol} \cdot \text{L}^{-1}$
- * B. $4.0 \text{ mol} \cdot \text{L}^{-1}$, $2.0 \text{ mol} \cdot \text{L}^{-1}$, $1.0 \text{ mol} \cdot \text{L}^{-1}$
- C. $3.0 \text{ mol} \cdot \text{L}^{-1}$, $1.5 \text{ mol} \cdot \text{L}^{-1}$, $0.75 \text{ mol} \cdot \text{L}^{-1}$
- D. $2.0 \text{ mol} \cdot \text{L}^{-1}$, $1.0 \text{ mol} \cdot \text{L}^{-1}$, $0.50 \text{ mol} \cdot \text{L}^{-1}$

(Answer: B)

Solution 1. $M_1 V_1 = M_2 V_2$
 $(8.0 \text{ mol} \cdot \text{L}^{-1})(0.150 \text{ L}) = M_2(0.300 \text{ L})$
 $M_2 = 4.0 \text{ mol} \cdot \text{L}^{-1}$

Solution 2. $M_1 V_1 = M_2 V_2$
 $(4.0 \text{ mol} \cdot \text{L}^{-1})(0.150 \text{ L}) = M_2(0.300 \text{ L})$
 $M_2 = 2.0 \text{ mol} \cdot \text{L}^{-1}$

Solution 3. $M_1 V_1 = M_2 V_2$
 $(2.0 \text{ mol} \cdot \text{L}^{-1})(0.150 \text{ L}) = M_2(0.300 \text{ L})$
 $M_2 = 1.0 \text{ mol} \cdot \text{L}^{-1}$

Excess Acid-Base Titrations

Initial concentrations and volumes for BOTH the acid and the base will be given. Such a titration will produce an excess of either acid or base. This type of question asks the student to find the new concentration of the excess substance and the resulting pH of the solution.

EXAMPLE: 200 mL of $0.125 \text{ mol} \cdot \text{L}^{-1}$ potassium hydroxide solution were added to 100 mL of $0.100 \text{ mol} \cdot \text{L}^{-1}$ nitric acid solution. The pH of the resulting solution is

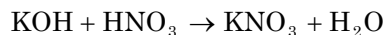
- A. 12.9
- * B. 12.7
- C. 1.30
- D. 0.0250

(Answer: B)

Solution: $n = CV$

$$\text{mol acid} = (0.100 \text{ mol} \cdot \text{L}^{-1})(0.100 \text{ L}) = 0.0100 \text{ mol}$$

$$\text{mol base} = (0.125 \text{ mol} \cdot \text{L}^{-1})(0.200 \text{ L}) = 0.0250 \text{ mol}$$



molar ratio is 1 : 1 \therefore all of the acid will be neutralized by the base and some base will remain.

$$\text{excess base} = 0.0250 - 0.0100 = 0.0150 \text{ mol}$$

$$\text{new } [\text{OH}^-] = \frac{\text{mol OH}^-}{\text{total volume}} = \frac{0.0150 \text{ mol}}{0.100 \text{ L} + 0.200 \text{ L}} = 0.0500 \text{ M}$$

$$[\text{OH}^-] = 0.0500 \text{ M}, \quad \text{pOH} = 1.3$$

$$[\text{H}^+] = \frac{1 \times 10^{-14}}{0.05} = 2 \times 10^{-13} \text{ M}, \quad \text{pH} = 12.7$$

Polyprotic Titrations

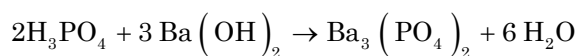
The formula ($M_a V_a = M_b V_b$) is modified when acids contain more than one H^+ and/or bases contain more than one OH^- .

EXAMPLE: What volume of 0.18 M $\text{Ba}(\text{OH})_2(\text{aq})$ is required to neutralize 0.061 L of 0.072 M $\text{H}_3\text{PO}_4(\text{aq})$?

- A. 0.120 L
- * B. 0.037 L
- C. 0.024 L
- D. 0.012 L

(Answer: B)

Solution: State the neutralization equation to determine the molar ratio of acid and base.



multiply the acid side by 3 because of the 3 $\text{H}^+(\text{aq})$ in $\text{H}_3\text{PO}_4(\text{aq})$ and multiply the base side by 2 because of the 2 $\text{OH}^-(\text{aq})$ in the $\text{Ba}(\text{OH})_2(\text{aq})$.

$$\begin{aligned} M_a V_a (3) &= M_b V_b (2) \\ (0.072 \text{ M})(0.061 \text{ L})(3) &= (0.18 \text{ M})(V_b)(2) \\ 0.0132 &= V_b (0.36) \\ 0.037 \text{ L} &= V_b \end{aligned}$$

Concentration Conversions (ppb, ppm, $\text{g} \cdot \text{L}^{-1}$, $\text{mol} \cdot \text{L}^{-1}$)

Both units, ppb and ppm, are gram-to-gram comparisons.

38 ppm is equivalent to $\frac{38 \text{ g of solute}}{1 \times 10^6 \text{ g of solution}}$. (1 mL of water = 1 gram of water)

38 ppm can be converted to ppb by using a ratio.

$$\frac{38 \text{ g}}{1 \times 10^6 \text{ g}} = \frac{x \text{ g}}{1 \times 10^9 \text{ g}}$$

$$1 \times 10^6 x = 38(1 \times 10^9)$$

$$x = \frac{3.8 \times 10^{10}}{1 \times 10^6}$$

$$x = 3.8 \times 10^4 \text{ ppb}$$

To calculate $\text{g} \cdot \text{L}^{-1}$ from ppm (or ppb), convert the ratio to litres. (1 L of water = 1000 g of water)

$$\frac{38 \text{ g}}{1 \times 10^6 \text{ g}} = \frac{x \text{ g}}{1000 \text{ g}}$$

$$x = \frac{38000}{1000000} = 0.038 \text{ g} \cdot \text{L}^{-1}$$

$$x = 3.8 \times 10^{-2} \text{ g} \cdot \text{L}^{-1}$$

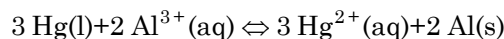
To calculate $\text{mol} \cdot \text{L}^{-1}$, use molar mass to convert grams to moles. In this example NaCl is the solute.

$$\frac{3.8 \times 10^{-2} \text{ g} \cdot \text{L}^{-1}}{58.5 \text{ g/mol}} = 6.5 \times 10^{-4} \text{ mol} \cdot \text{L}^{-1}$$

Equilibrium constant expressions for heterogeneous systems

When writing equilibrium constant expressions for a given equation, do NOT include solids and liquids in the expression. Their concentrations are constant and so become a permanent part of the K value. Gases and aqueous concentrations are included.

EXAMPLE 1: Write an equilibrium constant expression for the following reaction.



- * A.
$$K = \frac{[\text{Hg}^{2+}(\text{aq})]^3}{[\text{Al}^{3+}(\text{aq})]^2}$$
- B.
$$K = \frac{[\text{Al}(\text{s})][\text{Hg}^{2+}(\text{aq})]^3}{[\text{Al}^{3+}(\text{aq})]^2 [\text{Hg}(\ell)]^3}$$
- C.
$$K = \frac{[\text{Hg}^{2+}(\text{aq})]}{[\text{Al}^{3+}(\text{aq})]}$$
- D.
$$K = \frac{[\text{Al}^{3+}(\text{aq})]^2}{[\text{Hg}^{2+}(\text{aq})]^3}$$

EXAMPLE 2: If additional Al(s) is added to the above system at equilibrium, in which direction does the system shift and what happens to $[\text{Hg}^{2+}]$?

- A. The system shifts to the right, and $[\text{Hg}^{2+}(\text{aq})]$ increases.
- B. The system shifts to the left, and $[\text{Al}^{3+}(\text{aq})]$ increases.
- C. There is no shift, and $[\text{Al}(\text{s})]$ increases.
- * D. There is no shift, and $[\text{Hg}^{2+}]$ does not change.

Solution: The addition of more solid will not affect equilibrium.

EXAMPLE 3: If additional $\text{Al}^{3+}(\text{aq})$ is added to the above system at equilibrium, in which direction does the system shift and what happens to $[\text{Hg}(\ell)]$?

- A. The system shifts to the right, and $[\text{Hg}(\ell)]$ decreases.
- B. The system shifts to the left, and $[\text{Hg}(\ell)]$ increases.
- * C. The system shifts to the right, and $[\text{Hg}(\ell)]$ does not change.
- D. The system shifts to the left, and $[\text{Hg}(\ell)]$ decreases.

Solution: The forward reaction rate increases, and the system shifts to products.
The amount of $\text{Hg}(\ell)$ drops, but its concentration is constant.

Physics 30 (8213)
Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple Choice</u>					
I. Kinematics and Dynamics	x	x	x	x	40
II. Mechanical Energy	x	x	x	x	16
III. Electricity	x	x	x	x	24
IV. Nuclear Physics	x	x	x	x	20
TOTAL					100

Note: Changes have been made to the table of specification and formula sheet in Physics 30 in 2011.

* Refer to *Physics 20 & 30, A Curriculum Guide for the Secondary Level*, September 1992, pages 165–274.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each. **The questions are based on the four units indicated in the table of specifications. Teachers are expected to evaluate the optional units.**

A list of formulas from the curriculum guide is provided with each examination booklet. These formulas are included in the prototype examination. A table of trigonometric ratios, a periodic table of the elements, and graph paper is also provided.

Students should supply themselves with a graduated ruler, protractor, compass, and pencil for creating diagrams and graphs if necessary.

A scientific or graphic hand calculator is required. **All calculators must be cleared of programs.** Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, calculators capable of symbolic manipulation, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted.

Refer to Appendix E for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit I		Unit II		Unit III		Unit IV	
%	#	%	#	%	#	%	#
40	20	16	20	24	12	20	10

Mark values for each section may vary by $\pm 2\%$

Mathematics Section:

Mathematics A 30 (8404) Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple Choice</u>					
A. Permutations & Combinations	x	x	x	x	12
B. Data Analysis	x	x	x	x	6
C. Polynomials & Rational Expressions	x	x	x	x	16
D. Exponents & Radicals	x	x	x	x	18
E. Relations & Functions	x	x	x	x	24
F. Systems of Linear Equations	x	x	x	x	8
G. Angles & Polygons	x	x	x	x	16
TOTAL					100

* Refer to *Mathematics A 30: A Curriculum Guide for the Secondary Level*, September 1996, pages 301–383.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each as indicated in the table of specifications.

The quadratic formula and formulas for permutations, combinations, reciprocal identities, midpoint, slope, distance, and linear and quadratic functions, as well as a table of trigonometric ratios will be provided with the examination. This information is also included in the prototype examination.

Students should supply themselves with a graduated ruler, protractor, compass, and pencil for creating diagrams and graphs if necessary.

The use of a scientific or graphic hand calculator is encouraged. **All calculators must be cleared of programs.** Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, calculators capable of symbolic manipulation, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted.

Print dictionaries may be used for this examination. Electronic dictionaries and translation dictionaries are not allowed. Dictionaries may not contain any notes or reference materials.

Refer to Appendix F for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit A		Unit B		Unit C		Unit D		Unit E		Unit F		Unit G	
%	#	%	#	%	#	%	#	%	#	%	#	%	#
12	6	6	3	16	8	18	9	24	12	8	4	16	8

Mark values for each section may vary by $\pm 2\%$

Mathematics B 30 (8405) Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple Choice</u>					
A. Probability	x	x	x	x	14
B. Data Analysis	x	x	x	x	12
C. Matrices	x	x	x	x	20
D. Complex Numbers	x	x	x	x	6
E. Quadratic Equations	x	x	x	x	12
F. Polynomial Functions	x	x	x	x	14
G. Exponential & Logarithmic Functions	x	x	x	x	22
TOTAL					100

* Refer to Mathematics B 30: A Curriculum Guide for the Secondary Level, September 1996, pages 401–493.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each as indicated in the table of specifications.

The formula and information sheets provided with the examination include the formulas for permutations, combinations, binomial expansion, standard deviation, z -scores, compound interest, ordinary annuity, and present value. The quadratic formula, sequence formulas, and the standard normal distribution table are also provided. These sheets are also included in the prototype examination.

Examinations may include questions involving partial (fractional) z -scores.

Students should supply themselves with a graduated ruler and pencil for creating diagrams and graphs if necessary.

The use of a scientific or graphic hand calculator is encouraged. **All calculators must be cleared of programs.** Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, calculators capable of symbolic manipulation, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted.

Print dictionaries may be used for this examination. Electronic dictionaries and translation dictionaries are not allowed. Dictionaries may not contain any notes or reference materials.

Refer to Appendix G for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit A		Unit 2		Unit C		Unit D		Unit E		Unit F		Unit G	
%	#	%	#	%	#	%	#	%	#	%	#	%	#
14	7	12	6	20	10	6	3	12	6	14	7	22	11

Mark values for each section may vary by $\pm 2\%$

Mathematics C 30 (8406) Table of Specifications

CORE UNITS	LEVELS OF THINKING				MARKS**
	Knowledge	Comprehension	Application	Higher	
<u>Multiple Choice</u>					
A. Mathematical Proof	x	x	x	x	28
B. Conic Sections	x	x	x	x	18
C. Circular Functions	x	x	x	x	20
D. Trigonometric Applications	x	x	x	x	14
E. Trigonometric Identities	x	x	x	x	14
F. Trigonometric Equations			x	x	6
TOTAL					100

* Refer to Mathematics C 30: A Curriculum Guide for the Secondary Level, September 1996, pages 501–559.

** Mark values for each section may vary by $\pm 2\%$.

The examination is composed of 50 multiple-choice questions valued at 2 marks each as indicated in the table of specifications.

The formula sheet provided with the examination is included in the prototype examination. A table of trigonometric ratios is also included in each examination booklet.

Students should supply themselves with a graduated ruler, protractor, compass, and pencil for creating diagrams and graphs if necessary.

The use of a scientific or graphic hand calculator is encouraged. **All calculators must be cleared of programs.** Only silent hand-held calculators designed for mathematical computations such as logarithmic, trigonometric, and graphing functions are permissible. Computers, calculators with a QWERTY keyboard, calculators capable of symbolic manipulation, and electronic writing pads are not allowed. Calculators that have built-in notes (definitions or explanations in alpha notation) that cannot be cleared are not permitted.

Print dictionaries may be used for this examination. Electronic dictionaries and translation dictionaries are not allowed. Dictionaries may not contain any notes or reference materials.

It should be noted that the notation used to show angle sizes is $\angle P = 25^\circ$ as opposed to $m\angle P = 25^\circ$. This is consistent with the notation used in the curriculum guide.

Objective A.2 (completing deductive proofs using a two-column format) is considered testing material.

Refer to Appendix H for Prototype Examination. Prototype examinations are available on the Ministry of Education website at: <http://www.education.gov.sk.ca/prototypes>.

The following is a breakdown of the percentage and number of questions allocated to each of the core units.

Unit A		Unit B		Unit C		Unit D		Unit E		Unit F	
%	#	%	#	%	#	%	#	%	#	%	#
28	14	18	9	20	10	14	7	14	7	6	3

Mark values for each section may vary by $\pm 2\%$