Biology: Exploring Life Materials Review Instrument
Procedures for Completing the Review

This instrument consists of 10 pages. The first page is a copy of the three curricular objectives for the project, the seven overarching questions reviewers are to consider as they review the materials, and a summary of the three-stage learning cycle model. The next 8 pages present the 8 worksheets you will use to summarize what you conclude as a result of examining the *ELife* materials. The tenth page is the final worksheet you will use to address issues related to biology teaching and the utility of the materials.

Each of the first 8 worksheets lists a set of guiding questions to help identify the sorts of things you should look for as evidence of *ELife's* treatment of the topic addressed by that worksheet. Each of these sheets then asks you to respond to two short-answer items, one citing instances of things in the materials that exemplify attention to the topic of that worksheet and one in which you are asked to suggest ways to improve the way *ELife* addresses that topic in future revisions.

Although some space is provided below each short-answer item, you should not feel restricted by the space provided. We assume you will complete the worksheets using a word processor and may, therefore, include as much as you feel is appropriate.

The final worksheet asks you to address four questions. Once again, while space is provided for you to respond, do not feel limited in your responses.

To Prepare for Your Review

1. Read through the *Introduction and General Instructions* document.
2. Read pages **Tvi – Tvii** and **Tx – Txv** in the *Teacher's Edition*.
3. Print out a copy of this document. This will give you a set of reference sheets on which you can write notes.
4. Review each of the nine worksheets to get an idea of the things you will want to look for.
5. Put the sheet with the project objectives, overarching questions, and learning model somewhere you can refer to it regularly.

To Complete the Actual Review

1. Log on to *PH SuccessNet* at www.phsuccessnet.com. Use **sci_teacher** (note the underline between **sci** and **teacher**) as your user ID and **159263** as your password. The left column headed BOOKCASE contains only **BIOLOGY Exploring Life**. Clicking on that blue link takes you to the **Online Table of Contents** for *ELife*. From here you can choose units 1 and 3 to review. [**Important note:** Make sure you are using Internet Explorer 5 or later and have installed the Flash 6 plug-in, QuickTime 5.0, and Acrobat Reader 5.0 or later.]
2. Begin working through the chapters and related materials in Unit 1 (chapters 1-3) and Unit 3 (chapters 9-13). Try out all the Web activities and think about how they relate to the textbook concepts.
3. As you look at materials, refer regularly to the objectives and overarching questions.
4. Make notes to yourself of things you think are particularly good examples for each of the topics covered by the worksheets.

5. Similarly, write notes to yourself of things you think could be improved in future revisions of *ELife*.

To Prepare Your Review Report

1. Once you have completed your review of all materials, consult your notes. Now work through each of the first 8 worksheets, filling in ways in which *ELife* addresses that worksheet's topic and ways it might address it better. Since you are completing the worksheets after working through all 8 chapters, think broadly across those chapters and think about what *ELife* does well and how it might be improved in future editions. Give particular thought to how the various components are integrated.
2. Once this is done, use your notes and the insights you have obtained in completing the other worksheets to respond to the four questions on the final worksheet.

To Submit Your Review Report

1. Once you have completed all 9 worksheets, save the file.
2. **No later than Thursday, October 16**, attach that file to an e-mail and send it to amb4@lehigh.edu. Please copy ward.cates@lehigh.edu on that e-mail.

How To Handle Technical Problems and Questions

If you have trouble getting things to run, contact Al Bodzin by e-mail at amb4@lehigh.edu or by telephone at 610/758-5095.

One Last Reminder….

Our major focus needs to be on what NSF funded: the extent to which the shorter textbook and Web activities are well integrated in service to accomplishing the project's objectives and addressing the seven overarching questions. We have provided you with as many of *ELife's* components as possible to give you an idea of what the entire curriculum will look like.

Don't let yourself get distracted by individual materials, however (like the printed lab manual or the CD-ROM materials). Just examine these materials quickly to get an idea of what they look like and how they fit with the rest of the curriculum. Do take time, however, to work through the online activities carefully. Remember that they are intended to be integral to *ELife,* not supplemental.

As you work through the chapters, think broadly. Your goal is to consider the curriculum as a whole, looking for how well it integrates its resources and supports students and teachers.

ELife Curricular Objectives

1. A general biology program focused on a few key concepts for each major topic (chapter).
2. Student-centered materials for active learning of biology.
3. Tools to support teachers as they test out new ways to teach biology in the classrooms

Overarching Questions for This Review

How well does the *ELife* curriculum…

1. Address the conceptual foundations of biology?
2. Offer student-centered materials for active learning of biology?
3. Exercise students' skills in scientific thinking and decision-making?
4. Supply scientific thinking and decision-making activities students will find challenging?
5. Highlight the relevance of biology to important personal/social concerns of students?
6. Assess student learning in varied, reliable, and appropriate ways?
7. Support teachers in implementing enhanced pedagogy in their biology classrooms?

ELife Learning Model

Stage	Activity
Engage:	Students begin new concept with activity designed to create interest and generate curiosity in topic of study.
Explore/Explain:	Student explore concepts through online activities and laboratories. Textbook chapters provide explanations of science concepts. Explanations reinforced with online visualizations.
Assess:	Textbook: Assessment occurs at end of each concept as *Concept Checks,* at end of chapters as *Reviewing Concepts* and *Applying Concepts,* and periodically using items from the *Computer Test Bank*. Web site: Self-assessments follow each concept and are included in *Laboratory Online Companions*. Chapter-level quizzes.

WORKSHEET 1: ACTIVE LEARNING

Learning biology is something students do, not something that is done to them. In learning science, students describe objects and events, ask questions, acquire knowledge, construct explanations of natural phenomena, test those explanations in many ways, and communicate their ideas with others (*NSES* p. 20).

As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Are activities learner-centered?
2. Do materials engage students in activities to help them connect the biological sciences to current issues and events at the personal, community and global levels?
3. Do materials provide students with opportunities to engage in scientific inquiry, ask questions, propose hypotheses, gather data, manipulate and analyze data, develop arguments, and consolidate and communicate their ideas for biological phenomena?
4. Do materials include information and guidance to assist the teacher in implementing lessons involving active learning (for instance, ideas, possible methods, and kinds of resources)?

Cite instances in the reviewed units you feel **exemplify** **ACTIVE LEARNING**.

Suggest ways **ACTIVE LEARNING** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 2: DEPTH OF UNDERSTANDING

Do instructional materials provide opportunities for students to develop deep understanding of biological concepts? As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Is there an overview of the concepts to be learned in the instructional materials?
2. Do materials focus on the development of a limited number of fundamental biological concepts?
3. Are there diagnostic tools available within the materials to determine necessary prior knowledge?
4. Are opportunities embedded within the instructional materials to help students assess and probe their own understanding? (For instance: Thought-provoking questions embedded in the instructional materials? Opportunities to monitor their understanding and to make predictions?)
5. Do materials contain a logical progression for developing conceptual understanding?
6. Do materials revisit, summarize and provide closure for concepts?
7. Do materials provide opportunities for students to apply their understanding?

Cite instances in the reviewed units you feel **exemplify** a focus on **DEPTH OF UNDERSTANDING**.

Suggest ways **DEPTH OF UNDERSTANDING** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 3: ENHANCED THOUGHTFULNESS

Well-designed curricular materials should help students become better thinkers. They should require students to become more thoughtful and creative.

As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Do materials encourage each student to think about the purpose of the activity?
2. Do materials involve students in a logical or strategic sequence of activities (as contrasted with just a collection of activities)?
3. Do materials encourage divergent and creative thinking?
4. Are students challenged to think more deeply about biological concepts?

Cite instances in the reviewed units you feel **exemplify** **ENHANCED THOUGHTFULNESS.**

Suggest ways **ENHANCED THOUGHTFULNESS** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 4: HELPING TEACHERS ADDRESS COMMON STUDENT MISUNDERSTANDINGS

Current research in science education places emphasis on teaching for conceptual change. As learners develop, there is a need to construct meaning about how and why things behave as they do. Thus, learners begin to construct sets of ideas, expectations, and explanations about natural phenomena to make meaning of their everyday experiences. The ideas and explanations that they generate form a complex framework for thinking about the world in a way that is frequently different from the views of scientists.

As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Do materials alert teachers to student misconceptions or naïve conceptions for specific concepts?
2. Do materials explain the cause of the misunderstanding?
3. Do materials include specific questions, tasks, or activities that could be used by teachers to address student misunderstandings?

Cite instances in the reviewed units you feel **exemplify** **ADDRESSING COMMON STUDENT MISUNDERSTANDINGS.**

Suggest ways **ADDRESSING COMMON STUDENT MISUNDERSTANDINGS** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 5: EQUITY ISSUES

Curricular materials should be useful for a wide range of learners; they should not be better suited to some students than others. Materials can include a range of examples employing diverse race and gender illustrations. To facilitate equity, teacher-support materials can also address ways teachers might be more inclusive and accommodating.

As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Are instructional materials likely to be equally interesting, engaging, and effective for females and males?
2. Are instructional materials likely to be interesting, engaging, and effective for underrepresented and underserved students (for example, ethnic, urban, rural, those with disabilities)?
3. Do teacher-support materials suggest ways to include and accommodate a wider range of learners?

Cite instances in the reviewed units you feel **exemplify** how *ELife* addresses **EQUITY ISSUES**.

Suggest ways addressing **EQUITY ISSUES** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 6: ASSESSMENT

Instructional materials include classroom-based assessments and scoring guides that can be used to gather student achievement and performance data on important biological concepts and abilities. As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Do assessments align to learning goals and objectives?
2. Do assessments include a variety of ways for students to demonstrate the acquisition of intended abilities and conceptual understanding (selected response, open response, extended response, performance demonstrations, written reports, interviews, portfolios, etc.)?
3. Do materials include assessment tasks that require application of ideas?
4. Do materials include student-centered assessments to help learners gauge their own progress and improve their learning efforts?
5. Do materials include assessments that contain advice on how teachers might use the results to select or modify instructional activities?
6. Are assessments designed to provide valid, reliable, and fair data about student achievement and performance?

Cite instances in the reviewed units you feel **exemplify** **APPROPRIATE ASSESSMENT.**

Suggest ways **ASSESSMENT** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 7: IMPLEMENTATION SUPPORT

Well-designed instructional materials supply information about implementation and provide guidance on how to use them effectively in schools. As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Are directions on implementing activities clear?
2. Are suggestions for instructional delivery adequate?
3. Are suggested times for instruction reasonable?
4. Do background materials for the teacher provide sufficient information on the scientific content?
5. Does the *Teacher's Edition* help show how the components of the product may be integrated effectively in the classroom?
6. Do instructional materials provide information about the kind of resources and support required to facilitate implementation?
7. Overall, do materials make realistic demands on teachers, do they appear to be easily implemented in the classroom, and do teacher-support materials explain best uses with students?

Cite instances in the reviewed units you feel **exemplify** **IMPLEMENTATION SUPPORT**.

Suggest ways **IMPLEMENTATION SUPPORT** might be **strengthened in future** revisions of *ELife*.

WORKSHEET 8: CLARITY AND EASE-OF-USE

Curricular materials should be easy to understand and easy to use. The way in which the material is presented should not distract from teaching and learning.

As you review the *ELife* materials, please keep in mind the following guiding questions:

1. Is the format easy for students and teachers to follow?
2. Is the text for students appropriate for the target age/grade level?
3. Is the Web site easy to use?
4. Do Web site activities integrate appropriately with corresponding textbook concepts?

Cite instances in the reviewed units you feel **exemplify** **CLARITY AND EASE-OF-USE.**

Suggest ways **CLARITY AND EASE-OF-USE** might be **strengthened in future** revisions of *ELife*.

FINAL WORKSHEET: BIOLOGY TEACHING AND UTILITY OF CURRICULUM

The basic philosophy behind *ELife* includes organizing a biology program around a few key concepts per chapter (the big ideas of science) and integrating a textbook, Web site, and laboratory components as part of a learning model. Consider the following questions that cut across all chapters you have reviewed and address issues related to biology teaching and the utility of the materials.

1. Each chapter in the *Teacher's Edition* contains reports from pilot teachers on how they have used *ELife* with their students. Many of them report that it has affected the way they and their students approach the study of biology. Do you think *ELife* will make a difference in how certain students learn biology and how certain teachers use instructional materials? For which students and which teachers do you think *ELife* will make the biggest difference?

2. Do you feel that using these materials would help some teachers see new ways of teaching biology? If so, do the teacher-support materials do a good job of supporting changed teaching practice?

3. What kinds of professional development experiences would help teachers make the most of this biology program?

4. What general suggestions do you have for the developers in making future enhancements to *ELife*?