# Summary of AAAS Criteria for Evaluating the Quality of Instructional Support Responses

**Exploring Life Evaluation Report**
**May 23, 2001**

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The rating scale used in the Project 2061 Instructional Analysis of Biology Textbooks was also used in this analysis:

Excellent: 3
Good: 2.5-2.9
Satisfactory: 2.0-2.4
Fair: 1.5-1.9
Poor: 0-1.4

The ratings in this report are the average responses from the NSTA 2001 workshop participants. Materials reviewed included the Cellular Respiration and Photosynthesis chapters with new interface design.

## Category I. Providing a Sense of Purpose

### I.1 Conveying unit purpose
**Rating: Good (2.67)**

General comments

The material does a good job of conveying an overall sense of purpose and direction that is understandable and motivating to students.

The design of the materials does not meet each specific aspect of Criterion 4: "Students are given an opportunity to think about and discuss the problem, question, representation (or otherwise identified purpose)." The Web-based materials provide the learners scaffolds in many areas to think about the materials. However, learners are not encouraged to discuss ideas with other learners before submitting responses.

The Exploring Life materials do not return to the stated purpose at the end of the unit.

Recommendations

The Web-based materials should be designed for pairs of learners engaging in social discourse while working together on one computer. This change would enable the materials to meet *criterion 4* of this category: "Students are given an opportunity to think about and discuss the problem, question, representation (or otherwise identified purpose)."

The instructional design of the materials is geared towards one learner learning in isolation on one computer. We suspect that most classrooms will not have one computer per student.

A summary section at the end of the unit, either online or in the text, that enables learners to review the main ideas resented in each chapter should be provided.

Specific participant responses to note

1. The Exploring Life curricula introduces the defined purposes with each clearly labeled concept in every chapter evaluated. The wording in both the text and the Web-based materials is clear and easy to understand. The interactivity reinforces concepts that were previously introduced and sets the stage for further explorations
2. I have found this very difficult topic covered nicely. I even found information that is often difficult to get across to classes explained in a context that was very palatable for the students. I think EL does a fine job on conveying the unit's purpose throughout its materials.
3. The material is especially strong in #3. The connection to things the students already know about is excellent. The reason I did not give [this score] a 3 is that I believe a summary section at the end of the unit tying all major concepts would fulfill item 6.

**I.2 Conveying lesson purpose**
**Rating: Satisfactory (2.67)**

General comments
The material conveys the purpose of each lesson.

Recommendations
No recommendations for change.

Specific participant responses to note
1. I feel that the lesson purpose is conveyed in an excellent manner. The students can remain focused on the topic in an interactive and interesting manner. It was 'fun' to go on to the next page because every page left you wanting to see what was next. It allows one to think about what would naturally come next.
2. Objectives are clearly stated for each lesson - the language used is of an appropriate level for most high school students and is easily followed. Interactive activities engage the student and crate a logical progression of thought processes
3. Clear and concise material with plenty of material which shows relation to the world that a student lives in.

**I.3 Justifying activity sequence**
**Rating: Good (2.80)**

General comments
The material involves students in a logical or strategic sequence of activities.

Recommendations
No recommendations for change.

Specific participant responses to note
1. The text/Website provide an easily followed progression of activities. Reference to prior activities makes the sequence logical and easy to follow.
2. I thought the sequence was very logical and sequential. It was not just a bunch of facts lumped together. The sequence and the activities all fit together with the goal of making some topic more clear.
3. The material is presented in the way that I have found to be most successful with students--beginning with them (consumers, respiration, and ATP) and moving to photosynthesis and producers.

## Category II: Taking Account of Student Ideas

### II.1 Attending to prerequisite knowledge and skills
**Rating: Fair (1.93)**

General comments
Currently, the Exploring Life chapter materials do not specify prerequisite knowledge (prior knowledge or understanding that learners need to be able to learn new content or concepts) or skills that are necessary to meet the benchmark(s) for learning. The materials in Chapter 8 do contain links to content presented in Chapter 7.

Recommendations
Provide "strand maps" for learners and teachers in the Web-based materials that show the development of ideas and skills over a sequence of chapters. The AAAS Project 2061's *Atlas of Scientific Literacy* provides good examples of strand maps that show connections between related ideas and skills in the cluster areas of heredity, cells, flow of matter and energy, and the evolution of life. The Project 2061 strand maps can be used as templates to show the relationships among concepts presented in the Exploring Life chapters. These strand maps can hyperlink directly to specific concepts on the Exploring Life Website.

The developers should take advantage of the ability to provide hypertext links to prerequisite knowledge on the Website.

Specific participant responses to note
1. I don't remember any prerequisite information. I thought it did make connections between chapters in the unit.
2. I feel that as the units develop, EL will be able to address this issue better. At this time with only two chapters done, it is difficult to judge. I would like to see links between the chapters when the final version is completed. This could even be done in a manner where students could brush up on some previous ideas prior to beginning the new unit/chapter.
3. Perhaps I am not looking at the right place, but I cannot find a LIST of prerequisites in either the Teacher Resources or the Student Text. The material does a good job of reinforcing concepts already taught in a unit and unit 8 does spiral back to unit 7. It is the teacher support that seems to be lacking. I wouldn't need it but a novice teacher would perhaps.

**II.2 Alerting teacher to commonly held student ideas**
**Rating: Satisfactory (2.27)**

General comments
The Exploring Life chapter materials do not alert teachers to commonly held student ideas (both troublesome and helpful).

Recommendations
The Tips for Teachers area of each chapter (or perhaps each section) could address commonly held student ideas or misconceptions.

The materials could also provide a pretest for the teachers to use that includes specific questions that may help them understand the misconceptions their students may have on the chapter topic.

Specific participant responses to note
1. This isn't done even in the teacher resources section. Teacher section does a good job of explaining what to do in the labs but no commonly held misconceptions or ideas to be watchful for.
2. I feel that some ideas are addressed. However, I feel that more efforts can be placed on focusing on some of the more highly scrutinized misconceptions/concepts in Biology. Perhaps one may not need to explore all of them, but definitely the more popular concepts.
3. I could only find 1 example. The book does discuss greenhouse effect and explain it and the global impacts of deforestation. It is difficult to answer without seeing other units.

**II.3 Assisting teacher in identifying own students' ideas**
**Rating: Fair (1.67)**

General comments
The materials contain specific questions or tasks that can be used by teachers to identify students' ideas.

Examples were found in the material that includes questions/tasks that ask students to make predictions and/or give explanations of phenomena. This is clearly evident in Part II of the Investigating Cellular Respiration with Wisconsin FastPlant® Seeds lab.

Recommendations
The Teacher Resources area could suggest that teachers find out what their students think about familiar phenomena related to national science education standards and frameworks before scientific ideas are introduced. Providing a preinstructional quiz is a technique that can be used in the classroom to identify students' ideas. Current research in science education places emphasis on teaching for conceptual change. In teaching for conceptual change, it is necessary that the range of ideas regarding a topic held by different learners be made explicit. This is significantly different from common teaching practice. Identifying students' ideas recognizes that existing knowledge plays an important part in learning. In common instructional practice, students' ideas are not explicitly considered.

Specific participant responses to note
1. I think there was some of this. I think some of the labs and questions with activities such as the Webquests and Explores asked questions that got the students to write down ideas and comments, but I thought many of the questions were too difficult and fact based. I felt like some of the questions were detail oriented on things that the students would just memorize without potentially knowing it any clearer than having memorized it. I didn't think that understanding the concepts or the basics of the concepts was very clearly a goal of the questions.
2. In the beginning of each chapter online, there are many different opportunities that take place before the terminology "kicks in" and these are easy for a "laystudent" to do. #4-- [The material includes questions/tasks that ask students to **make predictions** and/or **give explanations** of phenomena (vs. focus primarily on identifying students' meaning for terms)]- one example would be asking about why leaves appear green, but not many more. No examples found of #5 [The material suggests how teachers can **probe** beneath students' initial responses to questions or **interpret** student responses (e.g., by providing annotated samples of student work)].
3. Leading questions are suggested in the Teacher Resources and are implied from the material itself. The on-line and wet labs allow students to make predictions and give explanations. However, I did not see strong support for ways to probe or interpret student responses.

**II.4 Addressing commonly held ideas**
**Rating: Satisfactory (2.20)**

General comments
The material contains interactivities and provides laboratories that are likely to assist learners to progress from their initial ideas.

The Exploring Life chapter materials do not explicitly alert teachers to commonly held student ideas.

Recommendations
In the Teacher Resource area of each chapter there could be a list of ideas commonly held by students. For example, plants get energy from the soil.

The Web-based interactivities should provide additional questioning strategies to prompt students to contrast commonly held ideas and the scientifically correct ideas in order to resolve differences between them. These questions should be presented to the students prior to displaying an animation that presents a concept.

Specific participant responses to note
1. I didn't see this as an underlying theme in the chapters. I think it was there to some extent in the activities. I thought some of the topics used were very familiar to this age student, which is terrific and gives them a place to start and does look at the ideas they hold. The activities were mostly directed. It would be difficult to have a really open ended experiment, with no direction at all.
2. EL definitely promotes an environment by which a teacher can expand on the student's thoughts. With the arsenal of additional activities to try, one can cover a wide range of topics and concepts. In this way one can dynamically extend the focus of the lesson to meet the needs of the student's inquiries.
3. In the Web activities and some labs students are asked to predict what may happen based on prior knowledge - the answers to their questions could alert teachers to misconceptions.

## Category III: Engaging Students with Relevant Phenomena

### III.1 Providing variety of phenomena
**Rating: Good (2.67)**

General comments
Most respondents (n=13) believe the material provides a sufficient number and variety of phenomena, observable events in nature that can make a scientific idea real to students. It is recommended that the teacher support materials contain an area that specifically states how each Web-based interactivity and laboratory aligns with the content ideas presented in the National Science Education Standards and related frameworks.

Recommendations
No recommendations for change.

Specific participant responses to note
1. The 2 units I have looked at are VERY STRONG in this area. The use of on-line resources, written text that is beautifully and appropriately illustrated and excellent suggestions for lab exercises provides a variety of learning experiences for students. The flow of energy concept presented in these two units is highly congruent with National Science Education Standards--with energy transfer being a major strand.
2. This area is excellent - there are many real world connections made: skaters, fast food, apples and bears, Lance Armstrong, chocolate - even just the idea of researching ideas on the Web is providing a variety of ways to learn.
3. I would like to see more choices where this is involved. Instead of just giving one example of a phenomena in its context I would like to see several phenomena explored. Not every student comes from the same ecological or socioeconomic area and therefore what may be good for one student may not fulfill the needs of another. The student should have the opportunity to pick from a variety of phenomena so that he feels comfortable with it.

**III.2 Providing vivid experiences**
**Rating: Good (2.47)**

General comments
Most respondents (n=14) believe the Exploring Life materials include activities that provide firsthand experiences with phenomena when practical and a vicarious sense of the phenomena when not practical. The experiences that are not firsthand (e.g., text, pictures, animations, interactivities) provide students with a vicarious sense of the phenomena.

Recommendations
No recommendations for change.

Specific participant responses to note

1. Vivid experiences are evident in numerous laboratory experiences as well as the interactive Web-based activities.
2. I liked the first hand experiences. I thought they weren't run of the mill or outdated. I thought they were practical for even districts that don't have a lot of equipment or money. I thought there was a good balance.
3. The phenomena are handled in a very nice manner. I feel they are thorough and efficient in nature. They definitely provide first hand experience through lab activities and compelling interactive graphics.

## Category IV: Developing and Using Scientific Ideas

### IV.1 Introducing terms meaningfully
**Rating: Good (2.60)**

General comments
Most respondents (n=14) believe the Exploring Life materials introduce technical terms in conjunction with an experience with the idea or with a process. Terms are introduced as needed to facilitate thinking and promote effective communication. The material is effective in linking technical terms to relevant experiences rather than just having students learn definitions of terms.

Recommendations
No recommendations for change.

Specific participant responses to note
1. From what I have seen so far in Chapter 7 and 8, there is more technical vocabulary than is necessary, at least by the standards set for 10th grade science in Oregon. For example, I believe students should have an understanding of cellular respiration and its importance, but the details and biochemical pathways are beyond what many 10th graders need to understand. However, I recognize that some teachers and students do wish to study such details, so I suppose it should be included so that we have the options.
2. Although written to include many details of these two complex processes, the vocabulary is not overwhelming and is only used when necessary -students are given some introduction before the vocabulary is used.
3. OUTSTANDING!!!!! Thanks for limiting the number of VOCABULARY terms. I fully believe in concepts--not memorization of terms. The necessary terms are introduced in a meaningful way--tied directly to content.

**IV.2 Representing ideas effectively**
**Rating: Good (2.67)**

General comments
Respondents believe the Exploring Life materials include accurate and comprehensible representations of scientific ideas. The interactivities provide a sufficient number and variety of representations that are explicitly linked to the presented concept and comprehensible to the students.

Recommendations
No recommendations for change.

Specific participant responses to note
1. Materials provide animations and activities that show excellent representation of scientific concepts and principles.
2. I am not a biochemist, but the material appears to be accurate, comprehensible and relevant to the real world.
3. Very well represented. Some of the best work I have seen in this area of critique. I think the demos are right on target. I almost want to say I think inclusion of these representations is a cornerstone of the EL program.
4. I did not find inaccuracies in the material. The facts are correctly and well presented. They are presented in a way to be comprehensible to students and linked to things they should already know.

**IV.3 Demonstrating use of knowledge**
**Rating: Satisfactory (2.13)**

General comments
The current Exploring Life Teacher Resource materials do not demonstrate/model or include suggestions for teachers on how to demonstrate/model skills or how to use the knowledge that is presented in the chapter.

It is noted that Exploring Life provides immediate feedback to learners in response to questions posed in the Web-based materials.

Recommendations
It is recommended that the Teacher Resource section include material that instructs the teacher regarding how to model the use of knowledge. For example, the Teacher Resource section might provide suggestions for implementing a classroom discussion that introduces diseases of the mitochondria and how it affects the human body.

Specific participant responses to note
1. I did not have the opportunity to view teacher resources other than limited ones on the Web. Some opportunities were given but not enough to substantiate evidence of meeting stated indicators.
2. Lab 7.2 is an excellent example of the power of multimedia to show students correct process and information of relevance so that the students are capable of doing their labs with understanding.
3. While the material is an EXTREME improvement over most texts--I would like to see more suggestions as to how to evaluate student performance. The performance is step by step and the material does suggest a logical performance of the students. I think I would have to re-evaluate this item after doing the unit with my kids.
4. These materials aim to broaden students' perspectives, allowing better understanding.

**IV.4 Providing practice**
**Rating: Good (2.67)**

General comments
Respondents believe the Exploring Life material provides a number of tasks in a variety of contexts, including everyday contexts. Furthermore, participants perceive that the materials include novel tasks.

Recommendations
No recommendations for change.

Specific participant responses to note
1. The tasks that fit this best were the ones after the illustrations and the lab activities. Support was only decreased in the labs. Complexity was increased mainly because of decreased support.
2. I felt that the material was always challenging the student to a higher level of performance. It allowed the students to become familiar with a concept and then encouraged them to expand their curiosity into different twists on the same procedure.
3. Very strong in this area. The concept check questions and the response questions in the Webquests provide students with opportunities to practice skills or use knowledge. In the early stages, students are allowed to "self check" their questions, which is good. Toward the end of the unit the more sophisticated thinking skills--analysis, synthesis, etc. are used to create and carry out and analyze lab procedures. KUDOS here.
4. As I mentioned before, yes, the material is presented in several different ways, which allows for the students to practice skills learned in different manners.

## Category V: Promoting Student Thinking about Phenomena, Experiences, and Knowledge

### V.1 Encouraging students to explain their ideas
**Rating: Good (2.47)**

General comments
Many of the online concept areas encourage students to not only express but also clarify, justify, and represent their ideas. The Web-based materials include text that directly provides students with immediate feedback regarding their ideas.

The material does not include specific suggestions to help teachers provide explicit feedback or include suggestions on how to diagnose student errors, give explanations about how these errors may be corrected, or how to further develop students' ideas.

Recommendations
No recommendations for change.

Specific participant responses to note

1. The variety of on-line tasks, questions from the text, activities, and self-quizzes is incredible. Unless I could guarantee a 1:1 student to computer ratio, I would not agree that every student could have an equal opportunity to express their unique ideas and expand upon them.
2. One of my major complaints with the interactive line of questioning is that some students will not be motivated to try to answering questions. A student can and write an incorrect answer and not suffer any adverse consequence. I feel that students should be held to a high standard for understanding material. I feel highly convicted on this point because I feel EL does an outstanding job of getting the information into the student's mind. There is no reason a student should not have an educated guess for any of the text -based lines of questioning.
3. Working through the Web-based reading and activities, the students are always asked to write down answers or "click" on correct choices in order to progress through the material- this feedback is immediate and powerful but often doesn't require a great deal of in-depth explanation of their answer.
4. The units are strong in [criterion] 1 & 3--there are many opportunities for individual students to express ideas--I'll only know after doing it with my students how much thinking those opportunities actually inspire. My hesitation is again with the "suggestions" for explicit feedback and suggestions to diagnose student errors. I just don't see strong evidence of this in the teacher resources.

**V.2 Guiding student interpretation and reasoning**
**Rating: Good (2.73)**

General comments
The participants perceive that the Exploring Life material includes specific and relevant tasks and/or questions for the experience or reading.

There are examples throughout the material that use questions or tasks that have helpful characteristics. Examples include: framing important issues, helping students to relate their experiences with phenomena to presented scientific ideas, helping students to make connections between their own ideas and the phenomena observed, and helping students to make connections between their own ideas and the presented scientific ideas.

Recommendations
No recommendations for change.

Specific participant responses to note
1. I thought the questions throughout the unit were pretty good. I liked them through the Webquests and explores and most of the labs. I liked the way they were sprinkled in and not just all at the end or beginning.
2. I think one of the intrinsic flaws with an interactive site is that it can't assure the background of the students using the site. One can make a statistical guess as to what are the common misconceptions but you will always come up short since immediate interactive feedback is not practical. I do feel that EL provides the best that can be expected for this criteria.
3. Each unit starts with the overall idea or theme and then each step seems to build upon the prior one: can't burn the marshmallow at the fire unless you understand the calorie idea and taking energy from food.

**V.3 Encouraging students to think about what they've learned**
**Rating: Satisfactory (2.07)**

General comments

This criterion focuses on the incorporation of metacognitive strategies. Metacognition is concerned with knowledge of one's own cognitive processes and products.

Responses to this criterion varied considerably. The material does not appear to provide students a way of expressing initial ideas about the content and concepts presented in the material. Furthermore, the material does not engage (or provide specific suggestions for teachers to engage) students in monitoring how their ideas have changed periodically in the unit.

Recommendations

Incorporate strategies for encouraging students to monitor how their ideas change throughout the unit.
Suggested ideas include:

1. Ask students to consider their own-recorded responses to some form of pretest.
2. Engage students in discussing whether two situations are analogous to one another.
3. Use direct questioning strategies that involve students in reflecting on their learning experiences.
4. Have students create and revise concept maps during the unit.
5. Use journaling throughout the unit.

Specific participant responses to note

1. The materials that I have seen so far do not seem to have a section to allow students to revise or reflect upon their ideas.
2. Could not find examples of [criteria] #2 or #3, but [criterion] #1 happens in the labs.
3. This can apply when students have to rewrite their answers that they input into the computer before they can go on - the teacher will have to provide most of this category if they want students to think about what they learned.

**Category VI: Assessing Progress**

**VI.1 Aligning assessment to goals**
**Rating: Satisfactory (2.33)**

General comments
Responses to this criterion varied considerably. Some participants were satisfied with the assessments that are provided in Exploring Life while others stressed a need to incorporate additional types of assessments.

Recommendations
Additional types of assessment should be included in the development of the materials. These could include open-ended questions, essays, and lab practicals. Rubrics could be developed to score these assessment items.

Specific participant responses to note
1. Chapter ending quizzes and questions met stated objectives. No other ancillaries were available for review. More variety is needed to best assess student performance.
2. The assessments I saw were multiple choice quizzes at the end of the chapter Web site. While cumbersome, I feel students need to write in order to truly assess their ability to think critically.
3. I feel that the questions asked are standardized (necessary) and also exploratory in nature. A student is ask to conceptualize what they have studied in the chapter and use the facts to come up with an answer. This is how it should be. I would like to see a little more in the way of challenge or analysis. The questions should follow the framework of the text in that it should also stimulate thought and insight not just verbatim information.

**VI.2 Testing for understanding**
**Rating: Good (2.52)**

General comments
The current Exploring Life material includes assessment items that require application of ideas and avoids allowing students a trivial way out, such as using a formula or repeating a memorized term without understanding. Some assessment items that appear in the "applying the concepts" section of the text include both familiar and novel tasks.

Recommendations
No recommendations for change.

Specific participant responses to note

1. Quiz online requires understanding of content. Suggest that if a student misses an answer he or she must go back and remediate. Suggest that remediation be included in the online format in order to go forward, especially since the concepts are building.
2. While many of the multiple choice questions are "novel", I still would prefer an assessment that evaluates students performance beyond the ability to "select the correct answer". Some of this occurs throughout the chapters, but is not included in what is the summative assessment.
3. The multiple choice assessments and fill in the blank seem to be rather ordinary and less analytical - the questions in the applying concepts area of the text are good Web activities are fairly simple questions to progress through the main idea.
4. Students have to analyze and give their own opinions and comments in several sections of critical thinking through out the chapter.

**VI.3 Using assessment to inform instruction**
**Rating: Fair (1.73)**

General comments
The Exploring Life material uses embedded assessment as a routine strategy throughout many of the Web-based interactivities.

The material does not provide specific suggestions to teachers about how to use the information from the embedded assessments to make instructional decisions about what ideas need to be addressed by further activities.

The material currently does not suggest how to probe beyond students' initial responses to clarify and further understand student answers.

Recommendations
This criterion should be discussed with regard to the level of importance to the curriculum.

Specific participant responses to note

1. No information is noted about how to modify instruction based upon student response; however, multiple pathways for extension are mentioned.
2. I didn't catch where there was so much suggestion of how to use the information the students provide to make instructional decisions. I liked the embedded assessment.
3. I would like to see more suggestions for teachers as to how to use the assessments to further the students' understanding. I would like to see the students progress in their level of questioning.
4. Perhaps I have not spent enough time in the Teacher Resources but once again, I did not find many suggestions to meet criteria #2.

## Category VII: Enhancing the Science Learning Environment

## VII.1 Providing teacher content support

General comments
Overall, there is a sense from the participants that ideas in the materials have been simplified so that students will be able to comprehend the content and concepts. However, the material currently does not contain a more sophisticated version for the teacher. Providing this in the curriculum would be a valuable asset for new teachers.

Recommendations
The Exploring Life content resources for teachers can be further developed in future sections to provide content and pedagogical support for the teachers. For example, because the inquiry investigations will allow students to question and explore, the teachers will need advanced information or suggestions for resources.

Section 1
**Criteria: Alerts teachers to how ideas have been simplified** for students to comprehend and what the more sophisticated versions are (even though students are not required to understand the more sophisticated versions). (Note: Ten participants did not respond to this item. Four participants commented that these materials were not available to review).

Specific participant responses to note
1. There are many concepts in ch7 and 8 that are simplified for example the pinball games help to clarify how ATP is used to make more energy by simply comparing them to coins in a game machine. There are also some opportunities to go further depending on what teacher decides to assign, like critical thinking in the chapter reviews and optional exercises while online.
2. On some of the activities I would have appreciated a more comprehensive explanation of the simplification procedures. I didn't feel I was exposed to more "sophisticated" versions but once again, it depends on the target audience.
3. The information given for each chapter on the Teacher Resources site is very complete. It explains the concepts in a way that it does refresh and improve teachers understanding.

Section 2
**Criteria:** Provides **sufficiently detailed answers** to questions in the student book for teachers to understand and interpret various student responses. (Note: Nine participants did not respond to this item. Six participants commented that these materials were not available to review).

Specific participant responses to note

1. The student Website does provide sufficiently detailed answers to questions, but these are mostly for student self-assessment, the way things are set up.
2. I think that the answers provided are adequate for the level of education being sought. The difficult concepts are detailed and the more general ones are not as heavily covered since there is no need in a typical case.
3. I don't think you can give teachers too much background information
4. Answer keys to labs and questions include a variety of student responses that can be anticipated.

Section 3

**Criteria:** Recommends **resources** for improving teacher's understanding of benchmark ideas. (Note: Ten participants did not respond to this item. Nine participants commented that these materials were not available to review).

Specific participant responses to note

1. Not that I have seen in the materials presented so far. Still in development.
2. I feel that the site provides many ancillary sources for a teacher to acquire more understanding. This often includes Web based sites of interest. I feel this is handled well.
3. A variety of Websites are suggested for Quests and background to widen teacher experience and confidence before approaching a class.

## VII.2 Encouraging curiosity and questioning

General comments

Exploring Life does contain materials that will help teachers to create a classroom environment that welcomes student curiosity, rewards creativity, encourages a spirit of healthy questioning, and avoids dogmatism. These materials include Webquests, the laboratories, the Explore! activities, and interactive tutorials.

Recommendations

The methods in which we are asking teachers to teach are new. It would be helpful for the curricular materials to provide examples of classroom interactions--e.g. dialogue boxes, vignettes, or video clips--that illustrate appropriate ways to respond to student questions or ideas, etc. This idea for curricular materials to provide classroom teachers with science pedagogical strategies is a novel idea.

Section 1

**Criteria:** Includes **suggestions** for how to encourage student questions and guide their search for answers or for how to avoid dogmatism, etc. (Note: Ten participants did not respond to this item. Nine participants commented that these materials were not available to review).

Specific participant responses to note

1. Introductory Webquests are excellent for encouraging curiosity and questioning.
2. I didn't see this. I felt that this was flexible in that you could use this if you had one computer and do the questions as a discussion together, or it could be mostly individual.
3. Presents info. for all types of learners - visual, tactile, auditory, etc.
4. Yes, in the Webquests and some of the lab/activities
5. This is evident in the review questions and various activities online where students are guided through the activities one section at a time.
6. I would like to see more information about encouraging student questions. I feel the site does a great job but there are many backgrounds that need to be covered in this endeavor.
7. Yes, good questions are suggested in the teacher's resources and also presented in the text.
8. The importance of citing sources and evaluating credible Websites is an issue to address for the Web Research assignment. Plagiarism is also brought up.

Section 2
**Criteria:** Provides **examples** of classroom interactions--e.g. dialogue boxes, vignettes, or video clips--that illustrate appropriate ways to respond to student questions or ideas, etc.

Participants noted that these materials were not available to review.

## VII.3 Supporting all students

General comments
The material avoids stereotypes or language that might be offensive to a particular group.

The material does suggest alternative formats for students to express their ideas during instruction and assessment. This was evident where students report their laboratory results in the form of a mini-poster, provided suggestions to give a report or create a PowerPoint presentation. Additional formats such as open-ended journal responses could also be provided.

Recommendations
Authors may want to include specific suggestions about how teachers can modify activities for students with special needs.

Section 1
**Criteria:** The material **avoids** stereotypes or language that might be offensive to a particular group.

Specific participant responses to note
1. I didn't see any evidence of a problem with stereotypes or language.
2. I found no examples of stereotypes or offensive language. for example, both male and female were represented in the activity where you analyze your own diet.
3. I saw no evidence of stereotyping or offensive language used in this program.
4. I did not see any material that would in any way be questionable.

Section 2

**Criteria:** The material **illustrates** the contribution of women and minorities to science and brings in role models.

Specific participant responses to note

1. In chapters 7 and 8, I do not see a great deal of evidence of meeting this criterion.
2. I've only seen two chapters, so it's hard to comment alot on this. I didn't see any evidence to the contrary. This would be something I am interested in.
3. Other than pictures in the student text, I do not see where this criteria is met.
4. I believe more can be done on this level. I am happy to see that the site does include multicultural video clips which expose students to places/situations that they would not experience otherwise.
5. Lance Armstrong is a great role model. Failed to see an example of a woman or minority in this particular unit.
6. Males and females of minority backgrounds seemed inclusive and integral vs. token. When it came to the illustrated demonstration by a scientist, (s)he had a "dark hand". Students will notice.

Section 3

**Criteria:** The material suggests **alternative formats** for students to express their ideas during instruction and assessment.

Specific participant responses to note

1. Yes, there are some, such as the mini-poster for the lab report.
2. I have not seen material hat I would consider alternative format.
3. The online quizzes at the end of the chapter seem limited.
4. There are alternative formats: multiple choice quizzes and questions, variety of review question types, and critical thinking which leads to learning communication skills.
5. The student is given lead questions which prompt further questions. These questions can easily be developed into an extension activity.
6. An assignment is suggested to be read and done for homework. A debate is presented as an alternative. Students are designing their own menus and designing their own experiments based on a model presented during the unit.

Section 4

**Criteria:** The material includes specific suggestions about how teachers can modify activities for students with special needs.

Specific participant responses to note

1. Not at this stage of development
2. I don't remember specific suggestions directed at teachers but the variety of options would allow a teacher to modify the lessons for students with special needs.

3. I would compile a database of teacher suggestions for things like this.
4. The suggestion for students allergic to peanuts is good--failed to see other suggestions for modification for special needs students.