

Exploring Life Materials Review Instrument

Scale of the review is based on 0.5 increments

Content Standards

Science as Inquiry (p.173-76 NSES) Instructional materials should provide opportunities for students to do scientific inquiry and understand scientific inquiry.

CRITERIA -

- identify questions and concepts about objects, organisms and events in the environment that guide investigations
- design and conduct scientific investigations
- use technology and mathematics to improve investigations and communications
- formulate and revise scientific explanations and models using logic and evidence
- recognize and analyze alternative explanations and models
- communicate and defend a scientific argument

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Science as Inquiry _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Science and Technology (p 190-91 NSES) Instructional materials should provide students the opportunity to develop abilities of technological design and understandings about science and technology

CRITERIA -

- understanding the role of technology in developing areas of biology
- designing activities around biological principles

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Science and Technology _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Science in Personal and Social Perspectives (p191-199 NSES) Instructional materials should provide opportunities for students to understand local as well as global phenomena and challenges that occur on scales that vary from quite short (natural hazards) to very long (potential result of global changes).

CRITERIA - fundamental concepts and principles that relate to biology include:

- a series under personal and community health including hazards, disease, fitness, mood and behavior, eating patterns, family health needs, and sexuality.
- factors associated with population growth such as linear and exponential growth, resource use, birth rates and fertility rates, carrying capacity, and technology effects on capacity of the earth systems to support human beings.
- environmental quality especially the human effects that influence that quality and how environment is affected by natural and human-induced hazards.
- science and technology in local, national and global challenges, especially as they relate to debates, land use and decisions about pollution and the effects of human activities on each other humans and other non-human organisms.

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Science in Personal and Social Perspectives _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

History and Nature of Science (p.200-201). Instructional materials should provide students the opportunity to develop understandings of science as a human endeavor, nature of scientific knowledge and historical perspectives.

CRITERIA - fundamental concepts and principles that relate to biology include:

- science as a human endeavor includes individual and team contributions. Scientists have ethical traditions that are influenced by societal, cultural and personal beliefs and ways of viewing the world -it is part of society!
- science differs from other ways of knowing through the use of empirical standards, logical arguments and skepticism as scientists strive for the best explanations about the natural world.
- scientific explanations require logic, respect for the rules of evidence, open to criticism, report methods and procedures and make knowledge public.
- all scientific ideas are subject to change, as new experimental and observational data becomes available.

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of History and Nature of Science _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

PEDAGOGY AND OTHER CONSIDERATIONS

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). Some guiding questions are:

- Do the materials engage students in activities that help them connect the biological sciences to current issues and events at the personal, community and global levels?
- Are the instructional materials likely to be interesting, engaging and effective for ALL populations of students (e.g., gender, ethnicity, disability, rural, urban).
- Do the materials provide students the opportunity for students to engage in scientific inquiry, to ask questions, propose hypotheses, gather data, manipulate and analyze data, develop arguments, consolidate and communicate their ideas for biological phenomena?
- Do the materials include information and guidance to assist the teacher in implementing lessons involving active learning (vignettes or scenarios, kinds of resources, support systems, professional development opportunities)?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Active Learning _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Depth of Understanding: Does the instructional material provide the student the opportunity to develop deep understanding of the biological concepts? Qualities to look for are:

- Is there an overview of the concepts to be learned within the instructional materials?
- Is there a concept map indicating the linkage between the concepts to be learned?
- Does the material focus on the development of a limited number of fundamental biological concepts?
- Are there diagnostic tools available within the materials to determine necessary prior knowledge?
- Are opportunities embedded within the instructional materials to help students self assess and to probe their understanding? (Thought-provoking questions embedded with the instructional materials? Opportunities to monitor their understanding and to make predictions?)
- Does the material contain a logical progression for developing conceptual understanding?
- Is historical development of concepts present, including evidence for “the way that knowledge was arrived at”?
- Does the material contain information that shows how science ideas change over time?
- Does the material revisit and summarize and provide closure to the intended learning concepts?
- Does the material provide opportunities for students to apply their understanding?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Depth of Understanding _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

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.

- Is the primary purpose of the included assessments to provide feedback to the student, teacher, parent/guardian, and district administrators about student attainment of the intended biological learning targets?
- Are the biological learning targets to be attained and the performance standards associated with the assessments clear and explicit?
- Are there assessments included that can be used for diagnostic, formative, and summative purposes?
- Are the assessments deliberately designed to obtain data regarding student attainment of the intended biological concepts and abilities (this encompasses the ability to inquire and an understanding of biological concepts principles laws and theories)?
- Do the 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.)?
- Do the materials include assessments within lessons and advice for teachers about using the results to modify instruction?
- Are the assessments designed to provide valid, reliable, and fair data about student achievement and performance?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Assessment _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Presentation and Format for Teachers:

- Does the background material for the teacher provide sufficient information on the scientific content?
- Does the background material for the teacher provide sufficient information on common student misconceptions?
- Is the format easy for a teacher to follow?
- Are the directions on implementing activities clear?
- Are the suggestions for instructional delivery adequate?
- Are the suggested times for instruction reasonable?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Presentation and Format for Teachers _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Presentation and Format for Students:

- Are the written materials for the students well-written, age -appropriate, and compelling in content?
- Do the materials encourage each student to **think about** the purpose of the activity?
- Do the materials involve students in a logical or strategic sequence of activities (versus just a collection of activities)?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
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Rating of Presentation and Format for Students_____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Implementation and System Support: Implementation issues are critical in focusing schools and districts on strategies for aligning curriculum across the grades, providing professional development and meaningful assessment, working with the community and parents, and evaluating the effectiveness of implementation of the particular instructional materials.

- Do the instructional materials include information and guidance to assist the teacher in implementing the lessons?
- Do the instructional materials provide information about the kind of resources and support system required to facilitate the district implementation of the required science materials?
- Do the instructional materials provide information about how to establish a safe science learning environment?
- Do the instructional materials provide information about the kind of professional development experiences needed by teachers to implement the materials?
- Do the materials provide guidance in how to link the materials with the district and state assessment frameworks and programs?
- Do the materials provide guidance and assistance for involving administrators, parents, and the community at large actively in supporting school science?
- Overall, are the materials usable by, realistic in expectations of, and supportive of teachers?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
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Rating of Implementation and System Support _____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.

Equity Issues: Instructional materials benefit from an explicitly focus on equity issues with suggestions for how teachers can gain access to needed materials and supplies and an understanding about complex but useful technologies for access for all. Often materials can address how to use heterogeneous student groups effectively and thereby accommodate various learning styles. Materials can reflect race and gender illustrations that allow materials to be more inclusive for a variety of student differences.

- Are the instructional materials likely to be interesting, engaging, and effective for females and for males?
- Are the instructional materials likely to be interesting, engaging, and effective for underrepresented and under served students (e.g., ethnic, urban, rural, with disabilities)?

0	1	2	3	4	5
Not addressed			Somewhat Addressed		Well addressed
	Poor	Inadequate	Adequate	Excellent	Exemplary

Rating of Equity Issues_____

Overall strengths that meet this criteria. Provide examples - including items not discussed above.

Overall weaknesses that meet this criteria. Provide examples - including items not discussed above.