

Name: \_\_\_\_\_

## Exploring Life Evaluation

### Criteria for Evaluating the Quality of Instructional Support Category I. Providing a Sense of Purpose

**I.1 Conveying unit purpose.** Does the material convey an overall sense of purpose and direction that is understandable and motivating to students?

#### Indicators of meeting the criterion

1. A problem, question, representation (or otherwise identified purpose) is **presented** to students.<sup>1,2</sup>
2. The problem, question, representation (or otherwise identified purpose) is likely to be **comprehensible** to students.
3. The problem, question, representation (or otherwise identified purpose) is likely to be **interesting** and/or **motivating** to students.
4. Students are given an opportunity to **think about** and discuss the problem, question, representation (or otherwise identified purpose).
5. Most lessons are **consistent** with the stated purpose and those that are not are explicitly labeled as digressions.
6. The material **returns** to the stated purpose at the end of the unit.

#### Scoring Scheme

**Excellent (3):** The material meets indicators 1-6.

**Satisfactory (2):** The material meets indicators 1-3 and 5.

**Poor (1):** The material meets indicator 1.

**None (0):** The material does not meet any of the indicators.

Score: \_\_\_\_\_

Comments:

Footnotes:

(1) The purpose may be presented to students in the student book or in the teacher's guide in the form of instructions to the teacher. If multiple purposes are presented to students, the reviewer should evaluate and rate each one separately and average the scores. If the presence of different purposes is likely to be confusing to students, then the reviewer may subtract one point (from the scoring scheme) from the average.

(2) If a material frames sections within a unit (rather than the whole unit), then the reviewer should evaluate and rate the purpose for each section separately and take the average. If a material attempts to frame both the unit overall and large sections within the unit, the reviewer should evaluate and rate each purpose separately. The overall rating of the criterion will be the average of the rating of the purpose for the unit overall and the average rating of the purposes provided for the individual sections.

**I.2 Conveying lesson purpose.** Does the material convey the purpose of each lesson and its relationship to others?

**Indicators of meeting the criterion**

1. The material **conveys** or prompts teachers to **convey the purpose** of the activity to students.
2. The purpose is expressed in a way that is likely to be **comprehensible** to students.
3. The material encourages each student to **think about** the purpose of the activity.
4. The material conveys or prompts teachers to convey to students how the activity **relates to the unit purpose**.
5. The material engages students in thinking about **what they have learned so far** and **what they need to learn/do next** at appropriate points.

**Scoring Scheme**

**Excellent (3):** The material meets all indicators.

**Satisfactory (2):** The material meets any three out of the five indicators.

**Poor (1):** The material meets any one out of the five indicators.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**I.3 Justifying activity sequence.** Does the material involve students in a logical or strategic sequence of activities (versus just a collection of activities)?

**Indicators of meeting the criterion**

1. The material **provides a rationale** for a logical or strategic sequence of activities.
2. The sequence of activities **reflects** the stated rationale.
3. If no rationale for a logical or strategic sequence of activities is provided, the **reviewer can readily infer** one.

**Scoring Scheme**

**Excellent (3):** The material meets the first two indicators.

**Satisfactory (2):** The material meets the third indicator.

**Poor (1):** The material meets only the first indicator or the reviewer can infer a logical rationale for the sequence of only a few activities.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

## Criteria for Evaluating the Quality of Instructional Support Category II: Taking Account of Student Ideas

**II.1 Attending to prerequisite knowledge and skills:** Does the material specify prerequisite knowledge/skills that are necessary to the learning of the benchmark(s)?

### Indicators of meeting the criterion

1. The material alerts the teacher to **specific** prerequisite ideas or skills (versus stating only prerequisite topics or terms).
2. The material alerts teachers to a **considerable proportion** of prerequisites identified by the reviewer.
3. The material **addresses** prerequisites in the **same** unit or in **earlier** units (in the same or other grades). [The material should not be held accountable for addressing prerequisites from an earlier grade range. However, if a material does address such prerequisites they should count as evidence for this indicator.]
4. If the material addresses prerequisites in earlier units, it **points explicitly** to these units.
5. The material makes **connections** between ideas treated in a particular unit and their prerequisites (even if the prerequisites are addressed elsewhere).

### Scoring Scheme

**Excellent (3):** The material meets indicators 1-5.

**Satisfactory (2):** The material meets three out of five indicators.

**Poor (1):** The material meets only one indicator.

**None (0):** The material does not meet any of the indicators.

If all identified prerequisites are benchmarks from an earlier grade range, then indicators 3 and 4 not be applicable. In this case, the scoring scheme that applies is:

**Excellent (3):** The material meets indicators 1, 2 and 5.

**Satisfactory (2):** The material meets indicator 1 and either indicator 2 or 5.

**Poor (1):** The material only meets indicator 1.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**II.2 Alerting teacher to commonly held student ideas:** Does the material alert teachers to commonly held student ideas (both troublesome and helpful).

**Indicators of meeting the criterion**

1. The material **accurately presents specific** commonly held ideas that are relevant to national science education standards/frameworks and have appeared in scholarly publications (rather than just stating that students have difficulties with particular ideas or topics).
2. The material **clarifies/explains** commonly held ideas (rather than just listing them).

**Scoring Scheme**

Excellent (3): The material meets indicators 1 and 2 for a considerable proportion of commonly held ideas that have appeared in scholarly publications.

Satisfactory (2): The material meets indicators 1 and 2 for some commonly held ideas that have appeared in scholarly publications.

Poor (1): The material meets indicator 1.

None (0): The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**II.3 Assisting teacher in identifying own students' ideas:** Does the material include suggestions for teachers to find out what *their* students think about familiar phenomena related to national science education standards and frameworks before the scientific ideas are introduced?

**Indicators of meeting the criterion**

1. The material includes **specific** questions or tasks that could be used by teachers to identify student ideas.
2. The questions/tasks are likely to be **comprehensible** to students who have not studied the topic and are not familiar with the scientific vocabulary.
3. The questions/tasks are identified as serving the purpose of identifying students' ideas.
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).
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).

**Scoring Scheme**

**Excellent (3):** The material provides a **sufficient number and variety**<sup>4</sup> of questions/tasks that meet indicators 1 and 2 and meet indicators 3-5.

**Satisfactory (2):** The material provides some questions/tasks that meet indicators 1 and 2 and meet indicators 3 and 4.

**Poor (1):** The material provides some questions/tasks that meet indicator 1 and 2.

**None (0):** The material does not meet any of the indicators.

**Footnote:**

(4) Sufficiency should take into account ideas from national science education standards and frameworks, student misconceptions, and contexts in which ideas are probed.

**Score:** \_\_\_\_\_

**Comments:**

**II.4 Addressing commonly held ideas:** Does the material attempt to address commonly held student ideas?

**Indicators of meeting the criterion**

1. The material **explicitly** addresses commonly held ideas.
2. The material includes questions, tasks, or activities that are **likely to help students progress** from their initial ideas, for example, by<sup>5</sup>
  - a. explicitly **challenging** students' ideas, for example, by comparing their predictions about a phenomenon to what actually happens
  - b. prompting students to **contrast** commonly held ideas and the scientifically correct ideas, and resolve differences between them.
  - c. **extending** correct commonly held ideas that have limited scope.
3. The material includes suggestions to teachers about how to **take into account their own students' ideas**.

**Scoring Scheme**

**Excellent (3):** The material meets indicators 1, 2, and 3 for a considerable proportion of commonly held ideas that are documented in the literature.

**Satisfactory (2):** The material meets indicators 1 and 2 for some commonly held ideas that are documented in the literature.

**Poor (1):** The material meets only the first indicator.

**None (0):** The material does not meet any of the indicators.

**Footnotes:**

(5) Please note that high quality activities that address student ideas need not have all of these characteristics.

**Score:** \_\_\_\_\_

**Comments:**

## Criteria for Evaluating the Quality of Instructional Support

### Category III: Engaging Students with Relevant Phenomena

**III.1 Providing variety of phenomena:** Does the material provide multiple and varied phenomena, observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), to support ideas presented in national science education standards and frameworks?

#### Indicators of meeting the criterion

1. Phenomena, observable events in nature that can make a scientific idea real to students, (this includes the use of technology to extend the senses, e.g., using a microscope), are **"right on target"** in addressing the content ideas presented in national science education standards and frameworks
2. Phenomena, observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), are **explicitly** linked to the relevant ideas presented in national science education standards and frameworks.<sup>6,7</sup>

#### Scoring Scheme

**Excellent (3):** The material provides a sufficient number and variety of phenomena observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), that meet indicators 1 and 2.

**Satisfactory (2):** The material provides some phenomena observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), that meet indicators 1 and 2.

**Poor (1):** The material provides one phenomenon, observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), that meets indicators 1 and 2.

**None (0):** The material does not provide any phenomena observable events in nature that can make a scientific idea real to students (this includes the use of technology to extend the senses, e.g., using a microscope), that meet indicators 1 and 2.

#### Footnotes:

(6) Reviewers should note that the link between a phenomenon and an idea can be made in either the student book or in the teacher's guide, e.g., through suggested discussions or through suggested answers to questions in the student book.

(7) Phenomena that are briefly described in the material still count as evidence for this criterion, as long as their link to the idea is made explicit. Criterion III.2 Providing Vivid Experiences examines whether the descriptions are sufficient to provide students with a

vicarious sense of the phenomena. In addition, to respond to this criterion, reviewers do not consider how much time is allotted for the discussion of the phenomena - this is examined in Category V: Promoting Student Thinking About Phenomena, Experiences, and Knowledge.

**Score:** \_\_\_\_\_

**Comments:**

**III.2 Providing vivid experiences:** Does the material include activities that provide firsthand experiences with phenomena when practical or provide students with a vicarious sense of the phenomena when not practical?

### **Indicators of meeting the criterion**

1. Each firsthand experience is **efficient** (when compared to other firsthand experiences) and, if several firsthand experiences target the same idea, the set of firsthand experiences is efficient (Efficiency of an experience: cost of the experience [in time and money] in relation to its value.)
2. The experiences that are *not* firsthand (e.g., text, pictures, animations, interactivities) provide students with a **vicarious** sense of the phenomena. (Please note that if the material provides only firsthand experiences, this indicator is not applicable.)
3. The set of firsthand and vicarious experiences is **sufficient**.

### **Scoring Scheme**

**Excellent (3):** The material meets all indicators or just indicators 1 and 3 or indicators 2 and 3, if firsthand experiences are not possible.

**Satisfactory (2):** The material includes some efficient firsthand experiences and, if several firsthand experiences target the same idea, the set of firsthand experiences is sufficient. When firsthand experiences are not practical, the material provides students with a vicarious sense of the phenomena for some of the experiences that are not firsthand.

**Poor (1):** The material includes only one efficient firsthand experience or provides students with a vicarious sense of one phenomenon that is not firsthand.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**Criteria for Evaluating the Quality of Instructional Support**  
**Category IV: Developing and Using Scientific Ideas**

**IV.1 Introducing terms meaningfully.** Does the material introduce technical terms only in conjunction with experience with the idea or process and only as needed to facilitate thinking and promote effective communication?

**Indicators of meeting the criterion**

1. The material **links** technical terms **to relevant experiences** (rather than just having students learn definitions of terms).
  
2. The material **restricts the use** of technical terms to those needed to communicate intelligibly about ideas presented in national science education standards and frameworks.

**Scoring scheme**

**Excellent (3):** The material meets both indicators.

**Satisfactory (2):** The material fully meets one indicator or partially meets both.

**Poor (1):** The material marginally meets both indicators.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**IV.2 Representing ideas effectively.** Does the material include accurate and comprehensible representations of scientific ideas?

**Indicators of meeting the criterion**

1. Representation is **accurate** (or, if not accurate then students are asked to critique the representation).
2. Representation is likely to be **comprehensible** to students.
3. Representation is **explicitly linked** to the real thing.

Scoring Scheme

**Excellent (3):** The material includes a sufficient number and variety of representations that meet indicators 1-3 and none of the representations included in the material are inaccurate.

**Satisfactory (2):** The material includes some representations that meet indicators 1-3 and few (if any) of the representations included in the material are inaccurate. (In some cases, including one accurate and comprehensible representation for a specific idea may be sufficient for a material to receive a "satisfactory" rating.

**Poor (1):** Even though the material includes a few representations that meet indicators 1-3, few or none of the ideas presented in national science education standards and frameworks are adequately represented.

**None (0):** The material does not meet any of the indicators.

Score: \_\_\_\_\_

Comments:

**IV.3 Demonstrating use of knowledge.** Does the material demonstrate/model or include suggestions for teachers on how to demonstrate/model skills or the use of knowledge?

**Indicators of meeting the criterion**

1. The material consistently **carries out** (or instructs teachers to carry out) the expected performance (e.g., the student text explains a particular phenomenon using a theory). (Teacher's guides often include responses to questions posed in the student text. If the material does not instruct the teacher to use the answers to model the use of knowledge, such responses do not count as instances of modeling. As answers in the Teacher's Guide, the teachers might use them only to correct student papers, never actually letting the students hear or read the correct answers.)
2. The performance is **step-by-step**.
3. The performance is explicitly **identified as demonstration** of the use of knowledge or skill.
4. The material provides **running commentary** that points to particular aspects of the demonstration and/or **criteria** for judging the quality of a performance.

**Scoring Scheme**

**Excellent (3):** The material meets all 4 indicators.

**Satisfactory (2):** The material meets indicators 1 and 2.

**Poor (1):** The material meets indicator 1.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**IV.4 Providing practice.** Does the material provide tasks/questions for students to practice skills or using knowledge in a variety of situations?

**Indicators of meeting the criterion**

1. The material provides a **sufficient number** of tasks in a **variety** of contexts, including everyday contexts.
2. The material includes **novel** tasks.
3. The material provides a sequence of questions or tasks in which the **complexity** is **progressively increased**.
4. The material provides students first with opportunities **for guided practice with feedback** and then with practice in which the amount of **support** is **gradually decreased**.

**Scoring Scheme**

**Excellent (3):** The material meets indicators 1, 2, and either 3 or 4.

**Satisfactory (2):** The material provides some tasks/questions, including novel tasks.

**Poor (1):** The material provides some tasks/questions but no novel tasks.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**Criteria for Evaluating the Quality of Instructional Support**  
**Category V: Promoting Student Thinking about Phenomena,**  
**Experiences, and Knowledge**

**V.1 Encouraging students to explain their ideas.** Does the material routinely include suggestions for having each student express, clarify, justify, and represent his/her ideas? Are suggestions made for when and how students will get feedback from peers and the teacher?

**Indicators of meeting the criterion**

1. The material **routinely** encourages students to express their ideas.
2. The material encourages students not only to express but also to **clarify, justify, and represent** ideas. (A material is not expected to encourage students to clarify, justify, and represent ideas *each* time they are asked to express their ideas; however, in the course of teaching a particular concept the material should provide students with opportunities to clarify, justify, and represent ideas.)
3. The material provides opportunities for **each** student (vs. just some students) to express ideas.
4. The material includes specific suggestions to help the teacher **provide explicit feedback** to students or includes text that directly provides students with feedback.
5. The material includes **suggestions** to diagnose student errors, explanations about how these errors may be corrected, and how students' ideas may be further developed.

**Scoring Scheme**

**Excellent (3):** The material meets all indicators.

**Satisfactory (2):** The material meets 3 out of 5 indicators.

**Poor (1):** The material meets 1 out of 5 indicators.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**V.2 Guiding student interpretation and reasoning:** Does the material include tasks and/or question sequences to guide student interpretation and reasoning about experiences with phenomena and readings?

### Indicators of meeting the criterion

1. The material includes **specific** and **relevant** tasks and/or questions for the experience or reading.
2. The questions or tasks have **helpful characteristics** such as
  - a. framing important issues
  - b. helping students to relate their experiences with phenomena to presented scientific ideas
  - c. helping students to make connections between their own ideas and the phenomena observed
  - d. helping students to make connections between their own ideas and the presented scientific ideas
  - e. anticipating common student misconceptions
  - f. focusing on contrasts between student misconceptions and scientific alternatives

(Please note that high quality tasks or question sequences may have one or more of these characteristics.)

3. There are **scaffolded sequences** of questions or tasks (as opposed to a separate question(s) or task(s)).

### Scoring Scheme

Each individual experience with a phenomenon (hands-on experience, demonstration, etc.) or reading sampled will be scored as follows:

**Excellent (3):** The material meets all three indicators.

**Satisfactory (2):** The material meets indicators 1 and 2.

**Poor (1):** The material meets indicator 1.

**None (0):** The material does not meet any of the indicators.

After scoring a sample of individual activities, an average will be taken that will give the final score to the material. For example, if five activities on a concept are sampled and the rating of each is: none (0), Poor (1), Satisfactory (2), Satisfactory (2), Satisfactory (2), the final score will be below satisfactory (1.5).

**Score:** \_\_\_\_\_

**Comments:**

**V.3 Encouraging students to think about what they've learned.** Does the material suggest ways to have students check their own progress?

**Indicators of meeting the criterion**

1. The material gives students an opportunity to **revise their initial ideas** based on what they have learned (without asking them *explicitly* to *think about* how their ideas changed).
2. The material engages (or provides specific suggestions for teachers to engage) students in monitoring *how* their ideas have changed **at one or few points** in the unit.
3. The material engages (or provides specific suggestions for teachers to engage) students in monitoring how their ideas have changed **periodically** in the unit.

**Scoring Scheme**

**Excellent (3):** The material meets indicator 3.

**Satisfactory (2):** The material meets indicator 2.

**Poor (1):** The material meets indicator 1.

**None (0):** The material does not meet any of the indicators.

**Score:** \_\_\_\_\_

**Comments:**

**Criteria for Evaluating the Quality of Instructional Support**  
**Category VI: Assessing Progress**

**VI.1 Aligning assessment to goals.** Assuming a content match between the curriculum material and the national science education standards and related frameworks, are assessment items included that match the same standards and frameworks?

**Indicators of meeting the criterion**

1. The specific ideas in the national science education standards and frameworks are **necessary** in order to respond to the assessment items.
  
2. The specific ideas in the national science education standards and frameworks are **sufficient** to respond to the assessment items.

Scoring scheme: <sup>8</sup>

**Excellent (3):** The material provides a sufficient number of assessment items that meet indicators 1 and 2.

**Satisfactory (2):** The material provides some assessment items that meet indicators 1 and 2.

**Poor (1):** The material provides one/few assessment items that meet indicators 1 and 2.

**None (0):** The material does not provide assessment items that meet indicators 1 and 2.

Footnotes:

(8) Reviewers should examine end-of-chapter and/or end-of-unit tests. If developers indicate that review questions in the student book may be used for assessment purposes, then reviewers need to analyze both these tests and the end-of-chapter or end-of-unit tests included in the teacher guide, rate each type separately, and then average the ratings to obtain the final score.

**Score:** \_\_\_\_\_

**Comments:**

**VI.2 Testing for understanding.** Does the material include assessment tasks that require application of ideas and **avoid** allowing students a trivial way out, like using a formula or repeating a memorized term without understanding?

**Indicators of meeting the criterion.**

1. Assessment items focus on **understanding** of national science education standards and related frameworks ideas.
2. Assessment items include both **familiar and novel** tasks.
3. Assessment **avoids** allowing students a trivial way out such as memorizing a formula or repeating a memorized term without understanding.

**Scoring scheme:**

**Excellent (3):** The material provides a sufficient number of assessment items that meet indicators 1, 2 and 3.

**Satisfactory (2):** The material provides some assessment items that meet indicators 1, 2, and 3 or sufficient assessment items that meet indicator 1.

**Poor (1):** The material provides one/few assessment items that meet indicator 1.

**None (0):** The material does not provide assessment items that meet indicators 1, 2, or 3.

**Score:** \_\_\_\_\_

**Comments:**

**VI.3 Using assessment to inform instruction.** Are some assessments embedded in the curriculum along the way, with advice to teachers as to how they might use the results to choose or modify activities?

**Indicators of meeting the criterion**

1. The material uses embedded assessment as a **routine strategy** (rather than just including occasional questions).
2. The material suggests how to **probe beyond students' initial responses** to clarify and further understand student answers.
3. The material provides **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.

**Scoring Scheme**

**Excellent (3):** The material meets all indicators.

**Satisfactory (2):** The material meets indicators 1 and 2 or indicators 1 and 3.

**Poor (1):** The material meets indicator 1.

**None (0):** The material does not meet any of the indicators.

Some materials suggest that teachers will use all practice tasks included in the unit as embedded assessment (typically, these suggestions are made in the introduction to the teacher guide). In these cases, reviewers need to examine these tasks (even if they were examined before in the practice criterion).

**Score:** \_\_\_\_\_

**Comments:**

## Criteria for Evaluating the Quality of Instructional Support Category VII: Enhancing the Science Learning Environment

For these criteria, no scores are given. Please write descriptions of the curriculum based on the following indicators.

**VII.1 Providing teacher content support.** Would the material help teachers improve their understanding of science, mathematics, and technology necessary for teaching the material?

### Indicators of meeting the criterion

1. 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).

2. Provides sufficiently detailed answers to questions in the student book for teachers to understand and interpret various student responses.

3. Recommends resources for improving teacher's understanding of benchmark ideas.

**VII.2 Encouraging curiosity and questioning.** Does the material help teachers to create a classroom environment that welcomes student curiosity, rewards creativity, encourages a spirit of healthy questioning, and avoids dogmatism?

**Indicators of meeting this criterion**

1. Includes **suggestions** for how to encourage student questions and guide their search for answers or for how to avoid dogmatism, etc.

2. 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.

