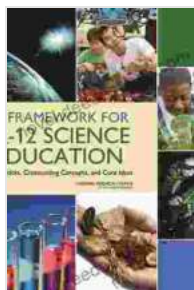


Framework for the Development of 12 Science Education Materials

Science education is critical to preparing students for success in the 21st century workforce. Students need to develop a strong understanding of science concepts and be able to apply them to real-world problems. However, many current science education materials do not meet the quality and rigor standards necessary to prepare students for success.

This framework provides a comprehensive set of guidelines for the development of science education materials that meet these standards. The framework is based on research on best practices in science education and is aligned with the Next Generation Science Standards (NGSS).



A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas by Linda W. Braun

★★★★☆ 4.7 out of 5

Language	: English
File size	: 9255 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 400 pages



Components of the Framework

The framework consists of the following components:

- **Guiding principles:** These principles provide the foundation for the framework and guide the development of all science education materials.
- **Content standards:** These standards define the specific science concepts and skills that students should learn at each grade level.
- **Performance expectations:** These expectations describe what students should be able to do with the science concepts and skills they learn.
- **Assessment criteria:** These criteria provide guidance on how to assess student learning of science concepts and skills.
- **Materials development process:** This process provides a step-by-step guide for developing science education materials that meet the standards.

Guiding Principles

The guiding principles of the framework are:

- **Science is a process of inquiry.** Students should be actively involved in the process of science, asking questions, making observations, and testing hypotheses.
- **Science is based on evidence.** Students should learn to use evidence to support their claims and to evaluate the claims of others.
- **Science is a social endeavor.** Students should learn to communicate their ideas and to work collaboratively with others.

Content Standards

The content standards of the framework are organized into four domains:

- **Physical science:** This domain includes concepts about matter, energy, forces, and motion.
- **Life science:** This domain includes concepts about organisms, ecosystems, and evolution.
- **Earth and space science:** This domain includes concepts about the Earth, the solar system, and the universe.
- **Engineering design:** This domain includes concepts about the engineering design process and how it can be used to solve problems.

Performance Expectations

The performance expectations of the framework are organized into three levels:

- **Level 1:** Students should be able to recall and understand science concepts.
- **Level 2:** Students should be able to apply science concepts to new situations and solve problems.
- **Level 3:** Students should be able to conduct scientific investigations and communicate their findings.

Assessment Criteria

The assessment criteria of the framework are organized into two categories:

- **Formative assessment:** This assessment is used to monitor student learning and provide feedback during the learning process.
- **Summative assessment:** This assessment is used to evaluate student learning at the end of a learning unit or course.

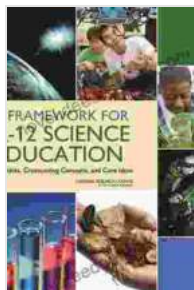
Materials Development Process

The materials development process of the framework consists of the following steps:

- **1. Define the learning objectives.** What do you want students to learn from the materials?
- **2. Identify the appropriate content standards.** Which content standards are relevant to the learning objectives?
- **3. Develop the instructional materials.** Create materials that meet the needs of the learners and that are aligned with the content standards.
- **4. Field-test the materials.** Try out the materials with a group of students and collect feedback.
- **5. Revise the materials.** Make changes to the materials based on the feedback from the field-test.

This framework provides a comprehensive set of guidelines for the development of science education materials that meet quality and rigor standards. By following this framework, developers can create materials that will help students succeed in science and prepare them for success in college, careers, and life.

Resources Next Generation Science Standards



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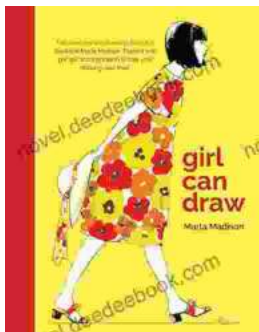
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