

ANATOMY OF A SCIENCE CTS STUDY GUIDE

Section I. Identify Adult Content Knowledge-

This section helps users identify what all science literate adults (including teachers) should know about science as well as what all students should know at the end of their high school education. It also provides content explanations for science or mathematics ideas encountered in the media, public issues, and other popular science venues in which an adult understanding of science is important.

Section II. Consider Instructional Implications-

This section helps users identify important considerations for K-12 or grade span instruction. It provides a broad overview of the ideas to be learned, including grade level pacing and difficulties, and suggests contexts and opportunities that foster learning.

Section III. Identify Concepts and Specific Ideas-

This section helps users identify the learning goals, the specific concepts and ideas in a learning goal, their level of sophistication, and the appropriate terminology to be used at different grade levels.

Section IV. Examine Research on Student Learning-

This section identifies related research so that users can examine developmental considerations, possible misconceptions and their sources, intuitive ideas, types of reasoning used by students, and difficulties encountered by in understanding scientific ideas.

Section V. Examine Coherency and Articulation (and more)-

This section helps users examine the K-12 conceptual growth in understanding as a coherent flow of ideas build in sophistication over time. It helps identify important prerequisites for learning, and connections between ideas within and across topics. **Note:** Sometimes new benchmark ideas have been added to maps that go with **Section IIIA**. These are noted in Atlas Vol 1 as “new benchmark” and in Atlas Vol 2 as **. In addition, Atlas Vol 2 has made edits to some original benchmarks which are indicated with a *. The narrative on the page preceding an Atlas map also enhances the overview and grade span implications in **Section IIA**. Both volumes of the Atlas provide research notes that can also be used with **Section IVA**. Atlas Vol 2 extends the research available in *Benchmarks* Chapter 15 by including more recent research available after the *Benchmarks* were published in 1994.

The right hand side of a CTS guide, titled “**Selected Sources and Readings for Study and Reflection,**” includes the selected readings from the CTS common set of resources for study and reflection that correspond to each of the outcomes, I-VI. Each section provides two choices of source material (A or B choices). Depending upon availability and the CTS guide selected, users may choose to read sections from both choices of source material, or choose to use only one.

| PLATE TECTONICS | |
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| Section and Outcome | Selected Sources and Readings for Study and Reflection Read and examine related parts of: |
| I. Identify Adult Content Knowledge | IA: <i>Science for All Americans</i> ▶ Chapter 4, <i>Processes That Change the Earth</i> , pages 44–46 ▶ Chapter 10, <i>Moving the Continents</i> , pages 152–153 IB: <i>Science Matters: Achieving Scientific Literacy</i> ▶ Chapter 13, <i>Plate Tectonics</i> , pages 176–185 |
| II. Consider Instructional Implications | IIA: <i>Benchmarks for Science Literacy</i> ▶ 4C, <i>Processes That Shape the Earth</i> general essay, page 71; grade span essays, pages 72–74 ▶ 10E, <i>Moving the Continents</i> general essay, page 247; grade span essay, page 248 IIB: <i>National Science Education Standards</i> ▶ Grades 5–8, Standard D essay, pages 158–159 ▶ Grades 9–12, Standard D essay, pages 187–189 |
| III. Identify Concepts and Specific Ideas | IIIA: <i>Benchmarks for Science Literacy</i> ▶ 4C, <i>Processes That Shape the Earth</i> , pages 72–74 ▶ 10E, <i>Moving the Continents</i> , page 248 IIIB: <i>National Science Education Standards</i> ▶ Grades 5–8, Standard D, <i>Structure of the Earth System</i> , pages 159–160; <i>Earth History</i> , page 160 ▶ Grades 9–12, Standard D, <i>Energy in the Earth System</i> , page 189; <i>Geochemical Cycles</i> , page 189; <i>The Origin and Evolution of the Earth System</i> , pages 189–190 |
| IV. Examine Research on Student Learning | IVA: <i>Benchmarks for Science Literacy</i> ▶ 4C, <i>Processes That Shape the Earth</i> , page 336 IVB: <i>Making Sense of Secondary Science: Research Into Children's Ideas</i> ▶ Chapter 14, <i>Mountains and Volcanoes</i> , pages 113–114 |
| V. Examine Coherency and Articulation | V: <i>Atlas of Science Literacy</i> ▶ <i>Changes in the Earth's Surface</i> , pages 50–51 ▶ <i>Plate Tectonics</i> , pages 52–53 |
| VI. Clarify State Standards and District Curriculum | VIA: <i>State Standards</i> : Link Sections I–V to learning goals and information from your state standards or frameworks that are informed by the results of the topic study. VIB: <i>District Curriculum Guide</i> : Link Sections I–V to learning goals and information from your district curriculum guide that are informed by the results of the topic study. |

Visit www.curriculumtopicstudy.org for updates or supplementary readings, Web sites, and videos.

Section VI. Clarify State Standards and District Curriculum- This section helps the user clarify the meaning and intent of their own state standards or learning goals in their district curriculum by taking the previous five sections and linking the information to the context the user works in. It also helps the user identify important, key ideas in science that may be missing at the state or local level which should be addressed along with their standards.

Optional Topic Specific Supplements: At the bottom of each study guide is a link to the **CTS web site**, where users can access the CTS database to find optional readings and media resources to supplement individual CTS guides.