

## Types of Knowledge Subscore Details

**Declarative Knowledge (DEC)**: This is knowledge of definitions and facts. It includes memorized statements of concepts, rules, and laws—“knowing that.” Although they may or may not understand the basis of the concepts or how to apply them to solve problems, teachers with this knowledge can

- perform skills by rote.
- apply rules.
- give definitions.
- recall facts.

**Scientific Inquiry and Procedures (INQ)**: This is knowledge of scientific procedures and approaches—“knowing how to do science.” Teachers with knowledge of the elements of scientific inquiry can

- identify questions for scientific inquiry.
- design and conduct scientific investigations and experiments.
- use appropriate tools, instruments, and techniques to gather, analyze, and interpret data.
- develop descriptions, explanations, predictions, and models using experimental evidence.
- think critically and logically to relate evidence and explanations.
- recognize and analyze alternative explanations and predictions.
- communicate scientific procedures and explanations.
- use mathematics in all aspects of scientific inquiry.

**Schematic Knowledge (SCH)**: Schematic knowledge represents a deep understanding of science concepts, laws, theories, principles, and rules—“knowing and understanding why.” Teachers with this knowledge

- understand connections and relationships among scientific phenomena.
- understand the reasons for scientific rules and laws.
- can explain the basis for concepts and understandings.
- discern the nature of relationships.
- can compare and contrast properties and characteristics of scientific concepts.
- can explain natural phenomena within the limits of current scientific knowledge.
- know that many phenomena have not yet been explained and that scientific knowledge is always evolving.

**Pedagogical Content Knowledge (PED):** This knowledge represents strategic knowledge for science teaching—“knowing when, where, and how to best teach science.” For these assessments, we are concentrating on the use of pedagogical content knowledge in the correction of student misconceptions about science. Teachers with this knowledge can satisfy two criteria:

1. Recognize the students’ misconceptions, and
2. Describe the most effective ways to teach scientific concepts--the most powerful analogies, illustrations, examples, explanations, experiments, and demonstrations.

**Science, Technology, and Society Knowledge (STS):**

STS addresses the interactions of science with technology and human society, including technology, personal applications, influences of society and government, and the history of science and technology. STS knowledge is represented in situations where human needs are a primary purpose for the application of science. Teachers with knowledge of STS can

- identify and utilize scientific principles and concepts incorporated into **devices and processes** designed to change the world for human purposes and to meet human needs.
- design, use and evaluate **technology**.
- understand the reciprocal influences of human society and technology on each other, including **ethical and environmental** considerations.
- understand the importance **of historical contexts** for the development of science and various technologies.