

Questions Teachers Should Ask in the Process of Planning the Unit

- ◆ What kinds of things do I expect students to know and be able to do by the end of the unit? (Unit Objectives)
- ◆ What type of experiences have students already had with this topic, even if they have not specifically labeled them as such? (Prior Knowledge)
- ◆ As we explore this unit, what are the key concepts and skills students will encounter and need to understand? (Unit Map and Unit Core)
- ◆ In what order should the key concepts be learned? (Unit Core—Sequencing)
- ◆ How many lessons will it take to accomplish my goals for the unit? (Unit Core—Timing)
- ◆ What kind of experiences should the students have to help them learn these concepts? (Unit Core and Applied elements)
- ◆ What materials and tools will I need to present and support the lessons in this unit? (Resources)
- ◆ How will I know if my students are ready for the unit? At the end of the unit, how will I know if my students really understand the most important concepts in the unit? (Assessment)
- ◆ Once we complete this unit, what is the next logical step in the students' learning sequence? (Inter-unit planning)

* Adopted from Brahier, D. (2005)

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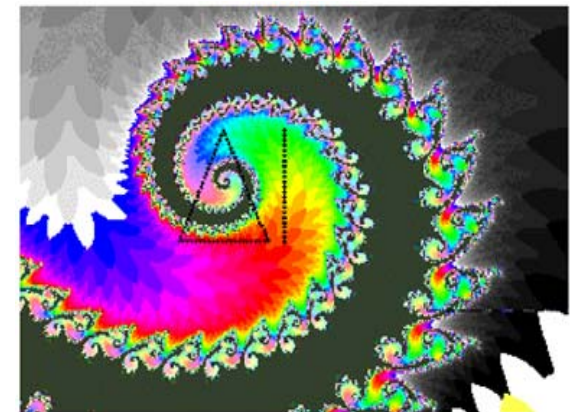
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UNIT PLANNING AND DEVELOPMENT IN MATHEMATICS



What is a Unit?

A **unit** is a carefully planned and thoroughly developed set of learning experiences designed to address one or more learning objectives. A unit may take several class periods, lessons, or several weeks to complete. There are three main elements in a unit*: introductory elements, core elements, and applied elements.

These elements reflect the three guiding principles of learning**.

- ◆ **Principle #1: Prior Knowledge**
Pre-assessment and introductory elements identify students' prior knowledge.
- ◆ **Principle #2: Conceptual Framework**
Unit core and applied elements develop mathematical proficiency and procedural fluency within a conceptual framework.
- ◆ **Principle #3: Metacognition**
Core and applied elements develop students' metacognitive and self-monitoring skills.

Elements of a Unit

Pre-Assessment: Assesses and determines student readiness to learn the content in the unit.

Introductory elements: Prepare students to learn the Unit Core.

Unit Objectives: Identify what students should understand and be able to apply by the end of the unit.

Prior Knowledge: Reviews preconceptions, skills, and experiences that impact the learning of the unit core.

Unit Map: Provides a holistic picture of the content to be learned in the unit.

Unit Project: Addresses the evolution and origins of fundamental mathematical ideas in the unit. It may include inquiry-based explorations.

Language and Communication: Identifies and clarifies mathematical vocabulary, and supports, English Language Learners (ELL).

Unit Core: Addresses the key mathematical concepts of the unit. A critical part of planning the Unit Core is sequencing key concepts to parallel the students' learning pathways.

Applied elements: Develop procedural and conceptual fluency for successful learning of key concepts.

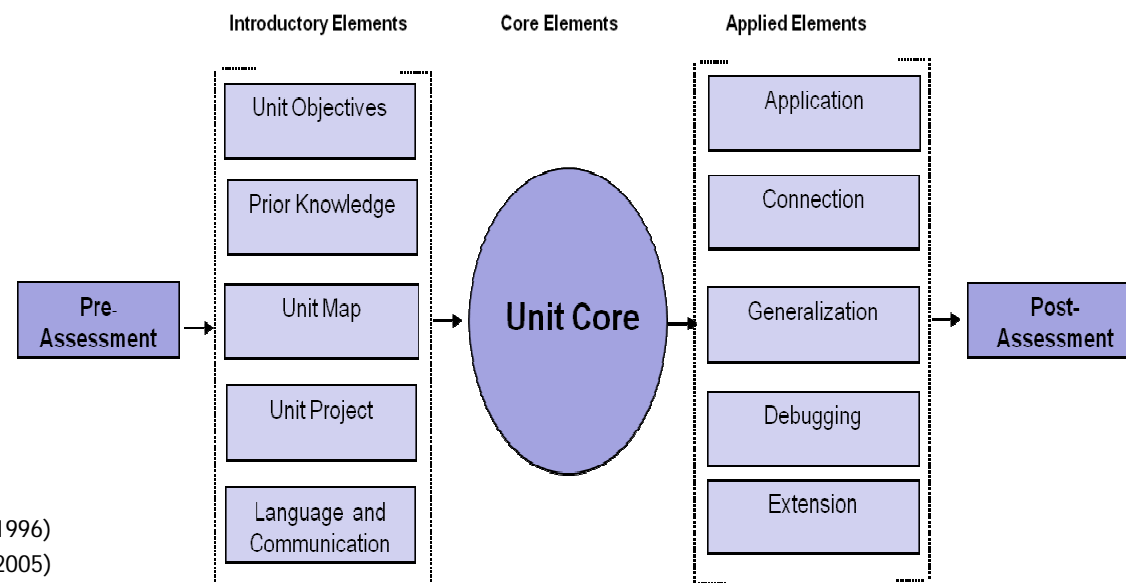
Applications and Connections: Enable students to practice skills in routine and non-routine problems, and to deepen their understanding of the concepts.

Generalization: Provides a summative representation of key concepts of the unit.

Debugging: Addresses student misconceptions.

Extensions: Offer enrichment activities to further deepen student knowledge.

Post-Assessment: Assesses student learning of unit content.



* Adopted from Tchoshanov, M. (1996)

** How Students Learn, NRC (2005)