



Concept Based Mathematics: Teaching for Deep Understanding Certification

By Jennifer Chang Wathall

Overview:

Traditional curriculum focuses on rules and procedures with little attention paid to the conceptual relationships of mathematics and mathematics is a language of conceptual relationships. Traditional curriculum often assumes the deep understanding of concepts, and fails to teach for transferability, or to consider context.

With the exponential growth of information and knowledge students need to move to a higher level of abstraction. We need to develop students' ability to critically think and reason, in order to solve complex problems and create new ideas.

This workshop will cover the concept based curriculum design model specifically for mathematics and be conducted in English. All content will be based on Jennifer Wathall's book "Concept Based Mathematics; Teaching for Deep Understanding in Secondary Schools" and a copy will be supplied for the workshop. Many early years and primary examples will be provided during the workshop.

This workshop will address the following questions:

- Why is it important for students to learn conceptually?
- What are the facts, processes and concepts in mathematics?
- How do I craft generalizations in mathematics?
- How do I craft quality guiding questions?
- How do I plan units of work for concept-based mathematics curriculum?
- How do I captivate and engage students? Practical strategies for creating rich learning experiences in the classroom
- How do I integrate technology to foster conceptual understanding?

After this workshop you will be able to:

- Understand the concept-based model for mathematics
- Write quality generalizations and guiding questions.
- Use a unit web to plan a concept based mathematics unit.
- Design engaging, rich learning experiences for your students.
- Use formative assessment strategies to inform teaching and learning.
- Embed the use of technology effectively to enhance conceptual understanding.

Agenda:

Day 1

Session 1 Introduction to concept-based curriculum and concept based mathematics. Why is it important for my students to learn conceptually? The facts, processes, and concepts in mathematics.

Session 2 Using the Structure of Knowledge and the Structure of Process in mathematics and how to craft quality generalizations.

Session 3 Concept-Based Mathematics Learning Experiences and recap preparation

Day 2

Session 1 Recap groups throughout the day. Continue with crafting mathematics generalizations, concept-based mathematics unit planning

Session 2 pm Unit planning, guiding questions and more concept-based learning experiences

Session 3 Critical content in unit planning: KUDs. Designing authentic performance assessment tasks.

Potential Audience:

Early years, Primary and Secondary Mathematics educators

Biography:

Jennifer Chang-Wathall is an independent educational consultant, author and part time instructor for the University of Hong Kong.

With over 25 years experience in the education field, Jennifer has worked in several international schools including South Island School, Hong Kong and The United Nations International School, New York and Island School, Hong Kong.

In the international arena she has presented numerous keynote addresses and workshops about concept-based mathematics and concept-based curriculum and instruction to K-12 educators. Jennifer holds a degree in Pure and Applied Mathematics from the University of Sydney and completed post graduate studies at the University of Hong Kong. Based on her Masters of Arts in Educational Technology she also facilitates concept-based mathematics online courses, gives talks about innovative uses of digital instructional media and how to effectively integrate a 1:1 program into the classroom.

As a qualified International Baccalaureate workshop leader ("Mathematical Studies, Mathematics Standard and Higher Level, Concepts and Inquiry in the Diploma Program and Approaches to Teaching and Learning") Jennifer has delivered numerous workshops in the Asia Pacific region. Her role as a field representative for the IB Asia Pacific serves as part of the quality assurance framework. She has been invited to give several talks at the IB Asia Pacific and IB Americas annual conferences.

She is a certified trainer in the DISCtm behavior assessment tool and she is a certified independent consultant in "Concept Based Curriculum Design" by Dr H. Lynn Erickson. Jennifer works as an independent consultant helping math departments and schools transition to concept-based curriculum and instruction. She utilizes her skills as a certified Performance Coach to facilitate transition and change.

Jennifer consulted for the IB on the new diploma mathematics courses for first teaching in 2019 to develop a concept-based mathematics curriculum model. She is currently working with a major publisher on student reference books for the new IB Mathematics courses.

Her best-selling book titled "Concept-Based Mathematics: Teaching for Deep Understanding in Secondary Schools" was released in February, 2016.

For more information please visit www.jenniferchangwathall.com