NCTM | NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

Mapping Essential Understandings to Cross-Cutting Concepts from *High School Mathematics Reimagined, Revitalized, and Relevant*

Essential Understandings	Crosscutting Concepts from *High School Mathematics Reimagined, Revitalized, and Relevant*
Functions	
Big Idea 1: The Function Concept	Functional and Structural Thinking
Big Idea 2: Covariation and Rate of Change	Variability and Change
Big Idea 3: Families of Functions	Functional and Structural Thinking
Big Idea 4: Combining and Transforming Functions	Functional and Structural Thinking
Big Idea 5: Multiple Representations of Functions	Comparison, Difference, and Equivalence
Geometry	
Big Idea 1: Working with diagrams is essential to geometric thinking.	Patterns and Generalization
Big Idea 2: Geometry is about working with variance and invariance, despite appearing to be about theorems.	Variability and Change
Big Idea 3: Working *with* and *on* definitions is central to geometry.	Patterns and Generalization
Big Idea 4: A written proof is the endpoint of the process of proving.	Patterns and Generalization
Proof and Proving	
Big Idea 1: Proof is part and parcel of doing mathematics and should be a regular and ongoing part of the learning of mathematics	Comparison, Difference, and Equivalence
Big Idea 2: A proof is a specific type of mathematical argument, which is a connected sequence of deductive, logical statements in support of or against a mathematical claim.	Patterns and Generalization
Big Idea 3: A proof demonstrates the truth of a statement beyond any doubt for all possible cases.,	Comparison, Difference, and Equivalence
Big Idea 4: A proof is not an argument based on authority, perception, popular consensus, intuition, probability, or examples.	Patterns and Generalization
Big Idea 5: Proof has many different roles in mathematics.	Comparison, Difference, and Equivalence
Statistics	
Big Idea 1: Data consists of structure and variability.	Variability and Change
Big Idea 2: Distributions describe variability.	Patterns and Generalization
Big Idea 3: Hypothesis tests answer the question, "Do I think this could have happened by chance?"	Making and Interpreting Predictions
Big Idea 4: The way in which data are collected matters.	Making and Interpreting Predictions
Big Idea 5: Evaluating an estimator involves considering bias, precision, and the sampling method.	Making and Interpreting Predictions