Synergistic Thinking and Conceptual Understanding in the IB Programmes

Let's Think About…

Why does the IB value its concept-based, three-dimensional curriculum & instruction model?

How is knowledge structured & how can we use this structure to raise all students up academically?

Why are macro-concepts (Key/Significant Concepts), and micro-concepts (Disciplinary Concepts) powerful tools for ensuring synergistic thinking to help develop the intellect?

What does conceptual teaching and learning "look like?"

Social Change Forces Impacting Education

- **Expanding role of technology**
- **Changing job demands**
- **Increasing global interdependence**
- **Rapid growth of knowledge**
- **Environmental concerns**

Our Changing World

Conflict

Complexity

Rapid Change

Cooperation

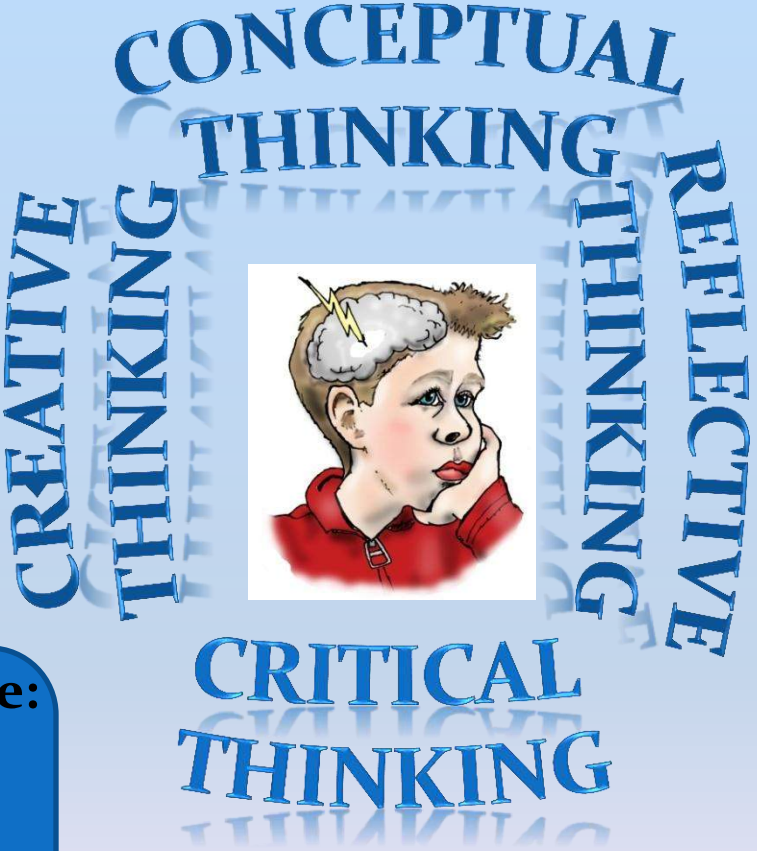
Polarization

Competition

Information without Intellect is Meaningless

Critical, Creative, Reflective

Curious, Playful



Metacognitive

Analytical, Strategic

The IB Learner Profile:

- **Thinker**
- **Open-minded**
- **Risk-Taker**
- **Communicator**
- **Reflective**

Traditional Curriculum Design has been more "topic-based" rather than "concept-based."

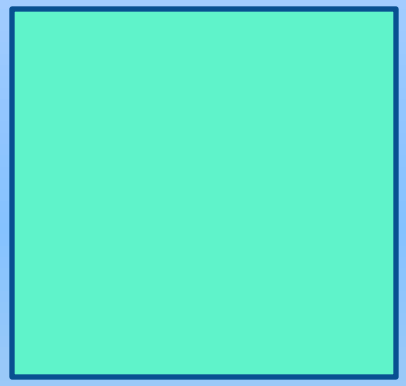
There are two major problems with topic-based models—

1. **They fail to engage and develop the personal intellect at a deep level.**
2. **They are inefficient—instant information is now a keystroke away. So how should we use our class time?**

Two Dimensional Curriculum Design

Processes & Skills

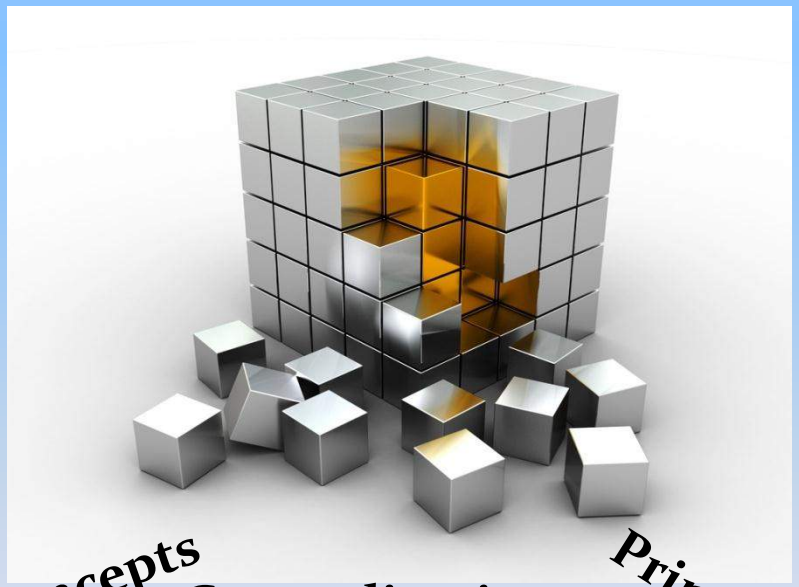
Factual Content



versus

Processes & Skills

Factual Content



Concepts **Generalizations** **Principles**

Three Dimensional Curriculum Design

Two-dimensional *versus* Three-dimensional

Coverage-centered
"inch deep, mile wide"

Idea-centered
-facts provide a foundation to understand conceptual, transferable ideas.

Intellectually shallow
- lacks a conceptual focus to create a factual/ conceptual brain synergy

Intellectual depth
-a "conceptual lens," or focus, requires mental processing on the factual and conceptual levels—producing intellectual depth in thinking and understanding.

Two-dimensional *versus* Three-dimensional

Fails to allow for transfer
- facts do not transfer
locked in time, place,
or situation.

Concepts and generalizations transfer
-allows the brain to make connections
and see patterns.

Fails to meet the intellectual demands of the 21st century

Develops the intellect to handle a world of increasing complexity and accelerating change.

Think of

KNOW

Factual Knowledge
which is locked in time, place or situation

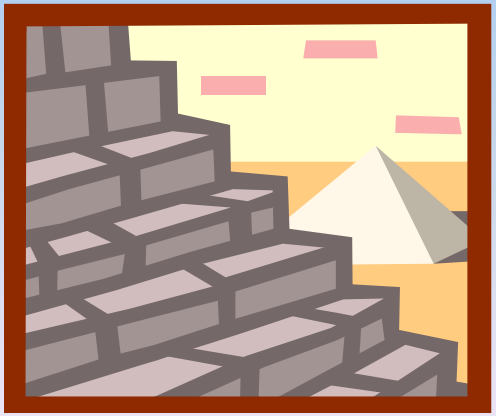
UNDERSTAND

Conceptual Understanding which transfers through time, across cultures, and across situations

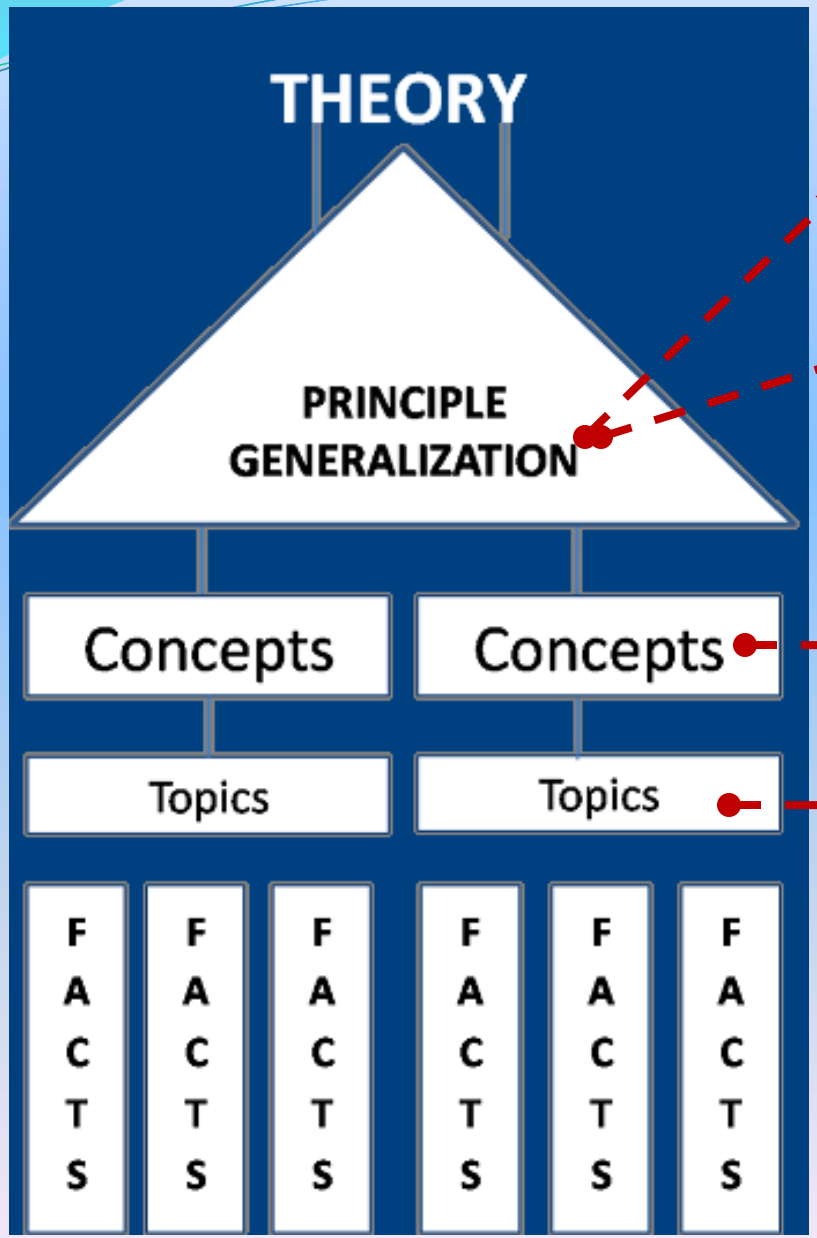
The IB Model for Curriculum & Instruction is a concept-based, three-dimensional model .

It is idea-centered, intellectually engaging by design, and fosters collaboration, social learning, and meaning-making.

The Structure of Knowledge



The Structure of Knowledge - PYP



Families cooperate to get things done. **3**

Families are alike and different.

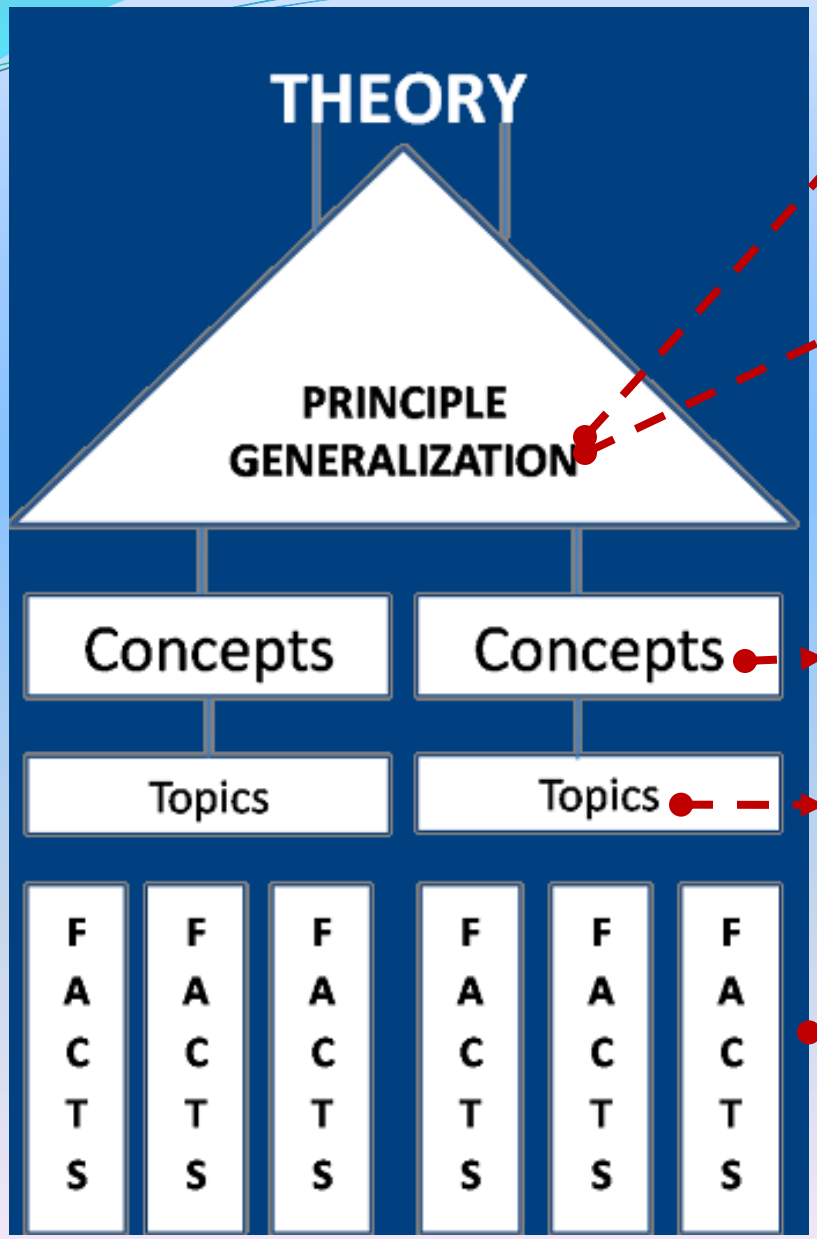
- **Families**
- **Cooperation**
- **Alike/Different**

2

My Family **1**

Generalization = Central Ideas or Lines of Inquiry in PYP

The Structure of Knowledge - MYP



People adapt to changing environments.

Migration leads to cultural diffusion resulting in social/economic change.

- Migration
- Cultural diffusion
- Needs
- Change

Early European Migration

Early European settlers migrated west.

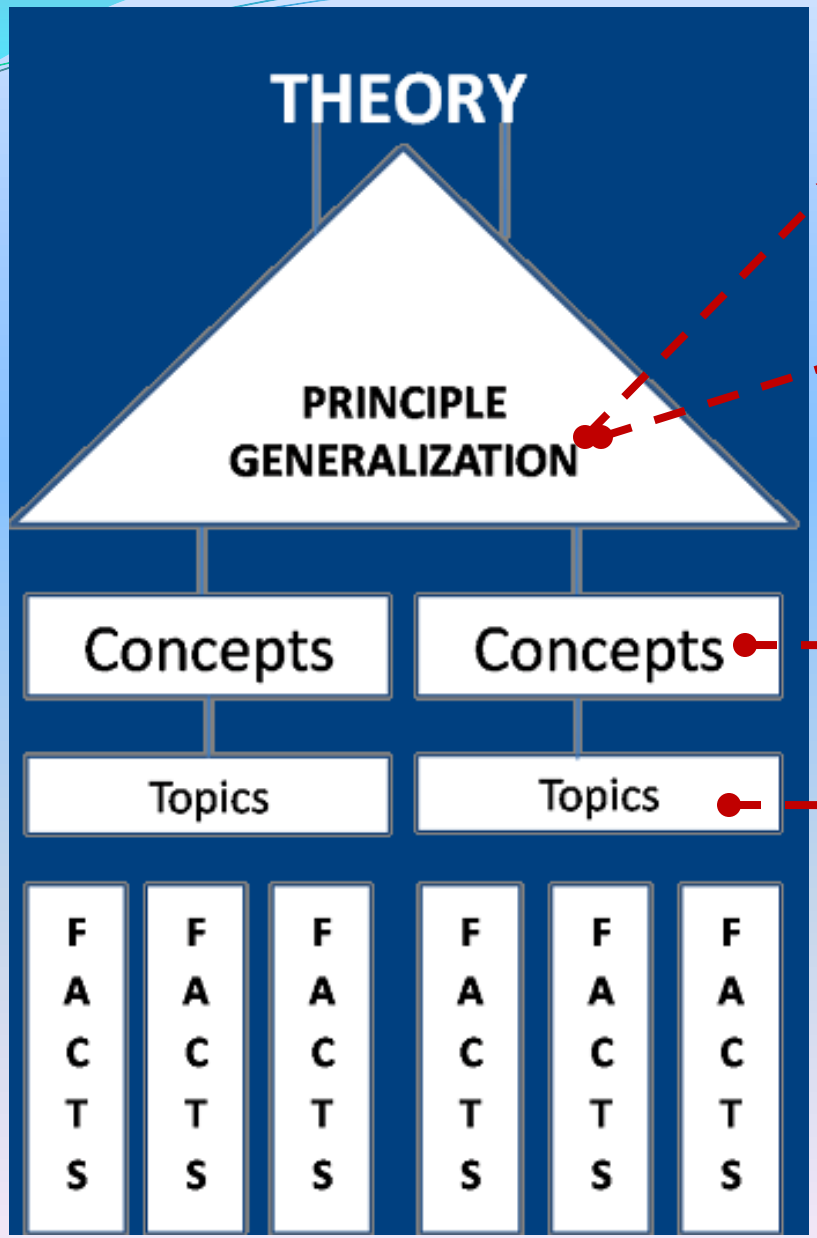
Early European settlers looked for new opportunities.

Generalizations = Significant Concept Statements and supporting ideas in formative unit work.

High School History Generalization:

Forces of imperialism, nationalism, militarism, or geo-political alliances, taken to the extreme, can generate international conflicts.

The Structure of Knowledge - Mathematics



Velocity can be mathematically represented by the **slope** of a **line**. **3**

The **slope** of a **graph** at a particular **point** indicates the **instantaneous rate of change.**

- **Slope**
- **Derivative**
- **Graph**
- **Line**
- **Velocity**

2

Measurement of Distance and Speed **1**

A **concept** is an organizing idea;
a mental construct…

- Timeless
- Universal
- Abstract (to different degrees)
- Represented by 1 or 2 words
- Examples share common attributes

Intelligence?

Transportation?

Examples of Subject Area Concepts

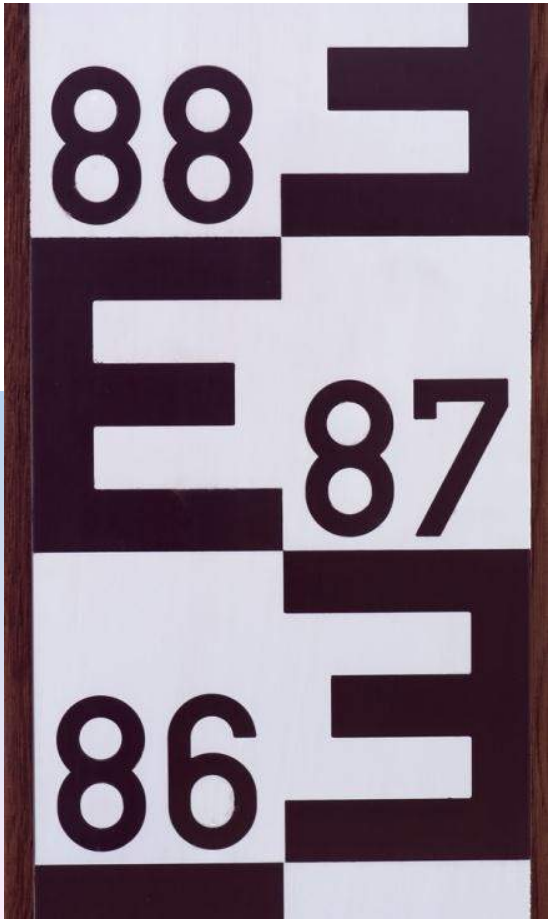
Science	Social Studies	Concepts in Text	Writer's Craft	Reader's Craft
Order Organism Population System Change Evolution Cycle Interaction Energy/ Matter Equilibrium	Conflict/Cooperation Patterns Supply & Demand System Change/Continuity Culture Scarcity Civilization Interdependence Cycle	Prejudice Perspective Conflict Cooperation Power Relationship Envy Emotions Oppression Influence	Organization Word Choice Context Conventions Fluency Voice Presentation Symbolism Allegory Metaphor Protagonist Antagonist	Inference Context Clues Meaning Paraphrase Summary Text Structure Reading Rate Directionality Self – regulation Imagery Genre Background Knowledge

*Which are "**macro-concepts" (Key Concepts)**?"*

*Which are "**micro-concepts?"(Discipline aligned)?***

MAcro-concepts give us breadth

MIcro-concepts give us depth

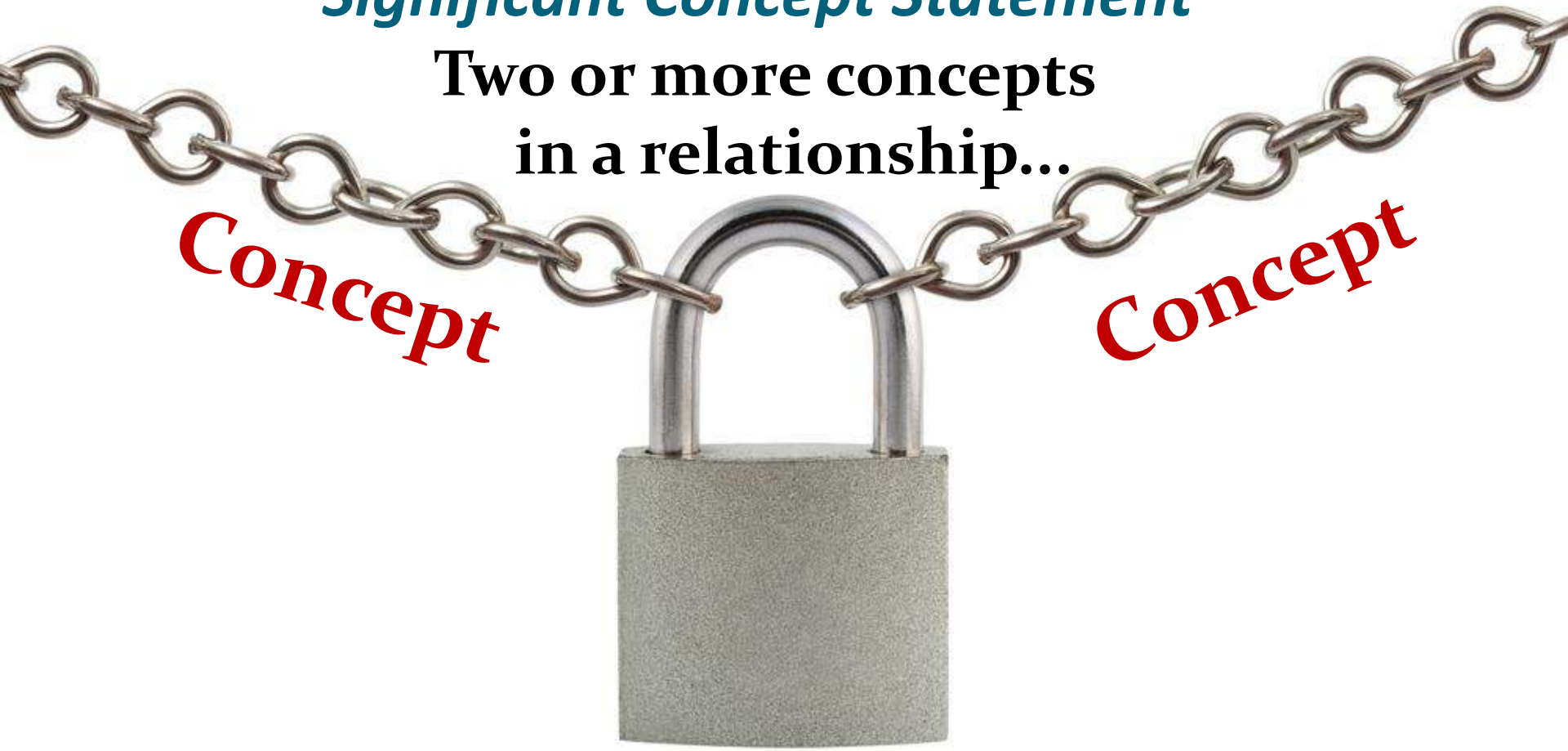


GENERALIZATION=

Central Idea

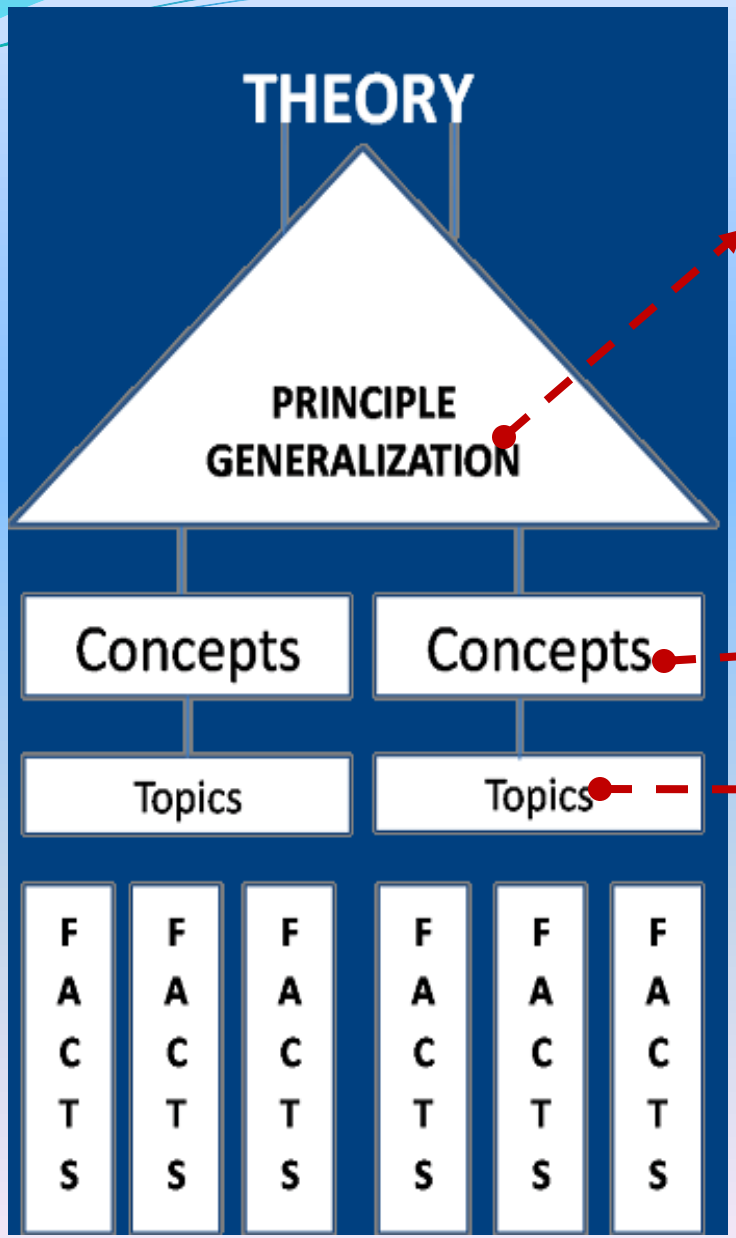
Significant Concept Statement

Two or more concepts in a relationship…



CONCEPTUAL IDEAS THAT TRANSFER
DEVELOP "DEEP UNDERSTANDING"

The Structure of Knowledge



3. The student understands that…_____

_____.

2. ☐ ☐ ☐ ☐

1. **Japan's Nuclear Disaster**

Possible Concepts for Line 2 - Japan's Nuclear Disaster

Environmental System

Natural Disaster

Living Things

Populations

Economy

Global Impact

Change

The Power of a Conceptual Lens:

Using Key and Significant Concepts to Focus Unit Work & to Foster *Synergistic Thinking*

Conceptual Lens?

The Global Economy

Interdependence

The Global Economy

Structure/Function

The Global Economy

Power/Influence

The Global Economy

Conceptual lens _____

Possible Topics:

- **Developing Nations**
- **The European Union**
- **Global Trade**

Topic: _____

Sample Conceptual Lenses

Conflict	Identity	Power
Complexity	Patterns	Influence
Beliefs/Values	Relationships	System
Paradox	Origins	Balance
Interdependence	Change	Structure/function
Interactions	Revolution	Innovation
Freedom	Perspective	Design
Transformations	Reform	Genius
Force	Heroes	Aesthetics
		Creativity

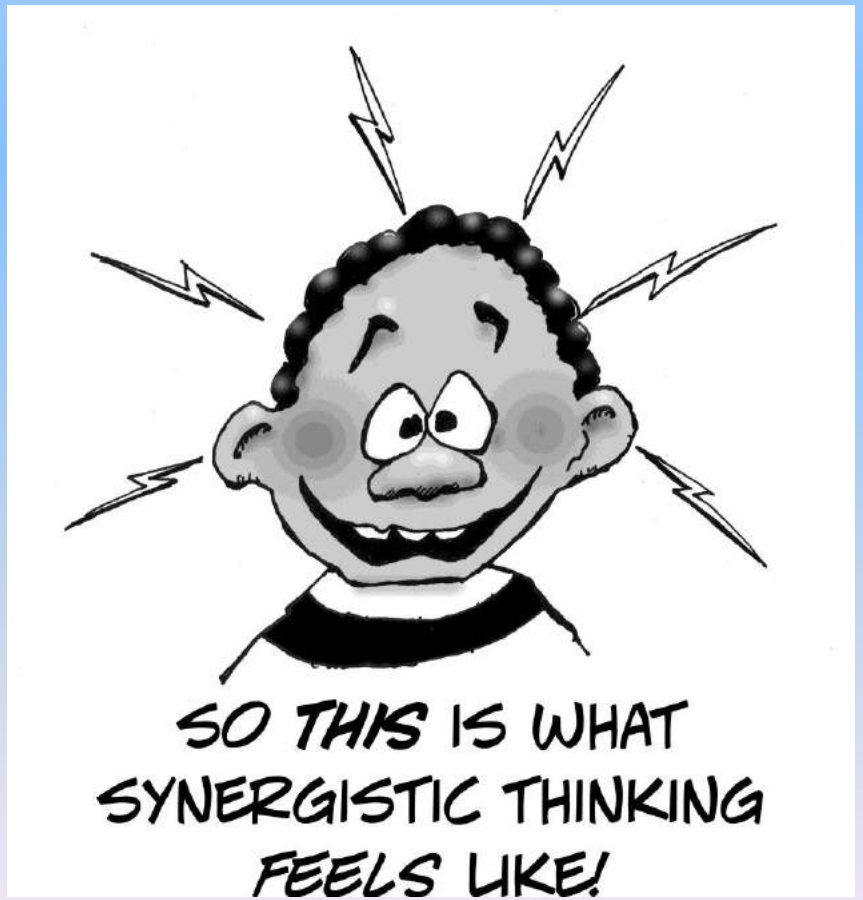
Looking at a topic through a "conceptual lens" engages the personal intellect and emotions of the student…

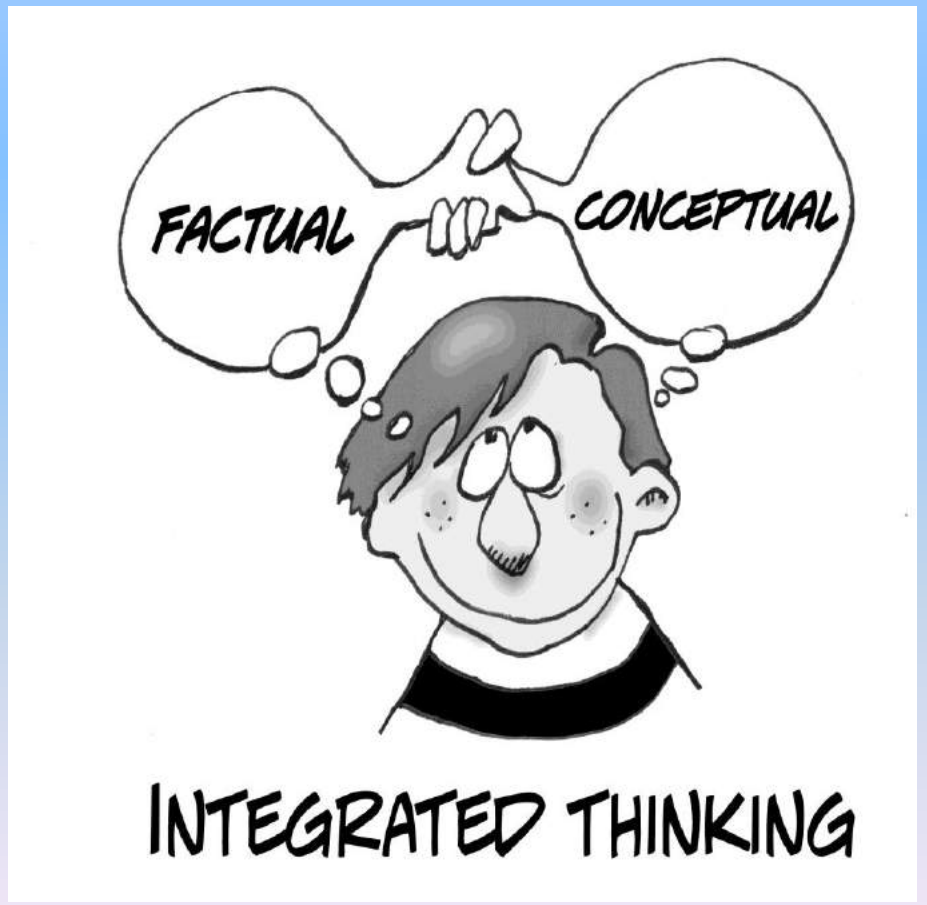
> ***creates deeper level of understanding,***

> ***retains the factual information because it has relevance, and***

> ***shows a greater love of learning.***

To develop the intellect and increase motivation for learning, curriculum and instruction must create a "synergy" between the lower (factual) and higher (conceptual) levels of thinking.



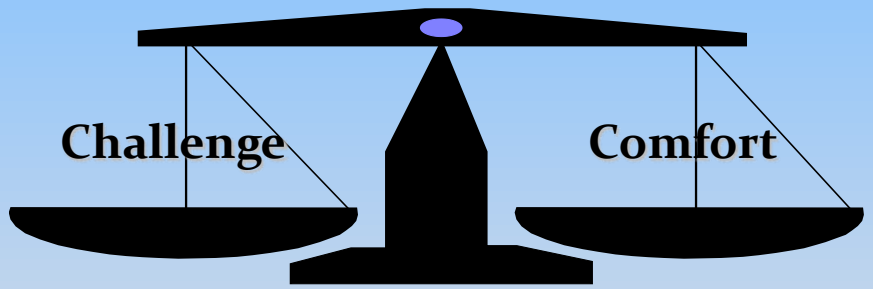


Cartoons by David Ford
davidford4@comcast.net

It is the Conceptual Mind that ….

- **creates connections to prior experience and finds relevance**
- **synergistically works with factual level of knowledge to develop the intellect**
- **creates deeper understanding at the factual and conceptual levels**
- **recognizes the transferability of knowledge**
- **becomes the springboard for *inspiration* and *action***

To make continuous progress in improving education, we must maintain a dynamic balance...



between challenge and comfort

...as we strive to inspire young people

to think deeply

to question openly

to risk personally

to care for others

to act globally

to value humanity & the environment