**Metacognition enables students to:**

* Increase their overall learning
* Self-regulate their cognitive activities
* Connect between different representations
* Plan, monitor and evaluate their thinking process
* Internalize new concepts
* Identify errors and ambiguities
* Independently execute learning activities

**Metacognition enables teachers to:**

* Provide explicit instruction
* Promote student broader learning
* Provide deeper, more durable and transferable learning
* Identify individual traits that effect learning
* Effectively use modeling instruction

**Conceptual change enables students to:**

* Make connections between their experiences
* Change their cognitive structure and the underling elements
* Change status of conceptions for meaningful learning
* Evaluate the intelligibility and plausibility and fruitfulness of new ideas
* Increase confidence in their conceptions
* Confirm and elaborate on their own ideas
* Choose different strategies for learning

**Conceptual Change enables teachers to:**

* Understand complex and coherent knowledge structures
* Identify gaps between students’ everyday experience and scientific ways of thinking
* Use different approaches to support meaningful learning
* Combine cognitive and social factors in teaching
* Direct questioning for checking student beliefs
* Provide vocabulary for discussion

**Modeling** e**nables students to:**

* Participate in authentic scientific process
* Record, evaluate, and clarify their own ideas
* Confirm or disapprove their hypotheses
* Clarify ambiguities and errors
* Play an active role in strengthening their scientific understanding
* Visualize, test hypotheses and predict phenomena
* Find accurate scientific principles
* Building analogies and general abstractions
* Challenge their own belief system

**Modeling enables teachers to:**

* Make instruction more coherent and student centered
* Provide structure and questions to guide students
* Play key role in scientific discoveries & reasoning
* Address weakness of traditional methods
* Engage students collaboratively in activities
* Assess student understanding in meaningful ways
* Identify gaps in metacognition
* Test assumptions and help conceptual change
* Bring together resources, activities and strategies
* Organize course content for students