



Biology Seminar

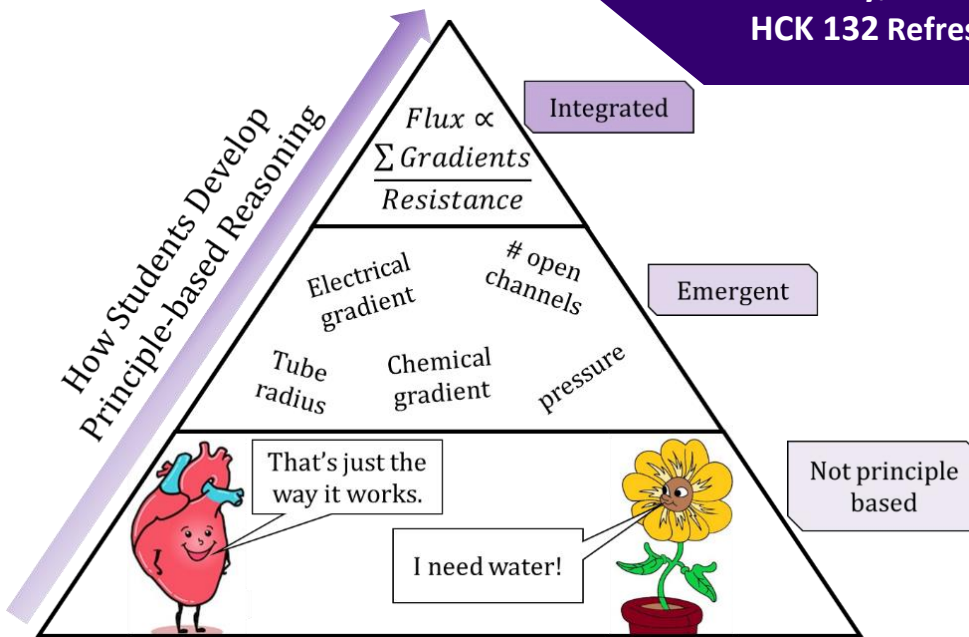
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A model for how students develop principle-based reasoning in physiology

Monday, October 29, 2018 | 12:00pm
HCK 132 Refreshments at 11:45am



To gain expertise in a field is to understand and use underlying disciplinary principles. Too often students rely on rote memorization to solve problems rather than apply appropriate principles of physics that governs biological phenomena, that is, use principle-based reasoning.

Students who rely on memorization can list the steps of generating an action potential or stomatal opening but cannot reason to a correct prediction when changes are introduced in the system, e.g. when a toxin is applied.

In this talk I will present a model of how students develop principle-based reasoning for the important physiological principle of flux (movement of a substance is directly proportional to the size of the gradient and inversely proportional to the resistance). We find students come into college using non-mechanistic reasoning then develop emergent principle-based reasoning where they use components of the principle, but not in an integrated way. Finally, students develop integrated principle-based reasoning.

