Teaching and Learning for Complexity

A general model for providing children with opportunities to develop complex, integrated understandings is depicted in the model below. This model involves a recursive or cyclical process of moving from exploring a particular concept or pattern in increasing depth (“DEPTH”), then applying the results across subject matter areas (“EXTENT”), while developing models and explanations that not only explain the initial concept, but also explain the use of the concept or pattern across all subject matter areas (“ABSTRACTION”). By approaching learning in this way, we can directly address children’s abilities to transfer knowledge.

A Simplified Example:

*Inquiry into DEPTH:* Children are exploring the cycles of how earthworms move. They notice that there is a repetition of contractions that occur as a wave that moves from one end to the other. They also find that two types (a binary) of muscle contractions occur to shorten the earthworm and to squeeze and lengthen the earthworm. *Inquiry into EXTENT:* They see that the same basic process is involved in how people walk and birds fly. As they continue to think about cycles and binaries, they see that their lives work in cycles between binaries of night and day and sleep and awake. *ABSTRACTION:* As they continue to probe into depth and extent, the children are encouraged to come up with an explanation for the cycles they have found. They see how cycles help animals move and how cycles keep their lives going. They also see that binaries or opposite types of things keep the cycles going. As a result, they generate explanations that state that some kind of binary of movement keep cycles going and that cycles help maintain movement and life.

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