Computational Thinking & Climate Change in K-2

Key Concepts:

There are four cornerstones of computational thinking: decomposition, pattern recognition, abstraction, and algorithms.

One way to teach pattern recognition is to talk about trees.

Activities:

Part One:

> If possible, take your students for a quick walk to see some trees – I know that's harder than it sounds, but worth considering. ☺
>
> Even if you don't have trees nearby, you can show your students pictures of trees and ask them to tell you what they notice: the size, shape and color of their leaves; the size of their trunks; their height and width; their location (isolated or in a group), etc.

Part Two:

A) Have your students draw a pictures of a tree they saw.
B) Post all the pictures together and ask the students to tell you what the trees have in common. The answers should cover "leaves," "trunks," and "roots."
C) Contrast trees with other items: fences, bushes, flowers, bulldozers, potatoes. ☺ They can tell you what separates trees from those other items and maybe what characteristics they share.

Part Three:

Introduce the key terms of

1. breaking things down into parts (decomposition)
2. recognizing similarities (pattern recognition)
3. applying what you see to other examples (abstraction)
4. repetition (algorithm)

Note: You may wish to mention that there can be patterns in many things, textiles, classrooms, daily routines, etc. Patterns are not exclusively the province of static objects.

Rationale

"By teaching students to recognize patterns, their awareness of the world around them expands. This helps them to use the patterns they have identified to solve future problems and make predictions about the world."

~Kristen Thorson, Early Learning Strategies for Developing Computational Thinking Skills

Standards

Primary Standard: CS&ED: 8.1.2.DA.3: "Identify and describe patterns in data visualizations."

Add'l Stds: VPA: 1.5.2.Cr2c, 1.5.2.Re7a, 1.5.2.Cn11b; CS&ED: 8.1.2.DA.1, Social Stds: 6.1.2.GeoHE.1, 6.1.2.GeoHE.3.