Brainstorm Template - 4.2.3 Simulation Project

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Period 2 AP CSP

Ideas:

I chose the **Virus** simulation in NetLogo as my basic template.

- Differentiate between children and adults.
- Unlike adults, children cannot reproduce.
- Change immunity system so that a person stays immune forever.
- Change the size of the turtle so children are smaller than adults.
- Change the chance of recovery to be accurate to chicken pox statistics.
- Make a plot for the population of children and adult.
- Change the chance of recovery depending on age, so that young children have a higher fatality rate.
- Create a button and slider to spawn in more infected people.
- Create a button and slider to vaccinate random people.

Research & Rules:

My article was “Chicken Pox Can Be Serious”
https://www.cdc.gov/features/preventchickenpox/

- Chickenpox is contagious
- When a person survives a chickenpox infection he or she has immunity
- Immunity for chicken pox lasts forever
- Children have greater probability of death than adults
- Vaccines gives immunity

Create Prompt:

This is my 150 to 250 word response to the Create Task Prompt (see 4.2.3, #5)

The model is an algorithm of algorithms in that many smaller algorithms are combined to create a larger simulation for the spread of chickenpox. The functions “setup”, “startup”, and “setup-constants” set global variables and spawn turtles. Turtles are randomly chosen to be set as infected with chickenpox at the spawn. Once setup the setup has completed, the turtles begin to move in random directions as dictated by the “move” function. The “update-display” function sets the turtles to look like people, changes their color depending on if they are healthy, sick, or immune, and set a size difference between children and adults. While alive, turtles have multiple actions that can be performed. Every tick, a turtle will become one week older using the “get-older” function, and will die if they go above a set lifespan variable. The “get-older” function also reduces their “sick-time” if the turtle is sick. A turtle with the “sick” variable can cause other turtles to become sick using the “infect” if they are on the same patch in the simulation, and if it is decided by a random float generator. Turtles also have a random chance to reproduce if they are old enough, and if the turtle limit has not been reached yet using the “reproduce” function. The “recover-or-die” function runs on infected turtles, and will randomly kill

or immunize a sick turtle. Children have a higher chance of dying. These functions, on there own are simple, but together form a much more complex simulation.