L175 : At each iteration i, resources diffuse when the resource content of a grid unit was above a threshold value. Fixed amounts of resources were distributed from resource grid units to neighbouring grid units with lower resource contents, up to a maximum diffusion rate. The update can therefore be written as:

$$\text{Resource}^{i+1}_{(\text{resource x,y})}=\text{Resource}^{i}_{(\text{resource x,y})}-\sum T^{i}_{(x,y)}$$

where $\sum_j T^{i}_{(x,y)\to j}$ denotes the total amount of resources transferred from cell (x,y) to neighboring cells during iteration i. This transfer is constrained by a diffusion threshold (donor eligibility, so that Ti(x,y) > 0 only if Resource(x,y) > Resource(neighbour) and a fixed diffusion rate (maximum transfer per neighbor), such that resource-rich cells lose a constant quantity to each eligible neighbor rather than a gradient-proportional amount.
This formulation explicitly reflects the stepwise and locally asymmetric redistribution process implemented in the cellular automaton. It also clarifies that diffusion leads to progressive homogenization of resource distributions without assuming instantaneous equilibrium.

L191 :

$$\text{Resource}^{i+1}_{(\text{parent x,y})}=\text{Resource}^{i}_{(\text{parent x,y})}-\text{Resource}^{i+1}_{(\text{descendant x,y})}$$

Regarding the reproduction mechanism, the location of the descendant cell is chosen randomly among the set of available neighboring cells that can be occupied (i.e., empty or otherwise permissible states depending on the model rules). If no suitable cell is available in the local neighborhood, reproduction does not occur during that iteration and is postponed until space becomes available. In practice, this situation is rare due to the spatial structure and occupancy dynamics of the cellular automaton.