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Planetary Dominos - How microbes drive biogeochemical cycles V.1

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1 Works for me dx.doi.org/10.17504/protocols.io.8wphxdn

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ABSTRACT

This protocol describes the step to assemble your own Planetary Domino.
We designed this at Georgia Tech for an Astrobiology outreach event called "An Evening of Wonder", which we organized as part of AbGradCon2018. The goal of this activity was to introduce how microorganisms drive many geochemical cycles and how they are interconnected. Each domino piece corresponds to a bacerial functional role/"trophic" role (i.e., aerobic heterotrophs, anaerobic metal reducers, etc.) contains substrates on one side and products on the other. The idea is to find how they can be connected, like pieces of a domino. [M]0 Mass Percent

GUIDELINES

While the domino is very effective in engaging both young students and adults, the pieces could be optimized better. There is not one final solution, this is intended to be used for illustration purposes, and multiple connections can be made. Not all the pieces need to be used. This is something to "fix" in the future, as I have found that younger children (4-9) tend to want to win and get it right. It could be redesigned with that in mind.
Also, some scientific licenses have been taken, for the purposes of clarity and readability. For example, while most bacterial groups are described based on function, Cyanobacteria is used instead of "Oxygenic Phototrophs".

MATERIALS TEXT

-Magnetic Board
-Adhesive magnets (those that you can stick permanently on one side)
-The attached file that will be printed as a poster, a cutter for cutting it into each "domino piece"

1 Print this file into a poster, cut each piece and add an adhesive magnet. These will be the domino pieces, and they are now able to stick to any magnetic surface. The pieces here are enough for at least three different sets, as they repeat. The design was created by Image Alleviation, in collaboration with us, specifically for this project. Planetary Domino.pdf

2 After a brief introduction about microbes in the environment (good vs. bad, or biogeochemical cycles, depending on the audience), ask your audience to get into groups or one by one add pieces of the domino to the board. It is key is to let them discuss and ask questions, and only if necessary explain why certain pieces might not go together, etc.