Pond Scum

Background information:

When we see scum on the surface of a pond we don't even stop to think about what it is before we pronounce it yucky and turn our thoughts elsewhere. What exactly is scum? It has to be made of something.

What we call scum is millions upon millions of the most interesting creatures on Earth. Most of these creatures can be seen only under a microscope. They are very simple, one-celled organisms called "protists." Even though they are one-celled they still are highly sophisticated and can do everything necessary to live: find food, eat, eliminate waste, stay away from harmful things, and reproduce.

Some protists can photosynthesize and make their own food from sunlight. This group includes the algae and some types of bacteria (cyanobacteria). The protists that cannot photosynthesize must hunt for food. They will generally eat any other protists that are smaller (or even the same size!) as themselves.

This game simulates what you might see if you looked at pond scum under a microscope. You would likely see a variety of algae and bacteria with protists swimming around them. The protists tend to look transparent, which is why they will be printed on transparency plastic. The rules governing the movements of the protist pieces are designed to simulate the way these creatures behave.

SIDE NOTE: We have chosen to spell the word "ameba" with the new, more modern spelling, instead of the old-fashioned "amoeba." Both are listed as correct in the dictionary, but science books are beginning to switch over to the easier spelling.

You will need:

- The four game board pieces (printed onto card stock if you want them to durable)
- 2 copies of the protist pieces, copied onto clear transparencies
- scissors, red permanent marker, clear packing tape (or other tape, but packing is best)

Set-up:

1) Assemble the four pieces of the game board so that the algae strands match up and the pieces form a large rectangle. Use clear tape on the seams on the underside of the board.

2) Before you cut out the protists, take one of the sheets and use a red marker to make a dot on each playing piece. (One player will take the plain pieces and one player will take the red dot pieces.) After you have drawn the dots on the one sheet, cut out all the protist pieces. CUT ON THE LINES, except for the stentor. The stentor is the only piece that won't be rectangular shaped. 3) You will need some kind of divider to put across the middle of the board before the game starts so that the players cannot see where their opponent is placing their pieces. You can use two books stood up on end, or you can make a divider out of an old cereal box, or whatever else you have handy.



How to play:

This is a two-person game, similar to chess. Players will try to "eat" each other's protists. The player who has the most protists left at the end of the game wins.

Each player takes a set of protists. One player will take the plain pieces and one will take the red dot pieces. Put the divider across the middle of board (it doesn't matter which way the board is turned). Each player now places his protists anywhere on his half of the board. The stentor must be placed with its slender base touching the edge of the board closest to the player. The top of the stentor must occupy exactly four spaces. The stentor will stay in this position for the rest of the game. It is the only protist that does not move. The other protists can start out anywhere, and will be moving about. When the pieces are set, take down the divider.

Protist must abide by rules of movement:

- 1) The stentor does not move.
- 2) The ameba may move only 1 space per turn, in any direction.
- 3) The flagellates (the ones with the tails) can move up to 5 spaces per turn in any direction except diagonal.

4) The ciliates (the ones with little hairs) can move up to 3 spaces per turn in any direction except diagonal. No changing direction mid-turn. A ciliate may pivot during its move, counting the pivot as one of the three spaces for that turn. To pivot, put your finger on one of the piece's corners. Keep that corner in that same spot as you turn the piece.



Rules for eating:

1) The definition for "eaten" is when the predator overlaps at least one space with the prey. For example:



for the ameba, all its plastic area counts

- 2) "Like species" may not eat each other, even if they are on opposite sides. In other words, your paramecium cannot eat your opponent's paramecium.
- 3) Euglena and chilomonas cannot eat any protists. (Euglena can photosynthesize, and chilomonas only eats bacteria.)
- 4) Peranema can eat only euglena.
- 5) The other protists can eat anything that is the same size or smaller than themselves (size is determined by how many squares the piece takes up on the board).
- 6) The stentor can eat anything that

comes within 2 spaces of its top.



7) Something is considered eaten by the ameba if it is overlapped by any part of the ameba's plastic, even the blank part.



Additional rules:

- 1) "Like species" may overlap and will not be considered eaten.
- 2) As soon as your hand leaves your piece, you cannot change its position. What's done is done!
- 3) Your own pieces are safe from your stentor.
- 4) Your own pieces may overlap each other.
- 5) When it is your turn, you are considered the predator. When you move onto another piece, you are eating, not being eaten.
- 6) You cannot "pass" on your move. You must move a piece. If you get eaten, that's life in the pond!

NOTE: If you run into any weird situations that are not covered by these rules, the players must decide on a rule for that situation. That rule will be in force for the rest of the game. As long as everyone is playing by the same rules, the game is fair. (If the players cannot agree on the rule, a third party should make the ruling.)

Winning:

The game is over when on of these situations occurs:

- 1) One player has no pieces left on the board (except for stentor). The player who still has pieces left wins.
- 2) There is a stalemate, where no more pieces can be eaten. In this case, the player with the most pieces wins. If both players have the same number of pieces, the game is a tie.









