

POND SCUM

A chess-like game about protists eating each other

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. (Rules for winning are on the next page, at the end.)

It helps if the players know a little bit about these protists before playing the game. If you’d like a guidebook for young people that you can download free, go to www.ellenjmchenry.com, FREE DOWNLOADS, MICROBIOLOGY, PROTOZOA GUIDEBOOK. Also, if you’d like two free chapters about ciliates, go to the store at www.ellenjmchenry.com, click on “Protozoa; A Poseidon Adventure” and you can download them for free.

You will need:

- One copy of each of the four game board pages (use card stock if you want the pages to be durable for re-use)
- Two copies of the protist page copied onto clear transparencies (If transparencies are really not an option, just copy onto regular paper and make do.)
- Scissors
- Red permanent marker (such as Sharpie)
- **Clear tape (and wide, clear packing tape, if possible, for taping the seams on back side)**

HOW TO ASSEMBLE THE GAME:

STEP 1: After copying the green pattern pages, trim the copies before taping them together. The edges that will become the outside edges of the board have been darkened. You can trim off the white from these edges or you can leave it on and have a white border around the outside of the green board area. Either way is fine. You will need to trim a few other edges as you go, so that you can overlap the pages to make the green squares line up flush against each other. However, you can do this trimming as you go. Look and see how the pages fit together, then trim just one side, not both. Overlap the trimmed side onto the non-trimmed side.

STEP 2: Assemble the four pieces of the game board so that the algae strands match up and the pieces form a large rectangle. (TIP: Match the light brown, oval diatoms first. Then match those *Closterium* that look like green bananas. The fourth pages should then be easy to match. Also, there are tiny red dots in the center corners.) Use small pieces of tape on the back at first, until you get it lined up right. Then go back over the seams on the back with wider clear tape.

STEP 3: Before you cut out the protists, take one of the sheets and use a red marker to make a dot on each playing piece. (Or you can be more elaborate and make red around the outline of the protists.) One player will take the plain pieces and one player will take the red dot pieces. (This is like playing red versus black.) When you cut the protist pieces apart, **CUT ON THE STRAIGHT LINES**, not around the outside of the protists. Notice that for *Coleps* you will have four of them all on one square. The *Stentor* is an exception and will be the only piece that is not a rectangle. Cut around the outline of the *Stentor*.

HOW TO SET UP FOR THE GAME:

Players need to place all their pieces on their side of the board before the game starts. You will notice that the board is not square, and is wider in one direction. You can choose which way to turn the board. (The recommended direction is turning the board so that the longest direction stretches from player to player, with only 16 squares on each player’s end of the board.) If the players would like to place their pieces secretly, you can provide some kind of divider to put across the middle of the board. You can use two books stood up on end, or you can make a divider out of a folded piece of card stock paper, or an old cereal box, or whatever else you have on hand. Some players are not bothered about placing their pieces out in the open. Others prefer not letting the opponent see what they are doing.

NOTE: The only piece that does not move during the game is the *Stentor*. Think about where you’d like to place it because you can’t change it later on even though in real life sometimes *Stentors* do swim. But this isn’t reality, this is a game, so the pieces must have rules for how they move. In our game, *Stentor* is stationary. The *Stentor*’s peduncle (foot) must touch the edge of the board somewhere. The top of the *Stentor* must line up exactly with 4 spaces. The other protists can be placed anywhere on your side of the board.

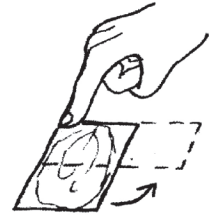
TIP: **Read the rules for how each protist moves before you decide where to place your pieces.**

HOW TO PLAY:

Rules of movement:

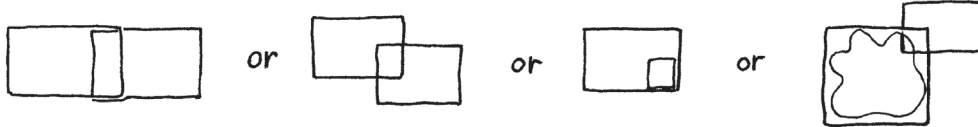
- 1) The *Stentor* does not move.
- 2) The *Ameba* may move only 1 space per turn, in any direction.
- 3) The flagellates can move up to 5 spaces per turn in any direction except diagonal.
- 4) The ciliates can move up to 3 spaces per turn in any direction except diagonal.
No changing direction mid-turn. 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.

PIVOTING:



Rules for eating:

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



Only the plastic piece has to overlap, not the drawing of the protist. For example, in the case of *Dileptus*, the drawing is smaller than the rectangular piece. If any part of the *Dileptus* rectangle overlaps another piece, it counts. (Otherwise it would be too difficult to determine whether something has been eaten. We are keeping it simple and saying it's the rectangle that 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*. Yes, in real life sometimes certain species can “cannibalize” their own kind, but this is the exception, not the rule. Again, this is a game, so the rules have to make it playable.
- 3) *Euglena*, *Chilomonas* and *Phacus* cannot eat any protists. They are photosynthesizers. However, one of these little pieces could possibly be your last piece on the board and win you the game. They can move quickly!
- 4) 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. For example, *Didinium* is 4 squares so it can eat anything that is 4 squares, 2 squares (such as *Paramecium*) or 1 square.
- 6) The *Stentor* can eat anything that comes within 2 spaces of its top. This is a 2 x 4 area. Your own pieces are safe from being eaten by your own *Stentor*, however, and can pass through that area. The other player's pieces will be considered “eaten” if they overlap even 1 of those 8 squares. They have to stay away in order not to get sucked down.
- 7) Notice that the *Coleps* function as a single piece even though there are 4 of them. *Coleps* is a species that likes to feed in groups. The *Coleps* piece counts as a 4-square, so it can be used against *Didinium*. (In reality, *Coleps* might even take a bite out of something larger, but we have to keep the rules simple.



Additional rules:

- 1) Your own protists can't overlap each other as they move around the board (unless both players agree to change this rule in order to make the game easier. Everyone has to agree to this change.)
- 2) As with real chess, your move will be “official” once you take your hand off your piece. Once you take your fingers off, you can't undo your move. (It's only a game; if you make a mistake that's okay!)
- 3) Know that pieces WILL get eaten. It's a vicious food chain down there under the microscope!
- 4) When it is your turn, you are the predator. When you move onto another piece, you are eating, not being eaten.
- 5) 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 situations that are not covered by these rules, decide on a rule for that situation, and keep that rule for the rest of the game. As long as everyone is playing by the same rules, the game is fair.

WINNING:

The game is over when one 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.



