

CRADLE OF CREATION

Life is believed to have originated near hydrothermal vents on the ocean floor. These vents are openings in the Earth's crust that release mineral-rich water, reaching temperatures of up to 370 degrees Celsius.

At these vents, there are a variety of chemical reactions taking place between the minerals and chemicals in the water. These reactions produce an environment that is rich in energy and nutrients. Scientists believe that the first life forms may have evolved in this environment, taking advantage of hospitable conditions.

The exact steps from the formation of organic molecules to the emergence of multicellular life are still the subject of much scientific investigation and debate. However, scientists have proposed several hypotheses and theories about how this process might have occurred. Here is a simplified overview of some of the proposed steps:

ORGANIC MOLECULES

Formation of organic molecules: Organic molecules, such as amino acids and nucleotides, could have formed spontaneously in the conditions found at hydrothermal vent.



Formation of self-replicating molecules: Organic molecules could have combined to form self-replicating molecules, such as RNA or DNA, which could carry genetic information and replicate themselves.

PROTOCELLS

Formation of protocells: Self-replicating molecules could have combined with other organic molecules to form protocells, which are primitive cells that can carry out some basic functions, such as metabolism and reproduction.

🔀 BACTERIA 🔀

Emergence of single-celled life: Over time, protocells could have evolved into single-celled organisms, such as bacteria and archaea, which are capable of carrying out more complex functions and interacting with their environment.

COMPLEX ORGANISMS



Emergence of multicellular life: Single-celled organisms could have formed colonies or clusters, which eventually led to the emergence of multicellular organisms, such as plants and animals.

The actual steps and mechanisms involved in the origin and evolution of life are likely much more complex than this simplified overview suggests. Nonetheless, exploring the processes involved in the origin of life can provide valuable insights into the nature of life itself and our place in the universe.

COMPONENTS



24 Blue Molecule Tiles

There are 2 types of tiles: tiles with 2 squares on either side and tiles with 3 on one side and 1 on reverse.



60 White Molecule Tiles

There are 2 types of tiles: tiles with 2 squares on either side and tiles with 3 on one side and 1 on reverse.



100 Double-sided Sheets (A & B)



Population Track & Population Tracker



20 starting condition cards Work in progress

1 Draw Bag 4 Pencils 1 Rulebook



SETUP

1) Each player receives sheet A, sheet B and a pencil.

2) Take the blue tiles out of the draw bag. For each player select 3 tiles of each type (2 squares on either side and 1+3 squares) and put them back into the bag. Put there rest away.



3) Place the population track and the population cube in the middle of the table.

4) Select a starting condition card (**disregard**): Work in progress Work in progress

First player is the person who has most recently dived in the ocean – they receive the first player marker.

The first player marker is passed clockwise at the end of every round.

HOW TO PLAY

Objective of the game:

The objective of the game is to score most points by creating organic matter and lifeforms, before the population limit is reached.

Draw and write:

Throughout the game you will be drawing random shapes (molecules) every round and using those shapes to fill in different parts of your sheet.

Basic and complex molecules:

A single tile represents a basic molecule.

A shape, built from 2 or more tiles, represents a complex molecule.

How to fill the sheet:

There are 3 ways the molecules can be used to fill in the sheet.



Organic chain. A white circle with a black shape can only be crossed off if you build the exact shape from the molecule tiles in a single round. Once you

cross it off you return all tiles used for this shape to the supply.



Protocell or organism. White squares can be filled with basic or complex molecules, built from the tiles over multiple rounds. Once a

shape is built from available tiles, colour in all squares representing that shape and return used tiles to the supply.

Autocatalysis. Represents spontaneous multiplication of organic molecules. Any basic or complex molecule can be assigned to this symbol. This symbol is filled in and the shape (molecule) is duplicated to use on both sides of the autocatalysis symbol in accordance with the 2 rules above.

Gameplay Sequence:

Each round is divided into 3 phases:

Drafting Phase
 Writing Phase
 Population Phase

1. Drafting Phase (blue tiles must be back in the draw bag):

The starting player closes their eyes and draws 3 tiles per player out of the bag and drops them on the table. This is important to make sure that tiles and their sides are selected at random.

2 players: draw 6 tiles, 3 players: draw 9 tiles, 4 players: draw 12 tiles, Solo player: draw 4 tiles (exception)

Starting from the first player and going clockwise each player selects 1 tile, then in reverse order each player selects 2 tiles.

Example, in a 3 player game: P1: 1 tile -> P2: 1 tile -> P3: 1 tile, P3: 2 tiles -> P2: 2 tiles -> P3: 2 tiles

2. Writing Phase:

All players simultaneously spend their drafted tiles to fill in selected parts of their sheets. All drafted tiles have to be spent or returned to the supply.

Sheets are divided into 4 sections each with specific layout, bonuses and rewards. (described on page 9)

Example:

The player has 3 tiles (molecules) available:



They use tile **1**) to cross off circle **a**), they use tile **2**) to cross off circle **b**). They finally use tile **3**) on the Autocatalysis symbol which allows them to cross off circles **c**) and **d**)



3. Population Phase:

The Population Symbol appears on all elements of the sheet that score points and represents the population value that is added to the population track when completing said elements. Once all players complete *Writing Phase*, starting from the first player and going clockwise, each player declares if they have marked any elements of their sheet that show a population count. If yes, then the population tracker is moved up on the population track by a number equal to the number of squares in the symbol. The player who declared the population increase, crosses this symbol off as a reminder for future that the population for that element has already been counted.

If you ever loose track of the population, the population count is always equal to the sum of all population symbols reached on all players' sheets.

At the end of this phase return all blue tiles to the draw bag.

Example:

The first player has reached the top of one of the **DNA** tracks. In the **Population Phase**, they declare that the population tracker has to be moved 2 spaces up and then cross off the symbol.

The second player has completed one of the **Protocells**. In the **Population Phase**, they declare that the population tracker has to be moved 1 space up and then cross off the symbol.







The population tracker is moved a total of 3 spaces this round.

Solo:

During *Drafting Phase* a solo player has taken 3 out of 4 tiles. During *Population Phase* the player moves the population tracker up by a number equal to the number of squares on the leftover 4th tile. Then the player adds population from completed elements like in a multiplayer game described above.

DETAILED SHEET DESCRIPTION

The sheets are divided into 4 sections:

- 1) DNA
- 2) PROTOCELLS
- 3) BACTERIA
- 4) COMPLEX ORGANISMS.

Below you can find the description of bonuses applicable to all sections and detailed descriptions of all 4 sections.

Bonuses:

Reaction biproducts. Whenever you cross off an element that has a pink symbol attached to it, you gain an extra molecule of that specific shape. You place it above the pink tiles marked on top of sheet A and you add them to your pool of tiles next round. This is a once off bonus and tiles are returned to supply after being used.

Example 1:

The player has crossed of the circle **a)** and now adds a 1-square tile to the their pool of tiles for next round.



Example 2:

The player has completed a full shape b) and now adds a 2-square tile to the their pool of tiles for next round.



1) DNA:



This section is divided into 4 tracks that have to be filled from bottom to the top. *Autocatalysis* symbol only works if all circles have been crossed off below, on both sides of the *Autocatalysis* symbol.

Once you cross off the shape at the top of a track you unlock a permanent bonus tile. Place the specific tile from the supply above the blue tile section. This tile is replenished at the start of each round, before the drafting begins.

Each unlocked DNA tile scores 2 points at the end of the game.

Unlocking some DNA tiles is a requirement to score points for complex organisms.

2) PROTOCELLS:



There are 8 protocells to complete in the game.

Each *Autocatalysis* symbol is used to fill in the same shape on both sides of it and can only be used once.

There are 5 permanent bonuses to unlock in this section. A bonus is unlocked if you complete 4 protocells around it. The outside bonuses allow you to duplicate a tile of a specific shape. This can only happen once per round after drafting and you can only duplicate molecules that you have in your pool (from drafting, from DNA unlocks or from pink bonuses). The central bonus allows you to flip one tile in your current pool to the reverse side. This can only happen once per round.

Each completed Protocell scores 1 point at the end of the game.

Completing some Protocells is a requirement to score points for complex organisms. Specific outside Protocells are a requirement to start completing specific Bacteria.

3) BACTERIA:



There are 4 Bacteria to complete in the game.

Each Bacteria requires 2 specific *Protocells* completed and consists of 3 *Organic Chains* that have to be built from tiles and crossed off. The required *Protocells* and outside *Organic Chains* have to be crossed off before the large middle organic chain can be completed.

Once a *Bacteria* is completed you gain one use of the large shape in the middle. You can fill in that shape in any *Complex Organism*. This can be done once per *Bacteria* – this is indicated by the large grey circle below. Once used, mark the smaller circle next to it.



Bacteria can multiply - additional uses of the shape can be "bought" by completing the shapes on either side of the grey circle.

Each completed Bacteria scores 4 points at the end of the game.

3) BACTERIA (continued):



Example:

The player has completed 2 specific Protocells and two outside Organic Chains in this specific Bacteria. During their turn the player builds the large central shape and crosses it off to complete the Bacteria.

The player then uses the shape to fill in a big part of a Complex Organism and marks that underneath the Bacteria.



The player then uses the remaining 2 tiles to buy another use of the central Organic chain.



The extra use is crossed off underneath the Bacteria. During Population Phase, the player will declare that the population tracker has to move 3 spaces up and will cross off the symbol above the Bacteria



4) COMPLEX ORGANISMS:



There are 3 Complex Organisms to complete in the game. The requirements for them to score, are shown on the left side of each image and all have a population count of 4.

A *Mussel* requires a fully filled pattern below and 1 completed *Protocell* and scores 6 points at the end of the game.

A **Tube Worm** requires a fully filled pattern below, 1 completed *Protocell* and 2 unlocked *DNA* tiles, and scores 8 points at the end of the game

A **Blind Crab** requires a fully filled pattern below, 2 completed *Protocells* and 1 unlocked *DNA* tile, and scores 10 points at the end of the game

Note:

To receive bonus tiles you must complete the marked shapes exactly and in a single round. This means that you will not be able to trigger bonuses with *Bacteria* shapes.



Example: no bonus for red markup. Bonus tile for green.

END GAME AND SCORING

End game trigger:

The game continues until a certain population limit is reached. This is indicated on the population track by 1P for solo, 2P for 2 players, 3P for 3 players and 4P for 4 players.

During Population Phase if the tracker moves past the population limit, the game will end at the end of the round.

The player whose declaration moved the tracker past the limit cannot declare more scoring elements. Remaining players can only declare 1 scoring element past this point, regardless of the population count of that element.

Example:

In a 3 player game, during Population Phase, the first player declares completing a Bacteria which increases the population count by 3 and moves it past the 3P limit. The player has also completed another Bacteria, but cannot declare it because the population limit has been reached. The second player has completed 2 Protocells this round but because the population limit has been reached they can only declare one of those and cross off the Population Symbol above. This means that one of the Protocells will not count for end game score. The third player has completed a Mussel and a Tube Worm this round. They can only declare one of those Complex Organisms and cross off the Population Symbol next to it. This means that the Complex Organism that was not chosen will not score points.

SOLO:

When the population count moves past **1P** limit, the game ends.

Scoring:

Use the scoring table to note the number of completed elements from each group. Count only elements that have a crossed off Population Symbol.

The player with highest score wins.

In the event of a tie, it's a tie.



Print and Play

Apart from printable material the game requires a first player marker, a population tracking cube and a draw-bag.

If above are unavailable, you can use anything for the first player marker, you can printout the population track each time and cross numbers off as you increase population. And if you do not have a draw bag and/or cannot make tiles that are robust enough to sustain drawing, you can select tiles randomly by rolling a D4 dice and following the rule below:

