

## Game or gamified educational experience

# GENB EDUCATIONAL BOARD GAME

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Created by: APRE, Agency for the Promotion of European Research

Technical contribution: AIJU, Technological Institute for children's products and leisure

Scientific validation by: BTG Biomass Technology Group B.V.

### Copyright Note

The game is considered validated **and under APRE's ownership** in its contents but not in its visual elements. The visual prototype (wireframe) has been used to conduct the various steps of the validation process in order to collect additional data for its replication in other educational contexts. We underline that the draft provided is only a model and that it will not be replicated in the final graphics. In the future we will proceed with the conception, validation and creation of the final product complete with all its visual components. Any feedback from using the game will be helpful to our validation process. Thanking you for your help, we ask you to contact us at the following email: [genb@apre.it](mailto:genb@apre.it)

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## ACKNOWLEDGEMENTS

The GenB Educational game has been reviewed from both scientific-technical and educational perspectives, ensuring their quality and appropriateness for the target audience.

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## ABOUT THE GAME

The GenB Educational Board Game conveys scientifically valid content to young European people and families in an attractive, simple, and comprehensive way.

Players: 4–6

Age: 8+

The GenB Educational Board Game is an educational game designed for young people and aimed at increasing their awareness and knowledge of the sustainable and circular **bioeconomy and its applications**, exploring the processes related to the production of bio-based products. A sustainable bioeconomy strives to be circular by preserving resources for future generations and promoting the use of residues from agriculture, forests, fishing and aquaculture, organic waste and by-products from industry (such as food).

The game was developed as part of the project funded by the European Commission, *GenB Informing and educating young people on more sustainable behaviours and choices to build a future Generation informed and interested in Bioeconomy* (G.A. 101060501), within a co-creation living lab in Italy path involving primary and middle-school students, and validated by experts in the field.

## GAME COMPONENTS

- (A) 1 Board
- (B) 6 Bio-Character Counters
- (C) 84 Bio-Formula Cards
- (D) 33 Bio-Question Cards
- (E) 35 Bio-Event Cards

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- (F) **84** Biomass Cards - **7** for each type of environment
- (G) **1** Die
- (H) **30** Energy Units
- (I) **6** Players aid cards

## OBJECTIVE

The objective in the GenB Educational Board Game is to obtain the highest **number of Sustainability Points**. To do this, players must **manufacture bio-based products** (Bio-Products). Each Bio-Product has its own Bio-Formula, and each Bio-Formula requires a number of biomass and a number of Energy units.

Players must **move their own Bio-Character counter around the board** to collect the required Biomass and Energy Units, according to the Bio-Formula they need to complete. A Bio-Formula is considered completed when the required Biomass and Energy Units are transformed into a Bio-Product by visiting the Bio-Refinery, and it will yield an amount of Sustainability Points depending on its difficulty.

## SETTING UP THE GAME

**Place the board** in the centre of the table. **Separate the cards** according to their type (Biomass, Bio-Formulas, Bio-Events and Bio-Questions). Also separate the Biomass cards according to their environment (Sea, Forest, City and Countryside).

**Shuffle each type of card** separately and form a deck for each. **Place each deck** in its corresponding place on the game board. The game board is divided into four environments, corresponding to the different Bio-Formula cards.

Form a **general pool** of the Energy Unit tokens within reach of all the players.

Each player chooses her/his **Bio-Character Counter** and places it on the starting square. Give each player the Players aid Cards (which will serve as storage for energy units) of the corresponding colour and deal each player 2 random **Bio-Formula** cards from the central deck. After looking at their **Bio-Formula** cards, each player draws 2 **Biomass cards** from an environment of their choice. Finally, each player rolls the die. Whoever rolls the highest number starts the game.

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## HOW TO PLAY

Starting with the first player and moving **clockwise**, each player takes a turn. Successive turns are taken in this manner until the end of the game is reached, and it is decided to move on to the Sustainability Points counting.

On their turn, the player **rolls the die and moves her/his Bio-Character Counter** the number of squares indicated by the die and in the direction of their choice. They **activate the effect of the square on the board** they land on, and then it is the turn of the next player.

What do the squares on the board represent?

There are different types of squares placed around the board: **Biomass [B]**: The player **draws a Biomass card** from the corresponding deck according to the environment in which they are in (Sea, Forest, City, or Countryside).

**Bio-Question [?]**: The player **draws a Bio-Question card** from the deck and hands it to the player to their right, who reads it aloud. The player **must answer correctly** (the answer is given below the question) to gain the Energy Units specified on the card, which vary depending on the difficulty of the card. Once answered, the card is returned to the bottom of the Bio-Question deck.

**Bio-Event [!]**: The player **draws a Bio-Event card** from the deck and deals with its effect. This can produce either advantages or disadvantages, either automatically or through specific actions detailed on the card. Once dealt with, the card is returned to the bottom of the Bio-Event deck.

**Bio-Hub [X]**: The player may remain in this position without acting and end her/his turn or decide to **move her/his Bio-Character Counter to one of the 4 special spaces** in the centre of the board and perform the corresponding action.

There are different types of squares placed in the centre of the board:

- **Bio-Laboratory**: draw an extra Bio-Formula card — to increase the chances of manufacturing Bio-Products and accumulating Sustainability Points.
- **Bio-Market**: begin a period of negotiation with the other players — ask for a specific Biomass card and, if someone offers it, swap it for another one.
- **Bio-Refinery**: complete a Bio-Formula card. For this, place the completed Bio-Formula in his/her play area, next to the Energy Storage card, discard the Biomass cards used to complete it face up in the Bio-Waste space and return the Energy Units to the general pool.
- **Bio-Waste space**: choose either a discarded Biomass card or a maximum of two Energy Units that the player needs to complete a Bio-Formula.

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## END OF THE GAME

As soon as a player **completes 4 Bio-Formulas**, they may choose to end the game. On his/her turn, (s)he announces the end of the game, and **the other players play one final turn**. The Sustainability Points are then counted, turning the Bio-Formula cards that are face down face up and adding up the points of the Bio-Formulas completed by each player. The player with the most Sustainability Points in total wins!

It is important to note that, even if a player has 4 completed Bio Formulas, **they do not have to** announce the end of the game. The player may think another player has more Sustainability Points, due to them having completed more complex Bio-Formulas and prefer to keep on playing **to get more points**, while maintaining the right to end the game on any turn (unless another player also completes 4 Bio-Formulas and announces the end of the game). In case of a tie, the player with the most remaining Energy Units wins.

Note: For a **more challenging version**, to finish the game, the 4 completed Bio-Formulas must belong to the **4 different types of environments** — one from each.

## FAQS

### How is Biomass obtained?

- 1) By drawing a Biomass card corresponding to the environment you are in, on a square marked **[B]**.
- 2) By taking part in a Biomass swap with other players in the Bio-Market, on a square marked **[X]**.
- 3) By dealing with the effect of a Bio-Event card, on a square marked **[!]**.

### How are Energy Units obtained?

- 1) Correctly answering the question when drawing a Bio-Question, on a square marked **[?]**.
- 2) Dealing with the effect of a Bio-Event card that provides them, on a square marked **[!]**.

### How are Bio-Formulas completed?

Once the Biomasses and Energy Units needed for the Bio-Formula have been collected, the player must reach a Bio-Hub i.e. a square marked **[X]** and choose to move to the Bio-Refinery (located in the centre of the board). Then they place the completed Bio-Formula

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face down on their playing area, signifying that they have manufactured that Bio-Product, which will earn the Sustainability Points at the end of the game. Finally, they discard the Biomass cards and Energy Units used to complete the Bio-Formula on the Bio-Waste space.

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## GET READY TO...CUT!

### BIOMASSES

Cut out the biomass cards along the edges.

There are 3 types of biomass per each environment: Countryside; City; Forest; Sea.

### ENERGY UNITS

Cut out the energy unit cards along the edges.

### PLAYER CARDS AND TOKENS

Cut out the player cards and/or the tokens along the edges.

The individual player can decide whether to use the token to be cut or to look for a small object near him of the color of the players aid cards.

### DIE

Cut out the die along the edges.

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## BIOMASSES

Wine Production Waste	Wine Production Waste	Wine Production Waste
Wine Production Waste	Wine Production Waste	Wine Production Waste
Wine Production Waste	Hemp	Hemp
Hemp	Hemp	Hemp
Hemp	Hemp	Tomato Scraps
Tomato Scraps	Tomato Scraps	Tomato Scraps
Tomato Scraps	Tomato Scraps	Tomato Scraps

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Apple Scraps	Apple Scraps	Apple Scraps
Apple Scraps	Apple Scraps	Apple Scraps
Apple Scraps	Pruning Waste	Pruning Waste
Pruning Waste	Pruning Waste	Pruning Waste
Pruning Waste	Pruning Waste	Coffee Grounds
Coffee Grounds	Coffee Grounds	Coffee Grounds
Coffee Grounds	Coffee Grounds	Coffee Grounds

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Bamboo	Bamboo	Bamboo
Bamboo	Bamboo	Bamboo
Bamboo	Wood Scraps	Wood Scraps
Wood Scraps	Wood Scraps	Wood Scraps
Wood Scraps	Wood Scraps	Mushrooms
Mushrooms	Mushrooms	Mushrooms
Mushrooms	Mushrooms	Mushrooms

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Posidonia	Posidonia	Posidonia
Posidonia	Posidonia	Posidonia
Posidonia	Spirulina	Spirulina
Spirulina	Spirulina	Spirulina
Spirulina	Spirulina	Fishery waste
Fishery waste	Fishery waste	Fishery waste
Fishery waste	Fishery waste	Fishery waste

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## ENERGY UNITS

Energy Unit	Energy Unit	Energy Unit
Energy Unit	Energy Unit	Energy Unit
Energy Unit	Energy Unit	Energy Unit
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Energy Unit	Energy Unit	Energy Unit
Energy Unit	Energy Unit	Energy Unit
Energy Unit	Energy Unit	Energy Unit
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## PLAYER CARDS



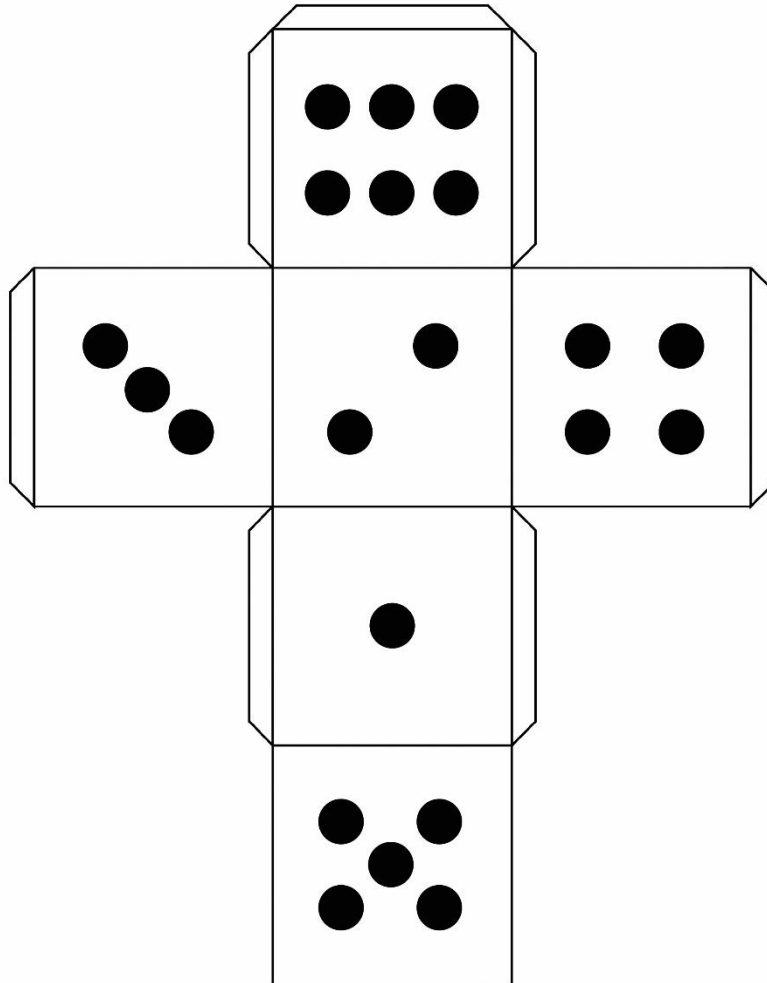
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## DIE



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