

## Global education module

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<b>COUNTRY:</b>	Hungary
<b>TITLE:</b>	Sustainable fishing
<b>AGE GROUP:</b>	12+
<b>SUBJECTS:</b>	geography, biology, economics, mathematics, ethics
<b>TIME REQUIRED:</b>	45 minutes

### Sustainable fishing

#### the aim of the game:

- players will have to choose between strategies of co-operation and competition
- players will experience the consequences of the use and overuse of shared resources
- players will be able to identify those factors that affect the process, both from an individual and a social point of view

**related subjects:** geography, biology, economics, mathematics, ethics

**age group:** 12+

**number of participants :** 3-30 people

**tools:** a table  
 an object symbolizing a pond (a plate, a sheet, etc.)  
 playfish (20 per round)  
 fishing rods (in case the snack is used, they can be thick plastic straws)

**time required:** 45 minutes

#### preparations:

The pond and the fish /fishing rod can be made at a handcraft workshop. It is fun if the fishing itself requires some skill and dexterity.

In case you buy some fish-shaped snacks, the fish can be caught (sucked up) by a straw:



#### Description of the game:

How to form groups: the group is randomly divided into three smaller groups of possibly equal number.

Instruction: *You are fishermen, and your only source of income comes from fishing. You sell the fish you caught, and you pay for everything you need from this income: the schooling of*



your children, health care, etc. There are two other fishermen and their families living by the lake.

Groups have 1 minute to choose themselves a family name. The three family names are written on the table where everyone can see them.

### The game itself (20 minutes)

As for the objective of the game, players need to know only the following: *Your task is to catch as many fish as possible by the end of the game.* It is important that the instruction should not be clear as to whether they should have as many fish as possible at the end of the game by individual groups, or all the groups together. This is up to the interpretation of the players. Any more detailed instructions may disturb the game. If they ask how long the game will last, the answer is, it depends on how effective they will be at fishing. (They probably will not make it to the 10<sup>th</sup> round if they choose the competitive strategy.)

The basic rules should be written on the board:

- the lake can maintain 20 fish at the most
- the game lasts for 10 rounds (10 years)
- one family can catch up to 3 fish a day (at the end of each round, families write down the number of fish caught by them in the table, and they put the fish into their "net")
- during the night, the fish that were not caught produce offspring by 25 %, up to, but not exceeding, 20 fish
- each round lasts until everyone catches as many fish as they have planned

The facilitator gives permission to begin the fishing season. Each round lasts until each family catches as many fish as they have planned in advance (between 0 and 3). At the end of each season (one round equals one fishing season) the number of fish a family caught has to be written in the table under that family's name. At the end of the season, the facilitator counts the fish left in the lake and adds 25 % to it. If the number of fish left in the lake cannot be divided by four, the extra fish should be added based on the nearest number dividable by four (rounded downwards). (If there are 10 fish left, then 2, if there are 13, then 3, etc.) This principle should be stated in advance.

The game lasts until there are fish in the lake. The facilitator should not interfere if someone wants to limit the fishing season, for instance.

If there are no more fish left, ask the players: *Next year, what will you make your living from?*

### Discussion (15 minutes)

Players should receive open questions if possible. They should tell others about their impressions and what they have learned from the game. Questions should be in line with the objective of the class.

At the end of the game players will sit in a circle and step out of their roles.

First they will get an opportunity to express their feelings: *What were your feelings? How did you find the other groups' behaviour? Are you satisfied with the result?, etc.*

They will tell what happened and why. Questions: *How did the game go? How did you co-operate within your family and among families?*

Use the table. Players can comment on it. They should look at the catch of a given family throughout the game. *Do you notice any turning points? How did you decide the number of fish you wanted to catch? Did you have a strategy? How did it change during the*



game? How did the other families' decisions influence yours? How would you describe the relationship between the families?

What do you think of this game?

Who won, and who lost? Each group should be able to give their opinion on this question. If it occurs to no one that everyone loses if the lake gets exhausted (or vice versa: everyone wins if there is always enough fish), we should ask: *How did you interpret the task? Can there be any other interpretations?* If they do not mention it, you can draw their attention to the fact that the instruction was not clear on whether the families have to have as many fish as possible by themselves, or the number of fish left in the lake has to be added to the sum. The task can be interpreted in such a way that while they make a living, they take care to always leave enough fish in the lake, because fishermen live longer than just 10 years. In an optimal case, that fact is realised by the players themselves.

*What would you change if you could play the game again and it lasted for a 100 rounds? Would you agree on certain rules and quotas regarding the maximum quantities of fish allowed to be caught per year? Would you monitor whether rules are observed? (What is the maximum amount of fish that can be caught without jeopardizing regeneration?* In order to ensure a maximum of 4 fish to be reproduced the second year, up to 5 fish can be caught in the first year. The following year, a total of 4 fish can be caught only. This way all of them would be reproduced, and their number would reach the maximum possible.

*How is the game and real life similar? Does the game remind you of a personal experience? Besides fishing, could you think of some other similar situation? How is the game different from reality? Can you know the actual quantity of fish in a lake?*

In the end, each player should tell the others their conclusions. *What have I learned from this game?* If time is short, they can write their reflexions on post-its. If this is the case, at least 3 players should give their feedbacks.

### Background information

Every activity that exceeds the regenerating capacity of a specific source is considered the exhausting of renewable sources (overconsumption). In other words, we are not consuming the natural surplus but we tear out a piece from the "core" of the source, so to say. A typical example of this process is overfishing. The population of the world's most fished species (tuna, cod) today is 90 % less than it used to be at the beginning of the 1900s. A further problem is that the most popular species are also carnivores, and as such, are situated at the top of the food chain in oceans. Overfishing of these species leads to a proliferation of plant-eating fish that can result in the destruction of species at the bottom of the food pyramid, like algae and planktons.

In the case of bluefin tuna, the quantity of sustainable fishing is 7500 tons per year, but 60.000 tons are caught per year instead.

Overconsumption of renewable and non-renewable resources is one of the greatest threats to biodiversity on earth.

It could be interesting to show a video on overfishing after the game, and discuss it with participants:

<https://www.youtube.com/watch?v=F6nwZUkBeas>



Table:

Round \ Family's name			
1.	.....	.....	.....
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
total number of fish			

