

COMMON POOL RESOURCES

Fishpond explained

1 Preparation and introduction

1.1 Get started	COMMENTS
<ul style="list-style-type: none"> ▶ Get everything together: check sheet for teachers, slides on rules of game, slide with scoring system, score sheet for players, projector, masks, prizes (optional). ▶ Seating may be arranged in a U-shape (optional). 	<ul style="list-style-type: none"> ▶ If no masks or blindfolds are being used, players need to be seated in a U-shape (facing away from each other), so that they can take anonymous decisions.
<p>1.2 Explain the game</p> <ul style="list-style-type: none"> ▶ In this role-playing game, players are asked to fish in a pond. ▶ At the beginning of the game, the pond contains four fish per player (e.g. 20 players = 80 fish). ▶ The game is played in rounds. In each round, every player may catch between zero and three fish. ▶ The remaining fish multiply between rounds. ▶ The game lasts for a maximum of ten rounds. 	<ul style="list-style-type: none"> ▶ Explain the rules as clearly and precisely as possible. The slides provided can be used for this purpose.
<p>1.3 Explain the aim and show prizes</p> <ul style="list-style-type: none"> ▶ The aim of the game is to catch as many fish (points) as possible in ten rounds. 	<ul style="list-style-type: none"> ▶ Show the players the slide with the scoring system as well as any prizes for top scorers. Awarding prizes increases motivation. ▶ Option: A prize can be awarded to the whole class if the pond has not been depleted after ten rounds.
<p>1.4 Describe stages of a round</p> <ul style="list-style-type: none"> ▶ Each round consists of three 'casts' (opportunities to catch a fish). In the first cast, players raise their hands if they wish to catch a fish. To catch a second or third fish, players keep their hands raised in the second and third casts. ▶ After each round, players enter their new points and the total points on their score sheets. ▶ The number of fish remaining in the pond doubles between rounds. However, there is a capacity limit. The pond does not hold more than four fish per player. 	<ul style="list-style-type: none"> ▶ Players who choose not to catch a fish in a particular cast may not re-enter the round in a subsequent cast. This means that the second cast is only open to those who fished in the first cast, and the third cast is only open to those who fished in the second cast. Anyone wishing to catch just one fish, therefore, must do so in the first cast. ▶ Ensure at this stage that the players know how to complete the score sheet. Penalties can be introduced at a later stage (if the teacher wishes to include this option).
<p>1.5 Additional remarks</p> <ul style="list-style-type: none"> ▶ Hand out masks. As fishing is done anonymously, masks need to be worn during the rounds. ▶ Players should not talk to each other. 	<ul style="list-style-type: none"> ▶ Instead of masks, blindfolds may be used. Alternatively, players may be seated in a U-shape (facing away from each other).

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2 The game

2.1 Play rounds without penalties	COMMENTS
<ul style="list-style-type: none"> ▶ The teacher enters the number of players and the number of fish in the pond at the beginning of the game on the check sheet. ▶ Players put on their masks. ▶ Players wishing to catch a fish raise their hands. ▶ The teacher enters the number of caught fish on the check sheet. ▶ The procedure is repeated for the second and third casts. ▶ Players take off their masks. ▶ The teacher enters the results (total number of fish caught, number of fish remaining) and the number of fish in the pond at the beginning of the next round. ▶ Players write down their points. 	<ul style="list-style-type: none"> ▶ A test round may be played without masks (use first line to write down results). ▶ Go through the three casts of each round at a steady pace, so that the players cannot guess how many fish have been caught.
<h3>2.2 Introduce penalties</h3> <ul style="list-style-type: none"> ▶ After each round, players may anonymously give penalty points to punish those who caught three fish in that round (overuse). ▶ Players wishing to give penalty points raise their hands. Points cannot be given for free, however. Anyone wishing to award a penalty point has to give up one of their own points. ▶ The number of penalty points received by the players who caught three fish corresponds to the number of players giving penalty points minus one. However, no more than three penalty points may be given. These points are then deducted from the score. 	<ul style="list-style-type: none"> ▶ The penalty option may be introduced after two to three rounds or at the beginning of a new game. The slides explaining the rules may be used again at this point. ▶ The calculation of penalty points can be explained as follows: a certain effort is involved in punishing overuse; in order for the penalty to be effective, therefore, at least two players have to participate. ▶ In small groups (fewer than ten players), the penalty points may be calculated without the deduction of one point, and in big groups (more than twenty players), two points instead of one may be deducted.
<h3>2.3 Play rounds with penalties</h3> <ul style="list-style-type: none"> ▶ Players put on their masks. ▶ Play first three casts as before. ▶ Introduce penalties: players wishing to give penalty points raise their hands. ▶ The teacher enters the number of caught fish on the check sheet. ▶ Players take off their masks. ▶ The teacher enters the results (total number of fish caught, penalty points given/received) and the number of fish in the pond at the beginning of the next round. ▶ Players write down their points, deducting one point if they gave a penalty point or one to several penalty points if they themselves were penalised for having caught three fish. 	<ul style="list-style-type: none"> ▶ To increase the suspense when announcing the results to the class, keep the slide covered and reveal the results gradually, moving from left to right. (How many players gave penalty points? How many players received points? And so on.)

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2.4 Call a conference

- ▶ A further option would be to call a class conference after a few rounds. Players get to discuss how they want to proceed. Any resolutions made may change the players' behaviour, but will not affect the laws of nature.
- ▶ Depending on the level of the class, the teacher could have the players themselves organise the conference, intervening only if inadmissible resolutions are made or if certain resolutions could disrupt the game.
- ▶ The teacher ends the conference after three minutes and starts the next round. The players receive no help in implementing the resolutions nor are they told if someone does not observe them. If necessary, the teacher can call another conference.

COMMENTS

- ▶ Permissible resolutions include all those concerning the players' (non-binding) behaviour, such as agreeing that all players may take no more than two fish. Improvements to conditions (such as a recovery of the fish population or an adjustment to the cost of awarding penalty points) are not permissible. In case of doubt, the teacher decides whether or not a resolution is permissible.
- ▶ Decision-making is not easy and implementation can often raise tricky questions. This is also the case in reality at international conferences.

2.5 End of game

- ▶ The game ends after ten rounds or as soon as the pond is empty (depletion of resource).
- ▶ If the pond is depleted (which is normally the case), the fish remaining at the end of the previous round are divided among the players as follows: all players who caught a fish in the first cast are each given a fish. If there are fish left over, those who caught a fish in the second cast are given their second fish. This is continued until there are no fish left to allocate.
- ▶ Example: 15 fish were in the pond; 12 players caught a fish in the first cast, 5 caught a fish in the second cast, and 2 caught a fish in the third cast. First, the 12 players who caught a fish in the first cast are each given a fish. Subsequently, there are 3 fish left in the pond. All 5 players who caught a second fish are given a fish (the number of fish is rounded up to correspond to the number of players). After that, the pond is empty. Nobody receives a third fish.

- ▶ As an exception, the game may be ended before the ten rounds have been completed, even if the pond has not been depleted (e.g. if a learning effect is visible at an earlier stage).

2.6 Record individual results and marks

- ▶ Place slide with the scoring system on projector.
- ▶ Players make a note of their marks.
- ▶ Prizes may be awarded to top scorers (optional).

Two options:

- ▶ Reveal identities and award scores. Discuss the different tactics ("Why did some people catch three fish?").
- ▶ Maintain anonymity also at this stage, the scores remain a secret. If awarding a prize, only ask if the score required to win the prize was attained.

2.7 Record performance of class as a whole

- ▶ The teacher calculates the total number of fish caught and the averages (per player, per player and round) and enters them on the check sheet.
- ▶ The average calculated per player and round is compared with the most sustainable solution, in which all players could have caught two fish per round, i.e. twenty fish.
- ▶ To calculate the average per player and round, the points are divided by ten, even if the pond was empty before the ten rounds had been completed. (It is possible to play ten rounds if players do not catch more than two fish per round.)

- ▶ A collective result does not take the penalties (penalty points given and received) into account and cannot be compared directly with individual results.