myfish
Maximising yield of fisheries while balancing ecosystem, economic and social concerns

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Myfish?
Our Fish!

The role-playing game where EVERYONE wins

(including the fish!)

Downloadable Lesson Plan

Including full guidelines, materials and teachers' notes

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Myfish? Our Fish!

Downloadable Lesson Plan

Learning Level:	**Pupils of 10 years and upwards**
Time:	**One class period (45 minutes approximately)**
Aim:	**The purpose of this activity is to introduce the many factors involved in sustainable fisheries management and to acquaint pupils with the various decision-making processes involved by playing a simple, enjoyable role-playing game**

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- Printable fish

Introducing the Myfish? Our Fish! game

Background

This game was developed within the framework of the **Myfish** project, which was funded by the European Union under its Seventh Framework Programme (FP7).

Fishing stocks may be renewable, but they are finite. Some fishing stocks are being overfished. Although it is important to maximise catches, there must be limits. We need to make sure that fishing practices do not harm the ability of fish populations to reproduce. As a result, EU countries have taken action to ensure the European fishing industry is sustainable and does not threaten the fish population size and productivity over the long term.

The new Common Fisheries Policy (CFP) is a set of rules for managing European fishing fleets and for conserving fish stocks. Designed to manage a common resource, it gives all European fishing fleets equal access to EU waters and fishing grounds and allows fishermen to compete fairly.

The CFP aims to ensure that fishing and aquaculture (fish farming) activities are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens.

The principal aim of fisheries management under the CFP is to ensure high long-term fishing yields for all stocks by 2020. This is referred to as Maximum Sustainable Yield (MSY). MSY is the maximum yield that can be derived from a renewable resource over a prolonged period of time.

The **Myfish** project aimed to address ambiguities relating to the interpretation of the “sustainability” and “yield” components of the MSY concept in relation to fisheries by evaluating different MSY objectives, conditional on different kinds of constraints (ecosystem, economic, social) and with different kinds of management measures to achieve the objectives.

For more information, visit the **Myfish** website at: **www.myfishproject.eu**

General Description

The objective of this game is to examine how we balance the 'see-saw' of fisheries yield (the amount of fish that can be caught and sold) vs sustainability (the number of fish left in the sea and the condition of the marine environment after the fishing has taken place).

The pupils in the class are divided into five groups, each of which is asked to explore one of the characters in depth.

Class discussion takes place so that all the issues can be fully explored.

Characters:

1. **Consumers** of fish – an average family
2. A **fish trader (fishmonger)** – who sells fish
3. A **fisherman** – who catches fish
4. An **environmentalist/'eco-warrior'** – who is concerned about environmental issues such as: disturbance of the seabed by fishing gear, burning of fossil fuels by fishing vessels, bycatch of charismatic megafauna (such as whales and dolphins), 'ghost fishing' by lost nets
5. The **ecosystem** as a whole
6. A **fisheries scientist** – (played by the class teacher) who acts as the narrator/mediator/problem solver (***No previous knowledge of fisheries science required!***)

Each character wants something:

- The **fishmonger** wants to keep his fish business alive/buy fish at a reasonable price
- The **consumers** want to eat fish at a price they can afford
- The **fisherman** wants to catch fish to sell to support his family
- The **environmentalist** wants to preserve the environment
- The **ecosystem** also wants to protect itself to provide a safe home for the fish to grow and produce more fish to keep their species alive into the future.
- The **fisheries scientist** (played by the teacher) understands the whole 'game' and wants to show each 'player' how to play it so that everyone gets what they want without spoiling the game.

How do you balance the needs of each of the six characters and still leave enough fish in the sea to keep everyone happy in the long term?

Playing Myfish? Our Fish! - Directions for the teacher

- The class is divided into five groups (*according to the roles listed on page 1 and described in detail in the Role-Play Guides*) which then get together to play the game in three rounds.
- Each group is given a Role-Play Guide and asked to read it. One person from each group is then asked to say who the group is and what they want. They then answer questions from the other groups, until all five groups have had their say - guided by the teacher in the role of fisheries scientist.
- Once everybody fully understands what each group wants, the groups and the teacher stand in a ring and the teacher places all the fish on the floor in front of them:
    - The consumers are given 60 units of money for their group.
    - The fishmongers are given 30 units of money (demonstrating the difference between ‘wholesale’ and ‘retail’ prices).
    - 90 fish are then placed in the centre of the circle.
- The players then play the roles allocated to them, under the direction of the teacher, and observe the results in each of the three following situations:

Round One - Free for All!

1. The **fishermen** are allowed to take as much fish as they want
2. The **fishermen** then sell their fish to the **fishmongers**
3. The **fishmongers** then sell these fish to the **consumers**

Ask yourselves:

- How do the **fishermen**, the **fishmongers** and the **consumers** feel about that?
- Then look at the fish that are left:
  - *Are* there any left? (*Ask: what happens next?*)
  - How do the **environmentalists** and the **ecosystem** feel about this?
  - Will there be enough fish left to create more young fish to keep the populations of fish going into the future - and provide more fish for everyone?

Who Wins?

- The **fishermen** win because they have caught a lot of fish and sold it to the **fishmongers**.
- The **fishmongers** have won because they bought a lot of fish from the **fishermen** and could then sell it on to the consumers at a profit.
- The **consumers** won because they could buy lots of fish.

Who Loses?

- The **environmentalists** are upset because all the fish are gone!
- The **ecosystem** has lost because she has no more fish to support all the other animals and plants in the ocean.

This is what fisheries scientists call a 'Stock Collapse' and, in the long run, NOBODY wins. (*Ask Why?*)

How can we play the game differently so that everybody wins (including the fish)?

Round Two - Fish for Nobody!

Put all the fish back into the centre of the ring.

1. The **fishermen** are not allowed to take any fish
2. The **fishermen** have no fish to sell to the **fishmongers**
3. The **fishmongers** have no fish to sell to the **consumers**

Ask yourselves:

- How do the **fishermen**, the **fishmongers** and the **consumers** feel about that?
- Then look at the fish that are left:
  - *Are* there any left? (*Ask: what happens next?*)
  - How do the **environmentalists** and the **ecosystem** feel about this?
  - Will there be enough fish left to create more young fish to keep the populations of fish going into the future - and provide more fish for everyone?

Who Wins?

- The **environmentalists** win because the **ecosystem** is protected and there are now lots of fish to breed and create baby fish for the future.
- **Ecosystem** wins because all the fish are still there and the ocean is not harmed at all.

Who Loses?

- The **fishermen** and the **fishmonger** have no money because they have no fish to sell. To support their families they will have to find other work to do. Also, all the people who support the fishing industry by making boats and nets, or transporting and packing fish will have no jobs either.
- The **consumers** will have no fish to eat and will have to find something else that might be less healthy to feed their families.

How can we play the game differently so that everybody wins (including the fish)?

Round Three - Enough for Everybody!

Put all the fish back into the centre of the ring.

The **fisheries scientist** (i.e. the teacher) tells everybody that they have calculated that, if we leave one third of all the fish in the sea all the time, there will always be enough adult fish to breed and create the young fish needed to keep the entire population of fish going into the future.

This is why fisheries scientists take samples of fish at sea, monitor the catches that the fishermen take and suggest to national governments how many fish it is safe to take without risking a 'stock collapse'.

1. The **fishermen** are allowed to take only two thirds of the fish.
2. The **fishermen** sell these fish to to the **fishmongers**.
3. The **fishmongers** sell these fish to the **consumers**.

Ask yourselves:

- How do the **fishermen**, the **fishmongers** and the **consumers** feel about that?
- Then look at the fish that are left:
  - There are enough fish left in the sea to produce all the young fish we'll need for the future!
  - Take all the fish that were sold to the **consumers**, pretend they are new 'baby fish' and throw them back in the middle!
  - How do the **environmentalists** and the **ecosystem** feel about this?

Who wins?

- The **fishermen** win because they have enough fish to make a living
- The **fishmongers** win because they have enough fish to sell
- The **consumers** win because they have enough fish to eat
- The **environmentalists** win because the environment is protected and the fish stocks do not collapse
- The **ecosystem** wins because there are always enough fish in the sea

Fish for Everybody

The fish stock is now ‘Sustainable’ - in that the number of fish taken out of the stock are not beyond what fisheries scientists call the ‘Maximum Sustainable Yield’ or ‘MSY’.

It can therefore go on providing fish for the fishermen into the future.

This keeps EVERYBODY happy!

This is why fisheries scientists regularly monitor the number of fish in the sea by counting the numbers of fish being sold by fishermen, by going out in boats themselves and counting the numbers of fish caught, and by carrying out fishing surveys of their own.

They also monitor the places where they know fish breed and take samples of young fish (larvae) and fish eggs at sea to calculate how many fully grown fish they might expect in the future.

All this information is carefully analysed to calculate the MSY for each species of fish in each area of the sea.

This MSY is then divided up between the countries that fish each species and each country is given a quota on the amount of fish their fishing boats can catch. This amount is called the national ‘quota’ for each area of the sea.

What did you learn?

1. ***That commercial fishing - like so many environmental issues - is a complex debate***

Teacher's note: At its core the issue is about how to manage a renewable natural resource - the fish stocks - so that there are always enough fish in the sea to produce enough eggs to create more fish, and so on.

In the past - in the days when fishing boats had to be rowed or powered by the wind - nobody could ever catch enough fish to put the stocks in danger by exceeding the Maximum Sustainable Yield of a stock.

Nowadays, with huge modern trawlers, vast fishing nets bigger than circus tents and an insatiable demand for food, it is easy to take so many fish from the sea that the Maximum Sustainable Yield is exceeded and the fish stocks 'collapse'.

2. ***To understand more about the various different interests involved and their different points of view***

Teacher's note: In complex environmental issues such as sustainable fishing, there are many points of view. Fishermen want to make a living, as do the fishmongers, by catching and selling fish. Consumers want to eat fish. Environmentalists want to preserve the ecosystem, which in turn wants to sustain itself.

If *everyone* takes their own interests to the extreme and ignores everyone else, then we have conflict. Only by knowing the **facts** about how many fish we can take out of the sea and still have enough left to sustain the fish population (i.e. having the fisheries scientists work out the Maximum Sustainable Yield and the fishermen limiting their catch so that they don't exceed it) can we **manage** the stock in a sustainable way.

3. ***Is anyone 'right'? Is anyone 'wrong'?***

   Or is everyone just trying their best to follow what they see as 'the right thing to do' - to support themselves and their families by catching and selling fish (fishermen and fishmongers), by buying healthy, nutritious food to eat (consumers), by wanting to protect the ecosystem (environmentalists)?

Teacher's note: Ask your class if they can see how answers to complex problems such as fishing can be found if people are willing to talk to each other?

Can they see any lasting solutions for the future of fishing that noboby else may have thought of before?

More Information & Resources

- Other educational lessons are available at:
  www.myfishproject.eu/media-centre-2/educational-lessons

For older students and more detailed background information

- International Council for the Exploration of the Sea (ICES):
  www.ices.dk
- Information on EC fisheries:
  www.ec.europa.eu/fisheries/index_en.htm
- Marine Stewardship Council's 'Certified Sustainable Seafood' scheme:
  www.msc.org

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Role-Play Guide #6 - Fisheries Scientists

Printable money

Printable fish

ROLE-PLAY GUIDE #1 - CONSUMERS

We like to eat fish because (DISCUSS with everybody):

- It is healthy for us
- It tastes delicious
- It is easy to prepare and cook

We would be less likely to eat fish if:

- We thought it was damaging the environment
- Whales, dolphins and seals were likely to be harmed
- It was too expensive

ROLE-PLAY GUIDE #2 - FISHMONGERS

We like to buy and sell fish because (DISCUSS with everybody):

- We are proving a healthy food that people like to eat
- We can make a living selling fish
- We can pay our staff, transport, advertising and other costs

We could not buy and sell fish if:

- There were no fish to buy and sell
- We could not make enough money to cover our costs
- Fishing was doing so much damage to the environment that our customers would not buy our fish any more
- We have to pay too much to the **fishermen**, then the **consumers** will not be able to afford to buy our fish (*Ask: what happens then?*)

ROLE-PLAY GUIDE #3 - FISHERMEN

- We catch fish and sell them to the **fishmonger** at a reasonable price (DISCUSS with everybody)
- To catch fish we need to buy fuel to make our boat run and the fishing gear to catch the fish
- If there are no fish left in the sea we cannot catch them (*Ask: what happens then?*)

ROLE-PLAY GUIDE #4 - ENVIRONMENTALISTS

We are concerned about the effects of fishing on:

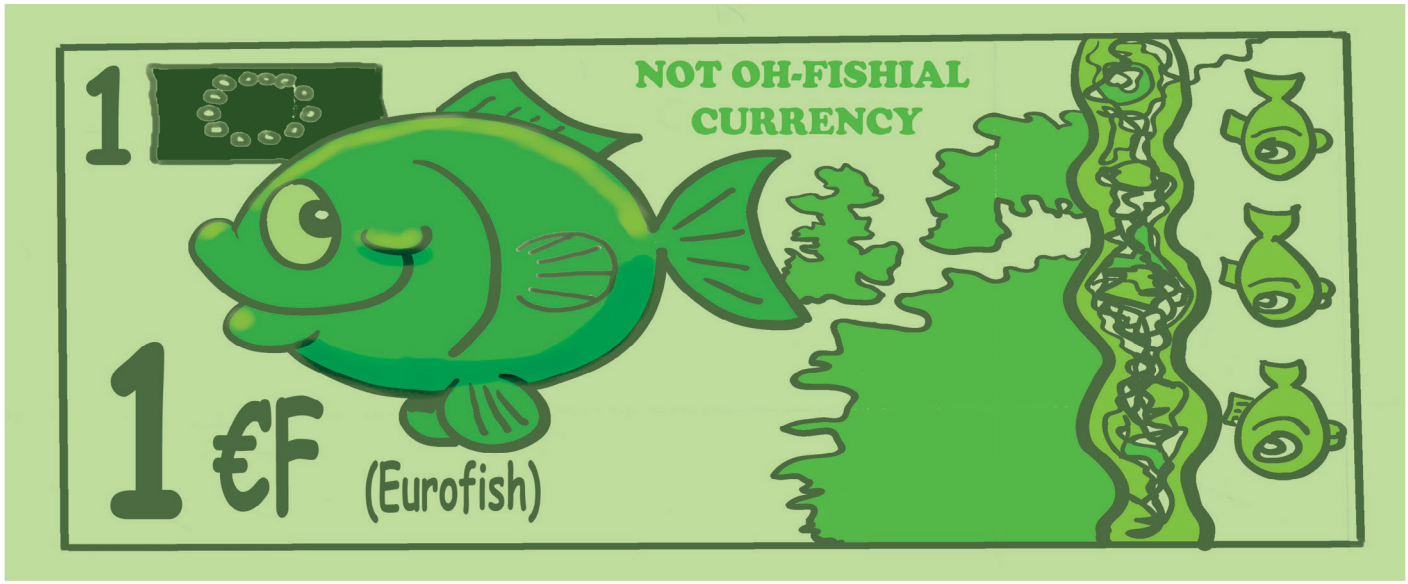
- The numbers of fish in the sea - which might get so small that there would be not enough grown up fish left to produce the baby fish needed to keep the families of fish going (*Ask: What would happen then?*)
- The bottom of the sea - when fishing nets drag along the seabed, churning up the sand and mud where fish lay their eggs or where delicate corals grow (*Ask: What happens then?*)
- The atmosphere - which will be polluted by the burning of fossil fuels like diesel to run the **fishermen**'s boats (*Ask: What happens then?*)
- 'Ghost Fishing' where lost or abandoned nets keep on killing fish that are never harvested (*Ask: What happens then?*)

ROLE-PLAY GUIDE #5 - THE ECOSYSTEM

- I am the **ecosystem**: the environment and all the living things, from humans, plants and animals to microscopic organisms, that live within it
- I want there to *always* be enough fish in the sea to produce enough. baby fish to keep the fish populations alive and all the players in the game (**Consumers, Fishmongers, Fishermen, Environmentalists** *and* the **Ecosystem**) happy
- Everyone playing the game *must* understand that the fish in the sea are part of a delicate and complex web of life. Each part of this web - the fish that are caught, the bigger fish that eat them and the smaller fish they feed on - are in balance, and this balance must not be upset (*Ask: What happens then?*)

ROLE-PLAY GUIDE #6 - FISHERIES SCIENTISTS

- Our job is to make sure that *everybody* gets enough fish while leaving sufficient adult fish in the sea to produce the baby fish needed for the future
- To do this, we work out the maximum sustainable yield (MSY) for each species of fish by finding out how many fish are caught each year by the **fishermen**, knowing how many eggs each fish will lay and how many of these eggs might survive to produce adult fish in the future
- This information is gained from our own scientific surveys at sea, from monitoring the fish caught by the **fishermen** and by sharing this information through ICES - the international council for the exploration of the sea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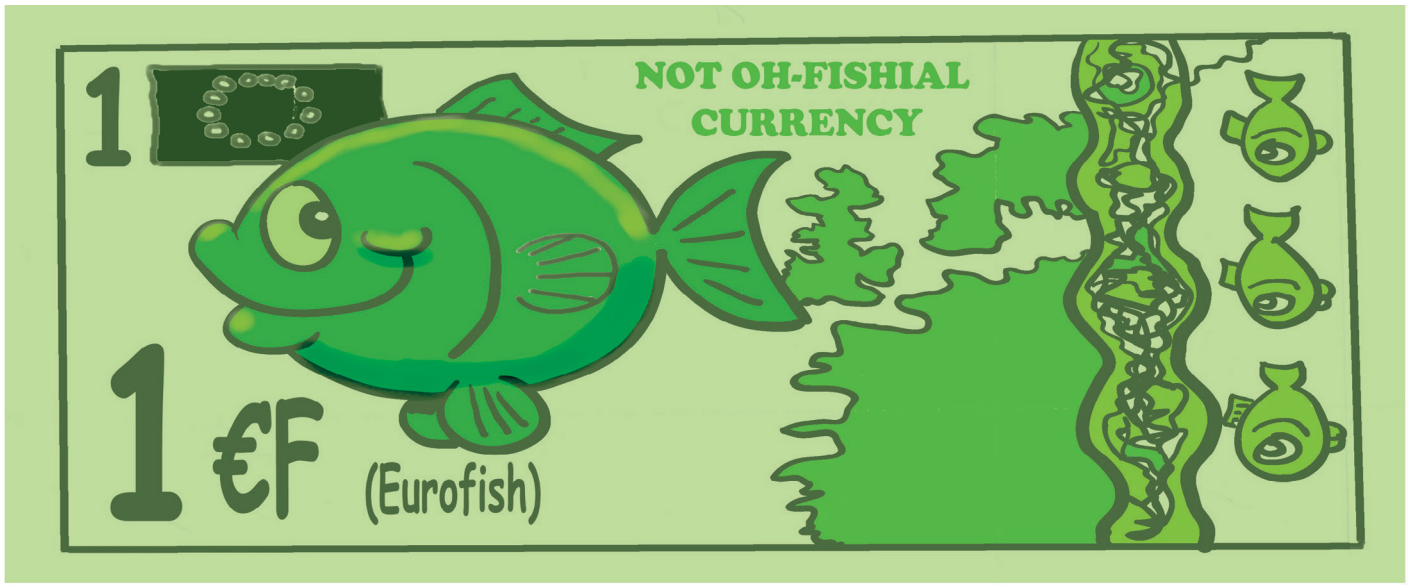
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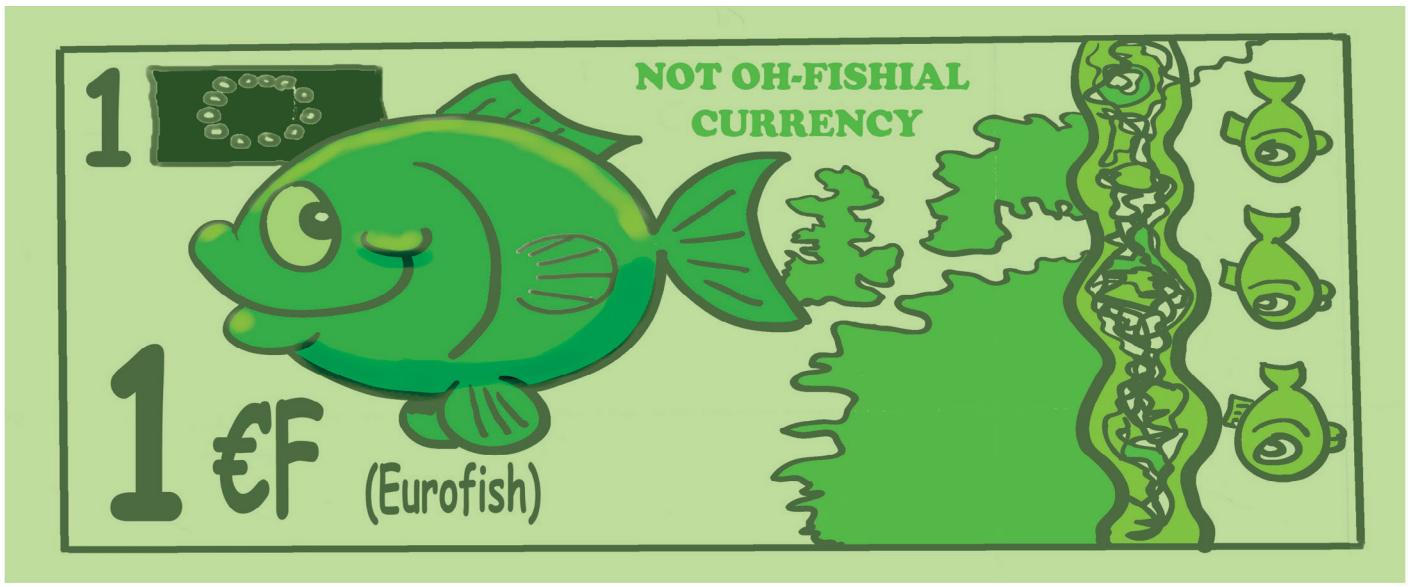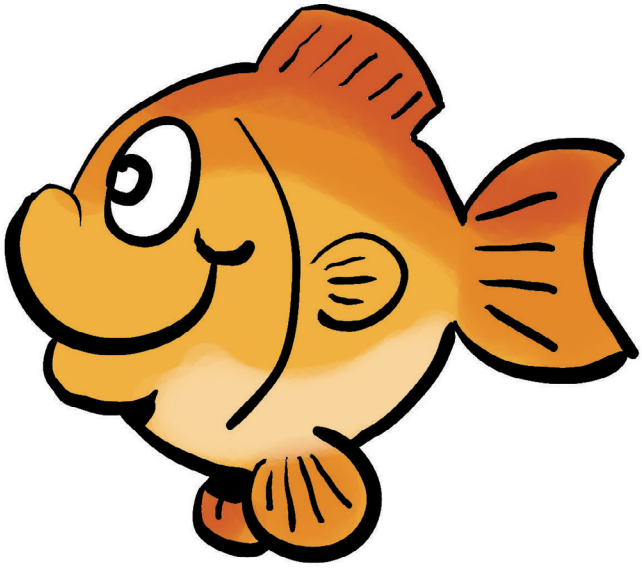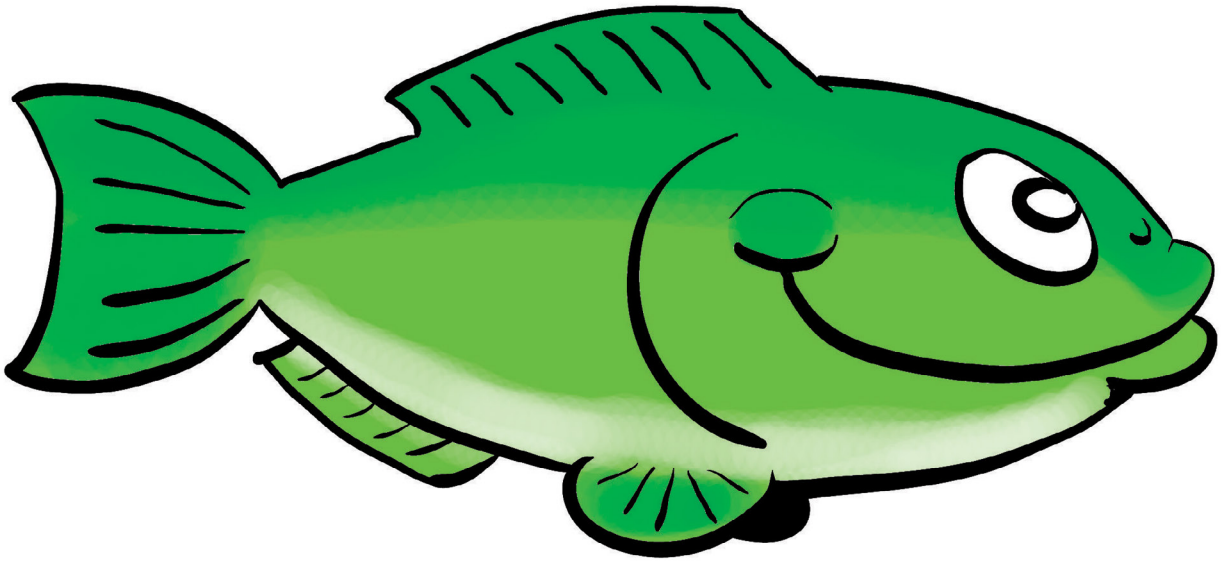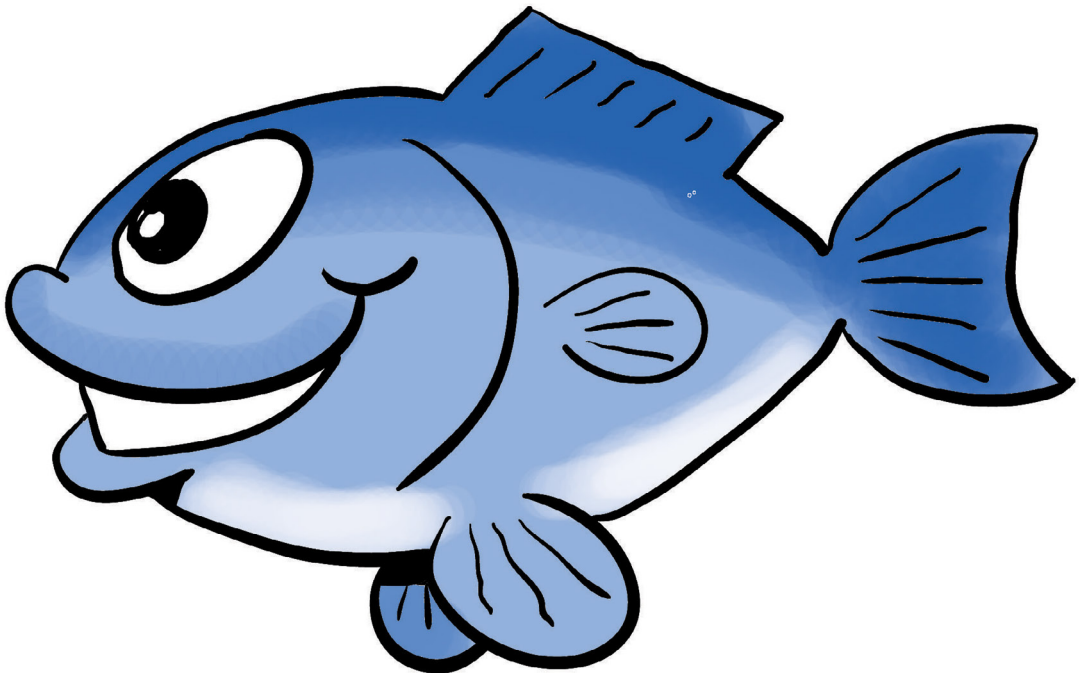
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