

Plastic Pirates – Go Europe! River sampling

Checklist for Group A - Waste on the river bank

The aim of Group A is to identify how much macro plastic can be found along European riverbanks per m².

Check that you have the **required materials**:

- 9 bags (30l bags) - to gather the litter if it will be counted later at the school
- Work gloves
- Tape measure
- A straight stick, approx. 50 cm long
- Piece of string with marked 1.5m section
- Pebbles or similar objects to mark out a circle
- Marker or pen
- White paper or cloth for photo background (A4-A3 size)
- Camera or smartphone to take photos



Method

Find a 50m stretch along the riverbank and make 3 parallel zones along the river. Zone A: 0-5 m, Zone B: 5-15 m, Zone C: 15-20 m. In each Zone three circles are needed for sampling, that makes 9 circles in total. If in doubt, **scan QR code to watch explainer video!** Determine sampling points in each of the three zones. Create circles with radius of 1.5 m with a stick and string, mark the borders of the circles. Ensure that the circles are not right next to each other.

Collect all litter in the circle. For found items in each circle use the white piece of paper or cloth as background, note down river name and sampling point number (for example, Zone 1, circle A = 1A). Make sure the litter items do not overlap and take a photo! Note what you found in the table. If you find nothing in any litter category, note down "0".

After you are done with all circles, hand the completed checklist pages to Group D - the reporters and send all photos to the person, who will upload the data to Plastic Pirates webpage.

Group A	Transect 1			Transect 2			Transect 3			Total
	A zone	B zone	C zone	A zone	B zone	C zone	A zone	B zone	C zone	
Paper										
Cigarette butts										
Plastics										
Metal										
Glass										
Food items										
Other litter										
Total										
Per m ²										

In order to calculate the total amount of litter per m², the total litter amount needs to be divided by the explored area. The formula to calculate the area is $A = \pi \cdot r^2$, thus $A \approx 7\text{m}^2$. Example: if 5 litter items found in circle 1A - 5 divided by 7 is **0,7**; 2A - 14 items, **2**; 3A - 12 items, **1,7**.

Average litter concentration calculation example Zone A: $(0.7+2+1.7)/3 = \mathbf{1,46 \text{ items per m}^2}$. Repeat calculations for each zone

Average litter concentration per m ²	Zone A	Zone B	Zone C

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Checklist for Group B - Variety of waste on the river bank

The aim of Group B is to identify the variety of plastic that can be found in a certain area along the riverbank. Collect all litter in an area 20 m x 50 m and categorize the litter items. Use a different area than Group A!

Check that you have the **required materials**:

- Trash bags
- Work gloves
- Tape measure
- Canvas, approx. 5x2m
- Marker
- Adhesive tape
- Scale (ideally a luggage scale) to weigh all litter
- Camera or smartphone to take photos

Method

Identify a 50 m long stretch along the riverbank and 20 m from the river (if the available area is smaller, note down the size in notes). All waste found in the area must be collected. If in doubt, **scan QR code to watch explainer video!**

After gathering all litter in the area, find a large enough surface for the canvas to create a litter sorting station. If it is too windy outside, you may bring the trash to the classroom and sort it there. On the canvas use the adhesive tape for labeling each litter category (see the Table). Sort litter by type. Take a photo of the whole canvas and take photos of each category separately – make sure the items can be counted from the photo and do not overlap!

Count items in each category. If you find nothing in any litter category, note down “0”. Weigh all single-use plastic items in a bag and then weigh the total amount of litter.



Group B Litter item categories

Length and width of coast searched

_____ m, _____ m

Share of single-use plastic in the total number of all waste items found:

_____ %

Weight of total plastic waste:

_____ kg

Weight of all waste including plastic:

_____ kg

Plastics	Amount
Plastic bags	
Plastic bottles for drinks	
Plastic lids of drink bottles	
Takeaway and fast-food packaging, including disposable coffee cups and their lids	
Plastic cutlery and plastic plates (also plastic coffee stirrers and plastic straws)	
Plastic packaging and plastic straws	
Cotton buds with plastic sticks („Q-tips“)	
Wet wipes, tampons and sanitary towels	
Polystyrene („styrofoam“)	
Total number of single-use plastic	
Small pieces of plastic less than 2,5 cm	
Other unidentifiable plastic objects	
Metal	
Metal beverage cans	
Bottle caps	
Aluminium foil	
Other unidentifiable metal objects	
Glass	
Glass bottles for drinks	
Glass pieces	
Other unidentifiable glass objects	
Other waste	
Cigarette butts	
Paper	
Textiles (clothing, shoes, textile remnants)	
Rubber (car tyres, rubber bands)	
Balloons	
Other unidentifiable waste	



Local waste (If you find waste not fitting into any category but specific to the sampling location or current events, note it here.)	
Total number (including single-use plastic)	

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Checklist for Group C - Waste on the river bank

The aim of Group C is to examine two different types of litter in water: **larger floating waste** and **microplastics in the water**. Check that you have the **required materials**:

- Microplastic sampling net
- Rope for the net (Thick, ~10m long)
- Tape measure
- 3 wooden sticks
- Stopwatch or smartphone



Method Microplastic sampling:

- Test the net in water - fill bottles with water so that the net is submerged halfway. Scan the QR code to watch the explainer video!
- Find a bridge or a platform so that the net can be placed where the water is flowing. The net has to stay in place securely for 1 hour. **Net opening has to face the opposite direction to the river's current** so that river water can flow through the opening.
- Once the net is securely placed, note down the start time of sampling. Set a timer to 60 min.
- Take a photo of the net floating in the river.
- After 60 min, retrieve the net and note down the time. Seal or fold the net so that it doesn't open.
- Return the net to researchers. (If researchers are not present during sampling - bring the net to school, dry it (without letting other things inside) and once dry, send it to Latvian Institute of Aquatic Ecology for analysis.

Start time ____:____ End time ____:____ Total time: ____ min

Measuring flow speed

In order to compare results with other rivers, we must know the river flow speed.

- Measure 20 m from the floating net along the riverbank. Drop a stick in water at the start point
- Wait until the stick reaches the end of the 20 m mark. Stop the timer and note down how long it took to complete the distance

<u>Measurement</u>	<u>Distance (meters)</u>	<u>Time (seconds)</u>	<u>Flow speed (distance divided by time - m/s)</u>
<u>First stick</u>			
<u>Second stick</u>			
<u>Third stick</u>			

Average flow speed: _____ m/s

Method Observing floating waste:

- Choose a point on the bridge close to your net
- Estimate the width of the river
- Note the start time of your observation
- Look for floating waste for 30min. As soon as you see an object, try to take a photo of it
- Make the other members of your group aware of it and, together, attempt to identify the object and to find out what material it is made out of. Waste that is stuck and not drifting is not counted

Start time ____ : ____ End time ____ : ____ Total time: ____ min

River width: _____ m

Did you see any floating waste? List them below:



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Checklist for Group D - Team of reporters

The aim of Group D is to gather information about the sampling location, take photos of the sampling process and interview other groups.

After the sampling, please gather all checklists with notes and make sure you get all photos from other groups.

Together with classmates and teachers discuss the reflection questions and summarize the main conclusions.

Required materials: camera or smartphone, pen and checklist paper.



Date: _____ River: _____ School name: _____.

Sampling point coordinates: Latitude _____ Longitude _____.

Weather conditions How has the weather been in the last 7 days?

- Was there a strong rain, flood? Yes/ No
- Storm or very strong wind? Yes/No
- Heat, dryness? Yes/No

Source of waste	Yes	Possibly	No	Evidence
Local residents				
Tourists				
Fly tippers				
Industry				
Agriculture				
Shipping				
Fishing				

Interview the other groups and find out if they encountered any challenges during the sampling:

Problems encountered during sampling	No problems	Some problems	Many problems	Describe the biggest challenges
Group A				
Group B				
Group C				

Did your group encounter any problems?

Reflections after sampling

Shortly after the sampling – the same day or later – please collect the joint answers to the following questions:

- How has the campaign changed your view of the issue of plastic waste?

- What did you find particularly surprising during the programme?

- What do you regard as the greatest challenge?

- Who would you like to talk about the project, and why?

- What have you learned about yourself throughout the project?

- How has your understanding of the term 'science' changed over the course of the project?

One person from the group needs to gather all checklist pages with results and photos. To upload the gathered data, visit Plastic Pirates webpage and fill out the information together with the teacher: www.plastic-pirates.eu/en/results/data-upload

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