Lesson plan (2) On site

This lesson plan combines Bioremediation learning content with a guided walk. Each site within the SymBioRem project has its own unique features, therefore this has been provided as a **template**. Site leaders can follow steps below to create a personalised lesson plan or use the pre-filled template as a guide. Both templates require site-leaders to add site-specific information.

How to use the template(s)

1. **Pick your way-points.** These are points of interest within your site. What's interesting?
    a. Where the project is taking place
    b. A place of historical interest
    c. A spot often used by the local community or specific groups
    d. Areas that are home to an interesting plant or animal
    e. Areas that are undergoing rapid environmental change
    f. Areas particularly damaged by pollution
    g. Areas that are being changed due to man-made actions
    h. Points where pollutants enter the site
    i. A place of particular natural beauty

    You can select multiple of each, e.g. suggest including multiple points related to pollution damage, as the benefit of being On Site is that learners can see this first hand.

    Suggested maximum number of waypoints: **15**

2. **Decide what learning content you want to focus on.** Use Lesson Plan (1) 3H Full model to identify what content would like to cover. You can pick out specific elements, or the walk can follow the same basic structure as the lesson plan.

    Note: you don't need to add learning content to every waypoint - break it up with fun facts and activities!

3. **Match your waypoints to your learning content.** Assess each waypoint to see what content it naturally links to. You can populate the empty template or work into the pre-filled template.

4. **Thread these into a logical order.** Create your walk by putting these waypoints into a logical order.

If possible, add these points to a map of the site, this can become a resource for local stakeholders who want to complete the walk in their own time.

Further suggestions:

- Base the walk around one animal or plant based on the site/ is endangered, and follow there story
- Make it personal to your experience of the site
- Bring visual prompts

Empty Template

Way point	Point of interest	Content	Direction
GUIDED WALK: LESSON PLAN			
			
1: ADD NAME	*Add type of waypoint: e.g. Areas particularly damaged by pollution*	*Add content topic: e.g. Polluting chemicals*	*Write yourself a prompt/direction. Try to keep it as relevant to the site and each waypoint as possible. Add any analogies or visual prompts you will to help explain technical content.*
2: ADD NAME			Add discussion points throughout, such as: • The history of the area • The way this area has changed/is changing
3: ADD NAME			
4: ADD NAME			
5: ADD NAME			
6: ADD NAME			Add questions throughout, such as: • What do they think of when they hear 'pollution'? • How do they use the site?/ what does it mean to them? • What would they like to see happen at the site?
7: ADD			

NAME			
8: ADD NAME			
9: ADD NAME			
10: ADD NAME			
11: ADD NAME			Add activities, such as: • Plant and wildlife bingo • A bird count of species observed along the way • Tree climbing • Pond Dipping • Water or soil sampling • History of the area - if you can build in a sense of how this landscape has changed over the years • Include legends or stories about the place
11: ADD NAME			
			
		Total	**ADD TIME**

Pre-filled Template

Way point	Point of interest	Content/ activity	Direction
GUIDED WALK: LESSON PLAN			

		Introduction & activity: hand out plant/animal bingo cards	• Allow late-comers at least 10 minutes to arrive
			• If the group is small enough, consider asking participants to introduce themselves
			• Introduce session, today we will:
			  • Learn about the history of the site, its features, pollution issues and their sources. Seeing first hand how this affects the ecology and habitats.
			  • Start discussions and the sharing of ideas, memories and knowledge of this site.
			  • Discover and take part in the SymBioRem Project improvement works happening in the area.

1: ADD NAME	A place of historical interest	n/a	Take a moment to explain how this landscape has changed over the years. Consider: • Is it a radically different type of landscape (I.e. was a built up area previously marshes?) • How has man-made actions changed it? • How have natural features changed it? Ask participants why they value the site / how they think it has changed over the years they have known it.
2: ADD NAME	A place of particular natural beauty	Invisible actors in our environment	Ask the group why this spot is beautiful, what does it mean to them? Discuss how invisible agents within our ecosystem ensure its working correctly, stays looking great and is safe to inhabit. (add examples relevant to this site) This place is beautiful, but it's suffering because of pollution. What does this tell us? ***The effects of pollution are hard to identify.***
3: ADD NAME	Areas that are being changed due to man-made actions	Polluting activities/ Polluting chemicals	Discuss what activities are polluting the site. Ask attendees how they feelabout this. Keep this conversation open. Remember: some causes, such as transport links, are important for the local community. *E.g. in Gallions Lake there is a bus station near the lake causing road runoff.* Discuss specific pollutants these are bringing to the site.

4: ADD NAME	Areas particularly damaged by pollution	Polluting chemicals	Explain what issues are facing this site and how this has affected the ecosystem/landscape/wildlife at this way-point. *E.g. Since Gallions Lake is relatively small, it can be impacted by unchecked algal growth. This can lead to Eutrophication which lowers dissolved oxygen in the water. This has led to mass fish kills in the past*
5: ADD NAME	Areas particularly damaged by pollution	Polluting chemicals Identifying pollution in water & soil.	Explain what issues are facing this site and how this has affected the ecosystem/landscape/wildlife at this way-point. [YOU MAY WANT TO ADD MORE OF THESE POINTS]
6: ADD NAME	Areas particularly damaged by pollution	Activity & break	Hand out the 'Identifying pollution' worksheets. Ask attendees to find examples of these that haven't already been mentioned. Give them a while, so they can have a brain break & explore the site. When they return, discuss what they have found.
7: ADD NAME	Points where pollution enter the site	How pollutants reach water bodies/soil	Discuss one or more points in which pollution is entering the site. Link this directly to the effects you have seen. *E.g. point out surface water drains, water mains, and sewer pipes. Comment on how easily one misconnected waste water drain from one of these properties would mean that untreated sewage would enter your site*
8: ADD NAME	Points where pollution enter the site	How pollutants reach water bodies/soil	Discuss one or more points in which pollution is entering the site. *E.g. Point out the steep sloping banks. Discuss the effect of rainfall. I.e. water flows downhill into the canal/lake system and carries pollutants and silt with it. The area here is not paved, what will the water be carrying with it into the lake?*
9: ADD NAME	Areas that are home to an interesting plant or animal	What is bioremediation? What are natural organisms?	Spend some time discussing an interesting plant or animal. Introduce bioremediation as a way to protect this plant/animal. Use visual prompts/ microbiome/gut analogy if that's helpful: *Think of the microbiome in your gut. We drink healthy drinks and eat specific food to increase the production of healthy microbiomes in our stomach. These healthy bacteria's help us digest food properly and keep harmful bacteria at bay. Getting rid of the bad stuff and encouraging the natural processes to continue as they should. In the same way, organisms used for bioremediation break down contaminants in soil and groundwater.*

			Explain that natural organsms are chosen because they are nature's cleaners.
10: ADD NAME	Where the project is taking place	Bioremediation in your area	Arrive at the SymBioRem activity area. Discuss ● how it was set up (was there community participation?) ● Explain it's features ● What natural organisms or systems it harnesses ● How this will help remediate the effects of pollution that have been discussed today
11: ADD NAME	Where the project is taking place	Bioremediation process cycle	Allow participants to complete a bioremediation task such as water/ soil sampling. Contextualise this within the Bioremediation process cycle.
	A spot often used by a community group.	Benefits and challenges	Check back in with the bingo. Who has found the most? Finish by looking to the future of the site, what are the overall aims, are there more activities they can get involved with. Before the group leaves, Get a group photo and tag SymBioRem online.
		Total	ADD TIME

Add your site map here.

E.g. Gallions lake.