Leading Tours at PIBS

A guide for staff and volunteers on how to lead an impactful and informative tour of PIBS

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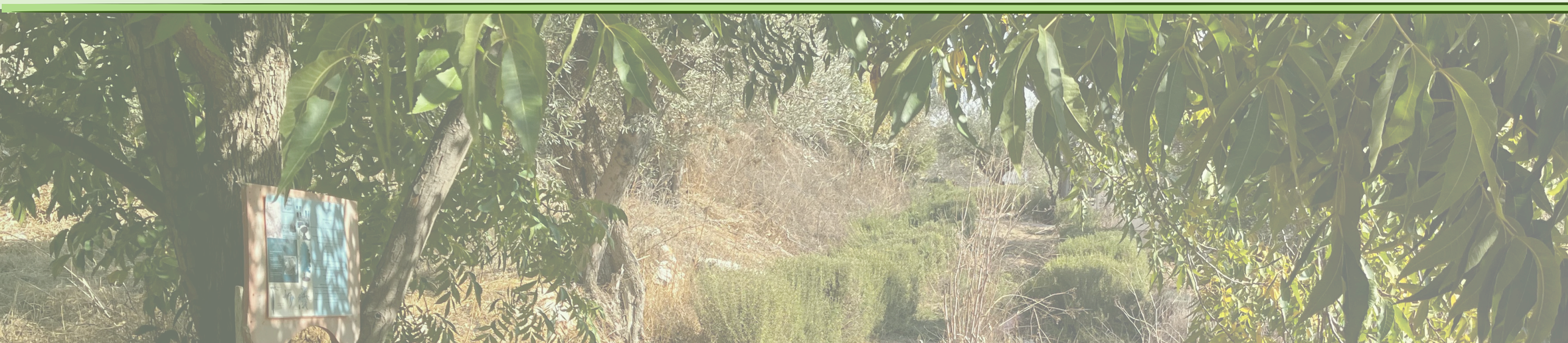


Key Objectives of Leading Tours

Draw upon the following objectives to inform your interactions with visitors and the tours you lead of the institute:

Imbue the PIBS values of respect for ourselves, for each other and for the environment.

Familiarise visitors with the reality of settler colonialism in Palestine and how our institute seeks to address the human and environmental injustices it produces.

Encourage visitors to be curious, observant, and involved in their tour of the institute — exploring the garden and exhibit areas, taking pictures, asking questions.

Inspire visitors to get engaged in Palestinian solidarity and by proxy, human and environmental justice in general.

Create an engaging and impactful learning experience for visitors about the fauna, flora and human ethnography of Palestine.

Encourage visitors to support the museum and wider community through donations and purchasing handicrafts made by women living in rural Palestine.

Key Considerations Before Leading a Tour

Time frame

Clarify how much time the visitors have at the museum. This is to determine the amount of time you will allocate to the tour of the botanical garden, natural history museum and ethnography exhibit *while* leaving sufficient time for the lecture (if taking place).

Language

Clarify the language of the visitors and the geographic region (s) they come from. If volunteers come from the same region as the visitors, it is preferable for them to lead the tour. Ask about the pace and clarity with which you are speaking to ensure visitors can follow.

Age-group

Be mindful of the age group of visitors. You may need to adjust the route you take and how much time you allocate to each area of the institute depending on this factor.

Unlocking rooms

Make sure you have unlocked the biodiversity exhibit, ethnography museum and lecture room before starting the tour. The keys can be found in the key box in the director's office.

Lecture room

Check that water and drinking glasses have been prepared for visitors outside the lecture room. Ensure the iPad is charged and in the lecture room for visitors to enter in their details. The iPad can be found in the director's office. Check that there is sufficient toilet paper in bathroom.

Taking photos

Make sure there is a charged camera (ask Amal or Sara) to take photos of the tour. If possible, have a member of staff or volunteer take photos as you are leading the tour. If a museum camera is not available, please use a personal phone camera temporarily and download the photos to the Museum computer.

Key Questions about the Structure of Tours

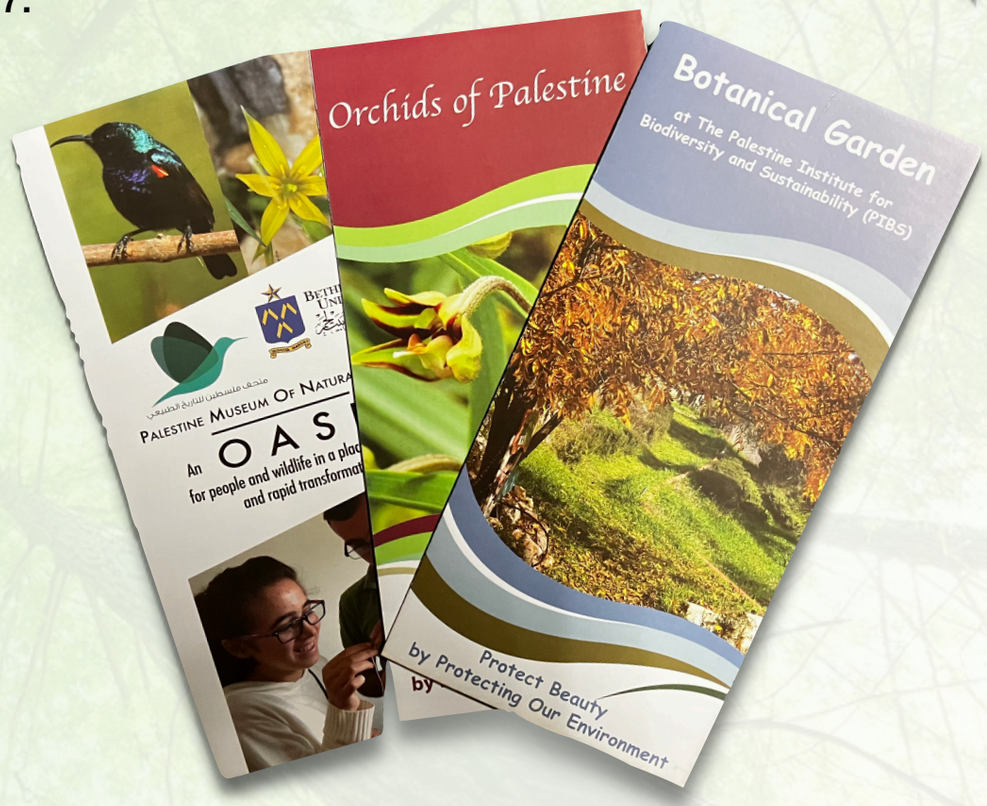
How long is the tour and how much time should I allocate to each area?

There is no set time for how long a tour should last. This largely depends on the visitors' schedule and the type of visitor group. Different visitor groups may include organised tour groups, school children and random visits from local families or tourists. Once you have confirmed how much time visitors have at the museum, allocate half of this period to touring the botanical garden, ethnography exhibit and museum of natural history and the other half to the lecture (if taking place). The ideal length of a tour should be 2 to 2.5 hours if a lecture is included. The minimum length of a tour should be 45 minutes to 1 hour without a lecture.

What should I cover in the tour?

This will be explained in more detail in the points to cover for each area. See pages 6-17.

- General overview of the flora and fauna at the museum grounds
- Beehives
- Ex situ conservation area (including orchids and iris)
- Water collection ponds and ponds that serve as educational display for kids
- Animal rehabilitation unit
- Greenhouse (including aquaponics and hydroponics)
- Nursery
- Compost area (including compost toilet)
- Community gardens
- Amphitheatre
- Aviary
- Vertical garden (aka green wall)
- Sensory path
- Playground
- Biogas digester (including the container kitchen and tool shed)
- Ethnography exhibit (including ethnography garden)
- Museum of Natural History



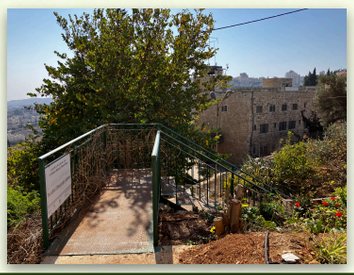
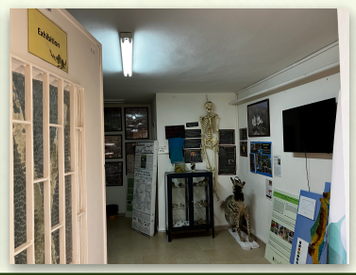
Check out above brochures for more information

The following areas and facilities can also be pointed out to visitors, check with directors or other members of staff as to their location: wild plants area, rare plants area, bird hide, Hugelkultur area, planned food forest area, tortoise breeding area, vermicomposr/worm compost, mealworm colony, solar electricity panels.

What route should I take?

A ***suggested*** route is outlined below. Of course, this route can be altered in consideration of the visitors you are touring:

1. Start outside of the museum building entrance to welcome visitors. Take the Jelena pathway to begin the tour of the botanical garden, starting underneath the pine.	
2. From the pine, take the pathway alongside the fruit orchard and move down to the ex situ conservation area.	
3. From the ex situ conservation area, walk down towards the ponds.	
4. From the ponds, take the path leading to the green house, passing the tire pathway and the animal rehabilitation area below.	
5. From the green house, pass the nursery and head towards the compost area.	
6. From the compost area, head towards the aviary, passing the community gardens.	

7. From the aviary, walk back towards the stairs that run alongside the animal room, passing the amphitheatre, vertical garden and sensory pathway.	
8. Pass the entrance leading to the playground and walk in the direction of the guard tower towards the biogas digester.	
9. From the biogas digester, move up to the ethnography exhibit.	
10. From the ethnography exhibit, walk back down to the Museum of Natural History. From the museum, head down to the lecture room to end the tour.	 

Suggested Dialogue for Tour

Below is a suggested dialogue for each key area you will cover in the tour. This is based off a tour led by Mazin. Each area is divided into sections with corresponding photos for guidance on where to pause and gather visitors. The dialogue is interspersed with questions to engage visitors. This is a comprehensive dialogue that you are **not** expected to memorise word by word, but rather to draw upon to help you lead an informative tour.

What: Welcoming the visitors
Where: Outside Museum entrance

Welcome to the Palestine Institute of Biodiversity and Sustainability. My name is _____ and I will be leading you on a tour of our facilities today. I am working here as a _____.

We will begin with a tour of the facilities followed by a discussion about the issues of human and environmental justice in Palestine. The tour will include three areas of this facility:

1. The botanical garden (which will be in peak season in the spring months between February and March).
2. The ethnography exhibit (opened in 2019) displaying the cultural heritage of Palestine.
3. The Palestine Museum of Natural History.

For this tour, let's try to stay together as much as possible and feel free to interrupt me at any point to ask questions.

History of the facility and institute: The Palestine Institute of Biodiversity and Sustainability was set up at Bethlehem University in 2014 and was officially opened to the public in 2017. We established it with the vision to preserve, research and educate about the natural history and cultural heritage of Palestine. In doing so, we aim to promote responsible interactions between humans and the environment. We are a team of staff and volunteers who work hard to serve this cause and share our learnings with the public and visitors like you.

The area of the facility is roughly 12 dunums (3 acres). When we began working on it in 2014, it mostly served as a trash site for the university rubbish. In the 1980s, this building (referring to Palestine museum of natural history) was a dormitory for female students. However, the restraints imposed by occupation resulted in most universities in the West Bank becoming community colleges. In the context of Bethlehem University, this meant they no longer got female students from other communities due to restrictions on movement. This removed the need for a girls' dormitory, which enabled us the use of this building. The other building (referring to sisters' covenant) is a residence for nuns and our volunteers. We are in the process of renovating it to become the new Palestine Museum of Natural History. Yalla, let's begin with the garden tour. Please watch where you are walking and stick to the paths.

What: History of pines in Palestine
Where: Gather under large pine at end of Jelena pathway

Note: Mazin will likely cover the history and symbolism of pine trees in Palestine in his lecture.

Has anyone noticed these pines during your travel in Palestine?
Has this raise any thoughts or questions for you?

The Aleppo pine you see here, along with a variety of European pine species, were planted en masse in Palestine with the creation of the state of Israel. Pine trees in Palestine represent the Zionist project to erase Palestinian existence and 'green' the falsely proclaimed 'barren lands' of Palestine. Why pine trees?

1. Pine trees worked to 'Europeanise' the landscape of Palestine, creating a sense of environmental familiarity for Jewish settlers from Europe.
2. Pine trees are fast growing. Fast growing trees made an effective means to cover up the remains of Palestinian villages that had been destroyed and ethnically cleansed during the Nakba.

Other than their political history, are pine trees really so bad for the environment?

In many ways, yes. Pine trees inhibit biodiversity and are not well-suited to the environment in Palestine. Pine needles are acidic and as they fall to the soil, this prevents the growth of lower canopy plants. They are also highly flammable due to the pine resin, leading to an increased forest fire risk during warm seasons in Palestine.

What: Background on botanical garden
Where: Move through botanical garden to explain its key functions.

Today, you see around us a great display of the diverse flora and fauna of Palestine, established gardens, walking paths, and a range of agricultural facilities. But when we first started here we did not do any interventions for two seasons.

Can anyone take a guess as to why?

Because we wanted to observe the flora and fauna first. We took note of where the plants were growing, then studied and classified them. We recorded nearly 400 species, 387 to be precise, of wild plants in this area. 60 of these are rare or endangered, including some orchid species and crocuses. In spring, this hill will be a carpet of colours. By waiting two seasons to evaluate the flora and fauna, we could also ensure that our pathways were not trespassing on endangered plants. We planted the rosemary passages you see around us as natural barriers and to produce nice flowers for our bees to pollinate. As you can see above (point to beehives), we raise bees and harvest lots of honey.

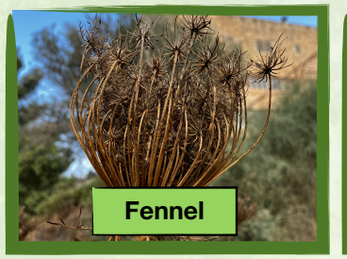
The garden is an ongoing process, it is not finished. It depends a lot on volunteer efforts and

incremental improvements in areas in which we can intervene (areas that have **not** been cornered off to protect wild plants). There are three key functions of the garden:

1. In situ conservation: This means the conservation of plant and animal species within their natural habitat. We try to achieve this by understanding the natural ecosystems of local plant and animal species of significance. This informs our approach to how we sustain and nourish ecosystem health. Through this work, we also want to show farmers that it is possible to both conserve nature and produce things. In fact, these two things are complimentary which brings us to the second function.

2. Production of plants: In areas we can intervene (areas that have not been cornered off to protect wild plants) we take care of a range of plant species — many of which are of cultural significance to Palestine. To name a few, we planted:

- **Za'ater** (thyme), a traditional Palestinian spice
- **Maramia (sage)**, a herb that you will often have in tea and that is also used as remedy here in Palestine to a range of ailments
- **Fennel**, used in cooking and tea
- **Sumac tree**, from which we source the sumac spice used in various Palestinian dishes
- **Palestine pistachio tree**, used in cooking and deserts, and of course;
- **Olive trees**



We planted native Palestinian trees alongside olive trees which helped to prevent erosion by stabilising the soil. As trees feed each other, they also enrich the soil. As a result, we discovered that the olive trees produce a greater yield when there are other trees around them. This is an example of one of the benefits to nourishing biodiversity that we want to share.

3. Ex situ conservation: This means the conservation of rare plant and animal species outside of their natural habitat in order to have a 'backup stock' in the event they go extinct or are nearing extinction in the wild. Here at the museum, we wrote a paper on rare plants in Palestine where we showed that 600 plant species are rare or endangered. We brought some of these plant species to the botanical garden to encourage growth. We currently have a variety of rare orchid species in the ex situ conservation areas.

What: Ponds
Where: Gather under shelter that looks over water collection pond

Another key intervention we did after two years of observation was building the rainwater collection system (point to pond below). This is a natural ecosystem of water that we not only harvest from, but also use to prevent soil erosion. Over the last few years, we measured the increase in the organic content of the soil. The water is home to a range of species including fish, frogs and dragon flies. It is also an attractive space for birds and other animals. In fact, we have recorded at least 51 bird species, including migrating birds, that come here to drink and enjoy the space. This makes for an interesting ecosystem for the children who come here to study and observe. The water is recirculated through a pump to get oxygenated. The pump is operated by solar panels which you see on top of the building — we try to be as energy independent as possible. The use of solar energy is increasing in Palestine as more Palestinians are becoming aware of Israeli control over energy sources.

Note: From this point, Har Homa (Israeli settlement) can be seen atop of the hill.

What: Tire stair case and animal rehabilitation unit
Where: Point out the below as you walk towards greenhouse

Animal rehabilitation unit: In our animal rehabilitation unit, we care for sick and injured animals. This year (2022) we rehabilitated an injured kestrel and hyena. With this work, we also aim to raise awareness about the importance of wild animals in natural ecosystems and to work against misinformed stigmas linked to certain species. For instance, there is a common misconception that hyenas attack humans, when they actually scavenge on dead and decaying animals. This can result in the needless harming and killing of hyenas.

Tire staircase: Our tire staircase was built by volunteers and demonstrates the creative reuse of waste materials in the institute. By the way, if any of you have creative ideas regarding the reuse of plastic bottles, we welcome them!

What: Aquaponics, Hydroponics, wicking bed
Where: Gather in Greenhouse

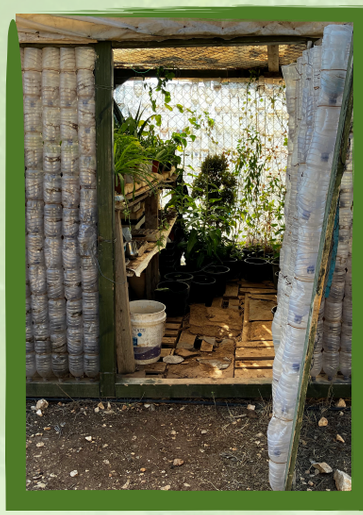
Introduce the need for innovative modes of growing food within the context of occupation and Israeli control of water supplies: Israel has taken the majority of our water in Palestine. It has imposed a system of unequal distribution that thwarts Palestinian access to and use of water resources, which are largely diverted to Israeli settlements. 93% of water here in the West Bank was stolen by Israel, and water consumption statistics tell the same story. In the occupied territories, Israelis consume on average 300 litres of water per day per person while Palestinians consume only 73 litres. This will be spoken about in more detail in the lecture. We now have to think of interim solutions that can function within the limits of the man-made water shortage that occupation has created. With regards to agriculture, aquaponic and hydroponic systems are promising options.

Aquaponics: In an aquaponics system, the ammonia-rich waste produced by the fish is sent from the fish tank to the water bed, where it is converted into nitrogen that is taken up by the plants. The lava rocks harbour bacteria that aid in this process. There are even earthworms living within the bed which help to break down nutrients that feed the plants. In return, the plants help to clean and filter the water for the fish. This is a closed system which works to minimise evaporation. Each of these systems cost around 900 USD, but they pay for themselves within a couple of years. The system also requires minimal maintenance other than feeding the fish, tending to the plants and occasionally cleaning the water beds and fish ponds. We actually brought some engineers and farmers from Gaza and trained them on how to build and maintain an aquaponics system.

Hydroponics: In this hydroponics system, water enriched with nutrients is circulated through the pipes to irrigate the plants. This removes the need for soil and hastens the growth of the plants as opposed to growing them in soil. Similarly to the aquaponics, this is a closed system that reduces water loss due to evaporation. It is also an effective means of crop production in smaller spaces. In our hydroponics system, we mostly grow leafy plants, such as herbs and lettuce.

Wicking bed: In the wicking bed system we have here, we only need to feed water into a pipe once or twice a week which flows into a container at the bottom of the garden bed. The roots of the plants draw or ‘wick’ up the water as needed through a layer of rocks and soil - essentially watering themselves! This also minimises water loss due to evaporation and avoids the disturbance of topsoil when irrigating plants. Unlike the aquaponic and hydroponic systems, the wicking bed does not rely on electricity to pump water for irrigation. This makes it a feasible solution for plant production in areas that lack consistent access to electricity and water.

What: Nursery and Compost area
Where: Point out the below on your way to aviary

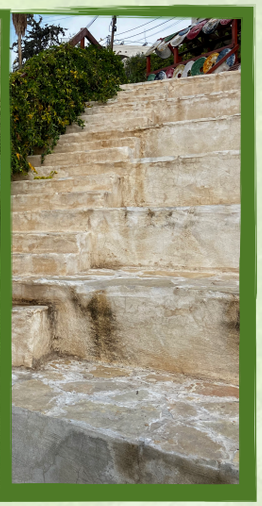


Nursery: Our nursery is made of recycled plastic bottles and was built by volunteers and staff. The plastic bottles actually aid in the insulation of the building. This is where we raise, nurture and propagate a variety of plant species.

Compost area: To the left is the compost area where we put the majority of our food and plant scraps. When we clean the chicken coop, we also use the chicken waste as an accelerator for the compost. It is estimated that 50% of the annual municipal waste produced in Palestine is organic! With our compost system, we want to show the value in reusing organic waste and the viability of composting for local communities. When our compost is 'cooked', it will be used to enrich the soil for plant growth. In this way, we divert organic waste from rotting in landfills — where it releases methane gas — and return it to its natural cycle to be broken down and fortify the earth.

Compost toilet: To the left of the compost you will see our compost toilet. When the toilet is in function, human waste will be mixed with sawdust and used as a fertiliser for trees.

What: Community gardens, aviary, amphitheater
Where: Gather under the shelter to explain the below



Community garden: The community gardens are dedicated to local families as a space for them to reconnect with their land and grow their own produce. This works against one of the key objectives of colonialism which is to disconnect the people that come with the land, from their land. Providing people with the freedom to interact with their natural environment and choose what they grow and eat is a powerful means of resistance.

Aviary: Our aviary is home to chickens, roosters, doves, a peahen and a rabbit. Notice that they also have their own olive tree! We harvest eggs and feed the animals our food scraps. There was even a point when our peahen was laying eggs (that we would eat!).

Amphitheatre: Our Amphitheatre was built in 2020 and it's construction was sponsored by multiple donors (Playground for Palestine, Rotary Foundation, Western Lieutenancy of the Equestrian Order (USA), the Jerusalem Fund, and the Association France Palestine Solidarity). It is a great space for outdoor gatherings.

What: Vertical garden, sensory pathway, playground
Where: Point out the below as you head towards driveway (take the stairs alongside animal room)

Vertical Garden: This is our vertical garden built from plastic bottles that feed into each other. We water the plants across the openings of the upper bottles, the water then filters down the vertical garden through holes that have been punctured into the neck of the bottles. Here, we grow flowers, herbs and leafy greens.

Sensory Pathway: Our sensory pathway was an addition from past volunteers. Those brave enough to walk it are blindfolded and must remove their shoes to feel the varying textures of the path.

Playground: This playground for children was sponsored by the Rotary Foundation of Bethlehem. This is a space for children to come and play. The playground is largely built from recycled materials. We have revolving plastic tubs with plant and bird species of Palestine, a seesaw made from recycled wood and tires, and lining the playground you will notice the round mats with a hole in the middle:

Does anyone know what these are for?

They were actually used in traditional olive pressing. Before the arrival of modern presses, olives were put between these mats and crushed with large stones. The oil seeps through the mats leaving behind the olive pulp.

What: Biogas digester
Where: Gather in front of container kitchen and tool shed

Biogas digester: Here at the museum, we are always experimenting with new projects that help us to minimise our environmental impact. Our biogas digester is one of these projects. It was built by volunteers in just one day! They converted two used IBC tanks into a biogas system that works by anaerobic digestion, similar to a cow's stomach. As a cow digests her food, it travels through the chambers of her stomach where it is fermented by special bacteria. In our biogas digester, we feed organic waste into this container which is oxygen free — anaerobic means without oxygen. Like the special bacteria breaking down food in a cow's stomach, the anaerobic bacteria breaks down the waste to produce biogas (methane). The gas is stored in the left container which we use to power our gas stove in the container kitchen.

What: Ethnography exhibit

Introducing ethnography exhibit: Palestine is part of the Fertile Crescent, often considered as “the cradle of civilisation”, where some of the first records of settled agricultural systems and human domestication of plants were documented. The Shuqba cave, excavated in 1928 in Wadi Natuf (southwest of West Bank, in Ramallah and Al-Bireh governorate) showed evidence of a late Stone Age culture that represented a key shift from hunter-gatherer society in Southwest Asia to settled agricultural systems based on the domestication of specific plant and animal species. This coined the now internationally recognised term “Natufian culture”. With this exhibit, we want to display the historical and cultural heritage of Palestine that continues to be undermined by colonial narratives.

We do have tools on display from Homo Erectus (see image 1) but most of the exhibit is made up of agricultural tools that our grandparents used. The majority of the tools are a few hundred years old at best.

1

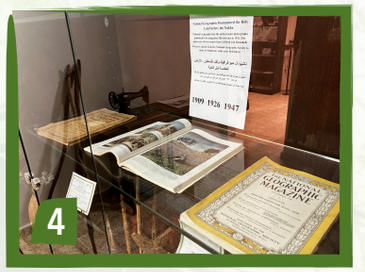
The pictures we have on display are also an important element of this exhibit as they show the actual use of these tools. For example, the woman here (see image 2) is using this tool to grind wheat in order to produce bread. We also have Canaanite pottery and beehives (see image 3). The Canaanite civilisation is a multi-ethnic group of Levantine cultures that predate occupation by Babylon, Persia, Greece and Rome.

2

Side room: In the side room here, there are a range of traditional instruments and clothing, including bridal wear used at weddings. There are also three copies of national geographic magazines (see image 4) from 1909, 1926 and 1947 — all predating the creation of the state of Israel. At this time the country was still called Palestine. Again, these displays reinforce that there was a land with a people before the arrival of Jewish immigrants. And a flourishing land too. For example, the first national geographic printed in colour in 1926 includes images that show the beauty of Palestine in the spring. Take a look. Here (see image 5), goat and sheep skins were used for both carrying water and milk for cheese production.

3

The idea of this exhibit is to conserve cultural heritage, both tangible and intangible. Intangible cultural heritage includes things like proverbs. We actually have a website funded by the British council - https://turathna.palestinenature.org/element/weather/ - where we collected proverbs that relate to natural and agricultural use. The website is in Arabic. These proverbs speak to the intimate relationship Palestinians shared with their land and how it shaped the lives they led.



4

5

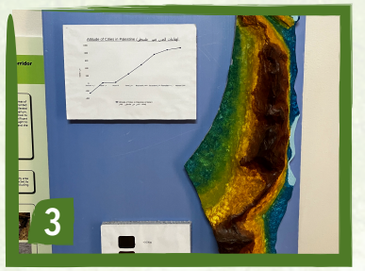
What: Museum of Natural History

Introducing the museum: Our natural history museum exhibits the geology, palaeontology and the rich biodiversity in the flora and fauna of Palestine. With the help of volunteers and architects, we have put together a vision for the new natural history museum (to be located at the sisters convent) which will include interactive and digitised exhibits.
You will notice that most of our fossils are those of sea creatures, like fish, snails, and sea stars. That's because Palestine was under the sea for millions of years.

We also have a range of vertebrate and invertebrate species on display, including butterflies, beetles (which have been carefully pinned by our staff) and larger mammals like birds, a fox and hyena. Our central exhibit of birds was actually collected by the Rodenko family from Jaffa between the 1920s and 30s in Palestine, before they became refugees following the Nakba. The family were able to take the bird species with them and keep them in Ramallah. They donated the birds to the museum a couple of years ago.

1

2


3

Biodiversity in Palestine: Just about everything you see in this museum is from Palestine. As you move past the various displays, you will notice the incredible biodiversity that can be found in this country. The reason for the richness of biodiversity is because Palestine is located at an intersection of continents and is shaped by diverse geographies. On the map of Palestine (see image 3), you can see mountain chains running through the country, creating deep valleys to the east. Here, the Jordan valley makes up approximately 30% of the surface area of the West Bank. Mountainous areas mark the landscapes of Nablus, Al-Quds (Jerusalem), and Al-Khalil (Hebron). As we move west towards the coastal plains and Mediterranean, the topography is defined by gradually sloping hills. And of course, the Great Rift Valley produced the lowest point on earth — the Dead Sea. This variety in topography and geography results in very biologically rich and fertile habitats.

Who here likes birdwatching? Have you ever considered birdwatching in Palestine?

What some of you may or may not be aware of, is that Palestine is actually located on the second most important air corridor for migratory soaring birds in the world. An estimated 500 million birds migrate through the skies of Palestine annually. This can also be attributed to the geographic make-up of Palestine. Bird species take advantage of the varying air flows created by the differences in latitude in regions such as the Naqab (Negev desert) and Jordan Valley by catching a ride on the thermals (warm air rising from earth's surface) and wind currents. This allows them to travel for long distances without expending lots of energy.

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