

REFUEL

Turn at trail junction 16 onto Alambique Trail. You will soon find a bench where you can take a break and refuel. You have been hiking for quite a while, sweating and burning up calories. It's time to refuel with a little water and a snack. The plants around you also use energy while creating new leaves, growing roots, and producing fruits. How do they refuel?



Look at the **madrone tree** growing behind the bench. It will twist and turn in its quest for sunlight. Trees use their leaves to trap light energy from the sun for *photosynthesis*, a process which allows them to make sugar. The sugar is transported to the roots and other parts of the tree. That is how a tree refuels.

The **sapsucker** woodpecker is a bird that knows how to refuel by snacking on tree sap. It drills horizontal rows of holes in a tree causing phloem sap to accumulate. The inside of a tree has tubes that transfer water (xylem) and tubes that transfer sugars (phloem). Phloem sap provides nutrients for the tree and is also made available by the woodpecker for other animals as a food source.



Also growing behind the bench is the **black oak tree**. Its leaves can grow up to 10 inches long and have 5-7 lobes with bristle tips on the ends. During winter it is bare but the rest of the year, it is full of leaves and acorns. The acorns are low in tannins making them a favorite food of deer, squirrels and jays. Similarly, Native Americans preferred these to other acorns.



BREATHE

Breathe deeply. When you exercise, your muscles need more oxygen and your brain responds by stimulating you to breath deeper and more rapidly. Your breathing may increase from about 15 times up to 40–60 times a minute; you may feel out of breath but you are conditioning your lungs and keeping them healthy. Now find a tree you can touch. Think about this, what the tree breathes out, you breathe in. Plants and trees breathe out oxygen and breathe in carbon dioxide.



Some aquatic animals, like the **rainbow trout**, can breathe underwater. They take in water through their mouth and then push it through their gills. The feathery gills enable them to take oxygen out of the water.

Salamanders like the **California Newt** breathe through their lungs while living on the land. They also spend time in water where they may stay submerged up to twenty minutes by breathing through their skin.



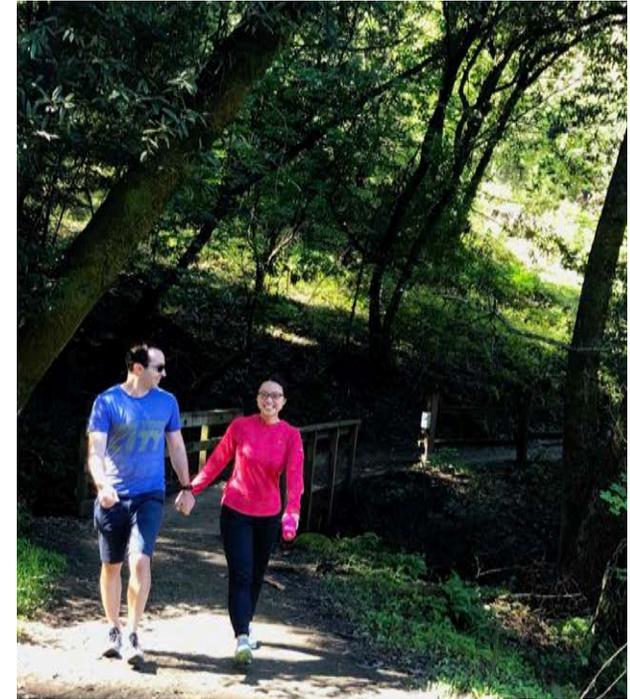
Plants breathe through tiny pores under their leaves called **stomas**. They are so tiny you can only see them through a microscope. The stomas open and close as the plants expel oxygen and take in carbon dioxide. Plants that lose their leaves in the fall breathe through their trunks and roots.

How can a tree breathe through its roots? On their roots are tiny hairs that breathe in carbon dioxide from the spaces between the soil particles. They release oxygen the same way.



WUNDERLICH WORKOUT

A 4.5 mile aerobic workout through redwoods, meadows, riparian and mixed evergreen habitats



**Bear Gulch to Meadows to Alambique Trail
4.5 Miles**

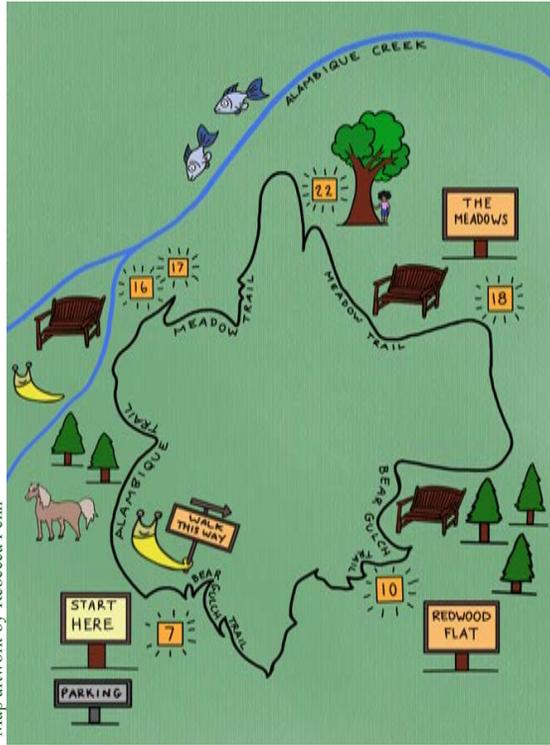


- * STAY HYDRATED and bring water
- * PREPARE for hot and sunny conditions
- * BREATHE in the fresh air
- * BRING A SNACK to refuel

BE CURIOUS AND CONNECT WITH NATURE

Wunderlich Park
San Mateo County

TRAIL ROUTE



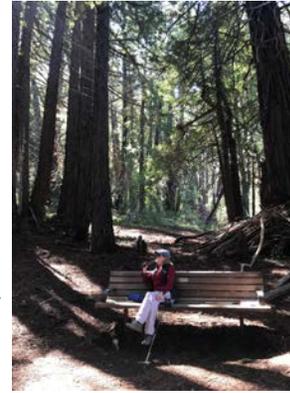
Map artwork by Rebecca Fenn

- Trail Junction 7**
Start on **Bear Gulch Trail**. You will be passing trail junction 8 and 2 as you continue uphill on the **Bear Gulch Trail**. When you reach **Redwood Flat**, near trail junction 10, rest on the bench. Read the section **HYDRATE**.
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- Trail Junction 10**
Return to **Bear Gulch Trail**, continue uphill until you reach trail junction 18. Rest on the bench at **The Meadows**. Read the section **ADAPT**.
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- Trail Junction 18**
Continue on **Meadow Trail** until you reach trail Junction 22.
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- Trail Junction 22**
Stay on **Meadow Trail** passing by trail junction 15. **Meadow Trail** ends at Junction 17. Turn left on **Alambique Trail**.
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- Trail Junction 16**
Stay right on **Alambique Trail** and hike a few minutes until you reach the bench. Read the sections **REFUEL** and **BREATHE**. Continue on **Alambique Trail** until you reach the parking lot.

HYDRATE

You will begin your workout by ascending the Bear Gulch Trail. You will need water to regulate your temperature and to prevent dehydration. Like all living things, we need water to survive. When you reach Redwood Flat you will know you are in the **redwoods**. The trees will be tall and straight and the air is cool and damp. You will feel the softness of redwood needles under your feet (redwood duff). Redwoods can live as long as 2000 years and are the tallest trees on our planet. A tree that tall needs a lot of water to survive.

Most plants take in water through their roots, the **redwood tree** can also capture water directly from the fog and absorb it through its leaves (needles). Some of the moisture caught in the branches falls to the ground in the form of fog drip. In the dry summer months, half of the redwood tree's water intake comes from fog.



Moss is a small flowerless plant that doesn't have roots. With no roots, it must soak up water like a sponge. A moss patch is made up of tiny plants that are tightly packed together to retain water as long as possible.

Banana slugs often make the redwood forest their home. Why don't banana slugs dry out? How do they stay hydrated? Slime! All parts of the slug's body produces slime. This slime helps the slug retain moisture.



ADAPT

At trail junction 18 you have reached The Meadows. Congratulations! Enjoy the view of the Bear Gulch Watershed in the distance. It was a steep, steady, uphill climb and you are now at 1,430 feet elevation. This is a grassland habitat, sunny with little shade. To **adapt** to these conditions, we drink more water, apply sunscreen, wear a hat, and put on sunglasses. Animals that choose this neighborhood have the adaptations needed to help them survive in these challenging conditions. An outer skin that won't dry out easily would be good. How about scales? That would work.

Reptiles, such as the **western fence lizard**, are well suited to a grassland habitat, where there is plenty of food for their diet of insects and spiders. Do you know that fence lizards have an amazing adaptation for survival? They have a detachable tail that can help them escape from a predator and it can grow back later.



Many plants in the grassland like, **coyote brush**, have developed small leathery leaves to prevent dehydration. Another adaptation is that it has sticky, oily leaves that keep the brush from being eaten. Their flowers have a rich nectar that attracts many pollinators such as bees, wasps, and butterflies.

In the grassland there are few places to hide from the sharp eyes of predatory birds or hungry coyotes. **Pocket gophers** have the right tools to burrow tunnels in the ground. They have adaptations such as clawed front paws for digging and long teeth for loosening soil.



Friends of Huddart & Wunderlich Parks
<https://www.huddartwunderlichfriends.org>
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