



Discovering the Underground with Snow White



# Discovering the Underground



with  
**Snow White**



B4U Publishing



The queen was waiting for the prisoner's return impatiently. She figured out that he had run away and that Snow White was still alive. She decided to trace Snow White on her own. She went to her garden where she grew many a poisonous plant and mushroom. She used them to prepare a poison, which she injected in an apple. She dressed herself up as an old woman, aiming to coerce Snow White into eating the poisoned fruit.





## Vegetable



### Potato

A widely used crop native to South America. Its underground tuber, which is its only edible part, is a popular side dish.



### Peanut

Its fruit is a pod also known as the peanut. It develops underground and it is a popular delicacy as well as meal ingredient.



### Onion

The onion bulb is the basic ingredient of most meals and its use reaches as far back as the antiquity.



### Garlic

A very popular aromatic crop, one of the first spices ever used and also a natural antibiotic.



### Carrot

Sweet orange root vegetable having beneficial effects on digestion, skin, and eyes.



### Beet

Red beet is a globular root vegetable, the healing effects of which are appreciated by people with blood circulation disorders.



### Wasabi

Or *Eutrema Japonicum*. The main ingredient of Japanese dishes with a hot flavour and aroma. It was also used in fire alarms for deaf people.



### Ginger

Popular for its high content of beneficial substances, helping people who suffer from digestive disorders, circulatory system problems, and it also works as immunity booster.

In her thoughts, the queen hatched her plans, preparing poison from the most venomous plants, and she could hardly wait to take her revenge upon Snow White. However, plants are not poisonous to do harm. It is to protect themselves where they would not otherwise withstand. Most plants even help each other and live together in perfect harmony. For example trees cannot exist without fungi and fungi cannot live without trees. They essentially operate as one organism.

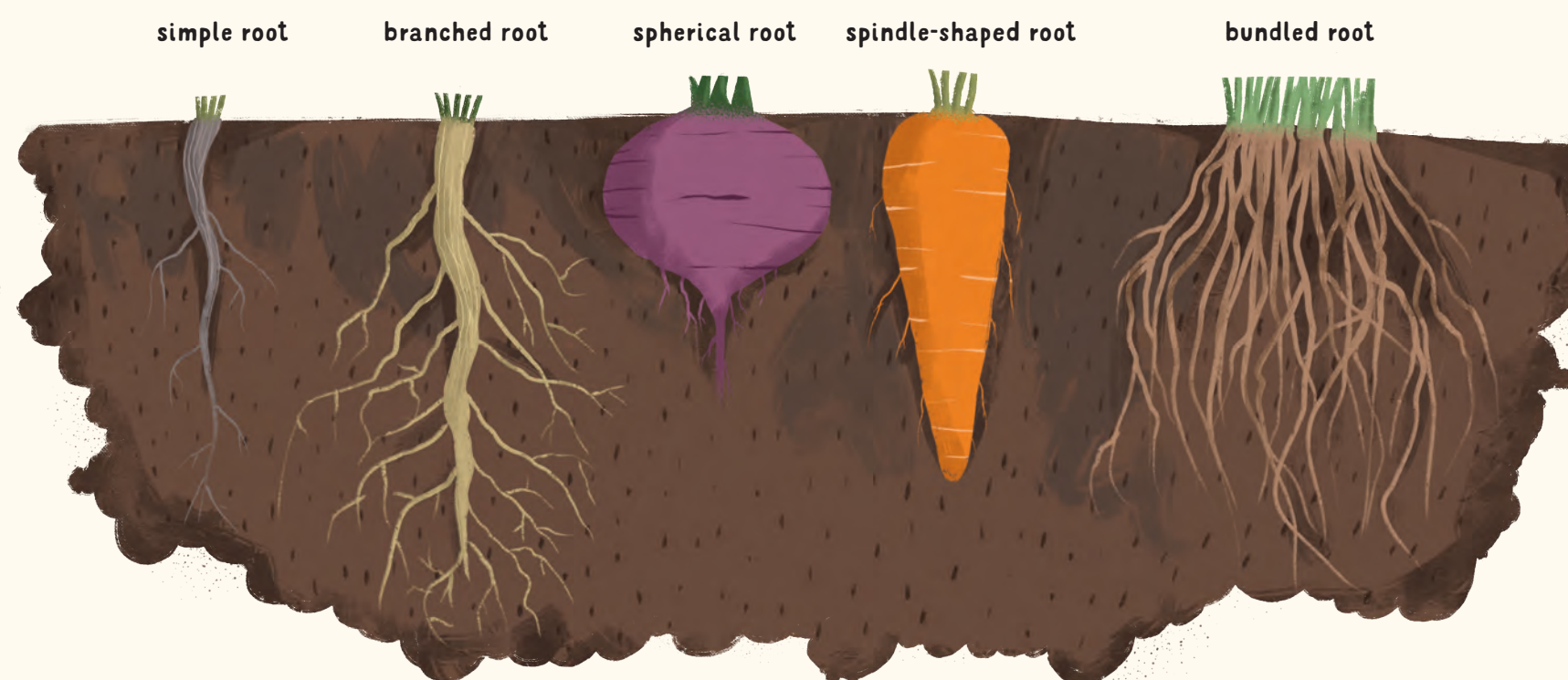
## Photosynthesis

Trees are capable of wonderful things, one of them being the photosynthesis. In the course of this process, they acquire substances they need from the sunlight, at the same time producing the life-giving oxygen. Tree leaves are also the place where important saccharides are made. Fungi are unable to produce saccharides, so they need trees to provide saccharides through their roots in soil.

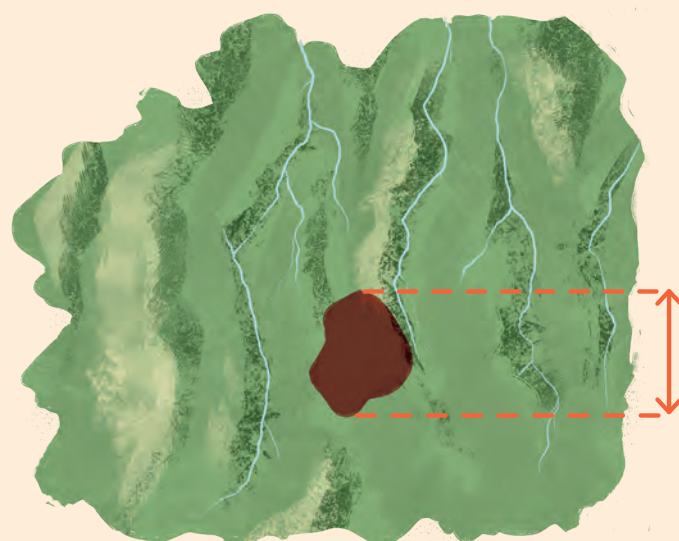


# ROOT SYSTEM

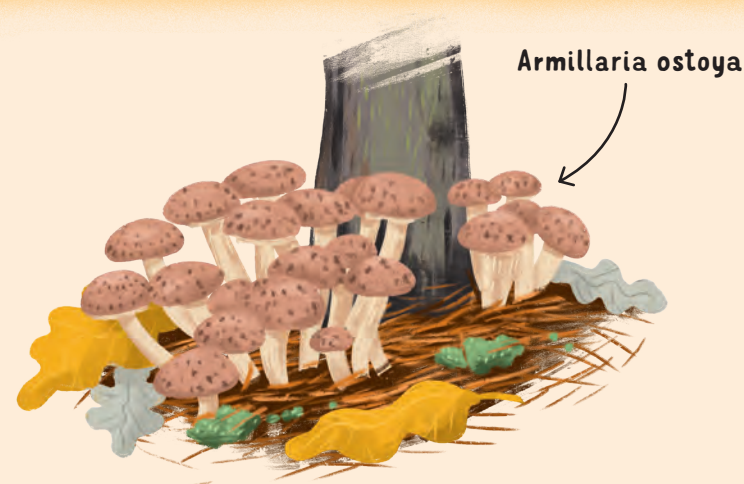
## Types of root system



## The biggest mycelium in the world



The Malheur National Forest in the U.S. state of Oregon



The biggest fungus in the world can be found in Oregon, US. Or rather the biggest mycelium. It belongs to a giant *Armillaria ostoya* and its mycelium covers 2,385 acres of the Malheur National Forest. It is almost as many as 2,000 football fields placed side by side. Thanks to this dimension, *Armillaria ostoya* is by right the largest living organism in the world.

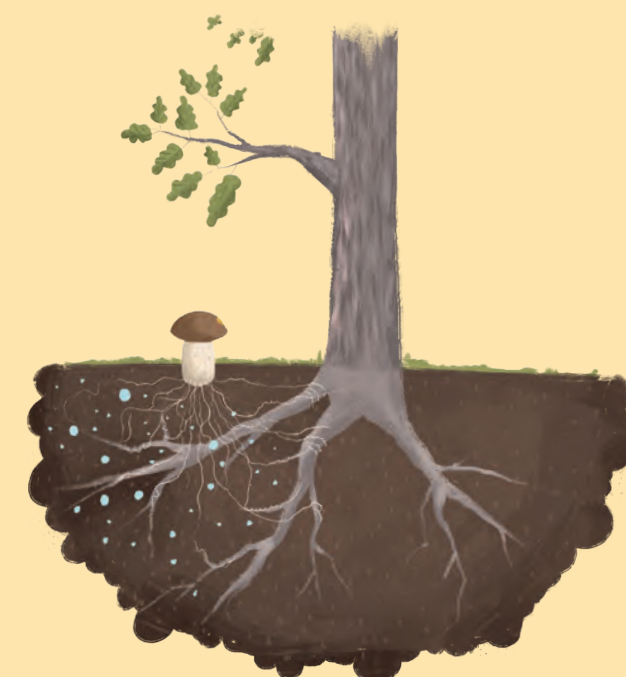
## Decomposition

The soil is full of **vitally important substances**. These are released from underground rocks and minerals and by the process of decomposition of living organisms and they accumulate in soil. When a plant fades, an animal dies, or leaves fall on the ground, they gradually decompose and turn in **soil nutrients** that plants need to live. Animals, or people, as the case may be then eat those plants because they contain those substances required. Each creature or plant is part of **the cycle of life**.

## Fungi

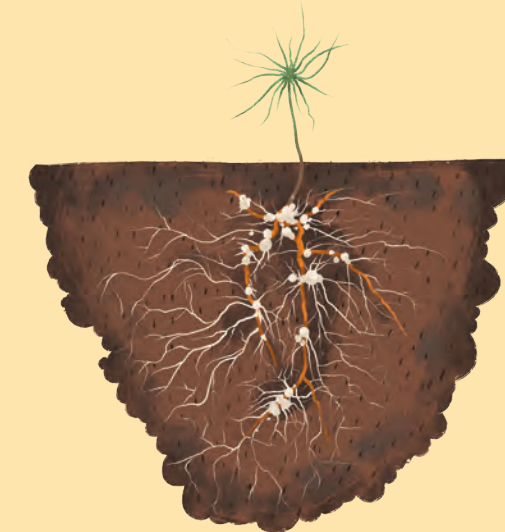
## Mycorrhiza

Now that we know that mushrooms receive the saccharides needed from trees, trees by contrast receive **water** and important **minerals**, such as phosphorus and nitrogen, from fungi. This exchange takes place by linking tree roots to fungal fibres called **the mycelium**. This is precisely why fungi are abundant around trees.



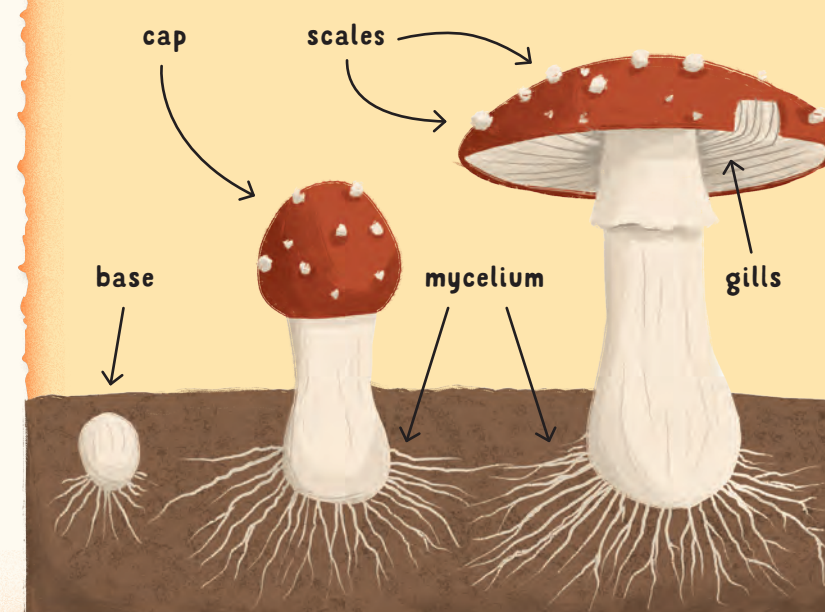
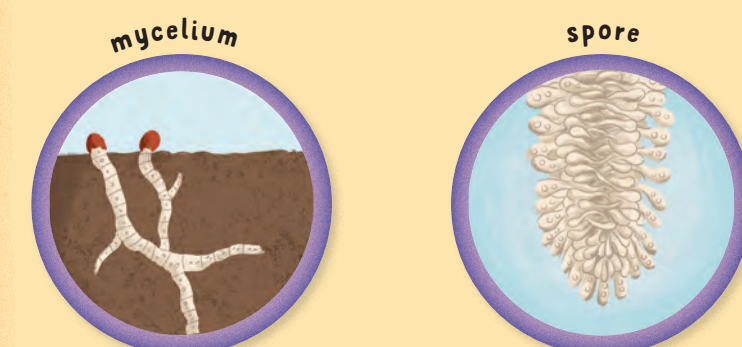
## Mycelium

Mycelium is a cluster of fibres, through which fungi receive nutrients from soil. The mycelium of a certain mushroom is linked to roots of a certain plant, and also with spawns of other fungi, and therefore also with roots of other trees. In this manner they form **a network**, through which trees and fungi even communicate. They e.g. send warning signals when there is an impending danger.



## Reproduction of fungi

Do you know the saying "like mushrooms after rain"? It means that something emerges and spreads in abundance and quickly. Because mushrooms grow really fast. When a mushroom grows, a so-called **spore** falls out of its cap. The spore forms its mycelium in the soil, from which a small veil emerges, **the veil** turns to a whole mushroom, from the cap of which a spore falls out...





For fear of the wicked queen, the prisoner fled to the neighbouring kingdom. He went to the prince of that country, and he asked him for help. The prince heard his plea, "I shall go and find the princess and chasten the queen. She is a threat even to our kingdom!" So the prince spoke and set out for his journey. He decided to use the network of underground corridors. He rushed through the tunnel and met dwarfs working in the mine. He confided his plan to them and they got scared. "We know where Snow White is, prince. Let's go, we must seek her quickly." They got in haste in a mining trolley and speeded to their house.





## Important Staff

The Metro operation requires the **cooperation of a variety of professions**. Some of the professionals may be seen right in the Metro. Right after its arrival to the station, you can see the train driver.



**Drivers**

The metro train is not controlled using a steering wheel as for example cars, but using a panel having lots of buttons and levers. The driver **controls** the Metro speed, the place where it stops, the direction it takes at crossroads (if there are any on the track) and he uses **a camera system** to check whether people are getting on and off.

## Ticket inspectors

The inspector is to check whether passengers **purchased** their tickets and **validated** them properly. Ticket fees allow the proper functioning of the Metro; they are used to pay for **repairs** and **improvements** of tracks and trains. Ticket checks are performed at turnstiles but there are also **random inspections** in cars.



## Engineers

Engineers play a very important role in each transport company. They monitor the condition of tracks and trains, resolving all technical problems so as to ensure the smooth running of transport.

Trains are capable to transport **millions** of passengers a day throughout the city.



# METRO

**D**warfs rushed with the prince to Snow White, taking the fastest way they knew. By mining trolley and through underground tunnels. Similarly, people make use of a system of underground train tracks called the Metro, allowing the fast movement of large numbers of people in metropolises. This transport system offers a great advantage, which is that trains follow a straight route and they do not need to overcome any obstacles. It is a highly effective, and thanks to its electric propulsion also an environmentally friendly solution.



## Schedules

To make the orientation easy for everyone, train schedules are located on platforms and in cars. However, they do not show arrival times, as would be the case of buses or trams. Instead they **display stops** and interchange stations where you can change for other Metro lines.

## Turnstiles

Turnstiles serve for validating tickets and for **regulating** the number of people entering the underground at the same time. **Passengers** usually rush, moving in large groups. Perhaps you can imagine what the situation might be, had there been no turnstiles.

## Escalator

To get passengers from the Metro station as fast as possible, **moving staircases**, also called escalators, are in place. They allow people to move quickly and easily.



## Train

The emergence of the Metro dates back to **1863**. After futile attempts to pull trains for example using a rope, the system quickly switched to **electric drive**. Electricity flows right through the rails and the train is capable of speeds from 80 to **121 km/h**.

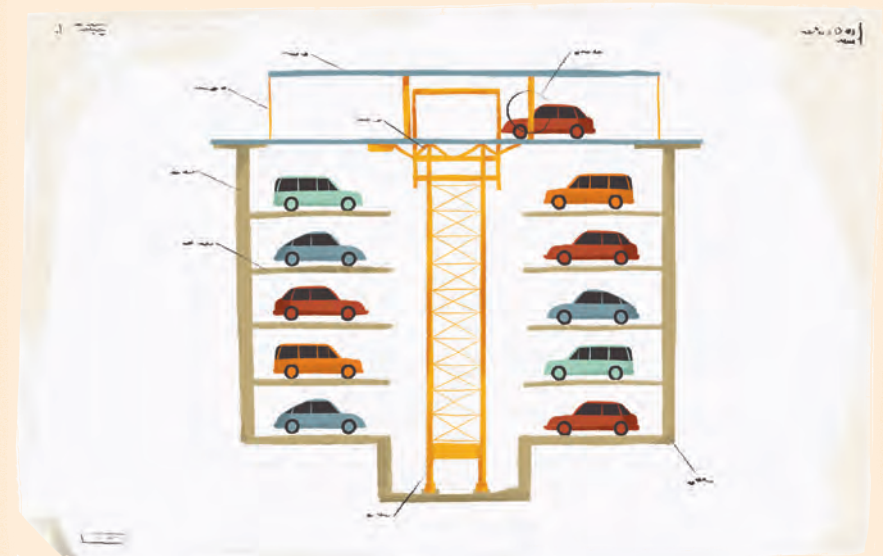
## Ticket

After **validating** your ticket, you can see the time of your entry in the Metro. This and your **fare** will help you determine the period of time, for which you are allowed to travel the city by the Metro. If you travel without a ticket, it is called "fare evasion." If you get caught by a ticket inspector, you can be fined as much as 10 times the ticket price.



## Further underground transport

The Metro is a unique transport system, which saves passengers a lot of time, at the same time being **environmentally friendly**. Other means of transport are aiming for the underground as well. Cars can already park under pavements, however, reducing car traffic using underground motorway systems is, for the moment being, **just a future plan**. Can you think of any **means of transport** that could drive other **than on roads**?



## Underground parking

As the numbers of passenger cars grow, parking spaces are becoming scarce. Underground parking lots with automated lifts allow to park cars also on **underground floors of buildings**. It is also considered cheaper and more practical in most cases than a car park. It protects vehicles from weather such as snow, rain, or high temperatures. Also it's safer, because it's impossible for robbers to get in the car.



## Underground motorways

This is a design, yet, but some **visionaries plan** an underground motorway. This would allow travelling below ground by electric cars **similarly to the metro**. Underground motorways should address crowded roads and **decrease pollution**, like the metro. The use of underground should also reduce the growing number of road accidents, as self-driving cars are considered to be involved.



## Underground messenger service

**On-line goods ordering** and shipping to homes is another source of the growing number of freight transport vehicles on roads. Such vehicles are bulky and heavy for the roads. Future plans foresee using **an automated underground transport service**. Some companies are considering using underground routes currently used by energy companies along with the use of magnetic motors (similar to rollercoasters) that promise a fast and safe transportation of goods.

## Underground types

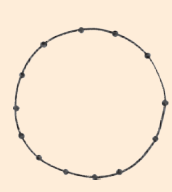
The world's cities differ from each other by area and structure, and the underground lines need to be adapted accordingly. There are **9 basic types**.



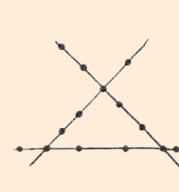
You can take **a direct line** e.g. in Algeria, Helsinki, Miami, Hiroshima, or Sydney.



**Two intersecting routes** forming a circle are available for passengers in Cairo, Marseilles, Montreal, Rotterdam, and Toronto.



The underground going just **in circle** can only be found in Glasgow, Scotland.



**Multiple intersecting lines** can be found in Athens, Budapest, Prague, Munich, and Rome.



This is how lines in Amsterdam, San Francisco, Brussels, or Stockholm underground are **connected**.



**Radial arrangement** – Boston, Vancouver, Washington D.C., Buenos Aires, Kiev.



Barcelona, Hong Kong, Mexico City, New York, and Osaka are cities with the **most complex systems**.



Underground lines **cross each other** in Atlanta, Kyoto, Minsk, Warsaw, and in Bangalore.



In Beijing, London, Moscow, Paris, or Tokyo the underground goes **in circle** as well, but also **across** the circle.





## Discovering the Underground with Snow White

Text by Tom Velčovský  
Illustrations by Jakub Cenkl

Once upon a time there was a Queen, who only cared about her looks. She believed she was the most beautiful woman in the world, except for her stepdaughter Snow White. And what happened to the beautiful princess and her evil stepmother? You can read that in the fairy-tale Discovering the Underground with Snow White. In addition to the well-known fairy tale there are seven folding and richly illustrated maps where you can also learn about what lies underground, who works there, which animals live there and other curiosities associated with the "realm" below the Earth's surface. Discovering the Underground with Snow White is a unique mix of encyclopaedia and the fairy story and that pleases but also instructs all young readers and their parents.



big  
folding  
maps



EAN + ISBN

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CE

WARNING:  
Choking hazard.  
Not suitable for children  
under 36 months.

