



I want to be a  
**SCIENTIST**

Written by Štěpánka Sekaninová • Illustrated by Honza Smolík



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**18**

Careers in SCIENCE  
to pursue



b4u publishing

# \* PALAEOLOGIST \*



A PALAEOLOGIST IS FASCINATED BY FOSSILS AND OTHER REMNANTS OF EARLIER LIFE ON PLANET EARTH. LIKE AN ARCHAEOLOGIST, ANOTHER SCIENTIST WITH AN INTEREST IN TIME LONG GONE, THEY ARE KEEN TO MAKE DISCOVERIES ABOUT THE PAST FROM DEEP IN THE SOIL, UNDERGROUND OR INSIDE ROCK.

## DIFFERENCES BETWEEN PALAEOLOGIST AND ARCHAEOLOGIST

Whereas archaeologists focus on objects and other traces left behind by earlier humans, palaeontologists research plants and animals we would have encountered on Earth millions of years ago. Over this long period, remains of these organisms have turned to stone, i.e. fossilized. Palaeontologists search hard for these fossils.

## WHAT FOSSILS REVEAL

Fossils show palaeontologists what long-ago organisms looked like, fed on, were hunted by, and how the plants and animals of earlier times are connected with those of today.

## HURRAY FOR ROCKS!

Fossils are scattered all over the world. To earn our admiration, they must first be discovered and extracted from rock by palaeontologists.



## FOSSIL HUNTING

Not all rock contains fossils. A palaeontologist knows where to look for them based on their knowledge and experience. This is more than just detective work. Fossils are not found in igneous rock – i.e. rock that formed from cooling lava or magma; nor are they found in rock formed by pressure and high temperature transformation from other rock. So fossils must be looked for in sedimentary rock. If a plant or other organism got into this as it was settling, it would certainly be fossilized.

### A PALAEOLOGIST'S EQUIPMENT



# \* ICHTYOLOGIST \*



AN ICHTYOLOGIST LOVES WATER AND ALL THAT LIVES IN IT: FISH LARGE OR SMALL, CARTILAGINOUS OR JAWLESS, WHALES, YOU NAME IT. AS THEY CONSTANTLY OBSERVE, STUDY AND EXAMINE ALL THESE, THEY SURELY KNOW A GREAT DEAL ABOUT THEM. ICHTYOLOGISTS STUDY HOW FISH HAVE EVOLVED AS WELL AS OBSERVING THEIR BEHAVIOUR, REPRODUCTION AND GROWTH, GOING ON TO WRITE ABOUT ALL THIS IN SPECIALIST ARTICLES.

## WHAT THINGS MIGHT AN ICHTYOLOGIST DO?

- Study the natural environment of fish.
- Examine their behaviour.
- Identify fish and fish species, and describe new ones.
- Monitor water quality in natural and manmade reservoirs.
- Work for the protection and safety of fish.
- Propose new research and publish findings.

## LOOKING FOR NEW FISH

Keen scientists travel to Earth's remotest places to find fish caught by local fishermen but as yet unrecorded by the ichthyological world. On making such a find, they launch their research immediately. So far, 27,000 fish species have been described, but there will surely be more in future. In 2016, scientists discovered a completely new species in the River Amazon.

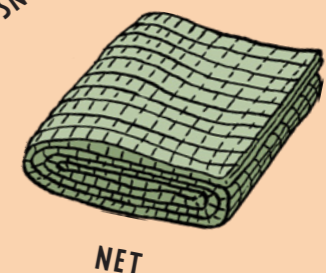


The greatest honour for an ichthyologist?  
To get to name a new species of fish!

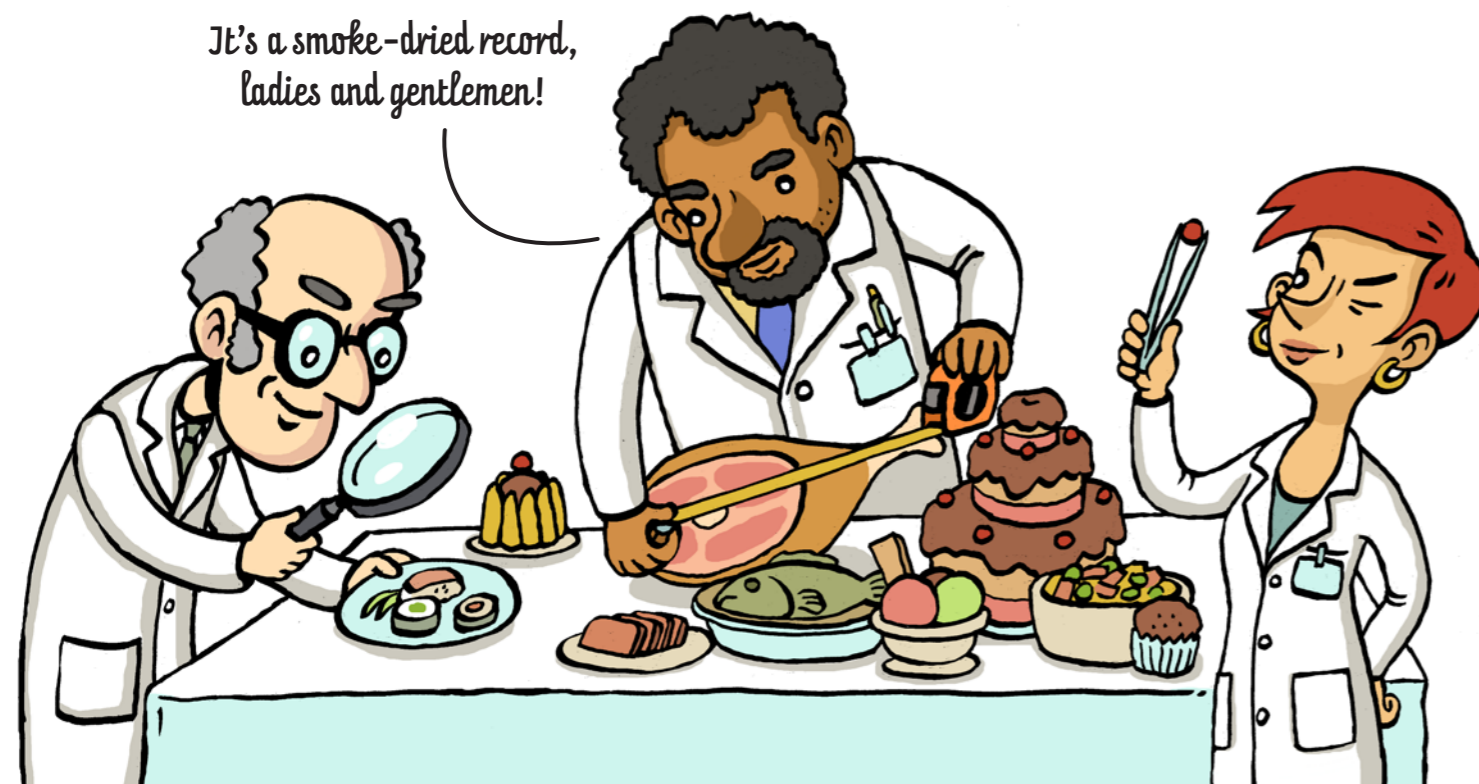
## FISH PROTECTION

Ichthyologists do what they can to prevent fish species dying out. They also study the fish we eat, using knowledge acquired on how they live to prevent them from coming to harm.

### AN ICHTYOLOGIST'S EQUIPMENT



# \* BROMATOLOGIST \*



A BROMATOLOGIST ENJOYS FOOD AND EVERYTHING ABOUT IT. THIS DOESN'T MEAN THEY ARE A BIG EATER. THEY ARE CONCERNED WITH THE QUALITY OF THE PRODUCTS ON THEIR PLATE OR IN THEIR CUP. YES – A BROMATOLOGIST IS A GENUINE FOOD SCIENTIST.

## WHAT A BROMATOLOGIST MIGHT DO

- A bromatologist works on ways of making healthy foods – such as dishes low in sugar and fat – taste as good as unhealthy foods, so that in future we will favour the healthy over the unhealthy.
- A bromatologist also thinks up new flavours of yogurt and ice cream, plus what to mix them with and how to do it. The result must be pleasing to the eye as well as on the tongue. A yogurt or an ice cream may taste good, but what if it is unpleasantly lumpy or full of ice crystals? In their mixing, testing and tasting, a bromatologist experiments with a vast range of ingredients and substances, over and over again.



- Bromatologists also think about ways to store food. They look for economical ways to preserve important substances, colours and tastes, and explore how food products can be dried or pasteurized. They analyse food composition at the factory where it is made, testing it for calorie count, allergens, nutrients, sugar, fat, vitamins and trace elements. Based on the bromatologist's analysis, the producer then labels the product so that the customer will know about the nutrients that enter their body by eating it.



## QUESTIONS A BROMATOLOGIST ASKS

How long does a particular food stay fresh? How should it be cooked and processed to make the most of its taste and not lose important nutrients and vitamins? Which preservatives can be used to retain its taste even if it is kept for several months? How can freshness be guaranteed? Is this food a healthy option?



Everyone likes good food. But for you it is a passion. If you enjoy checking what food is made of and what vitamins it contains, seeing how long it stays fresh and learning the best ways of keeping it so, you may be a future bromatologist.

*It's still pretty tasteless. No problem – I'll figure out what to do with it.*



## A BROMATOLOGIST'S EQUIPMENT



KITCHEN EQUIPMENT



LABORATORY EQUIPMENT

# FIELD OR OFFICE?

Don't get to thinking that an ornithologist spends all their time in the field peering through binoculars, with a recording device in their hand. They spend most of the day sitting at a computer, working through what they have observed or the results of tests and experiments.

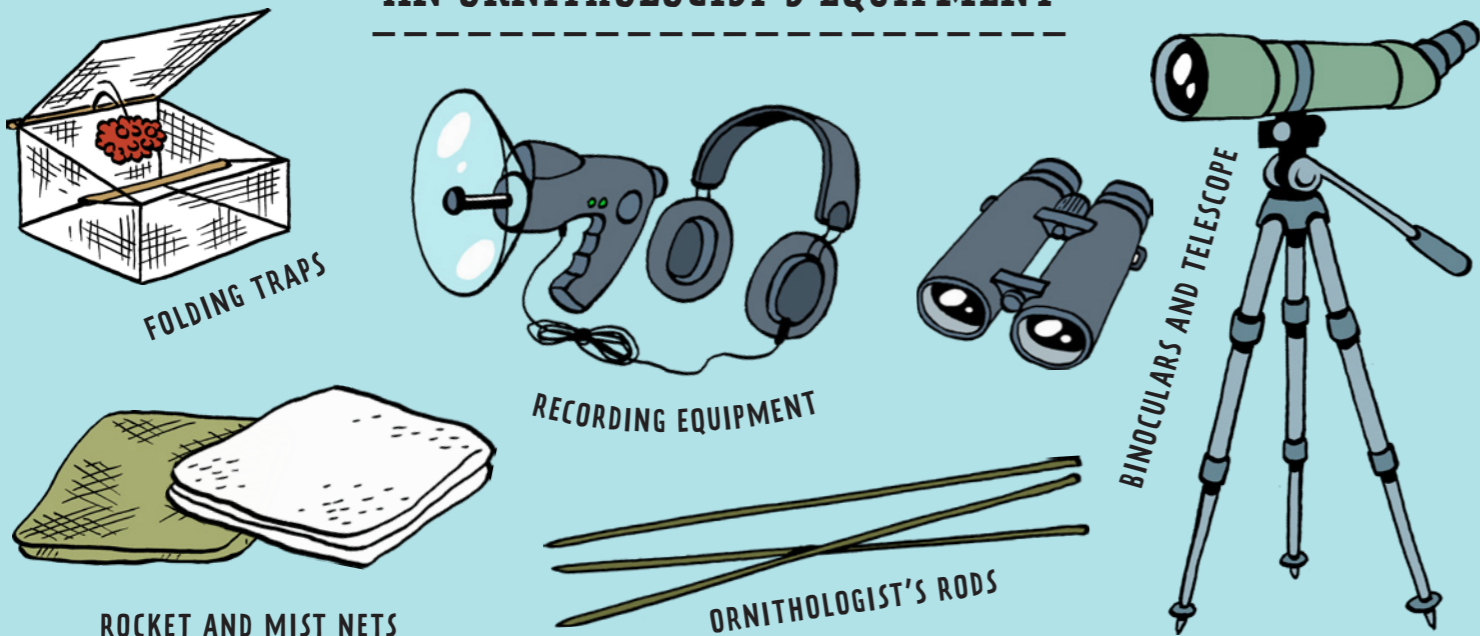


## WHAT AN ORNITHOLOGIST DOES IN THE FIELD

In the field, an ornithologist might count individual birds, and observe and investigate their nesting habits and how they build their nest and fledge their young, their style of courtship and how they get their food. They ring birds, so making it easier to estimate population numbers of given species and the degree of danger a species may be in. They collect data in the field for subsequent research in the lab.



### AN ORNITHOLOGIST'S EQUIPMENT



# AN ORNITHOLOGIST'S WORK IN A NUTSHELL



- In the field, they study birds' migratory and habitat behaviour, and their method and speed of reproduction.
- They monitor and determine the state of bird populations and the health of individual species.

- They track the movement of birds.
- They put together data on the total bird population.
- They work on projects for protection and safety of birds.
- They write academic studies.



## AN ORNITHOLOGIST IN A LABORATORY

In a lab, an ornithologist can examine and analyse bird feathers, from which they will obtain important genetic material. They can also track the behaviour of birds kept in special cages. They will then describe their research and publish its results in leading science magazines and other publications.

You hear the song of a bird above your head and know its species immediately. If you don't recognize the bird by its song, you will look it up, so learning still more about birds. Even now, you know that the only thing you want to be is an ornithologist!



# \* DENDROLOGIST \*

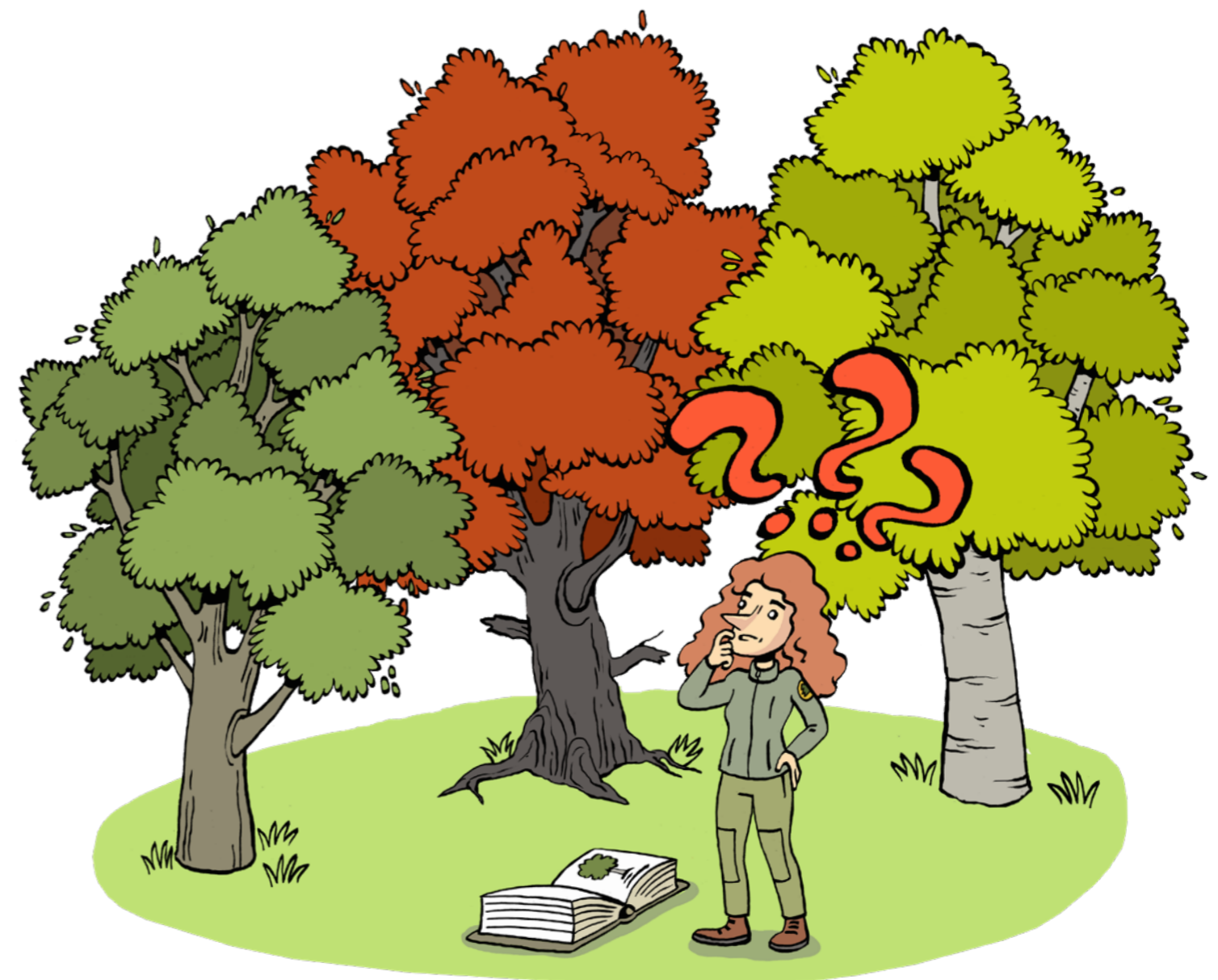


You are amazed and attracted by majestic crowns, trunks mighty and slender, leaves, flowers, annual rings ...



If you're an insider, you'll know that the talk here is of trees, the passion of all future dendrologists.

A DENDROLOGIST IS A PROFESSIONAL WHO STUDIES TO THE SMALLEST DETAIL TREES, SHRUBS AND ALL OTHER WOODY PLANTS THAT GROW OR HAVE EVER GROWN ON OUR PLANET. ASK THEM ANYTHING YOU LIKE ABOUT LEAVES AND NEEDLES AND THEY WILL KNOW THE ANSWER.



## WHAT A DENDROLOGIST DOES

First and foremost, dendrologists are able to recognize species and sub-species of trees, shrubs and other woody plants and identify subtle differences among them. Based on this ability, they prepare guides to help others learn their way around their world. While doing this, they diligently describe newly discovered species.

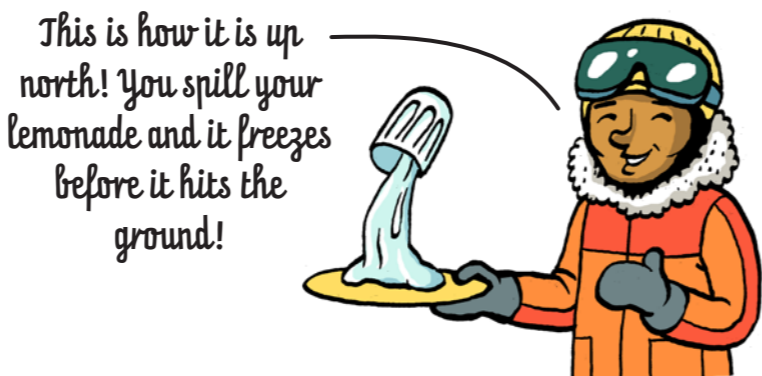


# RETURN JOURNEYS

A glaciologist travels a lot, typically to northern regions where there is plenty of snow and ice. They stay there for a long time at a special research station, observing their surroundings. To perform the observation, they install special outdoor electronic gauges. They also put special markers on glaciers, from which they will determine their direction of movement.

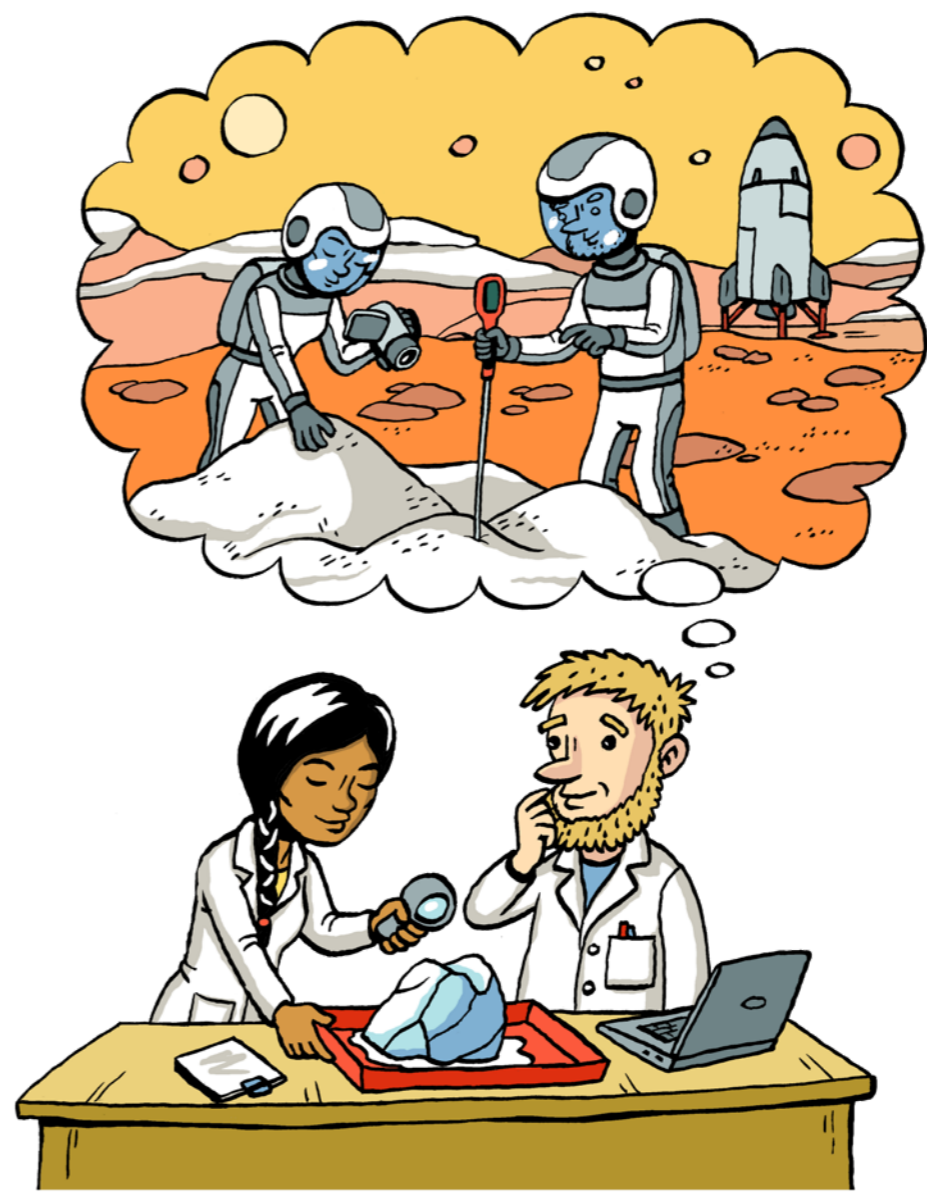
# CHANGES COMING


A glaciologist collects samples of snow and ice. From ice obtained from a crack in a glacier, a glaciologist can read how climatic conditions have changed over time as well as the extent of snowfall per year.



# THE FUTURE OF THE PLANET

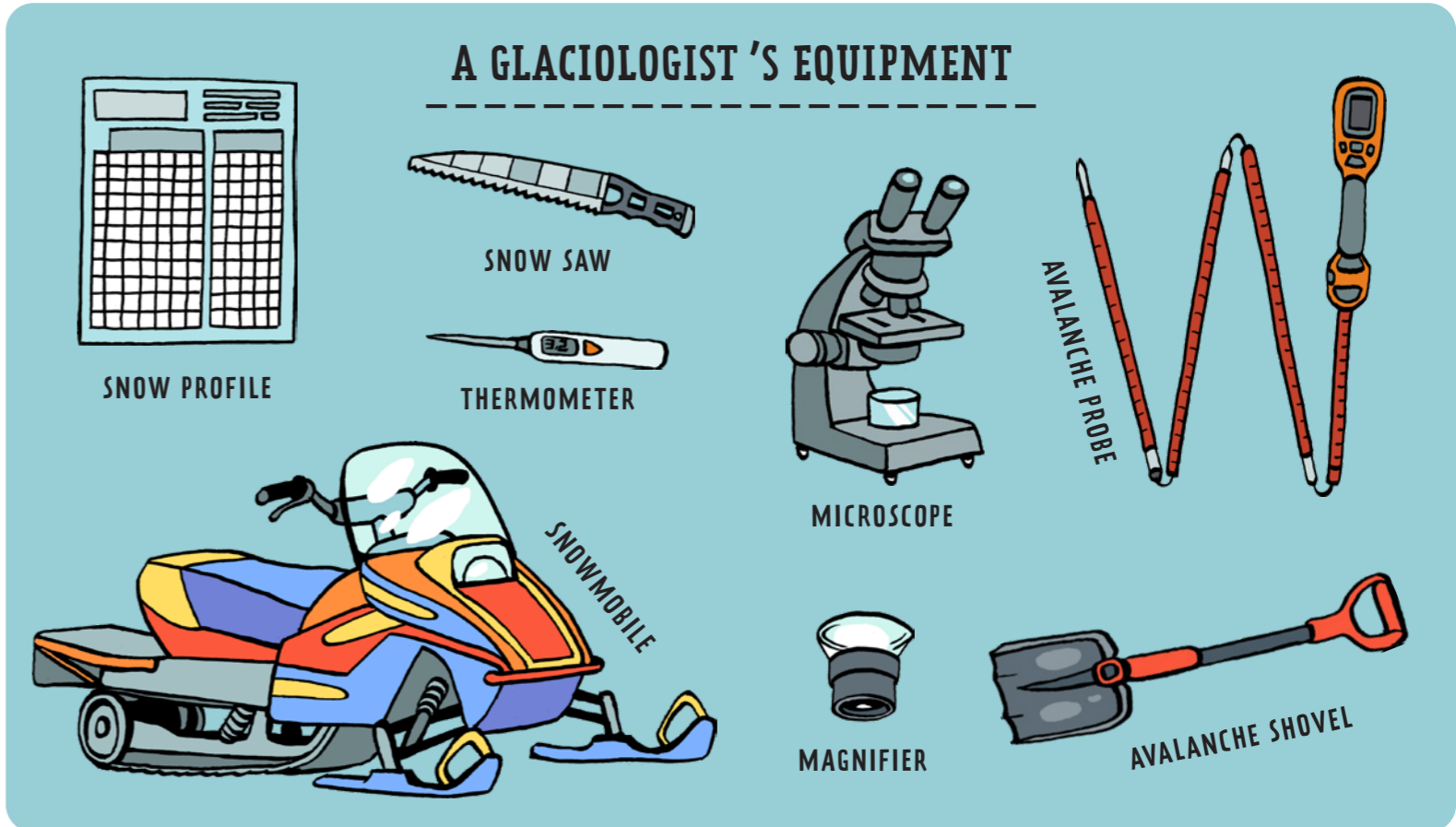
A glaciologist presents the results of their research to other scientists and the general public at conferences. Each one of us should be interested in the future of the blue planet. Based on their research, glaciologists can predict changes on Earth in relation to climate change.



 Snow and ice mean more to you than the promise of winter fun. You know that there are many kinds of snow, and you love the variety among snowflakes. Ice captivates you by its beauty. A career as a glaciologist awaits!

# ON EARTH AS IT IS IN HEAVEN

A glaciologist’s expertise extends beyond terrestrial snow and ice. Ice and snow are also found on other planets in our solar system. As they study these, scientists learn interesting things about these other worlds.



# \* HYDROLOGIST \*

Great! It's much cleaner than the last time we checked!



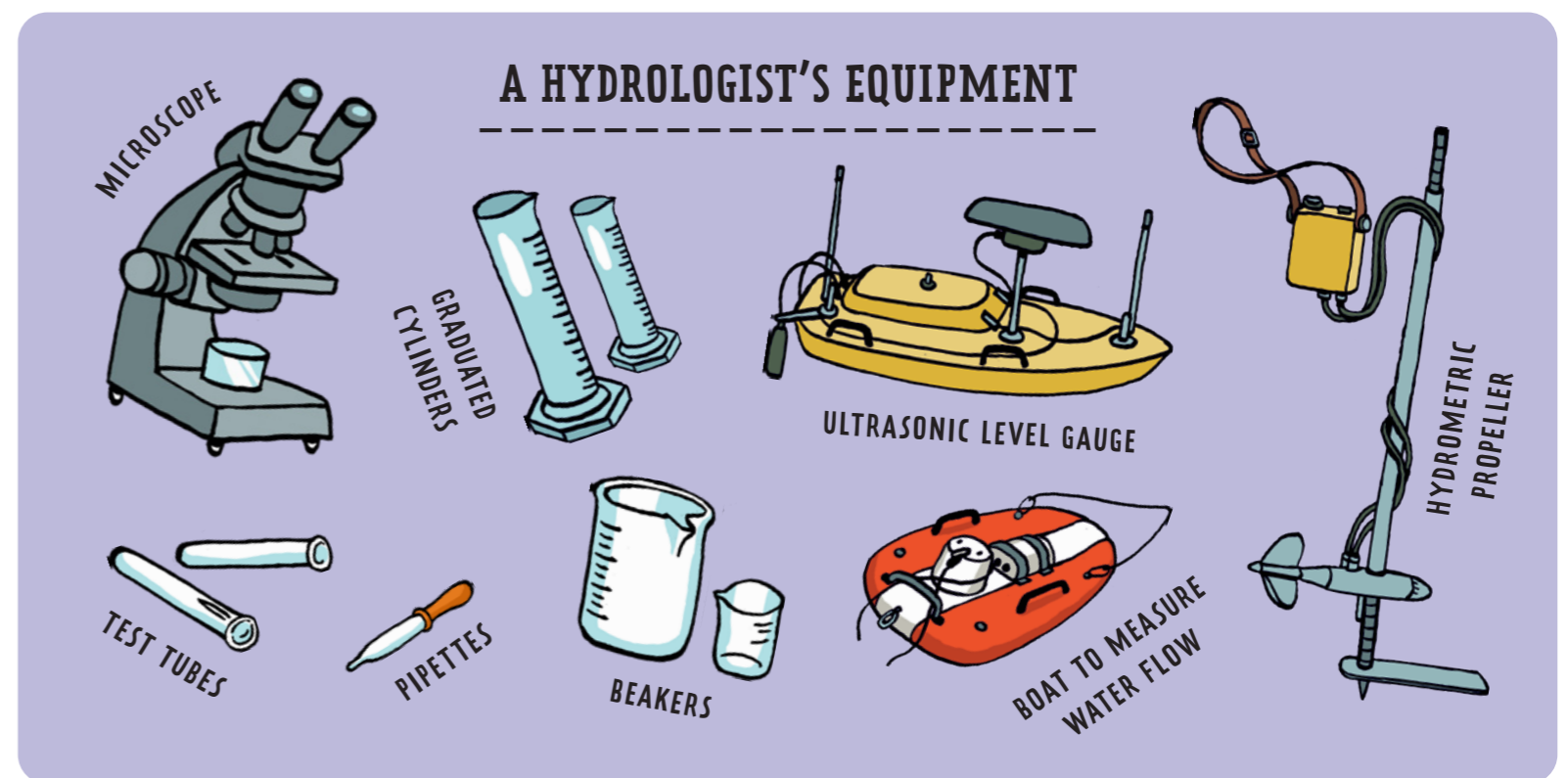
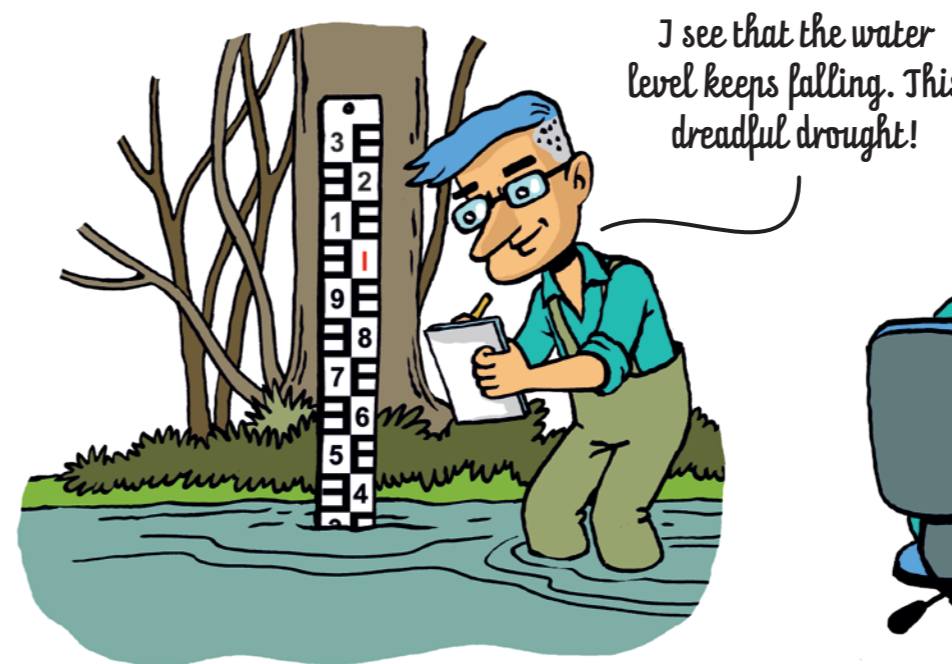
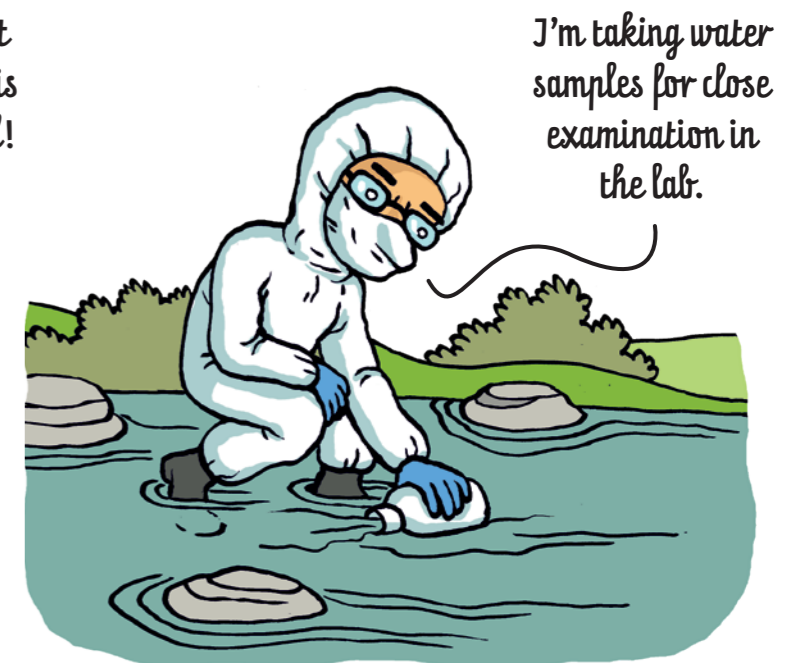
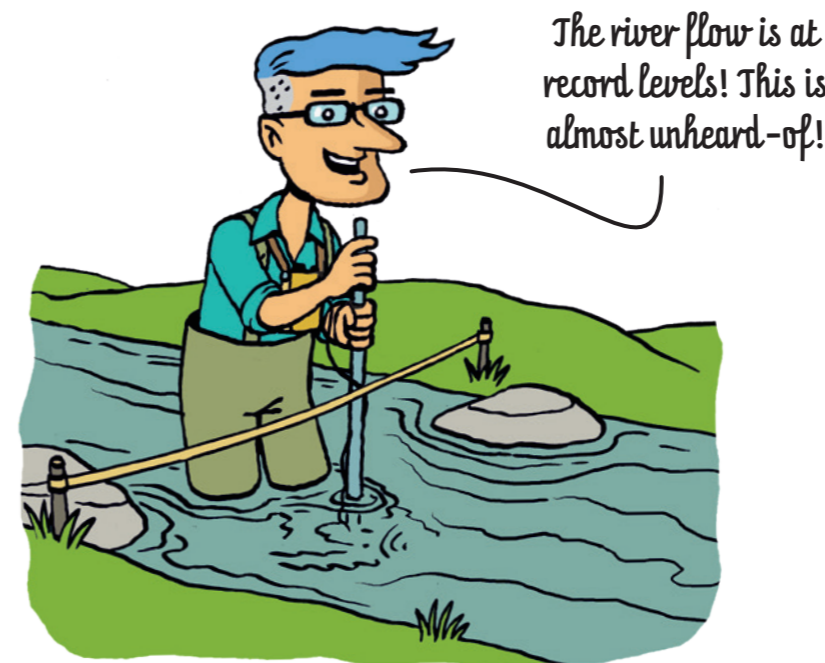
A HYDROLOGIST HAS DECIDED TO DEVOTE THEIR WORKING LIFE TO THE STUDY OF WATER. THEY EXAMINE WATER IN ALL ITS STATES: VAPOUR, LIQUID AND SOLID. THEY STUDY HOW AND WHY WATER SPREADS, THE WATER CYCLE PROCESS, AND PROPERTIES OF SURFACE WATER AND GROUNDWATER.



If you could, you would grow fins and spend your life in it. Water, the most practical of all things, salt or fresh. Water is everything to you. Water is life. How about becoming a hydrologist?

## WHAT A HYDROLOGIST DOES

Hydrologists collect samples of surface water and groundwater and analyse their state and composition. They explore river basins as well as measuring precipitation and studying its effect on river flow. They regularly check water quality and purity and for possible water contamination, and they propose ways out of undesirable situations.



# Would you like to be a **SCIENTIST**


when you grow up?

No way, you say, because science is boring? But what gave you that idea?! Scientists with specialist interests travel the world researching fascinating things – such as moss, the bones of our distant ancestors, fish, music ... Some of them even study humankind. Come with us for a look under the bonnet of a number of sciences, so learning for yourself what it takes to be a scientist. At the very end you will encounter a small, mysterious, somewhat unscientific curiosity. A question to start you off: Do you know what a bryologist does?

**FIND  
OUT**  
inside!



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