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Find out more about the Scent project:
https://scent-project.eu/

Lesson 1

Introduction to Scent and environmental monitoring

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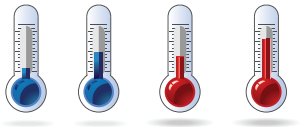
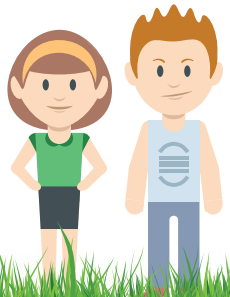
What is **environmental monitoring?**



Environmental monitoring is about looking closely at our surroundings to help us understand how healthy or unhealthy the environment is and to protect it from any negative impacts of human or other activity.

We can monitor seasonal change by studying how the length of the day changes, what time the sun rises and sets, when flowers appear in spring and when birds migrate. Much in the same way, we can monitor other changes taking place around us.



What is **citizen science?**

Citizen science is about people like us getting involved in research by collecting useful data for science projects.

We become citizen scientists when we participate in tracking different phenomena in our surroundings and contribute to science and technology. We help scientists by giving them information that they otherwise wouldn't have access to. Scientists often struggle to do environmental monitoring without our help because they don't have enough time or they are not able to be in the right place at the right time. Participation is usually made easy; no experience is needed and there are many ways to contribute.

Our contributions can be combined with everyone else's, and together they form the big picture!

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What's it all about?

Did you know that all of us play a vital role in the Bigger Picture? We all have the power to help to understand and protect our environment through Scent.

Scent is a project that tries to find out how the environment is changing. More specifically, it studies how the land cover and the use of land around us is changing.

Scent has created a toolbox full of smart apps and other technologies for us to use. The tools in the toolbox are fun and simple, and by using them, we help scientists monitor our environment and measure interesting environmental details. These are the tools we can use:

1 scent Explore

We can play a game called Scent Explore on our smartphones and tablets. We chase little characters that are hiding here and there around us. Our phones give a sound alert when we get close to a character. We earn points by finding the characters and taking photos of the places where we find them hiding. The more characters we find, the more points we earn. Some characters are uncommon and therefore more valuable than more common ones. We can compete against each other and see who collects the most points! The locations in which we find the characters contain interesting information about land cover and land use that scientists need to understand the environment better.

By playing the game, we take valuable photos that get uploaded to the Scent system, and we participate in research to protect the environment!

2 scent Collaborate

Another part of the Scent toolbox is the web app Scent Collaborate. We are invited to label images to teach the Scent machine to understand images better. The Scent machine is smart, but to become even smarter, it needs our help. Many types of images are difficult for the system to understand, so it wants to learn by having us tag what we see in them. We can train the machine to recognise obstacles in rivers, forests, paved areas etc. so that it remembers them and can identify them in the future. Our contributions combined with those of others can together be used to map the environment more clearly than before. The maps will help scientists predict – and prevent – flooding or other natural disasters. Scent Collaborate can be used anywhere on a computer, tablet or smartphone.

3 scent Measure

Scent Measure is a mobile app that collects and combines important details about the temperature and moisture level of the air and soil. To measure temperature and moisture, we use portable sensors that we place in interesting places, and the sensors then record and display the results in the app. The information from Scent Measure is used to discover how much moisture there is in the soil, how warm it is and so on. These details help the scientists understand how the environment is doing.

Interesting facts

Scent brings together people from 6 different countries and 10 different organisations to work on the project for three years.

We start testing the Scent toolbox in two interesting places: The Danube Delta in Romania and the Kifisos area in Greece. The Danube Delta is rural and the Kifisos area is urban.

This is just the start, and once the testing is done, the Scent movement will be ready to expand to other regions.

Kifisos River Basin, Greece

Size: 381 km2
Population: 4,000,000

Biodiversity: Despite having suffered terribly from human interventions, biodiversity is still partly maintained in the region with plane trees, ferns, oleanders, eucalyptus, blackberry bushes and reeds, and animals such as frogs, turtles and small fish.

"The urban landscape is changing dramatically. Streams are covered with concrete. Forests are torn down. The natural course of the river has been modified. We need to understand our river better. We need a clearer picture of its course and of surrounding land use changes. We need to protect our lives and our communities from the river's destructive potential. We play a vital role in the Bigger Picture."

The Danube Delta, Romania

Size: 3124.4 km2
Population: 20,000

Biodiversity: The largest area of vast biodiversity in Europe, with over 300 species of birds including cormorants, white tailed eagles and glossy ibises, other animals such as wildcats, foxes, boar and deer as well as 45 freshwater fish species.

"Our unique ecosystem, with its vibrant wildlife and remarkable plant life, is sustained by flood waters. They help keep the cycle of life flowing in the region. We need to understand how these flood waters work, and piece together all the data and images of this part of the planet – our part of the planet. We play a vital role in the Bigger Picture."

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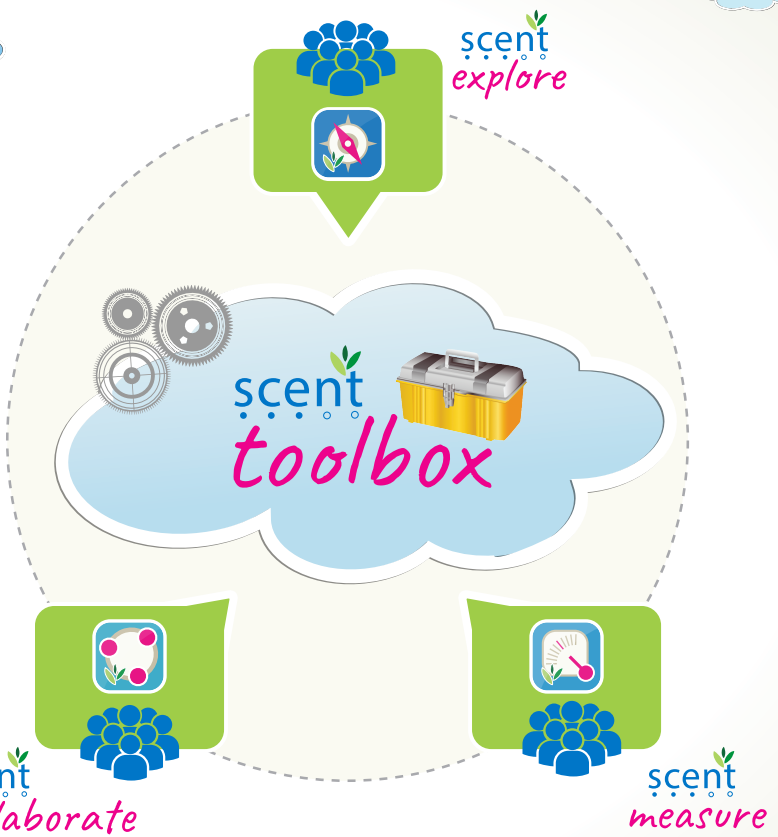
The details we collect are uploaded to the Scent Toolbox that combines and makes sense of it all. The data we collect is very valuable and helps the scientists understand how and why our landscapes are changing. These changes could create big problems over time, but we believe that the problems can be avoided if we gather enough information to identify and stop them before they cause destruction. Scientists use the data we collect to help protect the environment for example by making better flood risk maps and sharing the data with international databases so that anyone in the world can use it!

Scent is all about getting everyone involved in shaping the Bigger Picture!



Why should we care about our environment?

There are many reasons for us to protect the environment we live in!

Here are just a few examples to think about ...

1 Keep the environment happy by keeping it clean!

It's fun to be outdoors playing sports, go to the beach, walk the dog and play with our friends. But we don't want our favourite places to be polluted and full of rubbish. Breathing dirty air and swimming in dirty water can even be dangerous, both for ourselves and for animals and plants. That's why it's important to keep our neighbourhoods clean.

WHAT CAN *YOU* DO?

Make sure you don't leave rubbish lying around, pick up litter if you find some, recycle it or put it in the bin; avoid plastic bags as they are harmful to fish.

2 Fight against global warming and climate change by reducing your carbon footprint!

Even small changes in the Earth's temperature can lead to big problems for plants, animals, humans and the environment. Extreme weather conditions including dangerous storms, droughts and floods have become more common. We humans are responsible because our activities have caused greenhouse gases to be released into the atmosphere to warm up the climate.

WHAT CAN *YOU* DO?

Try to keep your carbon footprint as small as possible. Plant a tree – it will absorb some of the greenhouse gases in the atmosphere; ask your parents to cycle and use more public transport, and leave the car at home, and avoid unnecessary flights.

3 Save Planet Earth's natural resources by reducing, reusing and recycling!

There's a limited supply of resources on our planet, and we need to conserve them and be careful so that we don't run out. .

REDUCE
REUSE
RECYCLE

WHAT CAN *YOU* DO?

Reduce, reuse and recycle. Save water by turning off the tap while you are brushing your teeth. Bring your own water bottle and refill it instead of repeatedly buying new ones. Recycle plastics, metal, glass and cardboard at home and in school. Turn off the light when you leave the room to save electricity

the scent challenge

TAKE PART IN

THE SCENT CHALLENGE

AND

BECOME A CITIZEN SCIENTIST!

Next time we will ask you to draw a map of your environment!

We would like to get a clear picture of your local environment and we need your help.

01

Your teacher will divide you and your classmates into teams of 4-5.

When you know who is in your team, sit down with them and choose a location you would like to draw in your school outdoor environment, for example part of your school yard, a local park, forest or garden.

Ask your teacher if the location you have picked is suitable.

02

What do you think you will find in that area?

What animals, plants, buildings, hills, obstacles, paved areas, litter, etc.?

What do you think the area will look like in 50 years, i.e. what will change?

03

Next time, you will be able to go out into that location and draw everything you see there. Draw a map as detailed as possible of the microenvironment you have chosen. Include all animals, plants, buildings, hills, litter, paths etc. that you see.

Your group and the other groups will put together pieces that together will create the bigger picture.

Glossary

Biodiversity: the number and types of plants and animals that exist in a particular area or in the world generally.

Carbon footprint: the total amount of greenhouse gases that we cause through our activities.

Citizen science: science done by ordinary people, often for or with the help of scientists.

Climate change: changes in the world's weather, in particular the fact that it is believed to be getting warmer as a result of human activity increasing the level of carbon dioxide in the atmosphere.

Delta: an area of low, flat land, sometimes shaped like a triangle, where a river divides into several smaller rivers before flowing into the sea.

Greenhouse effect: an increase in the amount of gases in the atmosphere, that causes gradual warming of the surface of the earth.

Greenhouse gas: a gas that causes the greenhouse effect, especially carbon dioxide.

Land cover: refers to the physical cover on the land, for example water, vegetation, urban infrastructure, bare soil or other.

Land use: shows how people use the land, for example for recreation, wildlife habitat, agriculture or mixed uses.

UNESCO World Heritage site: a place that is listed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as having special cultural or physical significance.

Source: *Cambridge Dictionary*