



SOILS ON THE GOLF COURSE

 9-11 years  20-30 minutes per station

Introduction

Golf courses are community green spaces that provide recreational and environmental benefits to local areas. Golf courses are large parcels of land covered with turf, trees and other vegetation. Collectively, they provide wildlife habitat, improve air quality, reduce noise and dust, absorb and filter surface water, recharge ground water supplies, and in many cases, are used to reclaim and restore environmentally damaged sites.

For greenkeepers it is important to know the type of soil found on the golf course. Different soil types contain different minerals, levels of organic matter and nutrients which affect how the turf and other vegetation grows. It also affects how much water is retained in the soil. Water quickly drains away from soils containing a lot of sand. Whereas soil containing a lot of clay retains water and quickly becomes water-logged. Based on the soil type on a golf course, greenkeepers might grow certain plants or take steps to increase or decrease the soil's water retention.

In this session pupils are introduced to different soil types containing high levels of the minerals found in soil: clay, sand and silt. They are going to feel them and then investigate how easily each soil type allows water to pass through it.

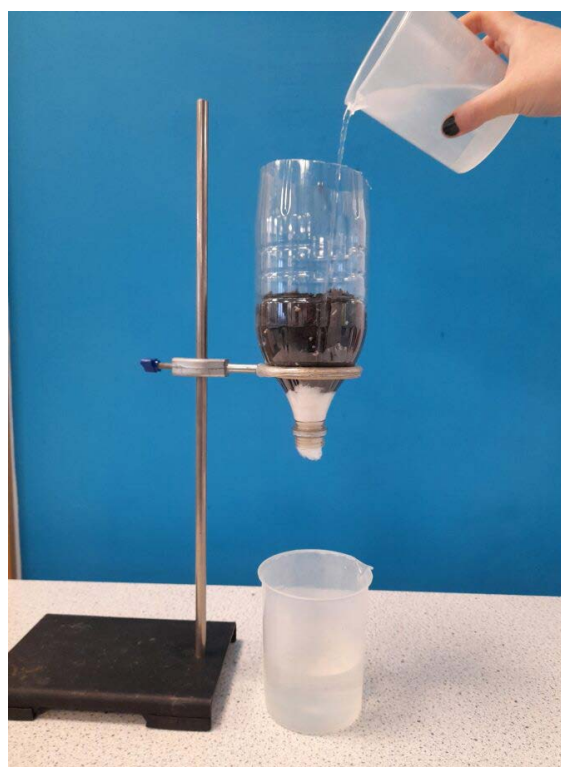
Pupil Learning Objectives

By the end of the session pupils will be able to

- » state that soil contains minerals, water, organic matter, air and microscopic organisms
- » name the three main minerals found in soil: clay, sand, and silt
- » make a simple soil filtration device to test how well water is retained in different soil types

What is needed for the session

Item	Who will provide it
3 buckets of different soils — with different levels of clay, sand and silt	Golf course
Empty plastic litre bottles with the bottom cut off and the neck of the bottle plugged with cotton wool or equivalent. (See photo below)	Golf course
Soil sieves (1 per 2/3 pupils)	Golf course
Trowels/large spoons to move soil	Golf course
Sources of water (large container or a tap)	Golf course
Plastic containers/jugs for pupils to collect water from tap and when passed through filter	Golf course
Dust pan and brush for cleaning up	Golf course
Mop/towel to mop up water spills	Golf course
Squeegee	Golf course
Stop watch (optional for extension)	Golf course/school
Hi-visibility jackets for all pupils (not essential)	School
Pencil and clipboard for every pupil (not essential)	School
Printed worksheet for each pupil (only if using worksheets as agreed with school)	Golf course
Wet wipes and a bag for rubbish	Golf course



What the greenkeeper needs to do

Prior to the session, fill 3 buckets with different types of soils (ideally clay, sand and silt). Fill one of the plastic bottles with one of the soil samples.

Activity	Equipment	Questions to ask
1. Ask the pupils to feel the 3 different soils and describe what they can feel.	» 3 buckets of different soils	What can you feel?
2. Show the pupils the soil sieve and show them how to sieve the soil. Give the sieves to the pupils and let them sieve the soil. Get them to sieve the different soil types and describe what is different about each type. Explain to the pupils that soil is made up of minerals, organic matter (dead plants and animals), water, air and microorganisms. (Some of the pupils might see these things as they look at the soil.) Explain that there are 3 mineral types found in soil: sand, clay and silt.	» Soil sieve	What happens when you sieve the soil? What differences can you see in the different soil types?
3. Show the pupils the plastic bottle filled with soil and explain that this will enable us to see how water moves through the soil. Demonstrate how you add the water slowly so that it does not spill.	» Plastic bottle » 3 buckets of different soils » Water in a container	How does the water move through the soil? What could affect how the water moves through the soil?
4. Get the pupils in small groups (group numbers will depend on how many plastic bottles you have). Give each group a plastic bottle and get them to fill it with soil from one of the buckets and then pour water into the top. Ask them to observe what they see.	» Plastic bottle » 3 buckets of different soils » Water	Compare with another group that have used a different soil sample, how the water flows through the different soils. Which soil type lets water pass through more quickly?
5. (Optional) Pupils repeat the process but this time they place three different layers of soil into their plastic bottle and see how this affects the flow of water through each layer of soil. Once the pupils have drawn their conclusions, tell them that sand allows water to drain through quickly, but clay does not. Silt is in between sand and clay. Discuss some of the advantages/disadvantages of each soil type. For example, clay becomes water-logged when it rains a lot, sandy soils dry out very quickly which may not be good for plants.		Which type of soil do you think is best for a golf course?
6. Explain to the pupils that when there is a lot of rain, some areas of the golf course, where there is a lot of clay in the soil, may become waterlogged because the water does not drain away easily. When this happens on a green, the water can be moved by using a large squeegee	» Squeegee	How do you think any surface water is moved off the green?
7. Get pupils to wipe/wash hands at the end	» Wet wipes	

Key words

You may have to explain some of these words as pupils will not be familiar with them. Check that pupils know their meaning before using them too much.

clay

sand

turf

sieve

micro-organisms

soil

mineral

silt

organic matter

Lesson extension activities

Pupils could make predictions about how fast the water will soak through the different soils. If more time is available pupils could investigate more carefully how well each soil type retains water by using the same volume of water for each soil type and time how long it takes for water to appear from the bottom of the bottle.

Ask pupils to suggest which soil types would be best for different parts of the golf course.

Also get pupils to describe how the different weather conditions might affect the soil types.

Support activities

Some pupils could be sensitive to handling soil. If this is the case, make sure there are small spades available for moving the soil.

Information for the teacher

National Curriculum links

England

- » Recognise that soils are made from rocks and organic matter.

Wales

- » Study a comparison of the features and properties of some natural and made materials

Scotland

- » Through evaluation of a range of data, I can describe the formation, characteristics and uses of soils, minerals and basic types of rocks.

Northern Ireland

- » Pupils are learning about some of the plants in a chosen habitat

Additional Resources that could be used to follow up the session

Click on the links below to access

- » [Rocks: rocks and fossils \(Soil detectives section\)](#)
- » [Do plants need soil to grow.](#)

Worksheet:

Soils on the Golf Course

Date Golf Course

Pupil Name

Please answer the questions below while participating in the session.

<p>Name the 3 different minerals found in soils?</p> <p>1.</p> <p>2.</p> <p>3.</p>	<p>Name the 5 items soil is made from</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p>
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What did you notice when the water soaked through the different soil types?

Sample 1 Type of soil	Sample 2 Type of soil	Sample 3 Type of soil



Why might one area of a golf course get lots of puddles after it has rained and another does not get many puddles ?

Draw the plastic bottle filtration equipment and explain how it works

Risk Assessment:

These are suggested risks, you will probably want to add some of your own.

School Name School Representative

Golf Club Name

Greenkeeper Name Date of Visit

What are the hazards?	Who/what is at risk?	What needs to be done to avoid accidents?	Who is to action?
There will be moving cars in the car park	Pupils	<ul style="list-style-type: none"> » Inform pupils that they must follow instructions when leaving the minibus » All pupils to wear high visibility jackets whilst on the golf club (if the school requires) 	Teacher Greenkeeper
Pupils might get lost from the rest of the group	Pupils	<ul style="list-style-type: none"> » All pupils to wear high visibility jackets whilst on the golf club (if the school requires) » Teacher to count pupils in every time they move between areas 	Teacher
Being hit by a golf ball	Pupils Teacher Greenkeeper	<ul style="list-style-type: none"> » Inform pupils that there are some areas of the golf course that may be dangerous, therefore they need to avoid » All pupil to wear high visibility jackets whilst on the golf club (if the school requires) 	Teacher Greenkeeper
Pupils will be handling soil	Pupils	<ul style="list-style-type: none"> » Pupils must wash their hands after the session » Tell pupils to keep their hands away from their mouth 	Teacher Greenkeeper
There will be other adults around the course	Pupils	<ul style="list-style-type: none"> » Pupils to be told to report to the teacher if they have any concerns 	Teacher Greenkeeper
Pupils will be handling water which may make the floor slippery if it is spilt.	Pupils	<ul style="list-style-type: none"> » Tell pupils to carry the water with care and if any is spilt to let the greenkeeper know so it can be cleaned up. 	Teacher Greenkeeper

