



COOL TOOLS ON THE GOLF COURSE

 9-11 years  20-30 minutes per station

Introduction

Technology is increasingly used on golf courses, just as it is in everyday life. Greenkeepers rely heavily on new tools in maintaining the greens to create optimum putting surfaces. The most important part of the golf course is the green, where golfers spend 40% of their time. Greenkeepers use technology to make sure the green is in perfect condition daily. They need to meet the demands and high expectations of the golfers to deliver very smooth surfaces for players' golf balls to roll along.

In this session the greenkeeper will show pupils some of the tools that they use and how they work. Pupils will also get the opportunity to use some of the tools under supervision.

Pupil Learning Objectives

By the end of the session pupils will be able to

- » name tools used by greenkeepers and explain what they do
- » use a soil probe to collect a soil sample
- » use a moisture meter to measure the moisture in different parts of the green
- » use a stimpmeter to measure the speed of a green (Optional as covered in more detail in activity 10 – How far does the ball roll?)
- » understand the difference between a reel and a rotary mower

What is needed for the session

Item	Who will provide it
A putting practice area or green	Golf course to identify
Putting golf club	Golf course
Golf ball	Golf course
Stimpeters (Optional)	Golf course
Reel mower	Golf course
Rotary mower	Golf course
Golf hole cutter	Golf course
Prism, soil probes and a macroscope	Golf course
2 x 20p coins	Golf course
Ruler	Golf course
Moisture meter	Golf course
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

What the greenkeeper needs to do

Prior to the session, identify a suitable area for the activity. It needs to be a green or practice area. Have some of your cool tools ready either on the area or very close by. (Some or all of the examples given here can be used if available.)

Activity	Equipment	Questions to ask
1. At the start tell the pupils that a golf course has different parts and they are standing on a putting green, but there are other areas called fairways. Ask the pupils if they have ever seen the grass in a lawn being cut. If they have, ask them how the grass was being cut and the tools that were being used. Explain to the pupils that where they are standing is a type of lawn called a green where a particular type of golf shot called 'putting' is used. Demonstrate putting.	<ul style="list-style-type: none"> » Club for putting » Golf ball 	How do you think the grass in the lawn in a garden/park/football pitch may differ from the grass on a golf green?
2. Get the pupils to look at and touch the grass and describe what it looks like and how it feels. Briefly explain how long it takes to get the grass on golf greens to grow this way.		<p>What does the grass look and feel like?</p> <p>How much time do you think it takes to get the grass on the green to grow like this?</p>

Activity	Equipment	Questions to ask
<p>3. Ask pupils to estimate the length of the grass. Show the pupils how long the grass is by placing 2 x 20p coins on top of each other. This is the length that the grass is cut. Use a ruler to show them the length in mm.</p>	<ul style="list-style-type: none"> » 2 x 20p coins » ruler 	<p>How long do you think the grass is on the green? Is the grass length longer or shorter than you expected?</p> <p>Why do you think the grass on a golf green is so short?</p>
<p>4. Show pupils how a prism works and why it is used. A prism is used to measure the height of the cut. Let pupils get down and look through the prism so they can see the height of cut; discuss how it is used.</p>	<ul style="list-style-type: none"> » Prism 	<p>How do you think the prism is used?</p>
<p>5. Show pupils the differences between a reel mower (7 – 14 blades) and a rotary mower (1 blade and spins horizontally) and how they cut. Speak about the mower maintenance, and how sharp the blades must be to make a clean cut.</p>	<ul style="list-style-type: none"> » Reel and rotary mower 	<p>What is the difference between the 2 mowers?</p>
<p>6. Show pupils the moisture meter and explain why it is an important tool for greenkeepers to measure the percentage of moisture in the soil. Take several readings on the green and discuss your findings. Talk about how it is used to measure water levels in the soil and then how this is used to decide how much water to add to the green. Greenkeepers are environmentally conscious, so want to conserve water by not over-watering the green and only watering when needed. Let pupils take some readings at different locations and discuss why there may be different percentages of moisture.</p>	<ul style="list-style-type: none"> » Moisture meter 	<p>Why is important to know how much moisture is in the green's soil?</p> <p>How often do you think the greenkeeper tests the soil moisture?</p> <p>Why is the percentage of moisture different at different locations on the green?</p>
<p>7. Discuss how and why a soil probe is used. Take two samples, one on the green and the other off the green. Show the differences between the grass height and the root length. Show pupils the root zone material and discuss how the quality of the roots affects growth.</p>	<ul style="list-style-type: none"> » Soil probe » Soil 	<p>What is the role of roots in plants?</p> <p>What is the difference between the grass on the green and the grass away from the green?</p>
<p>8. Show a macroscope and explain how it is used on the green. Macroscopes allow the greenkeepers to look at the health of the plant. They also can identify any diseases in the turf and check to see if the mowers are cutting properly. Let pupils look at a soil sample through the macroscope.</p>	<ul style="list-style-type: none"> » Macroscope 	<p>What can you see through the macroscope?</p> <p>Why is it important to identify diseases in the grass?</p>
<p>9. (Stimpeters are covered in activity 10 – How far does the ball roll? so you may choose to look at Stimpeters in that activity instead.) Show pupils how to use a Stimpeter and explain how it is used to check the speed of a golf ball on a putting green. Discuss how it is used to ensure consistency of golf ball speed on the putting greens throughout the golf course.</p>	<ul style="list-style-type: none"> » Stimpeter 	<p>Why does the speed of a golf ball on a putting green need to be consistent across the golf course?</p>

Activity	Equipment	Questions to ask
10. Show the pupils one of the holes on the green and ask how they think it is made? Demonstrate how to make a hole. Get one or two of the pupils to help you.	» Hole cutter	<p>How do you think the holes on a green are made?</p> <p>Why do you think greenkeepers move the hole on a green?</p>

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.

Stimpmeter

rotary mower

reel mower

moisture meter

soil probe

macroscope

green (in the context of a golf course)

fairway

putting

Information for the teacher

This session is focused on careers and shows some of the tools that greenkeepers use, how they work and what they do. It highlights the variety of skills needed to operate the tools. The links to the National Curricula will depend upon the equipment you show the pupils. Below are some possible links with the equipment they apply to in brackets.

National Curriculum links

England

- » Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment (prism/moisture meter/Stimpmeter)
- » Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (mowers)
- » Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye (prism)
- » Identify the effects of air resistance, water resistance and friction, that act between moving surfaces (Stimpmeter)
- » Recognise that environments can change and that this can sometimes pose dangers to living things (moisture meter)

Wales

- » Pupils should be given the opportunity to study the environmental factors that affect what grows and lives in an environment (moisture meter)
- » Pupils should use and develop their skills, knowledge and understanding by investigating the science behind everyday things, e.g. toys, musical instruments and electrical devices, the way they are constructed and work. (mowers)

Scotland

- » Makes observations and collects information and measurements using appropriate devices and units. (prism/moisture meter/Stimpmeter)
- » I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. (moisture meter)

Northern Ireland

- » Pupils learn how forces can affect the movement and distance objects can travel (Stimpmeter)
- » Pupils learn how light shines through some materials (prisms)
- » Pupils learn how knowledge in science supports technological inventions (all equipment)

Additional Resources that could be used to follow up the session

Click on the links below to access

- » [Plant parts including roots](#)
- » [Total internal reflection in prisms \(This is how prisms are used to measure grass height.\)](#)

Worksheet: Cool tools on a golf course

Date Golf Course

Pupil Name

Please answer the questions below.

Name four tools that are used on the green at a golf club

Select one of the tools you have been shown and describe:

- » how it works
- » what it is used for
- » If you want use a diagram to help your description

Why is the grass on a green different to the grass on a fairway?

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 pupils to wear high visibility jackets whilst on the golf club (if the school requires) 	Teacher Greenkeeper
The tools we are looking at can be sharp	Pupils	<ul style="list-style-type: none"> » Ask pupils to follow instructions » Ask pupils to observe rather than touch the tools which contain sharp edges » Where pupils are able to use a tool this must be done under close supervision. 	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