



Cool Tools on the Green

*This lesson plan is designed to go with our YouTube video, “Tech on the Golf Course.”
The video <https://youtu.be/yeh8uKTjqa4> should be viewed as part of the preparation for this lab.*

Technology is increasingly used on golf courses, just as it is in everyday life. Golf course superintendents rely heavily on the 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% their time. Superintendents and their crews use cool 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.

Student Learning Objectives

- 1. Describe what a prism gauge is and how it is used.**
(A prism gauge is used to measure the height of the cut and to show superintendents how well the mowers are cutting.)
- 2. Explain the differences between shoot heights in relation to root length on different areas of a golf course such as fairways vs the putting green.**
(Golf greens are mowed very short and turf grows mostly on a sand base with a small amount of soil. Fairways grow on a soil base and are let grow longer.)
- 3. Demonstrate how a soil probe is used and explain why it is important to superintendents.**
(A soil probe is inserted into the turf and pulls a sample of the turf and underlying soil. It is the fastest way to be able to see the root health, length, and thatch content as well as moisture amount of the soil.)
- 4. Describe how a moisture meter works and why it is important tool on a green.**
(Moisture meters are inserted into the turf with sensors that measure and display the percentage of moisture in the root zones of different areas of the green. They are helpful in knowing how much water the green needs on a daily basis.)
- 5. Explain why Stimpeters are important to superintendents for greens maintenance.**
(A Stimpeter is used to check for the consistency and speed on a green and throughout the golf course. This is important so that all greens on the course are the same speed for golfers.)

6. **Explain why superintendents use a macroscope.**
(Macroscopes allow superintendents to take a closer look at the blade of grass to be able to identify possible diseases and see if the mowers are cutting sharply and evenly.)
7. **Describe the differences between a reel and a rotary mower.**
(Reel mowers have 7-14 blades that spin on a shaft like a wheel. Reel mowers are very precise and can be set down to very low heights of cut. Rotary mowers have 1 blade that spins around horizontally. These are the same mowers that homeowners use.)

Student Worksheet Questions

Review the worksheet questions with students at the beginning of the lab and at the end. The work-sheet may also be printed out for students to complete as part of the field trip.

1. Name four tools that are used on the green and explain how they are used on the green.
2. Explain the relationship between shoot heights and root length as it relates to height of cut.
3. What is a soil probe used for and what results can be obtained from its use?
4. Why and how is a moisture meter used?
5. Explain the differences between a reel and a rotary type mower.

Field Trip Requirements

- Choose a putting green for this lab
- 2 quarters (2 x \$.25)
- Rotary mower
- Reel mower
- Prism, 2 soil probes, Stimpmeter and a macroscope
- Moisture meter
- Printed copies of student worksheets

Field Trip Activity Outline

1. The instructor should start the lab by asking students if they have ever been on a golf green. Or, have they ever mowed a lawn? Students will have several answers to share. Ask students if they think their lawn is different than the grass they are standing on.
2. Ask students to feel the turf on the green. What does it feel like? Is it truly real? Talk to them about the time it takes to maintain a green and what goes into it.
3. Stack two quarters (which shows the approximate green cutting height) and show to the students. Ask kids what they think their home lawn length might be.
4. Show and tell students about how a prism works and why it is used. A prism is used to measure the height of the cut. Let students get down and look through the prism so they can see the height of cut; discuss how it is used.
5. Show students 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. Golfers, who spend 40% of their time on a putting green, are very particular. They expect a perfect surface which requires considerable maintenance activity at the golf course.
6. Show students the moisture meter and explain why it is an important tool for superintendents 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 in the soil and how much irrigation might be necessary that day. Superintendents are environmentally conscious about not over watering and only watering when needed. Let students take some readings at different locations and discuss why these may be different percentages of moisture.
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 students the root zone material and how it affects growth. Students can also look at the moisture content of the samples and check to see if there any thatch present. Explain how excessive thatch affects putting green surfaces.
8. Show a macroscope and explain how it is used on the green. Macroscopes allow the superintendents 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 students look at a soil sample through the macroscope. What are they seeing?
9. Show and explain a Stimpmeter and how it is used to check for consistency and speed throughout the golf course. Show students how you use it and why it is an important tool for managing greens speed on the course. Let students take turns and measure the distances and compare measurements.

Wrap and Review Together

Ask students if they have any questions about what they learned.

1. What are four cool tools that are used on a green and how and why are they used?
2. What is the relationship between grass height and root length?
3. What is a soil probe used for and what does it tell a superintendent?
4. Why is a moisture meter used?
5. What are the differences between a rotary mower and a reel mower?

Other good questions at closing of the lab:

1. How many would like to learn how to play golf?
2. What was the coolest take-away from this lab?

Lesson Extensions for Older Students

In groups of 4 or 5

- Have students measure and write down their findings from moisture gauge readings on different areas of the green. Ask the students to explain these differences.
- Test the Stimpmeter on different areas of the green for consistency and compare.
- Use the prism gauge on different parts of the green and compare findings.

Remember to get some pictures of kids. Check thefirstgreen.org for necessary release forms.

