



# HOW FAR DOES THE BALL ROLL?

 9-11 years  20-30 minutes per station

## Introduction

The green is where the hole and the flag are situated. Golfers want the grass in this area to be short and as consistent as possible, so that when they try and putt their ball into the hole it travels smoothly. They also want a golf ball to travel at the same speed on all the greens on a golf course. To measure the speed of the greens, greenkeepers use a Stimpmeter. Stimpmeters work on the basis that the distance travelled by a golf ball from the Stimpmeter gives an indication of the speed of the surface of the green. The value a Stimpmeter produces is not the actual speed of the ball on the green. (Please note that pupils may have already been introduced to Stimpeters in activity 2 'Cool tools on the golf course'.)

**In this session pupils will investigate the distance a golf ball will travel on different grass surfaces using Stimpmeters made from pipes. (Please note that pupils in the UK work in metric rather than imperial units.)**

## Pupil Learning Objectives

**By the end of the session pupils will be able to**

- » describe the affect of the length of the grass on the distance a golf ball travels
- » design and carry out a fair test to work out the distance a golf ball rolls on different surfaces
- » calculate the mean of a range of results

## What is needed for the session

Item	Who will provide it
A putting practice area	Golf course to identify
Stimpeters	Golf course
Metre lengths of half pipe (1 between 2)	Golf course
Golf ball and putter between 2	Golf course
Irrigation flags or pegs	Golf course
Calculators (one between 4)	School
Metre rulers or tape measures (one between 4)	School or 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	Golf course

## What the greenkeeper needs to do

Prior to the session, identify a suitable putting practice area.

Activity	Equipment	Questions to ask
1. Demonstrate to the pupils how to use a putter to hit a golf ball. Give each pair of pupils a putter and a golf ball and let them try putting around the practice area to get an idea of how fast and how far the ball rolls.	» Putter and golf ball between 2	What factors make the golf ball roll further?
2. Explain to pupils that the length of the grass will influence how fast and how far the ball rolls. Let them try putting on different surfaces — greens, fairway, temporary greens.	» Putter and golf ball between 2	How do the different surfaces affect how the ball rolls?  What else could affect the speed of a golf ball on the greens? Water, frost
3. Explain to the pupils that golfers spend a lot of time on the green and need the surface to be as smooth and consistent as possible. One partner should putt the ball towards their partner and see how close they can get without hitting their feet.	» Putter and golf ball between 2	Can you hit the ball the same distance each time you putt?
4. Show the pupils how a Stimpeter works and explain that this score informs golfers about how fast a golf ball travels on the greens. (Please note a stimpeter does not give the actual numerical value of the speed of the golf ball on the green. It works on the basis that the distance a ball travels gives an indication of the speed. The further the distance travelled on the green surface the faster the green is deemed to be.)	» Stimpeter » Golf balls	Could you make your own Stimpeter? What would you need?  What does a higher Stimpeter reading tell you about the speed of a golf ball on a green compared to a green with a lower Stimpeter reading?

Activity	Equipment	Questions to ask
5. Ask the pupils how they would calculate the mean of a set of values. Some pupils may know how to do this. If not, show the pupils how to calculate the mean by adding values together and dividing by the number of values.	<ul style="list-style-type: none"> <li>» Calculators</li> <li>» Metre ruler/tape measure</li> </ul>	How do you calculate the mean?
6. Ask pupils to place a flag at 3m and hit 3 putts each as close to it as possible. Get them to measure the distance from the ball to the flag for each putt and then calculate the mean for all the putts.	<ul style="list-style-type: none"> <li>» Calculators</li> <li>» Metre ruler/tape measure</li> <li>» Irrigation flags</li> <li>» Putter and golf ball between 2</li> </ul>	How close to 3m were you able to putt?
7. Show the pupils the half pipes and ask how they could be used as a Stimpmeter. Give each pair 5 minutes to design a fair test to investigate how far a golf ball will travel on different surfaces.	<ul style="list-style-type: none"> <li>» Metre ruler/tape measure</li> <li>» Half pipes</li> <li>» Golf balls</li> </ul>	<p>Can you use the half pipe to create a fair test to investigate how far a ball travels on different surfaces?</p> <p>Which will you keep the same in your investigation? (golf ball, pipe used, angle of pipe to the green, starting point of the ball in the pipe)</p> <p>What are you going to measure? (distance travelled by the ball)</p> <p>What are you going to change? (the surface the ball travels along)</p> <p>How many results will you obtain?</p> <p>How will you present your results?</p>
8. Let the pupils perform their fair test and record their results onto the worksheet	<ul style="list-style-type: none"> <li>» Metre ruler/tape measure</li> <li>» Half pipes</li> <li>» Golf balls</li> <li>» Different grass surfaces (e.g different parts of a green, fairway)</li> </ul>	What did you find out?

## 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**

**putter**

**average**

**speed**

**mean**

**fair test**

**variable**

**putt**

## Lesson extension activities

Pupils could be encouraged to calculate the actual speed of the ball on a green by timing how long it takes a golf ball to travel a set distance on a green and then dividing the distance travelled by the time taken.

## Support activities

Pupils could be given a prepared result table for the investigation to record their results (see extra worksheet)

# Information for the teacher

## National Curriculum links

### England

- » I can calculate and interpret the mean as an average.

### Wales

- » I can find and use the mean of a simple set of data to explain how the statistics do, or do not, support an argument

### Scotland

- » I can find the mean, median, mode and range of sets of numbers, decide which type of average is most appropriate to use

### Northern Ireland

- » I can understand, calculate and use mean and range

## Additional Resources that could be used to follow up the session

Click on the links below to access

- » [What is an average? – Census at school](#)
- » [Video Use of a stimpmeter – United States Golf Association \(please note this uses imperial rather than metric units\)](#)

# Worksheet:

# How far does the ball roll?

Date ..... Golf Course .....

Pupil Name .....

Please answer the questions below while participating in the session.

<p><b>What do greenkeepers use to look at the speed of a green?</b></p>	<p><b>What factors could influence the speed of a green?</b></p>	<p><b>Why is it important to know the speed of a green?</b></p>
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**Place your marker at 3m and have 3 putts each to get the ball as close as possible to the marker.**

Measure the distance from the marker to the golf ball in metres after each putt in the table below.

<p><b>Player 1</b></p> <p>1.</p> <p>2.</p> <p>3.</p>	<p><b>Player 2</b></p> <p>1.</p> <p>2.</p> <p>3.</p>	<p><b>What is the mean for both players?</b></p>
<p><b>Mean</b></p>	<p><b>Mean</b></p>	

**Design your fair test to investigate how far a gold ball rolls on different surfaces**

**Method**

What are you going to do? Use a diagram to help. (Use more space on the next page if you need).

What factors will you keep the same?

What will you measure?

What will you change?

How many results will you record?



## Design your fair test to investigate how far a gold ball rolls on different surfaces (diagram)

### Test results

How can you present your results and any calculations?

### Conclusion

Which surface did the ball travel furthest on?

Why do you think the ball travelled furthest on this surface?

# Extra worksheet

	Distance ball rolls from the bottom of the stimpmeter (in metres)			Calculate a mean (Add up the 3 values and divide the total by 3)
Surface	Result 1	Result 2	Result 3	
Inner green				
Outer green				
Fairway				

Which surface did the ball travel furthest on?

Why do you think the ball travelled furthest on this surface?



# 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"> <li>» Inform pupils that they must follow instructions when leaving the minibus</li> <li>» All pupils to wear high visibility jackets whilst on the golf club (if the school requires)</li> </ul>	Teacher Greenkeeper
Pupils might get lost from the rest of the group	Pupils	<ul style="list-style-type: none"> <li>» All pupils to wear high visibility jackets whilst on the golf club (if the school requires)</li> <li>» Teacher to count pupils in every time they move between areas</li> </ul>	Teacher
Being hit by a golf ball	Pupils Teacher Greenkeeper	<ul style="list-style-type: none"> <li>» Inform pupils that there are some areas of the golf course that may be dangerous, therefore they need to avoid</li> <li>» All pupils to wear high visibility jackets whilst on the golf club (if the school requires)</li> </ul>	Teacher Greenkeeper
There will be other adults around the course	Pupils	<ul style="list-style-type: none"> <li>» Pupils to be told to report to the teacher if they have any concerns</li> </ul>	Teacher Greenkeeper
Pupils being hit by a golf club	Pupils	<ul style="list-style-type: none"> <li>» Explain to pupils how to use the putters safely with no back swing</li> </ul>	Teacher Greenkeeper

