Pitches have changed in many ways since 1863, when the rules of football were first written down:

- The maximum length of a pitch used to be 183 metres. Today it is 105 metres.
- Originally there were no markings for the penalty spot, the penalty box, the D, the halfway line and the centre circle.
- Goals used to be just two upright posts. Then a tape was hung between the posts. Later a crossbar was introduced, and later still a net was added to avoid doubt over scored goals.

One thing, however, has stayed the same: the surface of the pitch. Football has always been played on grass.

In this lesson we are going to discover why grass is one of the most amazing plants in the world. Not only is grass crucial to football and many other sports, it has also changed the course of civilization.

Weed on!
GRASS IS CLASS

Grass is one of the oldest types of plant. Scientists think it was growing around 100 million years ago, during the age of the dinosaurs, because they found five types of grass in a dinosaur’s fossilized poo. Stinky business!

GRAZE CRAZE

Some of the most common foods we eat are grasses, such as wheat, maize, rice and oats. We eat the seeds of these grasses, which we call grains. In fact, the discovery that we could grow grasses for their grains was the moment that humans stopped being hunter-gatherers, moving from place to place, looking for food. Instead we became farmers, based in the same place, tending our fields and storing grains for use all year round. This was the beginning of villages, towns and eventually cities.

Animals like cows, horses, sheep and deer are grass-eaters too. In fact, the word “graze”, which we use to describe how these animals eat, means to eat grass.

This means that grass is an important food for humans in two ways. First, as something for us to eat, and second as something for the animals that we eat to eat. The process by which plants (such as grass) are eaten by animals (such as cows) which in turn are eaten by other animals (such as humans) is called a food chain.

All grasses have similar characteristics. They all have a hollow stem and usually leaves, or blades, which are long and thin and relatively rigid. Some grass leaves are so sharp they can cut human skin.

Grass comes in many varieties. There are about 10,000 different species, including short grass that we use on lawns and long grass that grows higher than a house.

Grasses are long-lived. Some species of grass can live for hundreds of years.

Grass is versatile. It will grow on pretty much every habitat on Earth, including hot deserts, rainforests and cold mountains.

Grass is everywhere! You will find it on all the world’s continents, even Antarctica. In fact, up to 40 per cent of all the land in the world is covered in grass.

MULTI-GRASSING

Bread comes from wheat, which is a grass, and sugar comes from sugar cane, which is also a grass. So if you are having a sandwich and some orange squash while watching a football match, you are eating, drinking and watching grass at the same time!
Grass isn’t just for eating. In the form of lawns, it has become an essential part of people’s gardens. Ben loves mowing the lawn at the weekend, although his lines tend to be a bit wonky. Alex’s are much straighter! The first lawns were grassy fields that surrounded English castles, which were kept short, either by cattle grazing on them or by workmen who used sharp-bladed tools called scythes. The grass had to be kept short so enemies could be spotted approaching the castle.

By the 1800s having a grass lawn around your house had become a sign of wealth, because you could only have a lawn on your land if you were able to pay workmen to cut it with scythes. Using a scythe was slow and laborious work, and a big lawn required a team of scythe-wielding men. Expensive!

But all this changed thanks to Edwin Beard Budding, an inventor who was asked by a clothing factory to find a way of cutting off all the tufty bits of cloth from soldiers’ uniforms. He invented a machine with a rotating device that cut off the tufts. He realized his invention could work on grass … and in 1830 he invented the lawnmower.

The lawnmower made it cheaper and easier to maintain a lawn. The Budding Mower became a bestseller, and changed our gardens forever.

One of the loudest songs sung at Chelsea matches is the children’s nursery rhyme “One Man Went to Mow”. Fans think it was introduced by a Chelsea fan called Mickey Greenaway, who played a nursery rhyme tape of the song while Chelsea were playing a friendly match in Sweden in 1981. Chelsea fans all sang along and eventually the chant made it back to Stamford Bridge.

Grass is different from other plants because the leaves grow from the bottom of the stem. This means it can withstand being eaten from the top and also being trampled on. It is this resistance that makes it perfect for football pitches. Unlike other plants, it doesn’t die when it’s stamped on.

Even though the blades of some grasses can be really sharp, other species are very soft. Softer grasses are ideal for sport as the plant will act as a cushion when players fall over. Even the best artificial football pitches are not as soft as a well-tended grass pitch.
TURF WAR

Just as English castle-owners hired people to maintain their lawns, so do football clubs. Football pitches require a lot of attention to be at their best. We wanted to find out more, so we visited a club with a cutting-edge reputation and the man who has helped make it.

Leicester City surprised everyone when they won the 2015/16 Premier League title. It wasn’t the only award they took home that season though: because of the brilliant pitch at their King Power Stadium and the pitches at their training-ground, the club won Professional Football Grounds Team of the Year. We can only imagine the sheer delight at the club! The grounds team celebrated by mowing diamond shapes into the pitch on the final day of the season, with a star inside each diamond. It was a perfectly symmetrical pattern and celebrated the Foxes’ double success in style. “It was like drawing a big dot-to-dot picture,” the head grounds manager, John Ledwidge, told us.

Leicester have become well-known in football for their original pitch patterns. On Remembrance Sunday in November 2016, an image of a poppy was mowed into the pitch. But the team lost 2–1, so they might not want to remember it now!

Ledwidge wanted to mow an image of the Champions League ball into the centre circle before European matches, but was forbidden by UEFA, the European governing body. They say that for Champions League games the grass has to be mowed in straight lines. Ledwidge is always coming up with wacky design ideas. He might even mow the Football School crest into our pitch if we ask nicely!

GREEN FINGERS

Ledwidge’s skill is in creating patterns even though grass is just one colour: green. He can shade the green by mowing the grass in different directions: grass bent away from the mower will appear lighter and grass bent towards the mower will appear darker. He gets deeper contrasts between the greens by using a roller which flattens the grass even more. “We try to be as creative as we can within the framework of only using dark green and light green,” he says. “We are all mad scientists really!”
In order to create the perfect pitch, every day Ledwidge puts a stick called a moisture probe around fifteen centimetres under the surface to check moisture levels. The probe contains sensors that tell him how much water the grass needs that day. In other words, he is asking the grass how thirsty it is.

Every month, he also takes soil samples to check the levels of nutrients. So he’s asking how hungry the grass is! Ledwidge then creates a special mixture, based on what he discovers, to spray on the grass.

In summer the grass needs more water to keep it hydrated – just like a player – while in winter it needs nutrients like iron and potassium to strengthen it. Ledwidge even adds liquefied sugar and seaweed to the spray to keep the grass healthy. Apparently Manchester City put garlic in their grass spray. Not good if a team of vampires ever play there!

**LEDWIDGE’S GREAT GRASS FACTS**

- **In summer we can mow the pitch up to three times per day.**
- **2,000 litres of paint is used every year to mark out the pitches (seven at the training-ground and one at the stadium).**
- **We walk 7.5 miles every time we cut the pitch with a mower alone.**

**PITCH PERFECT**

We see the grass on top of the pitch, but this is what’s happening below it:

- **GRASS 25mm**
  For playing football on!

- **SYNTHETIC GRASS 180mm**
  Fake grass made of synthetic fibres is stitched into a mixture of sand and soil. This helps bind the grass roots.

- **PURE SAND 200mm**
  To help drainage and prevent waterlogging, as the water moves down from the grass to the roots.

- **GRAVEL CARPET**
  Where the pipes for draining away the water are kept.
HOW DOES YOUR GARDEN GROW?
The length of grass on a pitch or sports field depends on what you want the object in the sport to do. For example, in rugby the ball does not touch the ground, so the grass will be longer than in other sports. Some sports need even longer grass:

<table>
<thead>
<tr>
<th>SPORTS PITCH</th>
<th>GRASS LENGTH (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cricket wicket</td>
<td>0</td>
</tr>
<tr>
<td>Golf putting green</td>
<td>2–3</td>
</tr>
<tr>
<td>Bowling green</td>
<td>4.5</td>
</tr>
<tr>
<td>Tennis court</td>
<td>8–12</td>
</tr>
<tr>
<td>Football pitch</td>
<td>25–30</td>
</tr>
<tr>
<td>Rugby pitch</td>
<td>30–50</td>
</tr>
<tr>
<td>Horse racing track</td>
<td>60+</td>
</tr>
</tbody>
</table>

GEOGRAPHY QUIZ

1. What grass-related song do Chelsea fans sing?
   - b) “One Man Went to Mow”
   - c) “Green Grass Grows all Around”
   - d) “How Does the Grass Grow?”

2. Why is grass green?
   - a) It’s not. It’s blue!
   - b) The sun paints it green every night
   - c) So grasshoppers can jump around without being seen
   - d) Grass produces a pigment called chlorophyll, which reflects green light

3. Rotting plants are eaten by flies, which are eaten by spiders, which are eaten by mice, which are eaten by foxes. But what might eat a fox in this food chain?
   - a) Duck-billed platypus
   - b) A fly
   - c) A unicorn
   - d) A bear

4. Which country’s league introduced a rule in 2016 saying the grass needed to be greener in order to appeal more to fans and sponsors?
   - a) Spain
   - b) Russia
   - c) China
   - d) Greenland

5. What was unique about the lawnmower that English lower-league club Forest Green Rovers started using in 2012?
   - a) The players built it from scratch
   - b) It was solar powered and used by a robot
   - c) The manager’s 8-year-old son was hired to mow the pitch
   - d) It painted pitch markings at the same time

LORNE MOWER

Star Pupil

Stats

- Thickness of hair: 50mm
- Daily water intake: 4l
- Rotary blade power: 100w
- Longest rendition of “One Man Went to Mow”: 84 men
- Birthplace: Grasse, France
- Supports: Grasshopper Club Zurich (Switzerland)
- Favourite Player: Rob Green
- Trick: Cutting it fine

66 Turs

guys come first! 99