DATA SCIENCE

Data is important in football. It is used before the game to measure athletic performance and manage training programs. Data is also used during the game to track the number of passes or goal attempts.

Data on football players and games has also been used to create the FIFA$^{©}$ video games. Think of all the statistics that help you decide your team as a manager in real life or in a computer game.

Some players' data is in the stadium:

Matches: **Goals:**

Estimate the correct percentage from the options below that represents the proportion of goals scored to matches played for each of the players in the table below.

Tip: Think about what 1% and 10% of the number of matches would be.

2% / 8% / 21% / 54%

NAME	MATCHES	GOALS	%
ELLIOT	61	5	
CAREY	646	15	
MURRAY	426	91	
ATYEO	645	351	

Maths for the Match

On your tour of Ashton Gate Stadium, see how mathematics is all around us.

Maths effects our everyday lives. Think about the possibility of scoring a goal or the buildings we use or even the design of footballs.

This work is made possible by:

FUTURES
A FESTIVAL OF DISCOVERY

Unlock the answers, give feedback and find more information here:

ROBINS FOUNDATION

FUTURES
A FESTIVAL OF DISCOVERY

University of BRISTOL

Think about the material that the pitch is made from, what can you see?

The pitch is made from plastic grass *and* real grass – they are a **hybrid** working together. Scientists have researched the best surface for football players to use.

Plastics are a very useful group of materials as they can be made into many things.

If we cut a core from the pitch it would look like the picture below:

FOOTBALL PITCH
NATURAL GRASS ROOTS
PLASTIC "ROOTS"
GRAVEL
STADIUM GROUND

The type of plastic used in the grass is the same material used for the chairs, in water bottles and in the carpet in the stadium hallways.
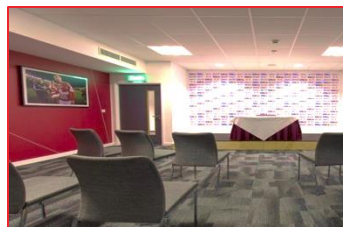
Look up in the stadium. Can you see what the roof is made from? We can see that the back end of the roof is **fixed** in place, and the other end is 'floating' **free**.
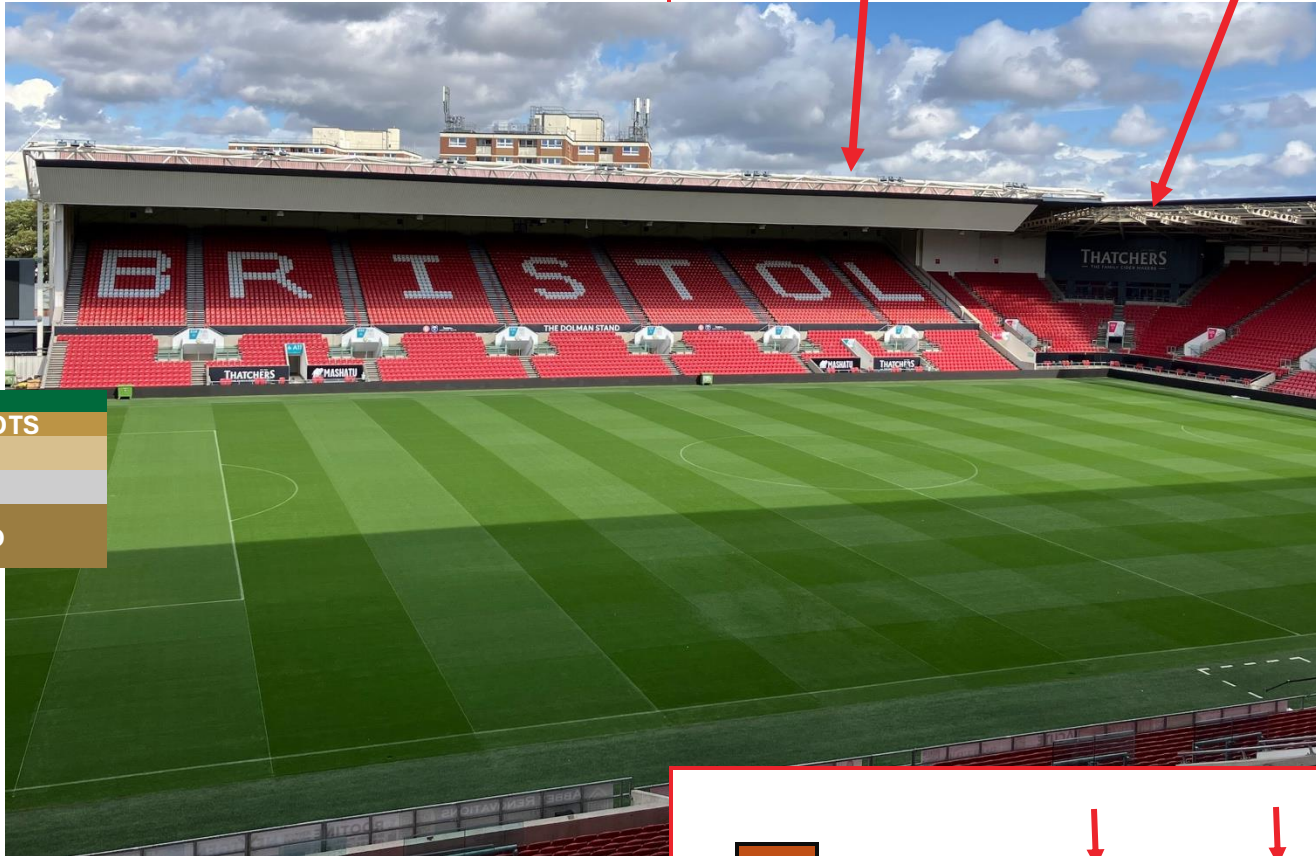
We call this a **cantilever**. We can think of the roof as a beam with forces acting on it.
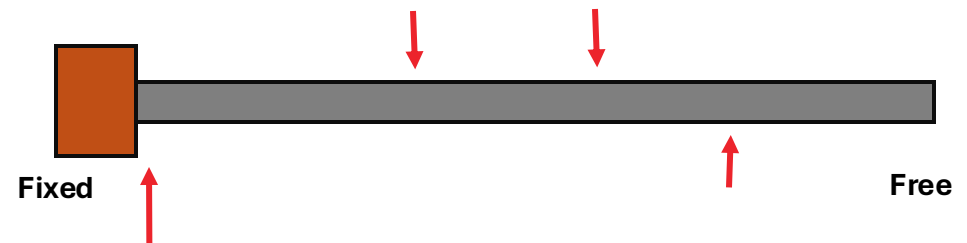
Can you label the arrows below with the forces?

Reaction Force

Lift from wind

Snow load

Weight of the roof

**Fixed**   **Free**

The structure must be stiff enough to not bend under the forces. Can you sketch above what shape the roof would be if it was too weak?

Maths for the Match

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Maths effects our everyday lives. Think about the possibility of scoring a goal or the buildings we use or even the design of footballs.

Match the maths words below to the picture.

goal structure

ball path

low probability of scoring

kick angle

ball inflation
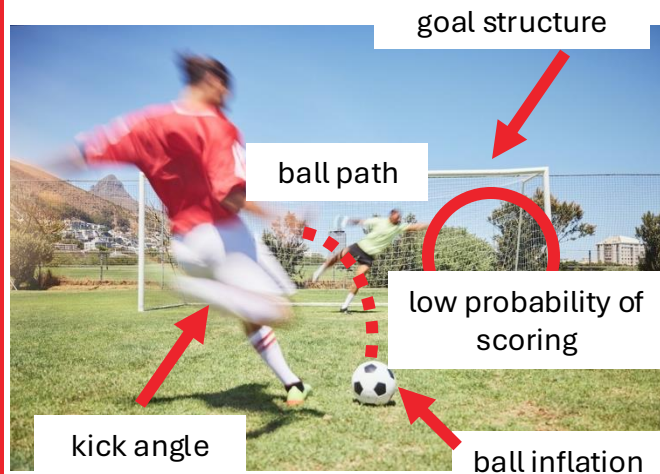
This work is made possible by:

FUTURES
A FESTIVAL OF DISCOVERY

FUTURES Festival is a fun, FREE event happening this Autumn!

One special event is in **Bristol**, at the **Up Late @ SS Great Britain**. Come along for a fun, evening adventure on the famous ship, the S.S. Great Britain. You can explore exciting exhibits, take part in hands-on activities, and listen to cool talks. You'll get to see how researchers from the University of Bristol are working to make life better for everyone.

Unlock the answers, give feedback and find more information here:

ASHTON GATE STADIUM TOUR

Maths for the Match

BRISTOL CITY
1894

ROBINS
FOUNDATION

FUTURES
A FESTIVAL OF DISCOVERY

University of BRISTOL

DATA SCIENCE

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Some players' data is in the stadium:

Matches: 👕   **Goals:** ⭕

Estimate the correct percentage from the options below that represents the proportion of goals scored to matches played for each of the players in the table below.

Tip: Think about what 1% and 10% of the number of matches would be.

2% / 8% / 21% / 54%

NAME	MATCHES	GOALS	%
ELLIOT	61	5	**8%**
CAREY	646	15	**2%**
MURRAY	426	91	**21%**
ATYEO	645	351	**54%**

MATERIALS

Think about the material that the pitch is made from, what can you see?

The pitch is made from plastic grass *and* real grass – they are a **hybrid** working together. Scientists have researched the best surface for football players to use. If we cut a section from the pitch it would look like the picture below:

| FOOTBALL PITCH |
| NATURAL GRASS ROOTS |
| PLASTIC "ROOTS" |
| GRAVEL |
| STADIUM GROUND |

Plastics are a very useful group of materials as they can be made into many things.

The type of plastic used in the grass is the same material used for the chairs, in water bottles and in the carpet in the stadium hallways.

True or False

Hybrid grass needs lots of water. (_**F**__)

It mixes natural grass and plastic. (_**T**__)

It's used on farms for animals. (_**F**__)

It's good for football fields. (__**T**_)

STRUCTURES

Look up in the stadium. We can see that the back end of the roof is **fixed** in place, and the other end is **free**.

We call this a cantilever. We can think of the roof as a beam with forces acting on it. Can you label the arrows below with the forces?

Weight of the roof   *Snow load*

Fixed   **Free**

Lift from wind

Reaction Force
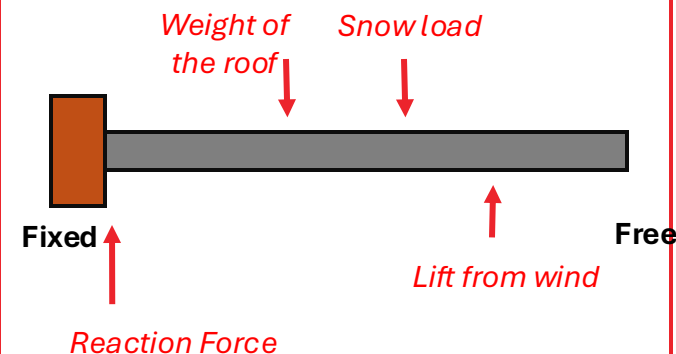
The structure must be stiff enough to not bend under the forces. Can you sketch what shape the roof would be if it was too weak?

Football Inflation	Surface	Number of Bounces
A: Soft	Hard Floor	5
A: Soft	Hard Floor	6
A: Soft	Astroturf	3
A: Soft	Astroturf	4
B: Hard	Hard Floor	10
B: Hard	Hard Floor	11
B: Hard	Astroturf	8
B: Hard	Astroturf	9