

**Directions:**

1. Read the article.
2. As you read, annotate using a **combination** of the following system:
  - a. Circle and define unfamiliar words,
  - b. Underline/highlight important info,
  - c. Use “?” and ask a question,
  - d. Use “!” and show your reaction confusion/resolution, questions, and
  - e. Draw arrows to connect ideas.
3. Identify T.A.R.P.S. on the last page.
4. Write a 1+ page reflection in your “AoW” section of your Writer’s Notebook.

**Super Bowl 50: How wearable tech is changing the NFL**

Source: Libby Plummer/Wearable/February 6, 2016

Like most other major sports, the NFL is currently enjoying a wearable technology explosion that's changing the game. As the players walk out to contest the 50th Super Bowl on Sunday, their training, preparation, tactics and plans will have been influenced by technology like never before.

From on-field tracking to improved safety and tactical HUDs, wearables are ushering a new era of football. Not only does this help coaches to get the best out of the players by monitoring their stats on the field and in practice, it also offers fans unprecedented insights into the game.

The stat-heavy nature of American football is why NFL works so well as a fantasy league compared to other sports and one of the reasons why it's important for fans to have access to this kind of in-game performance data.

On the eve of one of the world's greatest sporting events, here are the wearables dominating football.

**VICIS football helmet of the future**

Developed in collaboration with the University of Washington, the futuristic Zero1 football helmet from Seattle-based startup Vicis is designed to combat concussion.

One of three winners of the Head Health Challenge tech competition run by the NFL, Under Armour, and GE, the new design is intended to totally replace the league's existing headgear. The now outdated protective wear was originally based on motorcycle helmets and designed to prevent skull fracture, but not concussion.

While keeping the cracked cranium-busting build in place, the new helmet's outer shell buckles on impact before returning to shape, reducing the acceleration of a hit on the player's head. Players will begin to wear the Zero1 in the upcoming season.

**Army Research Laboratory tether system**

Another winner of the NFL's Head Health Challenge, the U.S. Army Research Laboratory came up with the simple yet potentially life-saving innovation that tethers the player's helmet to their shoulder

pads in order to prevent concussion.

The clever researchers developed a material that stretches when pulled slowly, but stays rigid and resistant to the sudden acceleration caused by collisions on the field of play.

This means that players can move around easily during the game without the tether restricting their movements, but in the event of collision with another player or the ground, the system jumps into action to lessen the chance of any brain injury.

### **VR headsets**

Virtual Reality is steadily revolutionising the way NFL players train thanks to headsets like the Oculus VR and Google cardboard.

Dallas Cowboys were one of the first teams to get involved with VR behind the scenes, using Oculus headsets and StriVR Labs software for immersive training. Players watch pre-recorded scrimmages filmed by players sporting 360-degree cameras, helping them to prepare for similar scenarios in future games.

Several teams in the league, including the New York Jets and Arizona Cardinals, have now signed up to use StriVR as an integral part of training.

There's also been plenty of experimentation with VR to enhance the fan experience. In December 2015, 10,000 Google Cardboard headsets were handed out to fans at Gillette Stadium prior to the Patriots' game against Philadelphia Eagles so that they could partake in a 360-degree version of the home team's training sessions.

### **Pivothead smart glasses**

In the run up to Super Bowl 50, Denver Broncos wide receiver Emmanuel Sanders attended a press conference wearing a pair of mystery specs that turned out to be Pivothead smart glasses. When quizzed on his unusual glasses, Sanders said: "NFL Network is doing something and they want me to wear the glasses and you're pretty much getting recorded...".

Pivothead specs are designed for live streaming and sport a tiny built-in camera with a Sony CMOS sensor to capture footage and stills, so the NFL is clearly upping its game when it comes to POV footage.

The Broncos recently teamed up with CrowdOptic, a company that builds software for wearable devices with the aim of streaming footage of the players before the game.

### **Catapult trackers**

Founded in Australia, Catapult Sports is one of the biggest suppliers of athletics tracking tech in the sports world. The company's gadgetry is used by a quarter of all NFL franchises, along with 10 college football teams and is used primarily for preventing injuries. The Jacksonville Jaguars were the first team in the NFL to team up with Catapult.

**Name:**

**Hour:**

**AoW15**

GPS trackers around the size of a small mobile phone are worn by the player, usually on the back using a chest harness, although some teams have sewn special pockets into the back of training tops.

By monitoring key data, coaches can monitor players' work rates and inform game rotations and practice schedules. The technology can also be used to safely rehabilitate injured players.

### **GoPro**

As NFL players wear helmets, the sport is well suited to player cams, which can be integrated into their head gear to help coaches with tactics and provide 'player cam' POV for the fans.

Several teams in the league, such as the Cincinnati Bengals, have already started using GoPro cameras in training, while New York Giants wide receiver Odell Beckham Jr - and the man responsible for one of the most amazing one-handed catches ever made - wore a GoPro during training for last year's Pro Bowl and has since recorded a video on 'How to make the perfect catch' while tooled up with numerous GoPros.

GoPro recently renewed its first major sports league deal, after signing up as official partner to the NHL in 2015. Could the NFL be next on the list?

### **Reebok CheckLight**

Produced in conjunction with tech company MC10, Reebok's concussion-busting skullcap was designed to tackle one of sport's most dangerous problems. American Football has worryingly high concussion - not surprising, given the physical nature of the game.

CheckLight aims to keep players safe by using multiple sensors to capture head impact data during play. A green light indicates a low impact, yellow indicates a moderate hit, while a red light means a heavy impact - giving an indication of when a player needs a medical check before returning to the field.

### **Zebra Shoulder Pad Censors**

Zebra is the catchily dubbed 'Official On-Field Player-Tracking Provider' of the NFL and brings the playbook into the 21st Century by capturing high-speed player data. The stats can be used by coaches to adjust their game and to give fans an insight into what's happening on the field.

NFL players literally have a chip on their shoulders thanks to Zebra's RFID sensors which are worn on their shoulder pads. These sensors send data which is picked up by 'receivers' that are placed around the stadium. Sensors can also be worn by officials or attached to objects like the first down marker.

Sensors were used inside balls for the first time in last year's Pro Bowl, though they're currently unable to detect air pressure, something that may have helped during the famous 'Deflategate' controversy.

### **Biostamp**

MC10 is currently working on the Biostamp which uses existing tracking technology squeezed into a

**Name:**

**Hour:**

**AoW15**

tiny plaster-like wearable device. The almost-invisible gizmo tracks temperature, movement, heart rate and more.

Because of its unobtrusive nature, the Biostamp is being touted as the future of fitness tracking. MC10 is well placed to ensure that Biostamp is a gridiron success, not least because the man in charge of consumer products at the tech firm - Isaiah Kacyvenski - is a former NFL linebacker who was the highest draft pick in Harvard history when he started out at the Seattle Seahawks.

At CES 2016, MC10 introduced a wearable UV sensor patch developed for cosmetics firm L'Oreal.

## **Google Glass**

As mentioned above, the Broncos also used CrowdOptic's tech prior to the 2015 AFC Championship game with fans on the sidelines wearing Google Glass to share virtual high-fives with the players and with fans outside of the stadium.

Former NFL punter Chris Kluwe was the first (and possibly only) pro footballer on the Google Glass Explorer programme and he believes that AR is important for the future of sports, even giving a TED talk on the subject.

His vision is a clear visor that projects the next play in front of the player's eyes, while an integrated Glass-style camera would provide valuable player insight for the coach and a cool POV for the fans.

The Philadelphia Eagles were reportedly the first team to test out Glass for in-game use and although Google Glass as we know it was ditched last year, it's likely that Google Glass 2, which is due to land in 2016, will see plenty more experimentation in the NFL.

## **Microsoft Surface Pro**

In 2013, Tech giant Microsoft signed a five-year deal to supply to the NFL with Surface Pro tablets. Though not strictly a wearable, the Surface has been kitted out especially for use on the sidelines, complete with a rugged case with a wearable hand strap. Each team is supplied with 25 Surface Pros, 13 of which are used on the sideline during each game.

All consumer software is stripped away leaving just the Sideline Viewing System app which allows coaches to review images from plays almost instantly, along with the X2 concussion detection app which includes symptom check lists and self-assessment tests for players to log how they're feeling after a potentially dangerous collision.

The recent Pro Bowl was once again used to test out video replays for players and coaches on the sidelines. This will also be tested in 2016-17 preseason games, but there's no word on whether it will be approved for use in regular season games.

The tablets ran into trouble during the 2016 AFC Championship game when the New England Patriots' tablets stopped working, inevitably resulting in the hashtag #tabletgate to trend on Twitter. Microsoft later claimed that it was down to a network issue, rather than a problem with the tablets themselves.

Name:

Hour:

AoW15

T – What is the **topic** of the article?

A – Who is the **author** of the article?

R – Who would want to **read** this article? Why?

P – What is the **purpose/point** of the article? (Think beyond “to inform”)

S – **Summarize** the article using 8 words.

Write a 1+ page reflection in your “AoW” section of your Writer’s Notebook one of the following prompts:

- What are your initial thoughts/feelings about the wearable technology in the NFL? Do you think wearable technology is a good idea or a bad one? Why?
- Do you think the information obtained from wearable technology is cheating? Do you think there should be limits to the type(s) of technology players can wear? Why or why not?
- Should there be a cutoff for the level (NFL, NCAA, high school, etc.) of American football that can use wearable technology? Why or why not?

#### AoW Article Rubric

	5 pts	4 pts	3 pts	2 pts	1 pt	0 pts
Annotations	Annotations throughout the article.	X	Some annotations throughout the article.	X	X	No annotations.
T.A.R.P.S.	All T.A.R.P.S. are correct.	4 out of 5 T.A.R.P.S. are correct	3 out of 5 T.A.R.P.S. are correct	2 out of 5 T.A.R.P.S. are correct	1 out of 5 T.A.R.P.S. are correct	0 out of 5 T.A.R.P.S. are correct