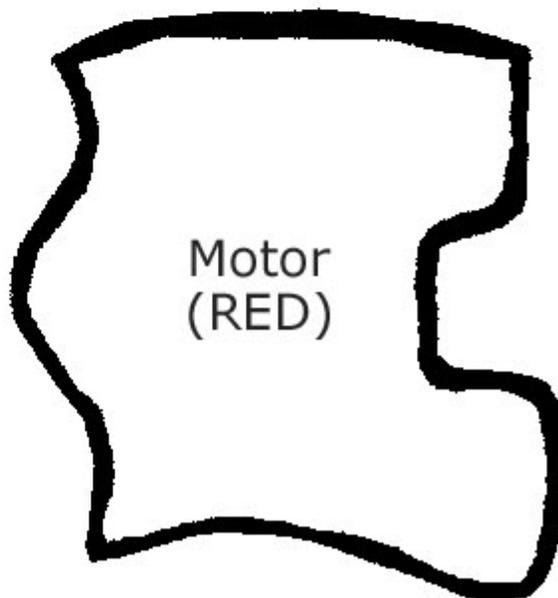
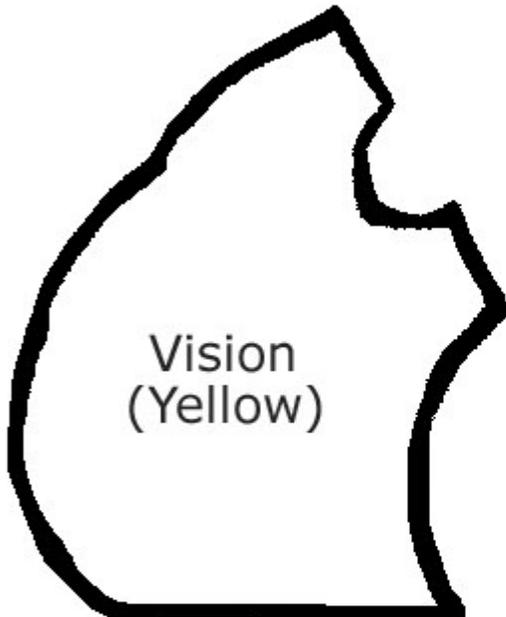
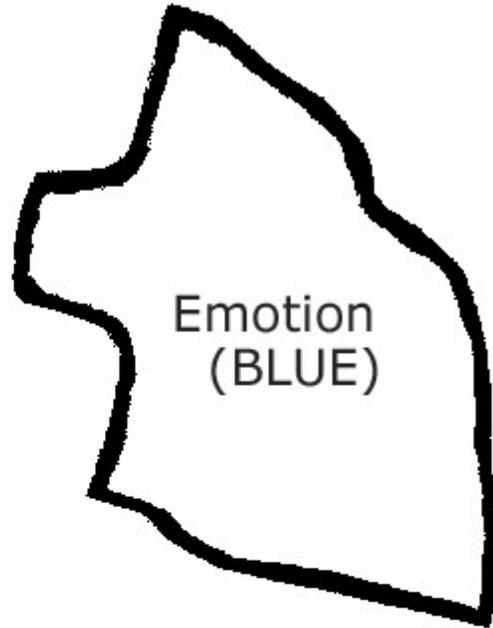


Memory  
(Green)

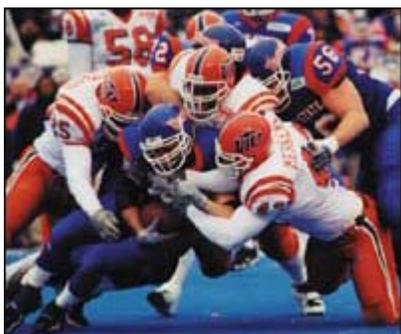
Speech  
(Orange)

Sound  
(White)

Others  
Senses  
(Purple)



## NASA Goes To The Super Bowl



There's nothing more down to Earth than a good old-fashioned game of football, some say. The Super Bowl is the perfect example of simplicity, right? Think again. Advanced technology figures into almost everything we do, and athletics is no exception. At the Super Bowl, you may not see the defense wearing space suits, but there *is* an element of aerospace research being used by just about every player on the field.

Take the helmets, for instance; the padding in the helmets was developed from NASA research, and the plastic in the shell is the same material used by astronauts on space walks. When it comes to the rough-and-tumble game of football, helmets are one of the most crucial pieces of safety equipment. Having well-padded headgear is essential to the safety of athletes involved in the game.

The move to use NASA technology dates back to the late 1960s. NASA Ames Research Center in California developed and tested a foam product that would be commercially marketed as Temper Foam, and was used for the protective padding of airplane seats.

Temper Foam is polyurethane plastic foam with several special qualities. It takes the shape of impressed objects, but springs back to its original shape, even if it's been compressed by over 90 percent. It conforms to body shape, evenly distributing weight over the entire contact area for comfort. It also absorbs up to 90 percent of impact shocks and becomes firmer after being subjected to sudden impact. In testing, a 3-inch thick pad could absorb all the energy from a 10-foot fall by an adult.

Besides airplane seats and football helmet padding, Temper Foam has been used for a variety of athletic equipment, including baseball chest protectors and soccer shin guards. In the medical field, the foam is used in wheel chairs to allow people to sit comfortably for longer periods of time.



That was in the 1970s. As time progressed, newer developments in safety foam served both NASA and the sports world well. Temper Foam, while still in existence, has been largely replaced—in airplane seats and in football helmets—with In-sullite foam.

While still enormously protective and cushioning, In-sullite is lighter weight than Temper Foam, and boasts a more rapid recovery rate. That is, the time it takes for the foam to regain its original size and shape is much shorter. Where Temper Foam might require 10



seconds to regain its shape, Insullite could be ready for its next encounter with a hard object in less than 1 second.



The outer shell of today’s football helmets is made from the same plastic material used in astronaut helmets. It’s a light-weight polycarbonate with the trade name of Lexan®. It helps reduce the impact of a tackle by spreading the force over a greater area of the head.

Astronaut helmets feature Lexan in the clear bubble part of the helmet assembly. Lexan is also used in the material for the helmet visors. When you see the astronauts’ faces through the helmet visor, you’re actually looking through two protective Lexan layers—one clear and one silver-coated.

Football players wear tough, lightweight pads and protective devices. Many of them are made with Kevlar, a material five times stronger than steel. It’s the same material used in bulletproof vests...and used to protect space vehicles from stray meteoroid collisions and jet engines from shrapnel.



NASA technology isn’t restricted to a football player’s uniform. Take a look in the stands. Depending on the weather, you might see a couple more examples of NASA technology used in down-to-Earth ways. Polarized sunglasses with scratch resistant and ultraviolet ray-resistant lenses were first developed for use in space vehicles. The Mylar thermal blankets that cold

sports fans huddle under were first used to insulate in space. Some stadiums (though not the New Orleans facility) have roofs built with the same fabric used in moon suits worn by Apollo astronauts. The Teflon-fiberglass fabric is lightweight, flexible, and waterproof. The material can expand with heat, contract with cold and won’t catch fire, and allows sun to shine through.



When it comes to sharing space technology with earthbound groups, NASA and professional football have scored a touchdown!

Lexan is a registered trademark of General Electric Corporation.

*Courtesy of NASA’s  
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