



# Exploring a New Technology

## WHAT IS VIRTUAL REALITY?



The term virtual reality is used different ways by many different people. Basically, virtual reality is used to describe an artificial three-dimensional environment created with computer graphics and simulation technologies. A computer modeling system lets a person interact with 3-D environments. Virtual Reality can also be viewed as a total immersion in another "world". Virtual Reality allows a person to do things they couldn't or wouldn't do in the real world. VR would allow you to experience hang-gliding, race-car driving, tour the solar system or explore the human body firsthand without leaving home.

Like many other technologies, the idea of Virtual Reality began first in science fiction stories - like the holodeck featured in *Star Trek: The Next Generation* where a crew member can visit another time and place. Some of the the first "virtual reality" uses were flight simulators for pilots to take "training missions." Many of the pilots who were involved in "Desert Storm" (a military operation in the Middle East in 1990) were trained using flight simulators.

## WHO USES VIRTUAL REALITY?

You probably have experienced a "version" of virtual reality if you have ever played video or computer games. But there are a lot of other applications of virtual reality. Not only is virtual reality used in the entertainment industry, it is also used in scientific research, medicine, architecture, engineering and lots of other occupations.



Many virtual reality designers use virtual reality to create buildings, objects, or scenarios on a computer to see what it will look like and what reactions might take place in different circumstances. The pictures are 3-dimensional so the designers can see all the sides of the object. Using virtual reality enables the designer to arrange and rearrange the parts of the design quickly, saving time, effort and money! If the virtual creation doesn't look right or something is wrong then the designer can fix it with a press of a button on the computer.

## WHAT ARE POSSIBLE USES OF VIRTUAL REALITY?

**Medicine** - Doctors can experiment with new techniques and ideas to help cure diseases, conduct surgery, see how germs react with various medications and treatments, and even explore the inner workings of the brain.

**Classroom** - Taking a trip to another part of the world, exploring the solar system, going inside a volcano - the sky is the limit! There would be lots of things that could be "brought to life" in the classroom and getting to experience it would be a lot more fun than reading about it!

**Ecology:** By simulating the spread of disease or other environmental concerns, scientists can predict and possibly stop potential disasters.

**Space Exploration:** Virtual Reality could allow scientists to explore the outer reaches of our galaxy - and even simulate life on other planets and learn what it would take to colonize Mars!

**Science:** Virtual reality systems could allow scientists to "zoom-in" on atoms and molecules to get a close up view of the reaction with germs and drugs, enabling the scientists to develop cures for diseases.



**HOW DOES A PERSON EXPERIENCE VIRTUAL REALITY?** To be immersed in a virtual reality world, you need interactive devices to send and receive information to the computer system. The input devices that can be used include goggles, gloves, bodysuits, earphones, remotes, and even your computer mouse! While using these interactive devices the computer can control three of your senses to give you the sensation of being in a different world. The three senses that are most effected are your sight, sound, and sense of touch.

When interacting with a virtual world, motion sensors give you a feeling of movement and can adjust the view according to your movements. By turning your head or stepping you can experience changing view points and perspective. Data gloves are equipped with force-feedback devices that give the sensation of touch. While using the gloves you can pick up and move objects in the virtual environment. The goggles track eye movement and responses and speakers give you the sense of being in the virtual world by providing sound. Sensory input is fed to the users through one of these devices. The hardware and software to create these virtual worlds is very expensive and is mostly used in research laboratories, but as the technology improves the price and availability of these tools will become easier to find for the average person.

### **HOW DO I BECOME A VIRTUAL REALITY DESIGNER?**

The best thing you can do is to be curious about how the world works! The next step would be to take lots of science, math, and computer classes. Most colleges and universities offer degrees in computer science, but not all offer degrees in virtual reality. So, you need to research what colleges offer this type of degree. This is a new and growing technology and could be the next step in the technology revolution!