

GPS 3D

Teaching the GPS System, astronomy, technology and science through 3D simulation

Lesson

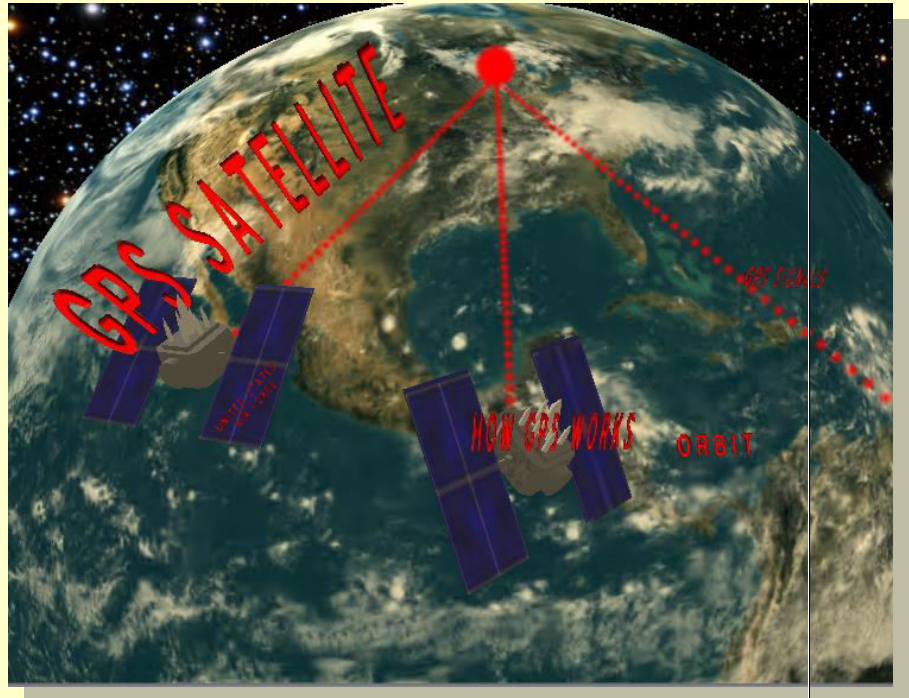
Teaching the GPS System, astronomy, technology and science through 3D simulation

Objectives

- 1) Students will gain a basic understanding of the GPS System through 3D simulation and visualization
- 2) Students will gain a deeper understanding of the components of the GPS System and how they function together

Activity

Students travel through the GPS System in real-time 3D, helping them to visualize and understand its structure and function



Materials

GPS 3D Homepage

(click or cut and paste URL into browser)

<http://www.sunrisevr.com/gps3d>

3D Simulation and Investigation

3D simulations are designed to make subject matter more engaging to today's technology-savvy kids, and help them bridge the gap between the "concrete" world and the abstract world of concepts. When students experience complex subject matter in real-time 3D it becomes clearer. Students learn best when they are actively immersed in subject matter from a variety of different viewpoints; 3D simulation is designed to help students visualize difficult ideas and objects through investigation at any scale (atomic, cellular, planetary, conceptual, etc), and doing things that would normally be impossible.

Required Technology

- PC/Tablet

Optional Technology

- Projector
- Multiple Computers
- Internet Connection

Grouping

- Large Group Instruction
- Small Group Instruction

Staging

Check computer/Tablet for Internet access if needed

Procedure

- 1) Access program
- 2) Pick a lead student navigator to control movement through the 3D environment
- 3) Pick a lead student reader to read information about the GPS System as it appears on-screen
- 4) Begin the lesson by asking students what they already know about the GPS System; write responses on the board
- 5) Review basic facts about the GPS System including:
 - GPS stands for Global Positioning System, a satellite-based navigation system comprised of a network of 24 satellites.
 - GPS satellites were first placed into orbit by the U.S. Department of Defense in 1978
- 6) Start traveling through the program, facilitate discussion by asking students where the class should go
- 7) Use the 3D simulation as a visual aid; explain information as needed
- 8) Have students pay special attention to:
 - How GPS works
 - GPS Signals
- 9) Have a final wrap-up with students with a question and answer period. Ask them why the GPS System was built, how it works, and what are the important parts of the system

Optional Activity: 3D Scavenger Hunt + Discussion

Have students find a particular part of the GPS System. If students are on multiple computers, have them “race” to the part of the GPS System the teacher wishes to highlight. Once students find/arrive at the location, the teacher may commence discussion. Repeat in other areas of the simulation as desired to build understanding.

Homework/Review

Students may also access the program outside the classroom to supplement textbook questions

Functional Notes

- The program is available on multiple platforms
- If using the program online, please ensure the Unity3D Player is installed on the computer; through the Internet Explorer Browser; download the latest at <https://unity3d.com/webplayer>.
- If you see something in **red** you can probably click on it
- For ease of use you can go through most 3D objects, and even the ground
- The school library can request and access programs (free) at www.sunrisevr.com for off-line use via PC and Mac if there is no internet connection