# (GIS) Trilateration

#### Summary

This lesson introduces GPS satellites and how they work. Radio waves and satellites help GPS users determine their position on Earth. Students will arrive at the conclusion that Venn diagrams are a form of trilateration.

#### Time Frame

3 class periods of 45 minutes each

## Group Size

Large Groups

Life Skills Thinking & Reasoning, Communication, Employability

Materials GPS Training Power point

## **Background for Teachers**

Read the information on How Stuff Works. Print out the printer friendly version if needed.

#### Student Prior Knowledge

Students should have seen models and photos of satellites and their position in space. Use JTrack for this. (Warning - Sometimes JTrack opens **behind** your open browser window.)

## Intended Learning Outcomes

This lesson is to be used in conjunction with several other lessons. The purpose of this lesson and the others is to prepare students to use GPS units to map their school or safe walking routes to school, etc. Before students use the technology they need to have some idea of how it works and where the information (radio waves) come from. Students will understand that they need to make contact with at least 3 satellites before finding their position on earth with the GPS and why.

## Instructional Procedures

This lesson will follow other lessons. Using the example of the city search on <u>How Stuff Works</u>, make 3 large circles from overhead transparancies. Start with one circle. Put several toys or other objects in the circle. (Mark the position of each toy to make it easier for yourself to be accurate)Give them no clues about the one you are thinking about. Then ask them to tell you what kinds of information would narrow it down for them so they could determine which item you want. Physical description and location will probably be some of the suggestions. When they get to location, put down the 2nd circle carefully setting the items in the same place they were before. This new parameter will narrow the search by limiting the location of the item you are searching for. At this point some of the students may recognise a Venn-Diagram format. They may suggest that you put down another circle of paper. If they don't make the connection yet, lead them there. Your strategy for laying out the items initially will pay off now because when you lay down the 3rd circle, there should be only one obvious choice.

## Extensions

The students should use the same overhead circles to do the activity with the cities that is listed on the <u>How Stuff Works</u> page (this activity has students using mileage to determine a particular city. Using the transparancy circles will facilitate the lesson.)

Students should also be challenged to create a similar problem of their own using a large map. Then they can work together as partner teams to see if they can solve each other's puzzle.

Bibliography

Authors

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