

**MAPS,  
SCHOOL BUSES  
AND  
CARBON  
EMISSION  
REDUCTION?!**



Using a Geographical Information System (GIS), virtually any kind of data can be placed on a digital map, then visualised, compared, measured, and analysed. For example, it may even guide you in how to go about reducing your school's contribution to harmful CO<sub>2</sub> emissions.

Here is an exercise which every class of the school should do.

The world is spewing out tons and tons of CO<sub>2</sub> gas, which is contributing to global warming, the gradual increase in the temperature of the Earth. This could lead to catastrophes like the melting of polar caps, rise in sea levels and floods if the emissions of greenhouse gases like CO<sub>2</sub> are left unchecked.

Greenhouse gases contribute to the greenhouse effect, which leads to global warming.



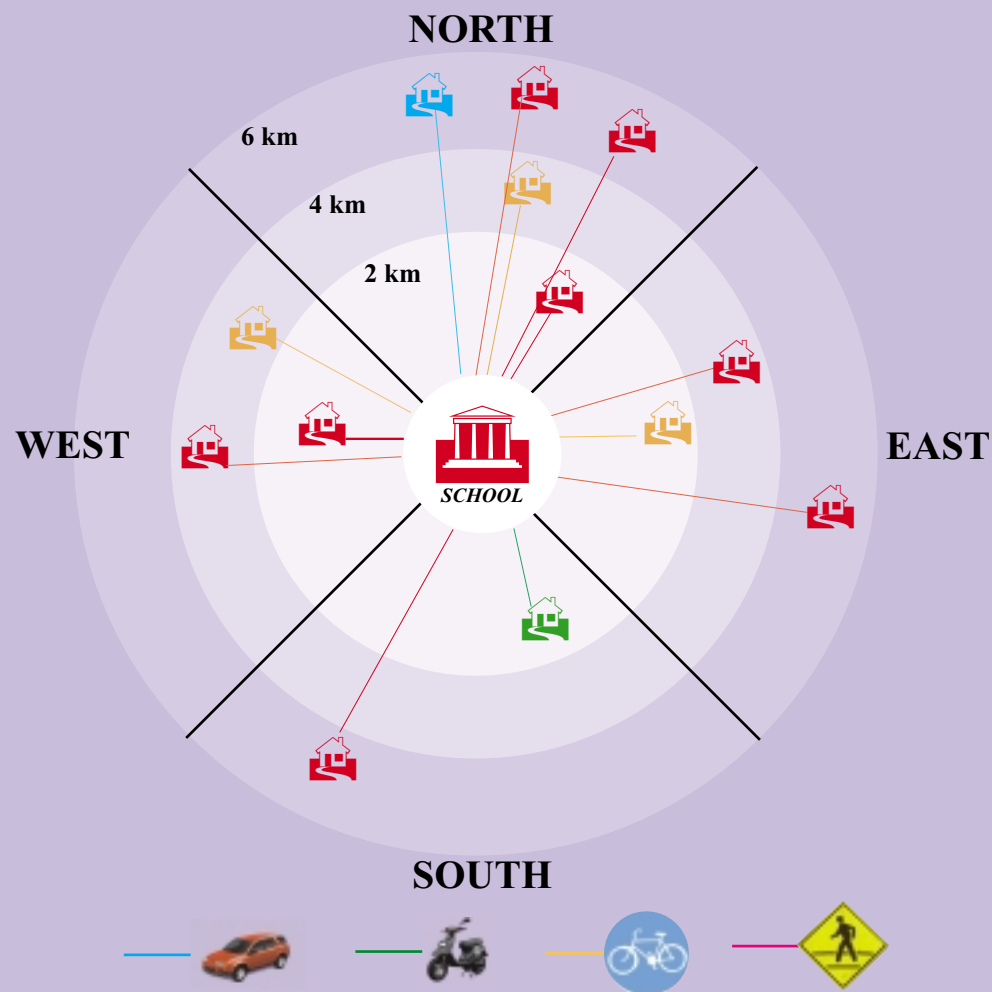
**HOW MUCH CO<sub>2</sub> DO YOU EMIT?**

How much you emit depends on how you travel.

**To know more about GIS check out these sites**

- ALL ABOUT GIS: [www.gis.com](http://www.gis.com)
- THE GIS DICTIONARY: [www.geo.ed.ac.uk/agidict/welcome.html](http://www.geo.ed.ac.uk/agidict/welcome.html)
- NOVEMBER 19 IS GIS DAY: [www.gisday.com/](http://www.gisday.com/)
- GIS JOBS: [www.gisajob.com](http://www.gisajob.com), [www.gisportal.com/gis3g.htm](http://www.gisportal.com/gis3g.htm)
- ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE: [www.esri.com/](http://www.esri.com/)
- GIS FREQUENTLY ASKED QUESTIONS: [www.census.gov/geo/www/faq-index.html](http://www.census.gov/geo/www/faq-index.html)
- GIS RESOURCES ON THE INTERNET: [sunsite.berkeley.edu/GIS/gisnet.html](http://sunsite.berkeley.edu/GIS/gisnet.html)

**A map with a view**



**Step 1**

Make a map like the one on your left with the school at the centre, four zones to mark the four directions from which the students come and successive rings to mark the distances.

**Step 2**

Start placing the students in the map depending on which direction they come from, how far they come and how they come.

For example, if a student's house is in the north at a distance of 5 kms and his parents drop him by car, then he'll be denoted by the blue house with a blue line. If another student stays in the south at a distance of 1.5 kms and comes by a two-wheeler, then he'll be denoted by the green house with a green line. And so on. Continue till you have mapped all the students in the class.

**Step 3**

List all the students and calculate how much CO<sub>2</sub> emissions each student contributes every day using the figures above (*How much CO<sub>2</sub> do you emit?*).

For example since the student in the blue house comes by a small car, which emits 150 gms/km, his mode of transport emits

$$150 \times 5 = 750 \text{ gms of CO}_2$$

Now do this for every student and the total will tell you how much your class contributes to CO<sub>2</sub> emissions worldwide just coming to class in a day!

**Now let's clear the smokescreen!**

**SOLUTION 1**

We can approach this problem by classifying the students according to the four zones. Calculate how much the emissions come down if **carpooling** is introduced in all four zones separately. That is if the student who lived the furthest in the north zone decided to pick up everyone on his route and in his zone on his way to school.

**SOLUTION 2**

Or you could approach the problem according to distances. Calculate how much the emission comes down if all the students who live in a 2 km radius **walk** to school, a 4 km radius **cycle** to school and the school hires four minibuses as **schoolbuses** to pick up the remaining students from the four directions and nobody came by any other mode of transport.