WILL MY LITTLE BIT MAKE A DIFFERENCE?

A look at household electricity usage.

RATIONALE

- This seemed like an interesting topic in which mathematics is used to calculate the effect that we, as individuals, have on the state of our world's environment.
- Is it our right to selfishly use as much fuel and energy as we please and to produce rubbish and other pollutants in large amounts without thought for future generations?

Will My Little Bit Make a Difference?

- This is a very large issue and it was important to keep it simple enough for Year 8 students to cope with.
- I made the decision to focus just on the household use of electricity.
- I am hopeful that we will also have time to introduce at least one of the other areas (water use, petrol consumption, garbage) next semester.

AIMS

- To show students some “real life” mathematics.
- To apply this maths in a socially responsible context.
- To personalise the maths to the students.
- To motivate the students to see the relevance of mathematics.
- To increase their awareness of their own power to make a difference.

ORGANISATION

- Unstreamed Year Eight class.
- Initially one lesson a week.
- 5 lesson block in computer room during Year 11 and 12 exams.
- Initial stages of project were completed individually.
- Final stage was a presentation in groups.

INTRODUCTION TO PROJECT

- Prior to the first lesson I had introduced the project to the class and explained that it was part of a project being run by Curtin University.
- I explained the basic outline of what we were hoping to do and students shared in a general discussion about greenhouse gases etc.

Part One

- Students were given a folder, some resource notes and a quiz on energy, from Origin Energy (Vic) material.
- This led to questions and discussion about how electricity was produced, renewable and non-renewable resources etc.
- We also talked about “essential” and “non-essential” uses which caused some interesting debate.

Part Two

- In this lesson, the students were given a set of worksheets using a fictitious Suzie and her family.
- This was completed and discussed in class.
- The students were then given a blank spreadsheet to take home and record their own data for a typical day.

PART THREE

- The students created a spreadsheet showing the number of hours each appliance was used.
- They used this information, along with lists of power use of various appliances, to create a second spreadsheet showing how much electricity was being used by these appliances each hour.

PART THREE (cont)

- They then calculated totals for each hour and an overall daily total on the spreadsheet.
- The final part of the spreadsheet activity was to draw a graph showing their daily use.
- Once they had completed this part, they completed a worksheet similar to Suzie's, about their own use of electricity.

PRESENTATION

- For the final stage of the project, the students worked in groups of three to produce a poster and a presentation about what they had learned.
- They presented this to the class, the School Principal and Bill Atweh from Curtin University.
- These are 2 examples of their presentations.

STUDENT FEEDBACK

- Students completed a survey for Ray.
- Bill interviewed a small group of the students.

STUDENT COMMENTS

- I liked learning to use a spreadsheet and that there was a lot of energy used in my house.
- I liked the fact that even though we were doing Maths, it was different and fun.
- Finding out how to do maths outside of school was good.
- It was good to learn that Maths is something we use every day. It was also good to learn how to use a spreadsheet.
- It was good finding how much electricity I use and comparing it to others.

- The thing that was especially good for me was learning new things.
- The best part was making a spreadsheet and learning to use one because they are extremely useful.
- It was good working a bit on something outside school and working on the computers was fun.
- Nothing. It was a waste of time and I didn’t like it. Try thinking of something that is actually fun or interesting instead of this program.
- I liked finding out that you still use electricity if it is plugged in, even if you are not using it.

- I thought it was good because you now have a better understanding of this major effect.
- Seeing how much Watts I and the other students used in 24 hours.
- I think learning about how even though your charger is plugged in but not charging, it is draining power is good. It helped me change my views on electricity and I am more cautious about what I use. It was different and usually fun.
- Some of it was fun, even though teachers may say that learning Maths isn’t meant to be fun.

RESOURCES

- 2004 47% of W.A.'s electricity sourced from coal, compared to 87% elsewhere in Australia.
- 2008 In W.A. 45% gas fired, 15% dual (gas & coal) fired, 25% coal fired and 10% renewable.
- A lot of our resources came from other states so this caused a few problems.

RESOURCES (cont)

- Sheryl Hawley who developed the original project.
- Home Energy Project (Origin Energy)
- www.synergy.net.au (interactive tour of house)
- www.energy.wa.gov.au
  www.climatechange.gov.au (free posters)
- www.epa.vic.gov.au (good little interactive activity)

RESOURCES (cont)

- www.climatechange.sa.gov.au (black balloons)
- Interesting fact sheets available at the following websites.
- www.worldofenergy.com.au
- www1.sedo.energy.wa.gov.au
- www.environment.gov.au

PROBLEMS

- Some confusion about power use of different appliances. Probably needed a more comprehensive list.
- Different resources gave different information. (this is a good learning experience for the students).
- Big differences in lists of appliances between students.
- Not easy to find up to date local data.
- Fitting project into the program.

POSITIVES

- Student responses were generally positive.
- Student who replied negatively on survey was quite positive when talking to Bill and presented his group's final presentation.
- Students helped each other.
- Several reported discussing the issues with their parents and agreeing to cut their electricity use.
- Students were actively engaged in the activity.
- There has been a flow-on in the level of motivation in the classroom.
- Challenged me to rethink what I do in the classroom.

WHAT ABOUT THE MATHS?

- Reading & interpreting a Pie Graph.
- Using fractions, percentages and basic operations to complete worksheets.
- Drawing a graph to represent data.
- Collecting data, entering it into a spreadsheet, doing calculations in spreadsheet and creating a graph to represent this data.

- Measurement – understanding of units and conversion of units.
- Worked with large numbers (e.g. multiplying by population of Perth). Had to deal with scientific notation.
- Finding averages – needed to find the average use of electricity in each group.