

## Year 6 Individual Cantamath Problem Challenge 2010

Choose one of the following three problems and work on a solution by yourself. Write up your working and solution neatly and clearly

Popcorn

Shaking Hands

Focusing on Water

Your work needs to include what you have done, any calculations you have done and what you discovered. You can present your work as a poster or booklet. You may include any models you created while working on a solution. No PowerPoint or other electronic presentations please. Hand your work to your teacher **before Tuesday 10<sup>th</sup> August 2010**.

All entries will be displayed in the Town Hall and judged in the display section of Cantamath.



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## Focusing on Water



How much water does your family use each day? In a typical household water is used for showers, washing clothes, flushing toilets, using a dishwasher and many other activities.

Using the information below to design a method for investigating how much water your family uses on an average day.



*Showers use up to 20 litres a minute.  
Washing a full load of clothes takes 175 litres.  
Together, 2 taps running use 14 litres a minute.  
A full flush toilet takes 11 litres. A half-flush takes 5.5 litres.  
A bath with enough water to cover you when you lie down takes 100 litres.  
A fast wash on a dishwasher takes 15 litres, a medium wash 20 litres, and a heavy wash takes 25 litres.*

Water can also be wasted by dripping taps. Setup an experiment for deciding how much water is wasted by a tap dripping for a minute, an hour, a day and a year.



You will then need to present your work in a suitable way (poster or booklet). You will need to include

- The method and calculations you used to decide how much water your family uses on an average day.
- The method and calculations you used to decide how much water is wasted by a dripping tap for a minute, an hour, a day and a year.
- Discuss the reliability and usefulness of your investigation
- Any other working you did to solve the problem.



Judges will be looking for mathematical accuracy, presentation, communication of your ideas, originality and any extension ideas of the problem you may like to include.



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### Popcorn

The Cantamath Corn Company wants to design a container that will hold approximately 2010 popped popcorn kernels.

You will need to decide how much space 2010 popped popcorn kernels will take up and then design a suitable cardboard container.



You will then need to present your work in a suitable way (poster, booklet and/or model). You will need to include

- An explanation of how you decided how much space 2010 popped popcorn kernels would take up
- Your final design with dimensions and any calculations you have done. (You may include any initial designs that you chose not to use).
- A scale diagram or model of your container.

Judges will be looking for mathematical accuracy, presentation, communication of your ideas, originality and any extension ideas of the problem you may like to include.



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### Shaking Hands



Six business people meet for lunch and shake hands with each other. How many handshakes are there?

At the start of a meeting if everyone in the room shakes hands with every other person, how many handshakes will have happened? Investigate the number of handshakes if there are 3, 4 or 5 people in the meeting. What if there are 10 people in the meeting?

Can you investigate a way of finding the number of handshakes depending on the number of people in the meeting?



You will then need to present your work in a suitable way (poster or booklet). You will need to include

- Any answers and calculations you did to decide the number of handshakes for 3, 4, 5 and 10 people in a meeting.
- The method you discovered for deciding on the number of handshakes for any number of people.
- Any other working you did to solve the problem

Judges will be looking for mathematical accuracy, presentation, communication of your ideas, originality and any extension ideas of the problem you may like to include.