Mathematics Task Centre

Picture the Possibilities

Teaching with Tasks
- a photographic stimulus -

Mathematics Task Centre is managed by Black Douglas Professional Education Services
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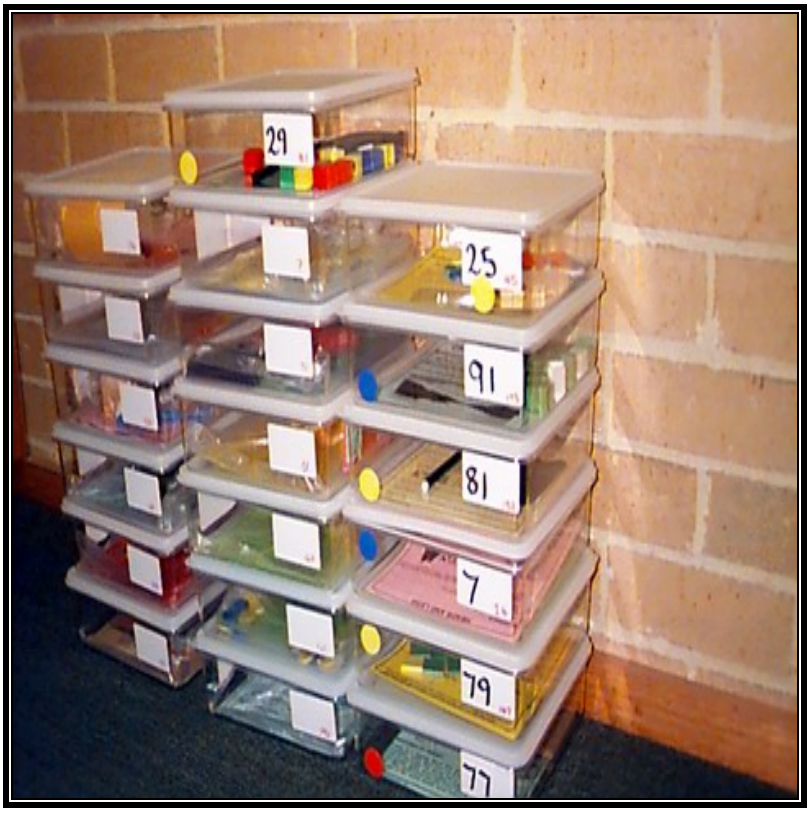
A classic task centre arrangement. Tasks in see-through boxes on attractive display shelves in a purpose designed room. Note the 'book style' arrangement of the boxes.

Stacking needs to be for easy access by students. *Where do I find..?* needs to be virtually self-answered. Coloured stickers indicate to teachers the curriculum strand(s) to which the problem relates.



Displaying task names prominently may work better for you.

If you can't afford a box for every task, you might store them in press-seal bags which in turn are stored in stackable drawers.

One purpose is to learn strategies for problem solving. This part of the Working Mathematically process makes a great display. The full process is a one page document which students can keep in their journal.

Tasks are an invitation to learn to work like a mathematician

This task could have been presented as a pencil and paper exercise. *What differences do the materials bring to the learning?* One principle for choosing tasks is *tip of the iceberg*. With the materials, this task can be accessed by Year 1 children. However it has extensions into Year 11. See its companion Maths300 lesson.

These two are working on the classic Soma Cubes task. Unlike text book type problems, many tasks have more than one answer. Soma Cubes has over 200. Notice the different presentation of this task card. It is from the *Task Centre Kit for Aboriginal Students*.

All tasks have developed from the work of committed teachers. They are not chosen just to 'keep students occupied on a Friday afternoon'. There are principles which guide selection and once you become conscious of them, you can create tasks for yourself.

Another principle is the *three lives of a task*. A task can be used as an invitation for two students to work like a mathematician; as a whole class lesson; or as a deeper investigation guided by a investigation sheet. This teacher has made multiple copies of *Tower of Hanoi* using different size washers.

Sometimes though the only way to run the whole class lesson depends on having enough of the right equipment.

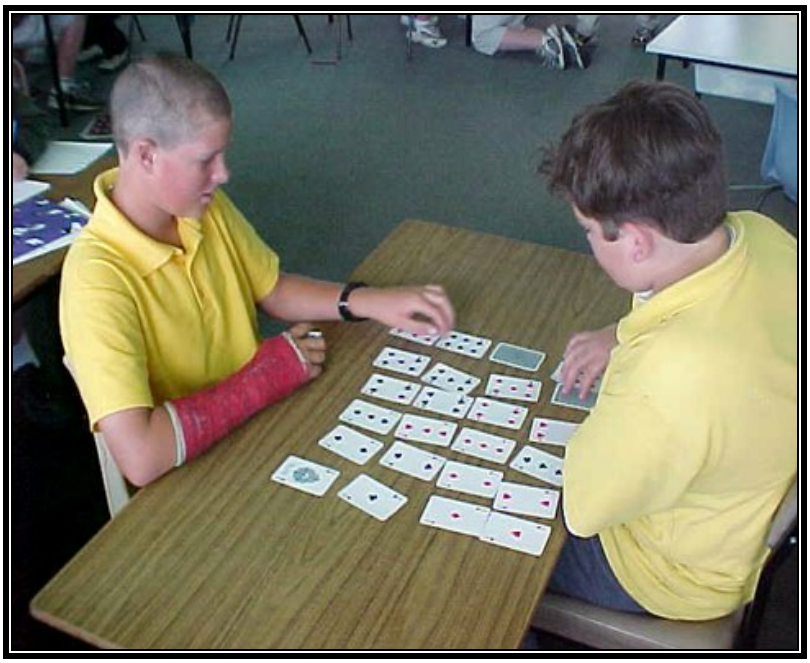
For example *Cube Nets* simply can't be explored in the same depth without plenty of these Geoshapes.

In the classic task centre room pairs of students are working on different tasks simultaneously. But that is not an essential. Many teachers use a work station arrangement which includes tasks, software and text-type work.

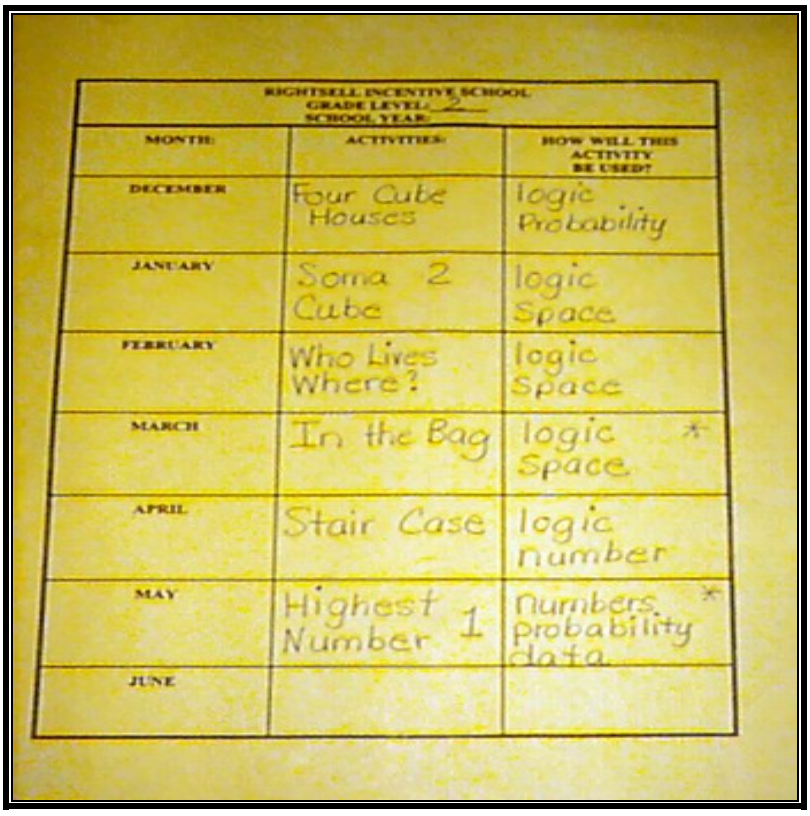
In some ways the role of the teacher and student is reversed. *Can you tell me how we can organise the data we have collected about this problem?*

The focus for the teacher is to illustrate the Working Mathematically process.

When students are focused many management problems fade away. As teachers realise this and begin to see their role as encouraging students to work like a mathematician, the use of tasks begins to feature for at least one lesson per cycle.



Each task is 'the tip of an iceberg'. This staff has planned that at least once a month they will work as a whole class to explore beyond the tip.



RIGHTSELL INCENTIVE SCHOOL
GRADE LEVEL: 2
SCHOOL YEAR:

MONTH:	ACTIVITIES:	HOW WILL THIS ACTIVITY BE USED?
DECEMBER	Four Cube Houses	logic Probability
JANUARY	Soma 2 Cube	logic Space
FEBRUARY	Who Lives Where?	logic Space
MARCH	In the Bag	logic Space *
APRIL	Stair Case	logic Number
MAY	Highest Number 1	Numbers Probability data *
JUNE		

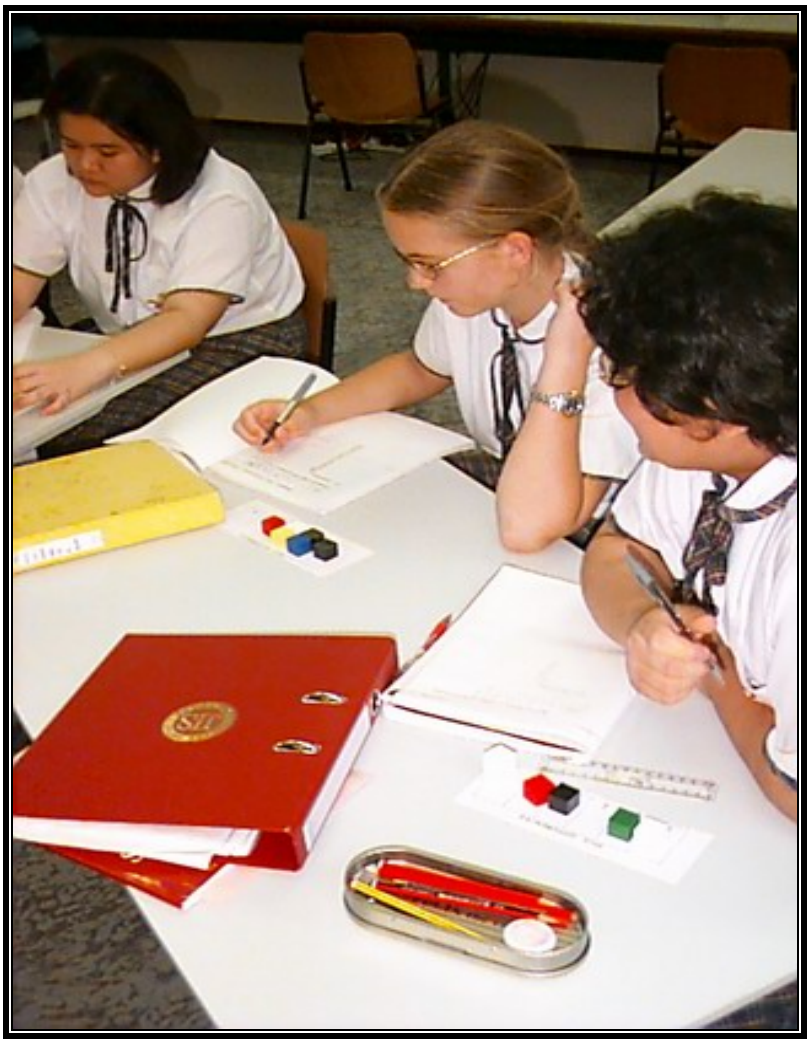
This teacher made a whole class lesson of *Four and Twenty Blackbirds* by changing the small counters with blackbird stickers into photocopied blackbirds using a picture from a clip art library. A grid marked on the playground substitutes as the Royal Garden card.

How many solutions are there?

How will we know when we have found them all?

Maths300 provides teaching notes which enable teachers to model the process of Working Mathematically. This teacher is choosing a variety of pedagogy to explore *Dice Differences*. First, whole class demonstration with large dice.

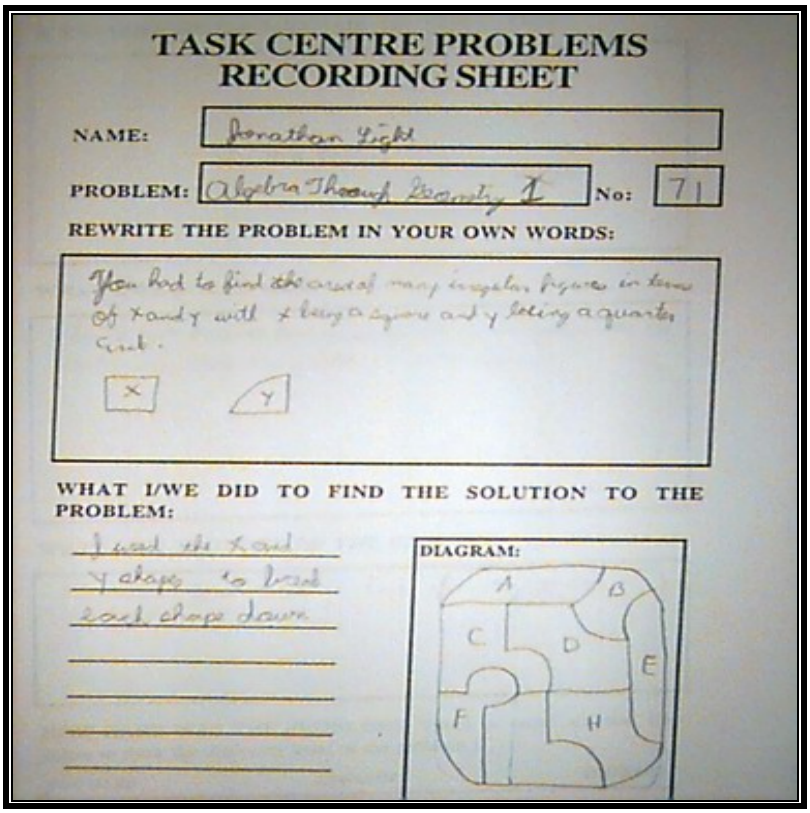
Second, small group exploration to gather first hand class data.



Third, demonstrating the power of the software to collect data much faster; the computer being used as an exploratory tool.

Fourth, small groups collecting more data with the help of the computer. Hypotheses are made and tested. Note the personal recording of the experiments. The computer doesn't do everything.

What to record, how often to record and in what form are important management issues. If the guiding objective is to teach students to work like a mathematician, then recording and publishing are appropriate because that's what mathematicians do.



TASK CENTRE PROBLEMS
RECORDING SHEET

NAME: Jonathan Light

PROBLEM: Algebra Through Geometry 1 No: 71

REWRITE THE PROBLEM IN YOUR OWN WORDS:

You had to find the area of many irregular figures in terms of x and y with x being a square and y being a quarter circle.

WHAT I/WE DID TO FIND THE SOLUTION TO THE PROBLEM:

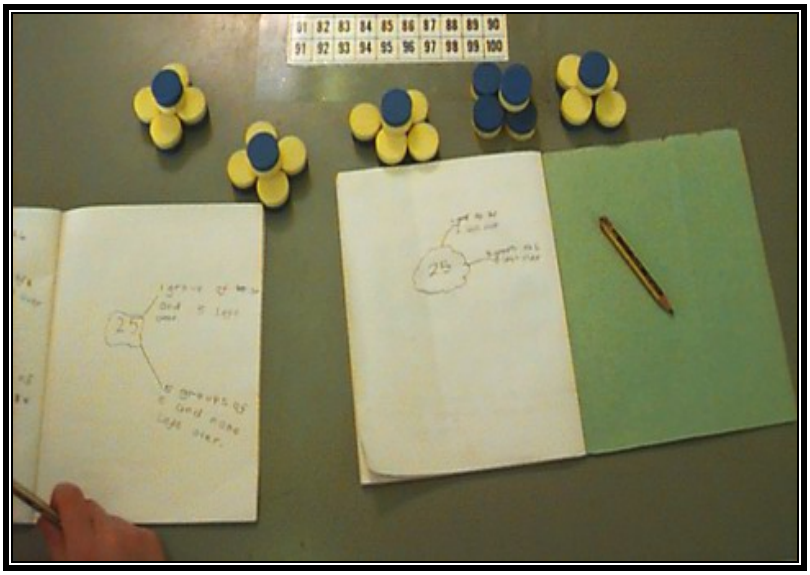
I used the x and y shapes to build each shape down.

DIAGRAM:

A B C D E F H

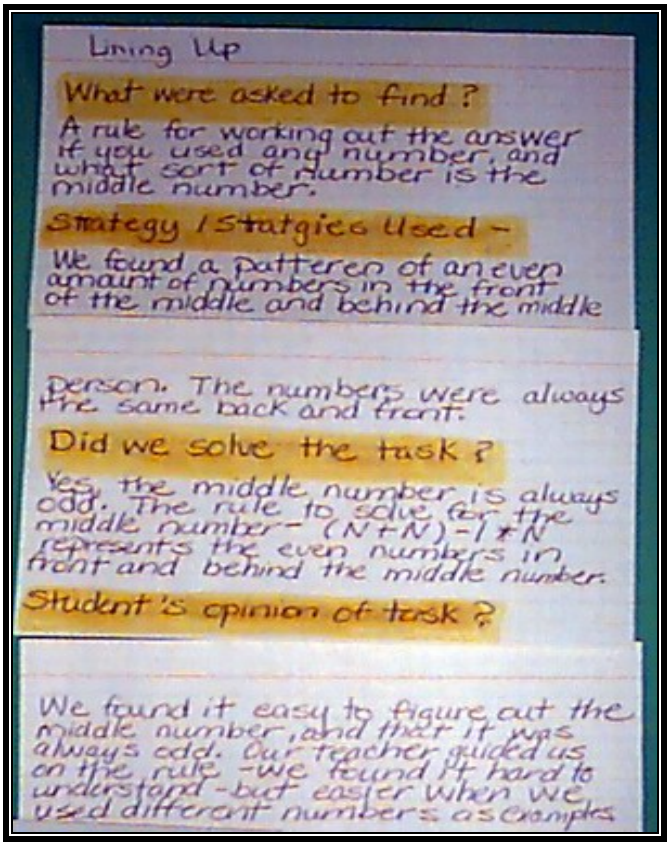
A proforma can be used as a framework for note taking or as a simple form of publishing.

Keeping a Mathematics Journal can be fruitful. These students are recording *Bob's Buttons*.



Full scale publishing can take several forms. A display, as here, a video, a PowerPoint presentation, a paragraph in the school newsletter, a report to the local paper, and so on.

These students are reporting on *Lining Up*.



It will help to build good home/school relationships if staff take the time to involve parents in the Working Mathematically curriculum. A parent night might begin with a whole class version of a task. These parents are engaged in *Dice Differences*.

This can be followed by some parent/child work on the tasks.

Didn't bring your child? No problem. Find a partner and get involved anyway. These two are working on *Back To Back Building*.

Success!

Parents (even a selection of students!) can be valuable participants in a workshop day introducing the tasks. *Why didn't we learn maths like this? How can we help teachers to use these tasks well?*

The Library Kit for Home Lending is another way to get families involved in problem solving. This family is working on *Who Owns The Monkey?* in their Easter Holiday.

Maths With Attitude eManuals combine eTasks and Maths300 into a week by week scope and sequence chart. Twenty-five weeks of investigation work for each year from 3-6.This resource may be the best way to begin.