NUFFIELD Applying Mathematical Processes (AMP)

The 20 AMP activities are accessible to *all* secondary pupils. Suitability for group work, required equipment, key mathematical features, extension opportunities, etc. are touched on in the *Teacher notes* included in the PDF package for each activity, downloadable from www.nuffieldfoundation.org/AMP starting 16 September 2010.

9 Practical explorations

Beach guest house **Time** Up to 2 hours Spreadsheet
Simulation of a booking system for a small guesthouse. Pupils have to manage the bookings and, as far as possible, arrange to give people the accommodation they request.

Cemetery mathematics **Time** 1+ days; 1½ hours upwards for preparation
Pupils can experience collecting primary data from a local graveyard or cemetery and then set and test their own hypotheses.

Design a table **Time** 2 to 4 hours
Pupils are asked to design a table for a group of 5 people for daily use. The table must be extendable to accommodate 8 to 10 people for some occasions.

Emergency shelter **Time** 1+ hours
The task is to design an emergency shelter, using a 4m x 3m rectangular piece of tent material, to protect three people from wind and rain.

Every second counts **Time** 2+ hours
Pupils explore how far away they could travel in one hour.

Fashion entrepreneur **Time** 1 to 2 hours
Scheduling jobs in a fashion workshop. There are six people in the workshop and a series of jobs to be completed in one day.

Money bags **Time** 1+ hours
Designing a wallet or purse, and explaining the rationale underlying the design.

Reaction times **Time** 1+ hours
Pupils have to develop an experiment to measure reaction times and use it to test people's reaction times. They can use any equipment available in the school/classroom, and will need to consider the reliability of their experiment and how any data collected will be analysed and presented.

School holidays **Time** 1+ hours
Pupils consider what factors might affect the choice of dates for school holidays and use these to determine the holiday dates for an alternative school year.

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11 Investigations

Average limits **Time** 1+ hours Spreadsheet
Pupils explore limiting values of an iterative process, using arithmetic, algebra or spreadsheets. Pupils can move from identifying patterns to forming, verifying and proving conjectures.

Co-primes **Time** 1+ hours
Starting with a definition of what it means for integers to be co-prime, pupils investigate how many positive integers are less than and co-prime to any given positive integer.

Corner to corner **Time** 1to 2 hours Flash & PDF interactive
Pupils investigate how different numbers of squares can be joined corner to corner, and the effect their arrangement has on the area of the rectangle that encloses the squares.

Fire hydrants **Time** 1to 2 hours Flash & PDF interactive
Pupils experiment with the placing and number of fire hydrants required in a city with square blocks that form a rectangular grid.

Golden mazes **Time** Up to 1hour Flash interactive
Rooms in a rectangular maze of rooms have bags with a varying number of gold coins. Pupils explore the effect of the route on the number of gold coins that can be collected.

Hide the spies **Time** Up to 1hour PDF interactive
Pupils determine where spies should sit in a park that has a square grid of benches, interspersed by bushes, so that they cannot see each other. They investigate how many different arrangements are possible.

Paper sizes **Time** 1to 2 hours
Pupils study paper sizes in the A and B international series, exploring relationships within each series and between the series.

Sending texts **Time** 30 to 45 minutes
This investigation involves determining the number of text messages sent if four people send texts to each other, and then extending this for different numbers of people.

Stacks **Time** 2 hours Flash interactive
Pupils explore, analyse and describe the patterns generated by moving counters between two stacks according to a fixed rule, always doubling the size of the smaller stack.

Symmetry **Time** Up to 2 hours PDF interactive
Pupils make different symmetrical shapes, using one or more of three given shapes.

Three dice **Time** 1 to 2 hours Flash interactive
To maximize their chances of winning a bingo-style game, pupils must decide which numbers are most likely to occur when three dice are thrown and the scores are added.