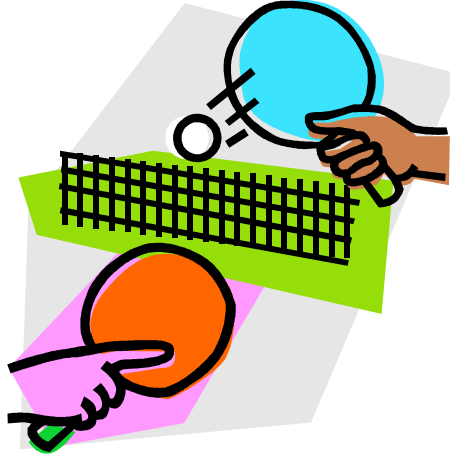


Structured and unstructured problems

Organising a table tennis tournament



You have the job of organising a table tennis tournament.

- 7 players will take part
- All matches are singles.
- Every player has to play each of the other players once.

1. Call the players A, B, C, D, E, F, G
Complete the list below to show all the matches that need to be played.

A v B	B v C
A v C	B v D
....	

2. There are four tables at the club and each game takes half an hour.
The first match will start at 1.00pm.

Copy and complete the poster below to show the order of play, so that the tournament takes the shortest possible time. Remember that a player cannot be in two places at once! You may not need to use every row and column in the table!

Start Time	Table on which the game will be played			
	1	2	3	4
1.00	A v B			
1.30				
2.00				
2.30				
3.00				
3.30				
4.00				

4.30				
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Designing a box for 18 sweets

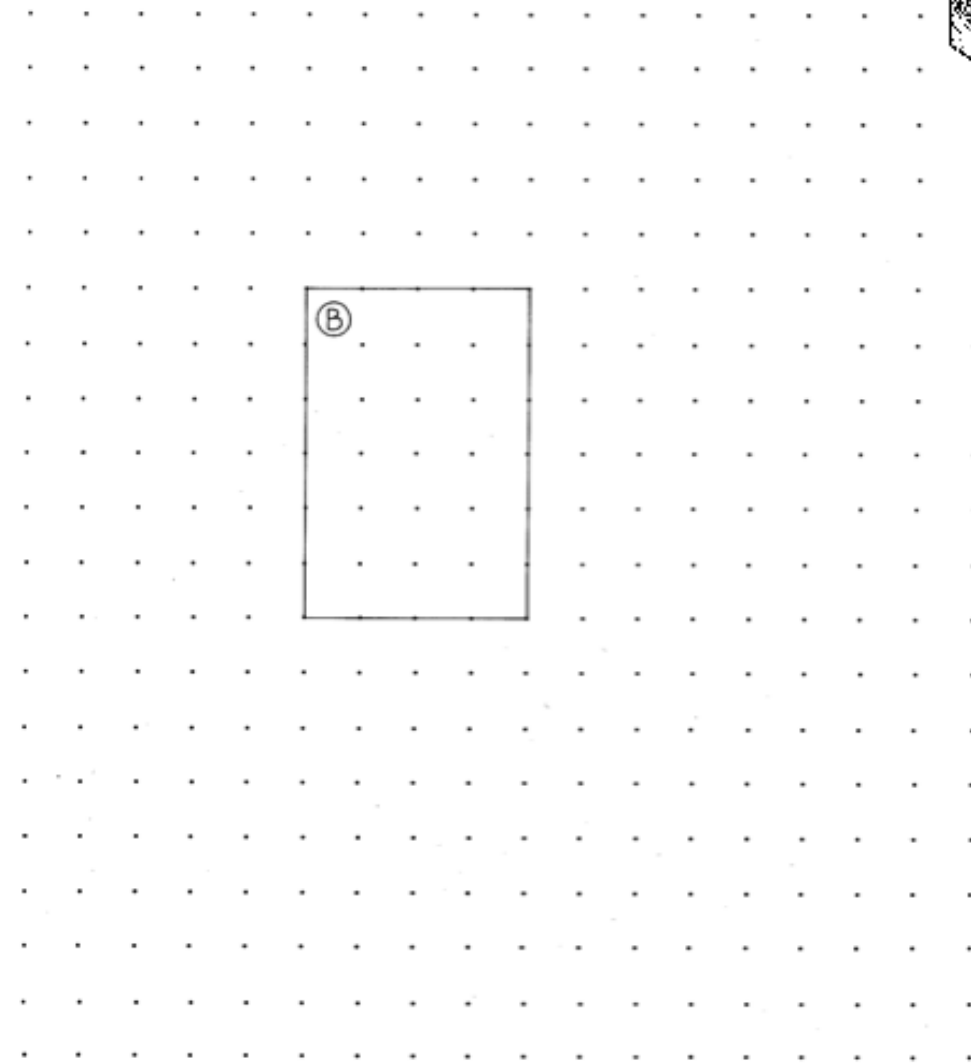
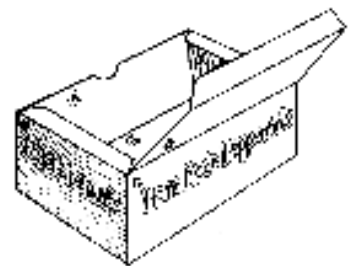
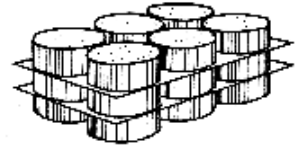
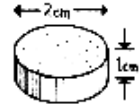
You work for a design company and have been asked to design a box that will hold 18 mints.

Each mint is 2 cm in diameter and 1 cm thick.

The box must be made from a single sheet of A4 card with as little cutting as possible.

On the grid paper below, show clearly how the card can be folded up and glued together to make the box.

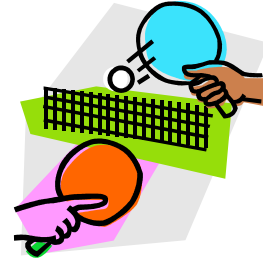
Make your box to check.



Organising a table tennis tournament

You have the job of organising a table tennis league.

- 7 players will take part
- All matches are singles.
- Every player has to play each of the other players once.
- There are four tables at the club.
- Games will take up to half an hour.
- The first match will start at 1.00pm.



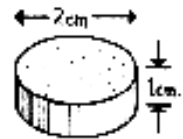
Plan how to organise the league, so that the tournament will take the shortest possible time. Put all the information on a poster so that the players can easily understand what to do.

Designing a box for 18 sweets

You work for a design company and have been asked to design a box that will hold 18 sweets.

Each sweet is 2 cm in diameter and 1 cm thick.

The box must be made from a single sheet of A4 card with as little cutting as possible.



Compare two possible designs for the box and say which is best and why.

Make your box.

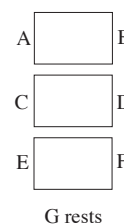
Sample responses to the unstructured problems

Organising a table tennis tournament

Pupils should quickly notice that it is impossible to use all four tables simultaneously as there are only seven players. On each occasion, therefore someone has to rest. One possible way of organising the matches is shown below.

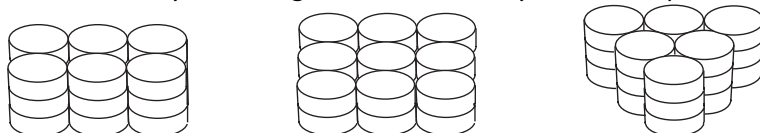
Start time	Table 1	Table 2	Table 3	
1.00	AvB	CvD	EvF	G rests
1.30	CvA	EvB	GvD	F rests
2.00	EvC	GvA	FvB	D rests
2.30	GvE	FvC	DvA	B rests
3.00	FvG	DvE	BvC	A rests
3.30	DvF	BvG	AvE	C rests
4.00	BvD	AvF	CvG	E rests

This solution was obtained by writing all the players' names on scraps of paper and placing them next to the three tables as shown. Every half an hour the players move one place clockwise. In this way each player plays against all the others once. It is also 'fair' in other ways; each player plays on each side of each table exactly once. Notice also that if there were 8 players, the matches would not take any longer. The additional player could play the resting player.



Designing a box for 18 sweets

18 sweets may be arranged in different ways. For example:



Each arrangement will lead to a different box design. Their dimensions may be calculated theoretically, or a more concrete approach may be adopted by drawing round sweets with appropriate dimensions. Furthermore any given design may be constructed from card in several different ways. Some possible nets for boxes are illustrated below:

