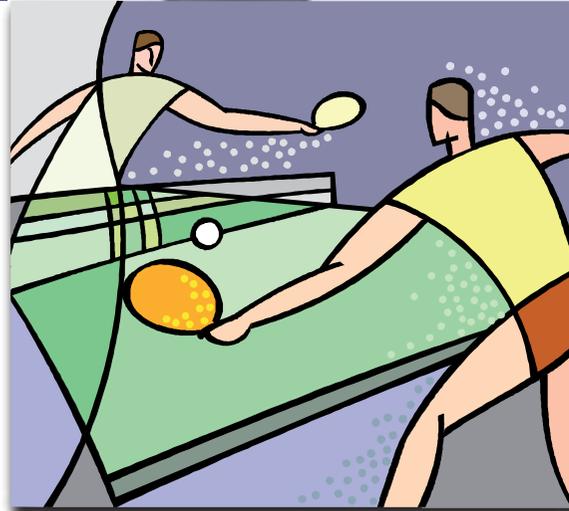


Working in the voluntary sector often means **working with young people**. This might involve running a youth club.



A club has 64 members.
How many matches
would be played in a
knock-out table tennis
tournament?



Experiment for **clubs** of **different sizes**.

working with others



Working in the voluntary sector often means **working with young people**. Sometimes you need to raise funds.

Three **games of chance!**

Rules of the games

You draw **two counters** from the bag.

If they are the **same**, you double your money.

If they are **different**, you lose.

Try these three games of chance to see if they would make money at a fund raising fair.

It's in the bag

Game 1 two **red** counters, one **blue**

Game 2 two **red** counters, two **blue**

Game 3 three **red** counters, one **blue**

Working in the voluntary sector often means **working with young people**. Playing sport is popular.

When clubs compete, they are usually organised into a league.

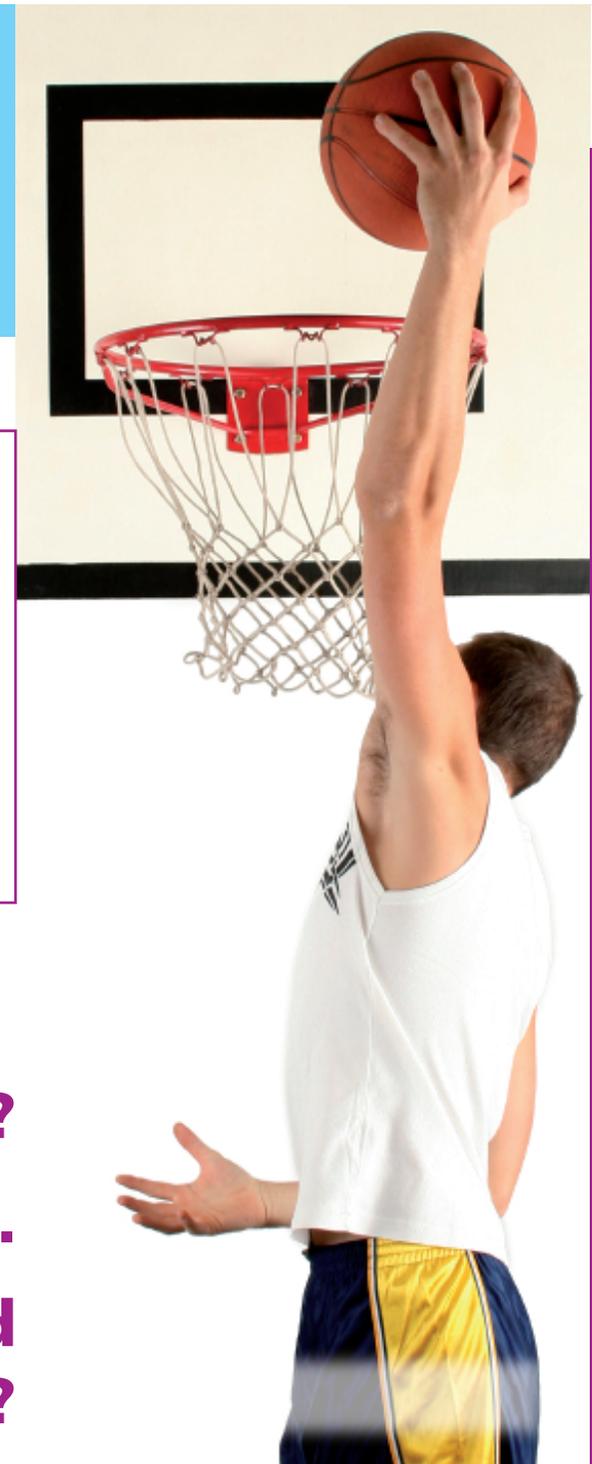
Each club plays every other club once.

Every club plays each weekend.

How many games are played in a six club league?

Make a league draw for six clubs.

Can you extend your method to eight clubs?



Working with others : Running a club

Description

Working in this sector often involves working with young people. This might be in the running a youth club. These activities draw on this context to work on chance and the mathematics of combinatorial thinking.

Resources

Red and blue counters, bags or envelopes.

Activity 1: Playing the game

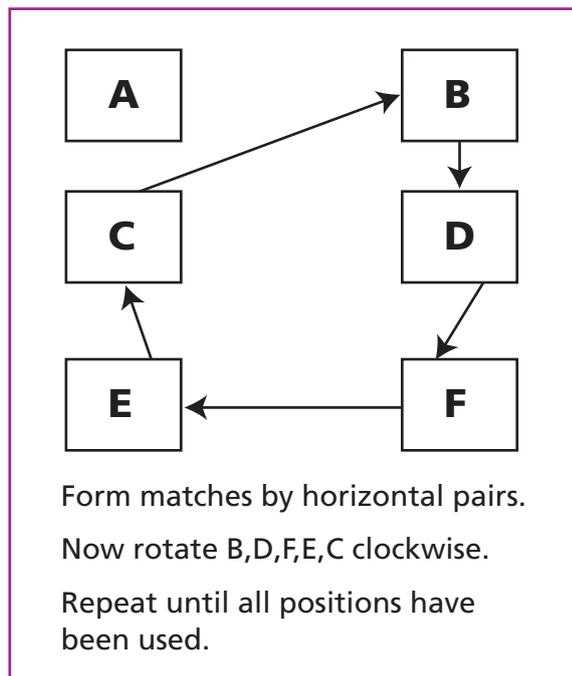
Activity 2: It's in the bag!

Activity 3: Organising the league

These three activities all require initial experimentation and a trial and error approach; but all need more systematic thinking to analyse the problem fully. The initial method used in **Playing the game** will probably be to work out how many games are played in the first round, the second round and so on. It is a good idea to start with quite a challenging problem first – later, if necessary, it can be simplified by choosing a lower number which is a power of two. Pupils will gain from realising this for themselves. Once the general solution is found, pupils can try drawing up knock-out tables and counting the number of games in each round for various numbers of clubs, each time looking for and trying to explain patterns that they find. An extension activity involves planning the tournament with seeded players – who needs to play to whom and when?



It's in the bag invites the pupils to experiment with three different games of chance. Ask the pupils to make conjectures before they begin about which, if any games, will make money for the club. Have the pupils working in groups – each group will need to conduct each experiment about twenty times. You can combine the overall results on the board to give a more extended data set which will allow the pupils to make conjectures. A systematic approach listing all possibilities is needed if pupils are to justify their thinking.



Experimentation and organised thinking are needed to solve the problem set in **Organising the league**. With only fifteen games to be played, careful work will lead to a solution. But eight clubs, and twenty-eight games, suggests a more general method is required. Finding a general algorithm is challenging. One possible way is shown here. Pupils can start by checking that this method works for six clubs and then try to use it to generate a solution for eight clubs. You can also ask them to work out a general formula for the total number of games for a given number of clubs – they may be surprised to see how this figure grows.