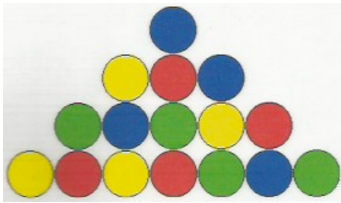## ONE THREE FIVE SEVEN GAME

This is a game for two players. Arrange 16 objects in rows of 1, 3, 5 and 7 objects as shown in the diagram.

Players take it in turns to choose a row and then to remove at least one object from that row.

The player left with the last object is the winner.

Try playing this game.

Keep a record of who wins and make a note of any tactic that seems to lead to winning.

Then play with a different number of objects.

Then play with a different number of rows.

Can you find any winning strategies?

Does it matter who goes first?

Notice especially the last few moves. There is a point where one player gets the upper hand and the other player cannot win whatever he does. Notice what leads up to that situation.

HELP

Play **NIM-7**, a very simple form of the same game. It is a game for 2 players.

You need 7 small objects in one row. Decide who will go first. (Players should then take turns to go first). Players take turns to take away either one counter or two counters.

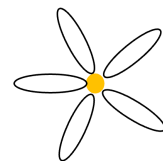The player who takes the last counter (or counters) wins.

DAISY

Another Nim game for 2 players. Draw a daisy with 5 petals.

Take turns to colour in either one petal or two petals next to each other.

The winner is the one to shade the last petal or petals.

Vary the game by starting with a different number of petals.

NEXT

This game is one of many variations of the Game of Nim. In another variation the player to remove the last object is the loser.

There is a variant called **Whim** in which the victory condition is undecided at the start of the game. At any point, once per game, either player can sacrifice his move and decide the victory condition, which is then permanent for that game. This also changes the turn order, forcing an additional move by the opponent.

You can vary the number of rows and/or the number of objects in the rows, or simply have several piles of objects.