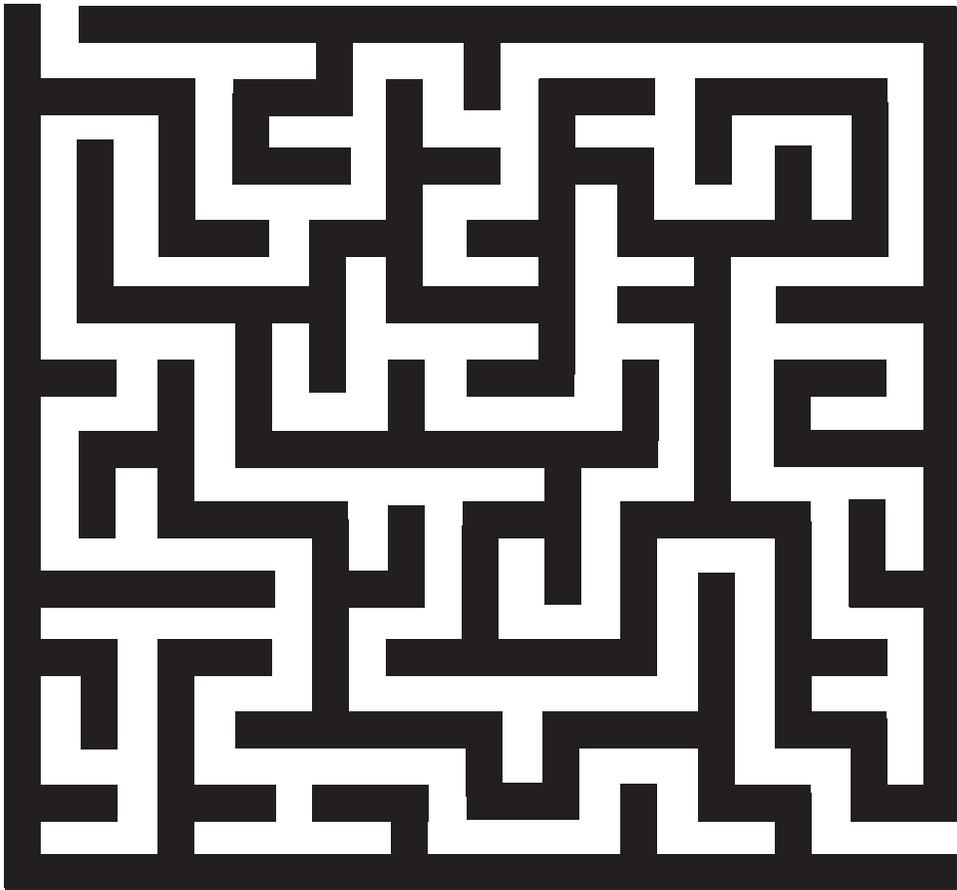


This maze was designed using the *Making a maze* spreadsheet.

## Can you solve it?



Play workers help to design play spaces.

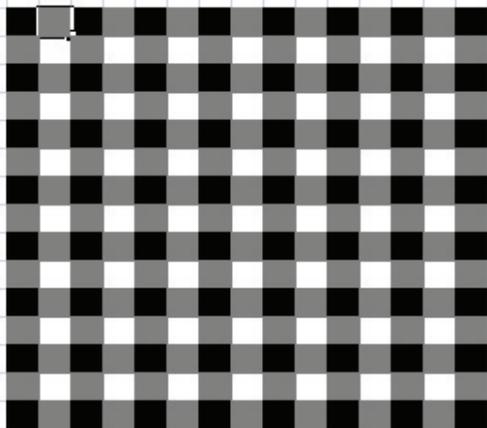
Flat mazes are popular in the playground for quiet play.

## Design a maze for the playground!

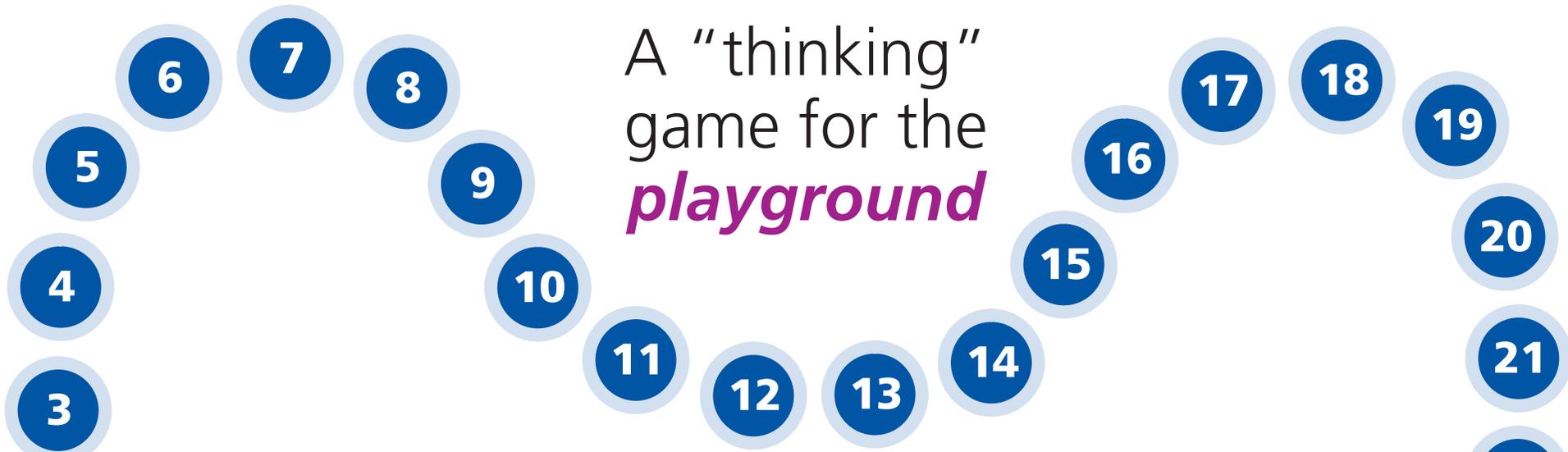
- You can choose how big you want your maze to be – 15x15, 21x21 or 25x25 squares.
- Make two grey squares white to make an entrance and an exit.
- Make some more grey squares white to make a path.
- Now make some more grey squares white to make dead ends. Don't join them back to the path and no circular routes allowed!
- Make the rest of the grey squares black. Check that there is one route through.
- Print out your maze. Test it on a partner.



## Painting the playground: Making a maze



# A "thinking" game for the *playground*



- 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15
  - 16
  - 17
  - 18
  - 19
  - 20
  - 21
  - 22
  - 23
  - 24
- start**

## A game for two players

Maximum jump size 4.

Decide who starts – this person takes the first jump.

The next player jumps on from where the first player is.

Your aim is to land on 24!

*Now try changing the maximum jump size.*



**Painting your playground**

- Play workers help to design play spaces.
- Playgrounds need quiet spaces.
- These can be for "thinking" games painted onto the playground.



**Jumping**

- Play workers help to design play spaces.
- Puzzle walks painted on the playground provide a space for quiet play.

Start this puzzle walk in the bottom left hand corner.

To complete the walk you have to find a path which goes

1; 1, 2; 1, 2, 3; 1, 2, 3, 4; ...

**Can you solve it?** →

3	3	4	5	1	2	3	HOME
1	2	5	3	2	4	5	8
4	3	2	4	5	6	3	7
1	3	1	5	2	1	2	6
2	2	1	6	5	4	3	5
1	1	2	7	1	2	3	4



Make up a **puzzle walk** for the playground. Experiment with different number sequences.

### **Remember**

There must be just **one way** through.

# Childcare and early years : Painting the playground

## Description

In recent years, the role of play spaces has been extended to include providing quiet “thinking” areas. Play workers will involve children in puzzles and games as well as more traditional more active pursuits. The topic lends itself to the development of personal thinking and learning skills.

## Resources

The Excel spreadsheet **Making a maze**, counters, squared paper, multilink or centicubes.

### Activity 1: Making a maze

### Activity 2: Jumping

### Activity 3: Puzzle walks

**Making a maze** involves the pupils in quite complex 2-D visualisation working with the prepared maze Excel template. Most will find the task challenging and will probably benefit from choosing the 15x15 grid initially although the larger grids usually lead to more interesting maze designs. The computer is not essential – the activity can be completed with pencil and paper – but it encourages pupils to refine and redraft their work. You may choose to link the work with Logo asking the pupils to programme the path of a turtle through their maze.

When exploring **Jumping**, the pupils should first play the game using counters a few times and see if they can spot any patterns. Then encourage them to question: does it matter who goes first? what is a winning strategy? Working on simpler problems (for example, having a jump size of four and a goal to land on 8) is a very useful strategy and should support the pupils in both pattern spotting and argumentation. Prompt them to consider “Where would you not want your opponent to be?” Working with the simpler problem through experimentation develops a “feel” for the task; working with the more complex problem encourages the move to analytic thinking. Some pupils will be able to generalise their results to jump size  $n$ , landing goal  $m$ .

**Puzzle walk** presents a puzzle for the pupil to solve. They then build on this to set up a puzzle walk for themselves. Pupils will need to test their puzzles on each other to make sure that the meaning is clear and the puzzles have unique solutions. Once designed, pupils can make posters of their puzzles. Alternatively, they can build their maze with interconnecting cubes where the height models the number – pupils can then try to translate their design into 3-D sketching software, for example, Google SketchUp.

## The mathematics

When **Making a maze**, the pupils will be involved in 2-D visualisation. **Jumping** calls for pattern spotting and logical analysis. **Puzzle walk** involves thinking about number sequences and their rules and can also include work in 3-D.