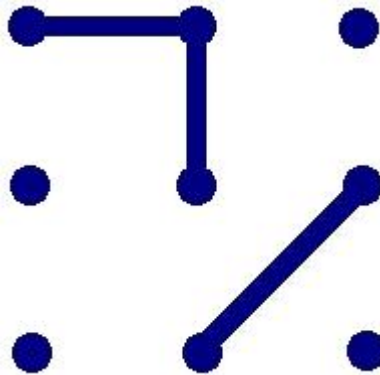


Flipping & Rotating Dot to Dot Patterns

This activity follows on from other activities you have completed where you had to remember shapes and patterns. Now you have to imagine how patterns would look when they are turned over or turned around.

Step 1. Working with dot to dot patterns

Click on '**Run activity**' at the top of this screen. When you click on '**Start**' at the bottom of the screen, a pattern of lines connecting between dots will be shown on the screen. There will be 3 lines on each pattern. An example is shown below.



You are now going to have to imagine that the pattern you see is transformed, flipped or rotated in some way. Your helper can flip or rotate a blank card to show you the direction of the flip or rotation. You will need a 3x3 dot pattern on a clear plastic sheet.

Flip top to bottom

Imagine the pattern on the screen is **flipped over so the top goes to the bottom**. Imagine how it would look after it was flipped top to bottom. Try to "see it in your head". You are now going to draw it on another grid of dots.

Draw the pattern you see flipped over top to bottom on your dot pattern on the clear plastic sheet.

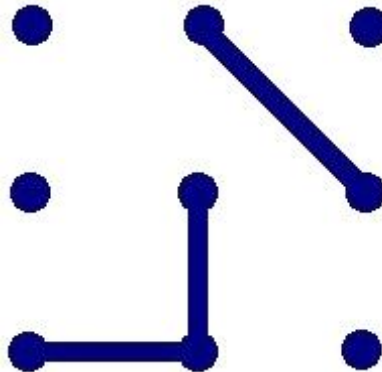
Check

When you are satisfied with your pattern, pick up the plastic sheet and begin to flip it over top to bottom. You have to watch your dot to dot pattern as it moves, so you can see the transformation of the pattern.

As the pattern is flipped and you see something that makes you want to change your pattern, you may realise you are not correct. If so, return the plastic sheet to its original position while you make your change. This can be repeated several times if necessary, until you are sure your pattern is right. After this, the plastic sheet is flipped and placed over the top of the pattern on the screen to see if they match.

Click on '**start**' to show another pattern and flip it top to bottom.

The pattern above would look like this when flipped top to bottom.



Flip Sideways

Now you must imagine that the pattern on the screen is **flipped sideways** left to right. Go through the same procedure as you did above. Also try sideways flips right to left.

Notes for helpers:

Flipping a pattern from left to right, or right to left, is really doing the same thing, i.e. the pattern will end up the same no matter whether it is flipped left to right or right to left. Eventually they will realise this - but don't tell them - let them discover this for themselves.

Rotate one quarter turn or half turn

Now you must imagine that the pattern on the screen is rotated **1/4 turn clockwise**. Then try **1/4 turn anti-clockwise**.

Finally try rotating **1/2 turn**. Remember to always follow the same procedure so that you imagine the change in your mind and make it. Putting a spot in the middle of the top edge of the clear plastic sheet will make it easier for your helper to describe how the pattern is to be rotated.

Reverse roles

Exchange roles with your helper. Now your helper draws the pattern of dots how they think it would look when flipped or rotated. You must now say whether your helper's pattern is correct, or not, before their pattern is flipped or rotated to verify the result.

If you disagree with your helper, you must tell them how you think it should look.

Flip and rotate other patterns at the same level

Continue working with patterns at the same level until your flips or rotations are always correct.

Step 2. More lines

Click on '**Level**' at the top of the screen and click on '**Level 2**'

Now a pattern of lines will again be presented, but there will be 4 lines on the pattern.

Then click '**Start**' at the bottom of the screen to present each pattern.

Go through the same sequence as you did in step 1, flipping patterns top to bottom, to the side and rotating them 1/4 turn clockwise or anti-clockwise or 1/2 turns. Check the patterns in the same way.

Also try level 3 which has 5 lines.