

# Flipping & Rotating Blocks

This activity follows on from other activities you have completed where you had to imagine how shapes would look when they were turned over or turned around. Now you will use patterns of blocks.

## **Step 1. Working with blocks**

Sit at a table or desk with your helper sitting next to you.

Your helper makes a pattern with the square central and triangle and diamond next to the square (as in level 1 below) using Blu-tac to stick the blocks to a clear plastic sheet.

You now 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.

### **Flip top to bottom**

Imagine the pattern your helper has made is **flipped top to bottom**. Imagine how it would look after it was flipped over, top to bottom. Try to "see it in your head". You are now going to build it using blocks that will be given to you by your helper.

So that you get the most benefit from this activity it is extremely important that you build your pattern as follows:

1. Your helper places the diamond on the table in front of you. (**Your helper must NOT give you the square first.**) You cannot touch the block until you are sure you know where it goes and which way it will face. Take as long as you like until you are sure.

When you are ready to place the block, you must do so immediately, without any trial and error or movement of the block in your hand.

Even if you realise that the block is not correct it must stay there. You will be able to change it later when all the 3 blocks are in place.

1. Now your helper gives you the triangle and when you are sure you know where it goes you place it. The square is then given to you, to be placed in the same way.
2. When all the 3 pieces are placed you can make any change you want. Try to see the change in your mind first. When you are sure, make the

- change immediately with no trial and error or movement of the blocks in your hands.
3. When all changes are made, your helper will ask you if you think your pattern is right.

### **Check**

When you are satisfied with your pattern, your helper picks up the plastic sheet, slowly begins to flip it over, top to bottom. You have to watch the pattern of blocks as it moves, so you can see the transformation of the pattern.

As the pattern is slowly flipped you can say "**stop**" at any time if you see something that makes you want to change your pattern.

If you say "stop", your helper returns 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 again slowly flipped and placed over the top of your blocks to see if they match.

### **Flip Sideways**

Now you must imagine that your assistant's pattern is **flipped sideways** to the left. Go through the same procedure as you did above. Also try flipping the block patterns sideways to the right.

#### **Notes for helpers:**

Flipping any pattern of blocks sideways, to the right or left, is effectively doing the same thing. The pattern will look the same whether it is flipped sideways to the right or left. Don't tell them that this is so let them work it out for themselves. With practice they will begin to realise that the pattern will be the same when flipped to the right or left.

### **Rotate one quarter turn or half turn**

Now you must imagine that your helper's pattern 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 without any trial and error or movement of the block in your hands. 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 makes the pattern of blocks how they think it would look when flipped or rotated. You must now say whether your helper's pattern is correct, or not, before the original pattern is flipped or rotated to verify the result.

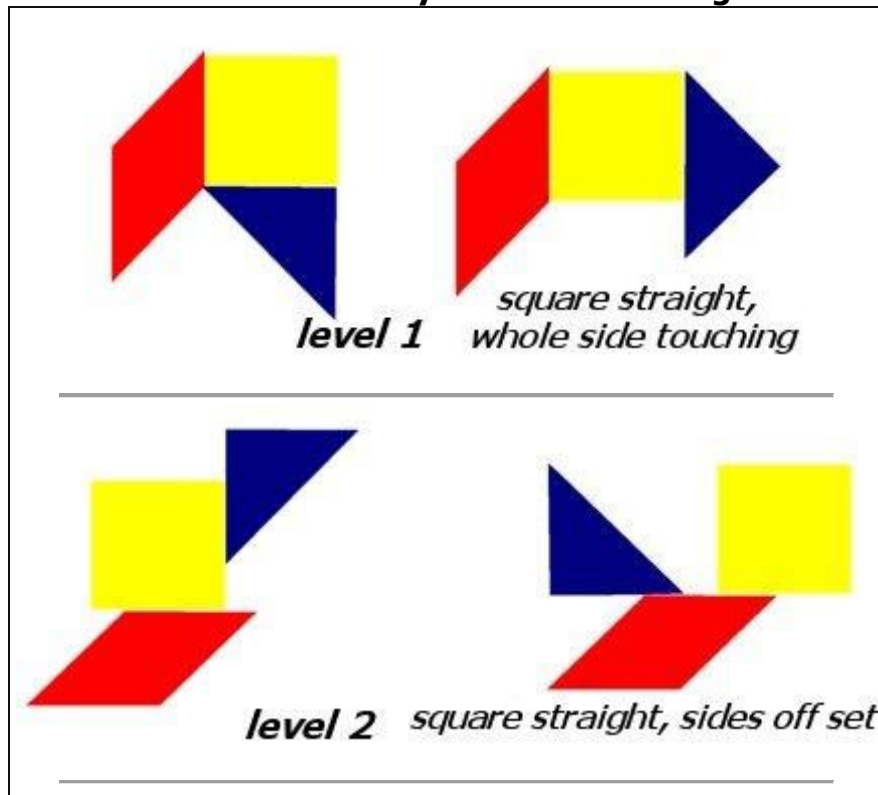
If you disagree with your helper, you must tell them how you think it should look.

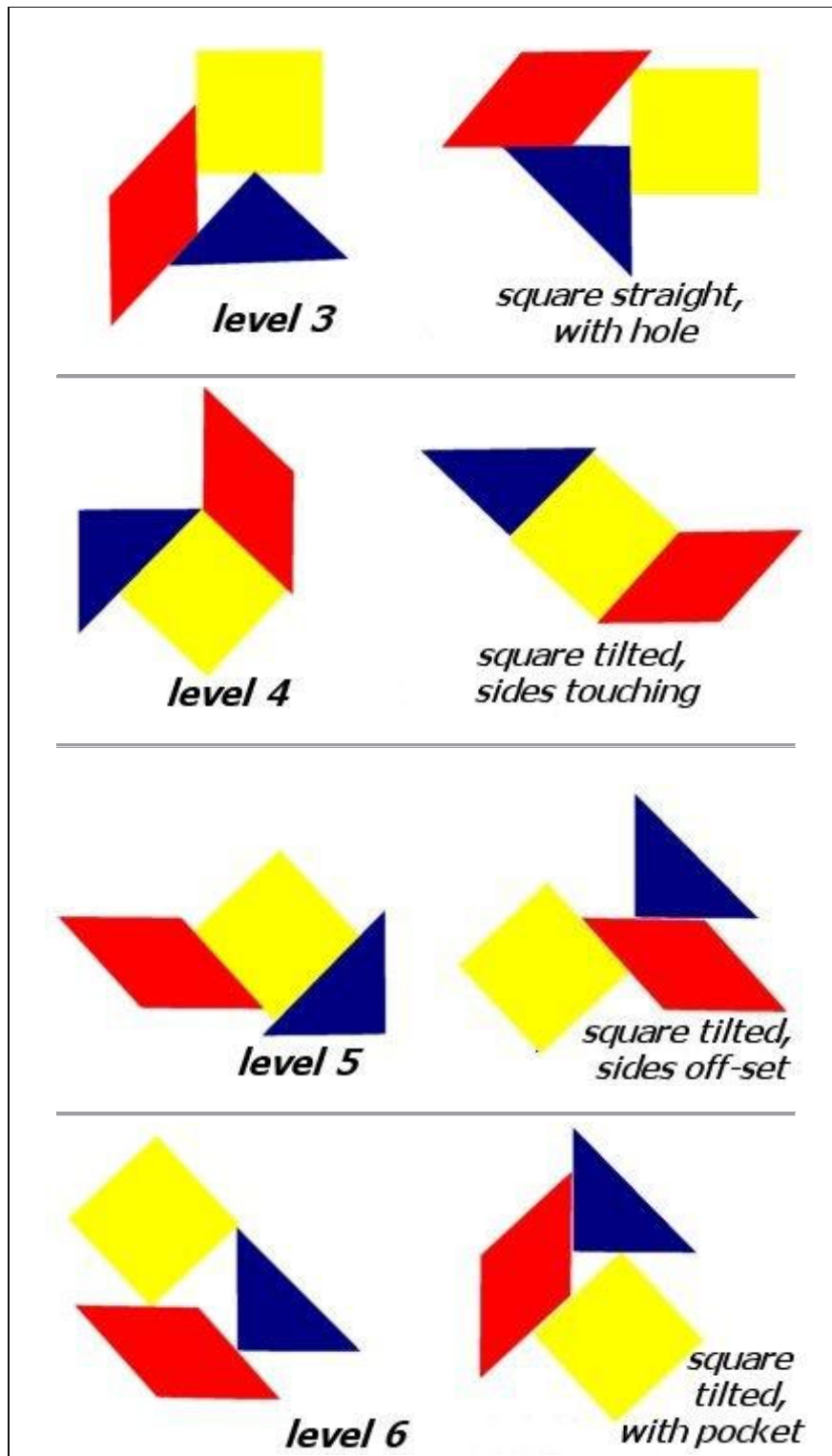
### Flip and rotate other patterns at the same level

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

### Proceed to the next level

#### Wachs Hierarchy of Visual Thinking

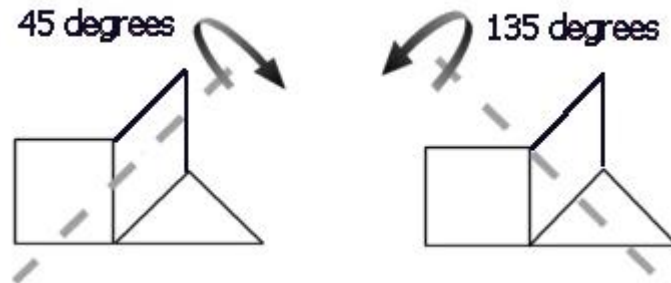




This hierarchy was developed by Dr Harry Wachs, OD. Washington DC and is used with his permission.

## **Step 2. Diagonal flips**

Now you have to imagine your helper's pattern is flipped on the diagonal. There are two ways this can be done, at 45 degrees and at 135 degrees, as in the diagrams below.



Follow the same routine as before imagining how the pattern would look then make it without any trial or error. Again your helper gives you the blocks one at a time, giving you the square last. Work through all the levels above.

## **Step 3. Double moves**

This time you have to imagine how your helper's pattern would look after 2 separate flips or rotations, e.g. flipped up-side down then rotated 1/4 turn clockwise. You have to '**see in your mind**' the first move, then the second, then you have to show how it would look after both moves have been completed. Again, try to do this without trial and error as each block is handed to you by your helper, who will again give you the square last. Try working through all the levels as you did with single flips or rotations.