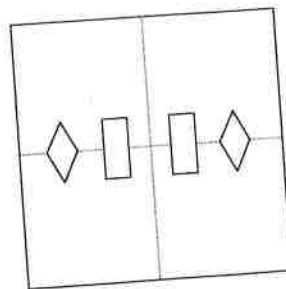


Interaction in practice – Symmetry (Year 3)

Follow up questions ...

The teacher has folded the paper left to right and then downwards and cut a square and an equilateral triangle from the top edge. The unfolded pattern will be two oblongs and two 'diamonds' (rhombuses) left and right of the vertical fold line.



T: What I want you to do is watch as I unfold the paper slowly and picture it in your mind, like playing a video in your head. Try to make your video go just ahead of mine though, so you see it unfolding just before it actually happens. OK ... here goes.

[Teacher unfolds the paper slowly.]

T: Right, now, I'm going to do it again and this time I want you to do a commentary to yourself as we go. In your head, imagine describing what is happening to someone else, on a phone maybe. Someone who can't see you. Yes? What would you say to them to describe how each part of the pattern was moving? OK, here goes.

[Teacher again unfolds the paper slowly.]

T: OK, now I want you to talk to your partner and describe to each other what you saw. Try to think about how each part of the pattern moved.

[Children spend a minute talking in pairs.]

T: Right. Now I'm going to make it harder. One person in the pair put your hand up. ... OK, you have got to turn round and face the other way. Face the wall over there. Right. Everyone else, you are going to watch me do a new pattern and then you have got to describe it to your partner who is going to try to draw it. Yes, on the whiteboard, that's right.

[Sounds of surprise ... groans of general excitement.]

OK, are you ready? No peeping you lot.

[Teacher cuts a new pattern and slowly unfolds it, then hides it away.]

T: OK, turn round the others. Off you go. The one who wasn't looking has got to draw what their partner describes to them. Think about how it unfolded to help you.

Ch1: Can we draw it for them?

T: No, you can only talk ... and no pointing and drawing with your fingers either!

[Children talk in their pairs, trying to recreate the pattern.]

T: OK, let's see what's happened. Can you sit round the edge of the carpet? [Children shuffle to the edge.] Right. Here is the pattern I cut out [shows the paper pattern]. How have you done? [General chatter which the teacher lets run ... then, interrupting] OK, OK. Listen ... listen. I want you to decide who you think got it closest.

Ch1: Marie-Jane.

Ch2: Mine's useless!

Ch3: Jay. His is good.

Ch4: Yeh, his is really close.

[Children continue to comment freely until a general consensus is reached about the best.]

T: Right Jay, your one has got the vote. Can Luke [partner] describe for us what you said to Jay.

Luke: Um ... it's hard ... I said, like ... no, it's hard.

T: OK, well I'll unfold the paper again and you talk out loud. Everyone else, keep quiet as Luke talks, but be ready to make suggestions for different things to say at the end.

Luke: The square starts in the middle of that side and when you unfold it it goes into an oblong.

Ch5: It's like a ...

T: [Interrupting] No, stop. You are listening now and then you can say it in a minute. Let Luke finish first.

Luke: Then the oblong goes over to the other side ... the same shape ... I mean the same place.

T: Ok, thanks Luke, well done. Now, what about others. Any comments?

Ch5: The oblong is like a double square. It's kinda two squares on top of each other.

[Teacher nods but remains silent. Indicates with a gesture for other comments.]

Ch6: They're the same on each side.

T: Can you say any more about that?

Ch6: The same distance [meaning from the centre-fold; again, teacher nods and gestures].

Ch7: The triangle turns into a diamond.

Ch8: Yeh, it kind of gets long.

Ch6: And it goes on the other side again, like the oblong.

T: What do other people think?

Ch9: It is. It's the same over there as over there [indicating on each side of the vertical fold].

T: Several people have said that now. It's the same over here as over here [indicates the two sides again]. What I want to know now is, if I asked for a rule to describe how it unfolds what would you say? I want a rule that tells me where the shapes end up. Talk together first.

[Children talk in pairs for a minute or so. One or two ask for clarification of the task.]

T: OK, what rules would you have?

Ch4: They're the same size ... the same. Each shape ... is the same ... you know ...

T: No. I don't know yet. Can you explain again.

Ch4: [Pauses to think.] Both the shapes are the same size.

Ch10: Which shapes?

T: Good question. Which shapes?

Ch4: The oblongs. They are the same. And the triangles are.

T: OK, thanks. Any other rules?

Ch9: And they are the same place.

T: How do you mean, same place?

Ch10: He means ...

T: [Interrupting] Hold on. Let her finish.

Ch9: It's the same on this side as that side. The place. This is the same [gets up and indicates distance from central fold to oblong on each side.]

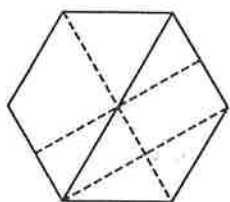
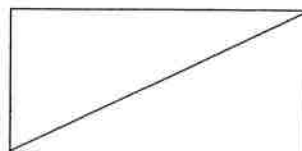
T: Great, OK. Anything else to say?

[The conversation continues for a short while with the teacher continuing to help the children to articulate the ideas behind reflective symmetry.]

It is worth noting how much of the extract above is dominated by the teacher talking, yet it remains interactive in the sense that the children are thinking deeply about how the reflections work. This is a nice example of how interaction can be visual as well as oral – playing up the mental and playing down the oral in 'mental/oral'. It is the visualisation that matters in this task and it is from this that children can then develop the 'rules' for symmetry through discussing these visual images.

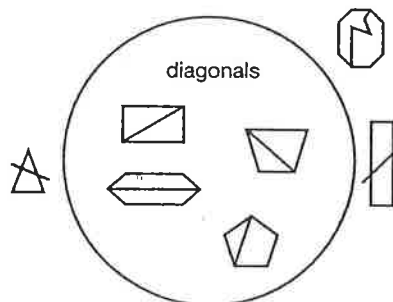
PRACTICAL EXAMPLE

Children in two parallel Year 3 classes are being introduced to the idea of 'diagonals' in 2D shapes. In the first class they are shown an oblong and told that the diagonal is the line that joins the two corners. They are then



given some other shapes to draw diagonals on, but can only draw one diagonal for the hexagon, as shown by the solid line. When the teacher suggests other lines (dotted) they are not sure whether these are diagonals or not. One child complains that 'one is going the wrong way'. Superficially, they eventually agree with the teacher's new meaning of the term, but there is a sense that they don't really believe it!

In the class next door, the teacher plays a game with the children. She draws different shapes and marks a line on them that either is, or is not, a diagonal. For each one she asks: 'this is a diagonal: true or false?' and the children try to guess. As she then reveals the answer she puts the shapes in, or outside of, a ring marked with the label 'diagonals'. After several goes she asks the children to discuss in groups what they think a diagonal is. The debate that follows is heated, but after a few more shapes the class has agreed together on the conditions for a diagonal – straight, joining opposite corners, staying within the shape etc.



When the group is then asked about a hexagon they are still confused about some lines, but their earlier argument has prepared them to understand the word diagonal in a more flexible way and most children seem ready to accept this 'new' idea. One child notes that 'we need to add that to our definition'.