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b. The Square

1. Draw a square using any method that the child will find acceptable – this might be a by using a ruler or by drawing around a square object. As you work, use the word “square” as often as possible.
2. Ask the child to draw the square using the same method as you. If the shape that is drawn is not a square (angles not at 90 degrees or each side not of equal length) tell the child “that is not a square” and ask the child if he/she can find the difference between your square and the one just drawn. Then help the child to draw a square as you have done.
3. Ask the child to look for other examples of squares – boxes are the most obvious. Be aware that some things that look as if they might be squares (CD containers, for example) are often not. Draw around some of the squares you find and label them, still using the word “square” wherever possible.
4. Draw a rectangle – making it clear from the picture that it is not a square. Ask the child if this is a square or not. Discuss the answer – it is not a square, because two of the sides are long and two are short. A square is an enclosed shape which has four sides all of the same length. You don’t have to use these exact words – it is perfectly acceptable for the child to say that the last line drawn comes back to meet the first. There is no need to use the phrase “right angle” to describe the angles – but we do need to say that not only are the four lines equal, so are the four angles. The child may need to be told the word angle and to see what it is.
5. If any of this has caused a problem, ask the child to draw a square and then to tell you the important points about the square. These are:
 - a) That it has four equal sides
 - b) That the shape is enclosed
 - c) That the angles are equal.
6. Take a pencil and ruler and draw a square. Draw diagonals from corner to corner. Now measure the distance from where the diagonals cross to the edge at several points. It will always be the same. This shows that the diagonals cross at the centre. The square has an easy to recognise centre, just as the circle does.
7. Ask the child to draw a square and mark the centre using the diagonals. Now continue the diagonals outwards. Now draw another larger square with the first square inside. The corners of the new square must be on the diagonals. If the child starts drawing lines which are not at 90 degrees to each other then stop the child and ask him/her to look at what is wrong. Discuss it with the child. If necessary draw a rectangle and a square and ask the child to highlight the differences.
8. Draw a third square on the same diagonals – either inside or outside the original square. You now have three squares. Ask the child if all three are squares. The answer is yes – the size of the square is not relevant – just like a circle. Squares and circles can be big or small – it is not the size that makes them squares and circles, but the shape.
9. You may choose to introduce other terminology at this point. Again this may not be at all appropriate for younger students. However even if not teaching the word

“diagonal” it is worth saying “diagonal” as you use the line.

- a) **The diagonals** – the lines that cross from one corner to another and pass through the middle.
 - b) **The perimeter** – the distance around the outside of the square. This can be used for any shape. The perimeter of the circle is the circumference.
10. As a revision point ask the child to draw you a square. Ask the child what makes it a square (the lines are all the same length, the last line meets the first, the angles are all the same and the diagonals are also the same length.) Ask the child to show you the centre of the square.
 11. Ask the child to draw a large square on paper and then cut it out. Ask the child to fold it in half and then open it out so the fold (which will pass through the middle of the square) is clearly seen. Repeat the process with another fold – this will give you another line through the centre. Ask the child to draw in the two lines along the folds. Where do they cross? If all has gone well they cross at the central point.
 12. Ask the child to draw a little square and a really big square. Ask the child “Are they both squares?” The answer is yes – because the idea of square has nothing to do with size.
 13. Ask the child to draw a square, and then using a compass draw a circle that is inside the square but with the circle touching each edge of the square – not crossing the square but just touching the square. The only way to do this is to have the centre of the circle and the centre of the square in the same place. If the child does not recognise this then work through this process.
 - a) Ask the child to mark the centre of the square (by crossing the diagonals).
 - b) Ask the child to take the compass, put the point at the centre and then ask the child to draw a circle as requested above.
 - c) Now cover this point again, to see if the child can undertake this work without any help.
 14. Ask the child to draw a four sided figure that is NOT a square. Ask the child to explain why it is not a square. This is an important final exercise – showing that the child really does have a full understanding of what constitutes a square.

c. The Triangle

1. Draw a triangle using a ruler and pencil. As you work, use the word “triangle” as often as possible.
2. Ask the child to draw the triangle using the same method as you. If the shape is not a triangle (not straight lines, or more than 3 lines) tell the child “that is not a triangle” and help the child to draw a triangle as you have done.
3. Ask the child to look for other examples of triangles. This is difficult – we use triangles in life far less than other shapes – but you might find the musical instrument of the same name in the music department. And the child’s parents might have a warning triangle in the back of the car at home.
4. Put together a chart of the shapes you have covered – square, circle, triangle. Every time the child sees an object that meets this shape the child must write it down. The chart can look like this:

Item	Square	Circle	Triangle
Cake tin	X		
Warning sign in back of mum’s car			X
CD		X	

Ask the child to continue filling it in day by day, and insist there must be at least one new entry each time you see the child.

5. Draw a three sided shape which is not a triangle because the sides are not straight. Ask the child whether or not this is a triangle. Discuss the answer – it is not a triangle, because the sides are not straight. A triangle has three straight sides.
6. Draw a four sided figure in which the sides are not straight and ask whether or not it is a square. The same answer applies as with point five.
7. Take a pencil and ruler and draw three triangles – one right angled triangle, one equilateral triangle and a third with three sides of different lengths and three angles of different sizes. Ask if all three are triangles. The answer is yes – as long as there are three straight sides and the shape is enclosed then it is a triangle. Draw a fourth shape in which there are three straight sides but in which the shape is not enclosed – it would need a fourth side to complete the enclosure. Is that a triangle? The answer is no.
8. Ask the child to draw a square. Now ask the child to draw one diagonal from corner to corner. Put your hand or some card over half of the square (with the diagonal as the dividing line) so what can be seen is the diagonal and two sides of the square. Ask the child what that shape is now – it is a triangle.
9. As a revision point ask the child to draw you a square. Ask the child to make a triangle in the square using some of the lines already drawn. The simplest answer of course is the creation of two triangles using a diagonal. Ask the child how many triangles you now have. The answer is two.

10. Ask the child to draw a large square on paper and then cut it out. Ask the child to make a cut along one diagonal line to create two triangles. Then ask the child to take the two shapes and make them into a square.
11. Ask the child to cut up several triangles of different sizes. Then ask the child to try to join two together to make a square. The child may find it impossible – unless of course he/she has cut up two triangles of identical size. The child should become aware that two triangles only make a square if the two triangles are identical and have an angle like the side of a desk (a 90 degree angle), and have two of the sides of equal length. They are not expected to learn this curious combination of effects – but rather to learn that most combinations of triangles can't be added together to make a square – even if they are identical.
12. Ask the child to draw a square. Using a compass draw a circle that is inside the square but with the circle touching each edge of the square – not crossing the square but just touching the square. Now add two triangles by just drawing one line across the diagonal. This line goes through the centre of the square and the circle. Ask the child to show which of the shapes is the square, which is the circle and which is the triangle.