# Things not allowed in Bongard Problems

Not everything is fair game in Bongard Problems. In particular,

* The rule that describes the six boxes on the left (or right) side cannot use the absolute position of the boxes. For example, one cannot state: "the first, second, and sixth boxes contain triangles", or: "the first column of boxes...", or: "the odd-numbered rows of boxes...", etc. All boxes on the left and all boxes on the right are regarded as a collection, or set (in the mathematical sense), with no particular ordering imposed.
* Apparently, using the same box on both the left and right sides creates an invalid problem. The reason is this: although the designer of such a problem might intend a different description to be given to each of the identical boxes, nothing prevents the solver from applying the same description on both boxes. Thus, what appears as "solution" for the left side applies also as the description of one of the boxes on the right, which is against the implicitly understood definition of Bongard problems. (Such a definition is implicit through the original 100 problems by Bongard, and should include the statement that the proposition which is the "solution" on the left side should not apply to any individual box on the right side, and vice-versa.)
* Bongard problems are traditionally based on the geometry of the given patterns, i.e., just the pixels and their relations. For example, an invalid BP, not based on geometry, would be one presenting a spoon, a fork, a knife, a glass, a dish, and a pan on the left side, stating that "all boxes on the left depict utensils". I find that adhering to geometry and excluding human-specific knowledge is esthetically more pleasing, in the sense that if an alien were to visit Earth and be presented with geometry-specific BP's, this hypothetical alien would be given an equal (and fair) basis for intellectual comparison with humans (and other BP-solving devices!). Would it not be unfair to require that aliens (and other "artificial intelligencies") be familiar with our anthropocentric view of the world before their intelligence can be compared to ours?  
    
  By the way, notice that [BP#100](http://www.foundalis.com/res/bps/bongard/p100.htm) (last one designed by Bongard) could be regarded as violating this principle. From another viewpoint, however, it is possible for a program to learn the pattern "A", or "Be", etc., abstractly, based only on the geometry (topology) of the lines and curves involved and thus find the solution, ignoring any world-related knowledge about alphabets. (On the other hand, I am fully aware that my [BP#200](http://www.foundalis.com/res/bps/foundal/p200.htm) clearly violates this principle; but then, it was the 200th one, so it had to have some special status!)
* A note about "if ... then ..." rules: Strictly (and logically) speaking, these rules should be allowed. It turns out, however, that such rules can be very tricky and counter-intuitive for us, mere mortal, non logico-mathematically oriented humans. For example, consider the seemingly simple rule: "If there is a triangle then it is isosceles". So what if there is no triangle in one of the boxes at left? Apparently the box would satisfy the rule (since the premise is false), so it should be placed on the left side. We could then have a Bongard problem showing just one isosceles triangle in one of the six boxes on the left, with the other five boxes containing irrelevant (non-triangular) shapes, and all boxes on the right containing at least one non-isosceles triangle (among other shapes). Such a problem would be extremely hard to solve. Besides, it would be possible for one to postulate weird "if ... then ..." rules for most of the hard problems which contain a different, elegant solution, and thus render them trivial. So, I believe, "if ... then ..." rules should be avoided, not because they are logically impossible, but because they do not comply to the spirit of BPs, which is to probe common-sense intelligence.
* For reasons similar to the ones explained above, rules consisting of long sequences of disjunctions ("... or ... or ...", etc.) should be avoided. Again, one can turn the most elegant problems to trivial ones in this way. Two clauses, however, ("... or ...") do not seem to be an extreme thing to consider (in fact, [BP#13](http://www.foundalis.com/res/bps/bongard/p013.htm) appears to be just of that sort).