DIRECTIONS FOR TESSELATING AND SOME DEFINITIONS

DIRECTIONS FOR TILING:

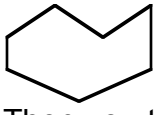
Now that you have had a shot at doing a tiling without particularly formal instructions, I think it might be helpful to see a written out set of instructions (still not altogether formal!). Basically, what is needed is a visual pattern so clear and coercive that if you put your finger at any spot on the edge of the pattern you can immediately say exactly what tile should go there, and in what position, and know that it will indeed fit there, because that combination in that position has occurred already in the existing pattern. For some of you, this type of visual organization seems to come naturally. Other are more like me, and could use a recipe. The drawback to giving a recipe is that it does not, in fact, cover all possible tilings. On the other hand, it does cover any tiling we run into in this course, so here goes. I will describe the procedure for a monohedral tiling--the generalization to the case where you have two or more shapes to tile with is clear.

Start by just tiling a while, but be on a lookout for familiar situations. When you have fitted the tile together a few times, don't put it on randomly--see if somewhere in what you've already done you find gap of the same shape, and if so, add the tile in the same way that you did before. This should produce either a dead end, in which case you start again, or an organized pattern, in which case you are ready for the next step: find a strip of the pattern, going all the way from one side to the other or top to bottom), in which all of the notches on one side are exactly matched by bumps on the other side. Highlight both sides of the strip and you've produced a visual proof that you would be able to continue forever.

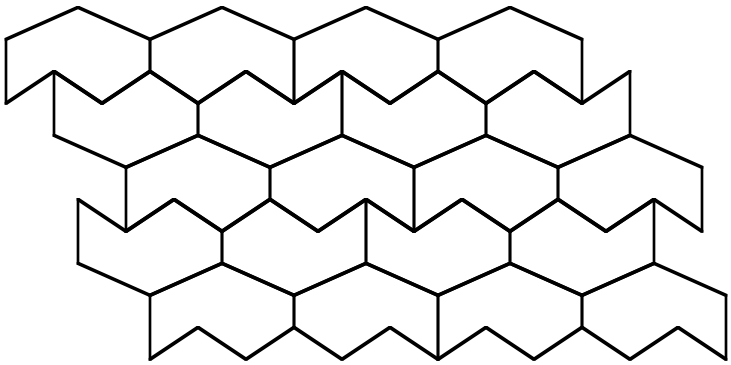
Refinements: 1) If you can see from the start what's going on, you can just produce the strip itself, provided the matching of the two sides is completely obvious.

2) You can take the process one step further and mark off a single shape (presumably made up of a batch of copies of your original tile) such that the whole tiling can be reproduced by making a rubber stamp of that shape and moving it up and down or back and forth <u>without turning it</u> .

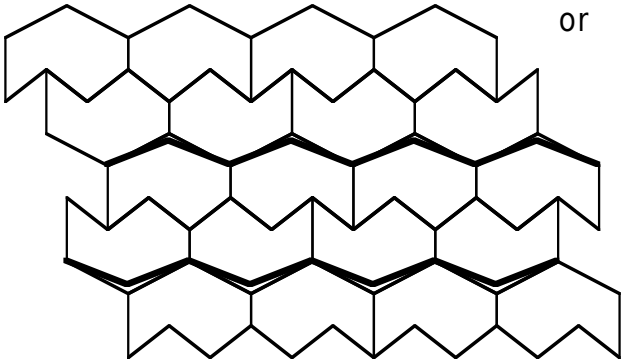
EXAMPLE: Suppose your prototile looks like this:



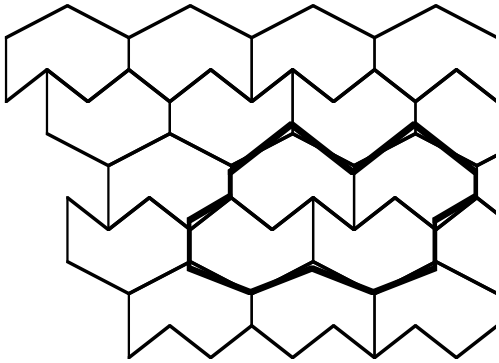
Then you tile a while and get this:



Then to convince the Friendly Skeptic, all you have to do is this:



or



or even