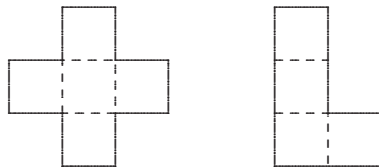


**MATHEMATICS CHALLENGE FOR YOUNG
 AUSTRALIANS
 INTERMEDIATE: YEARS 9 and 10
 WARM UP PROBLEM 04**

Pentacross

John is a tiler. He has a large number of two kinds of tiles, as shown.



The Pentacross The Tetral

The shortest edge of each tile is 10 cm, which we call one unit. John wants to know what size rectangular kitchen benches he can completely tile using these two kinds of tile (without cutting any). Note that each tile can be laid on either face; that is, they can be turned over.

1. Draw diagrams to show how John can tile:
 - (a) an 8 unit by 3 unit bench,
 - (b) a 6 unit by 5 unit bench.
2. Show how John can tile any bench 6 units wide and k units long, where k is an integer and $k \geq 9$.
3. Convince John that, in completely tiling benches of width 4 units, he can never use Pentacrosses.