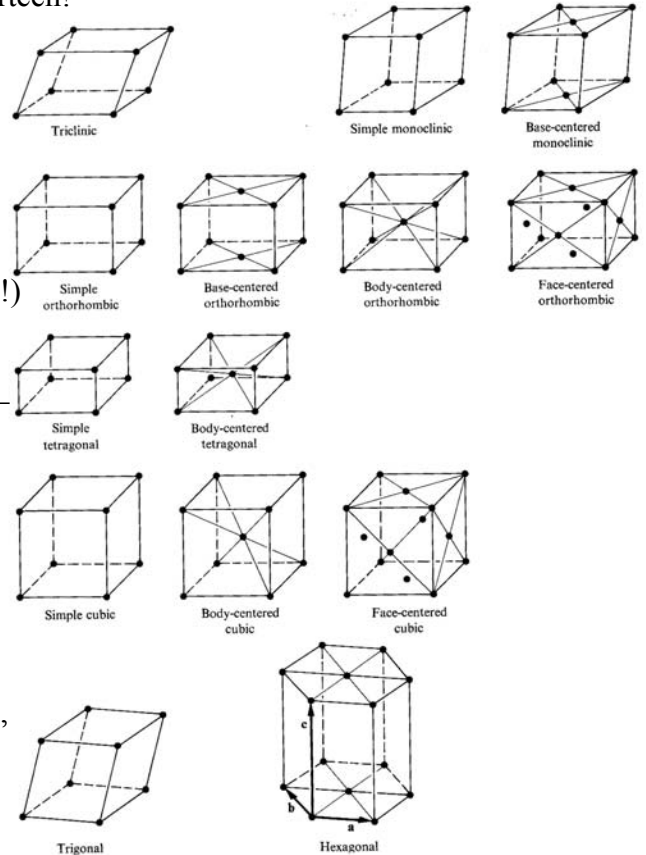# The Bravais Lattices Song
Walter F. Smith 1-22-02

If you have to fill a volume with a structure that's repetitive,
Just keep your wits about you, you don't need to take a sedative!
Don't freeze with indecision, there's no need for you to bust a seam!
Although the options may seem endless, really there are just fourteen!
There's cubic, orthorhombic, monoclinic, and tetragonal,
There's trigonal, triclinic, and then finally hexagonal!
There's only seven families, but kindly set your mind at ease—
'Cause four have sub-varieties, so there's no improprieties!
(Chorus:
'Cause four have sub-varieties, so there's no improprieties.
'Cause four have sub-varieties, so there's no improprieties.
'Cause four have sub-varieties, so there's no impropri-e, prieties!)
These seven crystal systems form the fourteen Bravais lattices.
They've hardly anything to do with artichokes or radishes –
They're great for metals, minerals, conductors of the semi-kind –
The Bravais lattices describe all objects that are crystalline!

The cubic is the most important one in my "exparience",
It comes in simple and in face- and body-centered variants.
And next in line's tetragonal, it's not at all diagonal,
Just squished in one dimension, so it's really quite rectangular!
The orthorhombic system has one less degree of symmetry
Because an extra squish ensures that *a* not equals *b* or *c*.
If angle gamma isn't square, the side lengths give the "sig-o-nal"
For monoclinic if they're different, or, if equal, trigonal!
(Chorus (reprovingly):
Of course for trigonal, recall that alpha, beta, gamma all
Are angles that are equal but don't equal ninety, tut, tut, tut!
Are angles that are equal but don't equal ninety, tut, tut, tut, tut tut!)
If you squish the lattice up in every way that is conceivable,
You'll get the least amount of symmetry that is achievable –
It's called triclinic, then remains the one that really self explains –
Hexagonal gives us no pains, and so we now may rest our brains!

The 14 Bravais lattices grouped into the 7 crystal systems.

Figure from
Elementary Solid State Physics,
by M. Ali Omar (Addison Wesley, 1993)