

MILLER INDICES

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INVENTOR OF MILLER INDICES

- THIS SCHEME, DEVISED BY
- BRITISH MINERALOGIST AND CRYSTALLOGRAPHER WILLIAM HALLOWES MILLER, IN 1839, HAS THE ADVANTAGE OF ELIMINATING ALL FRACTIONS FROM THE NOTATION FOR A PLANE.

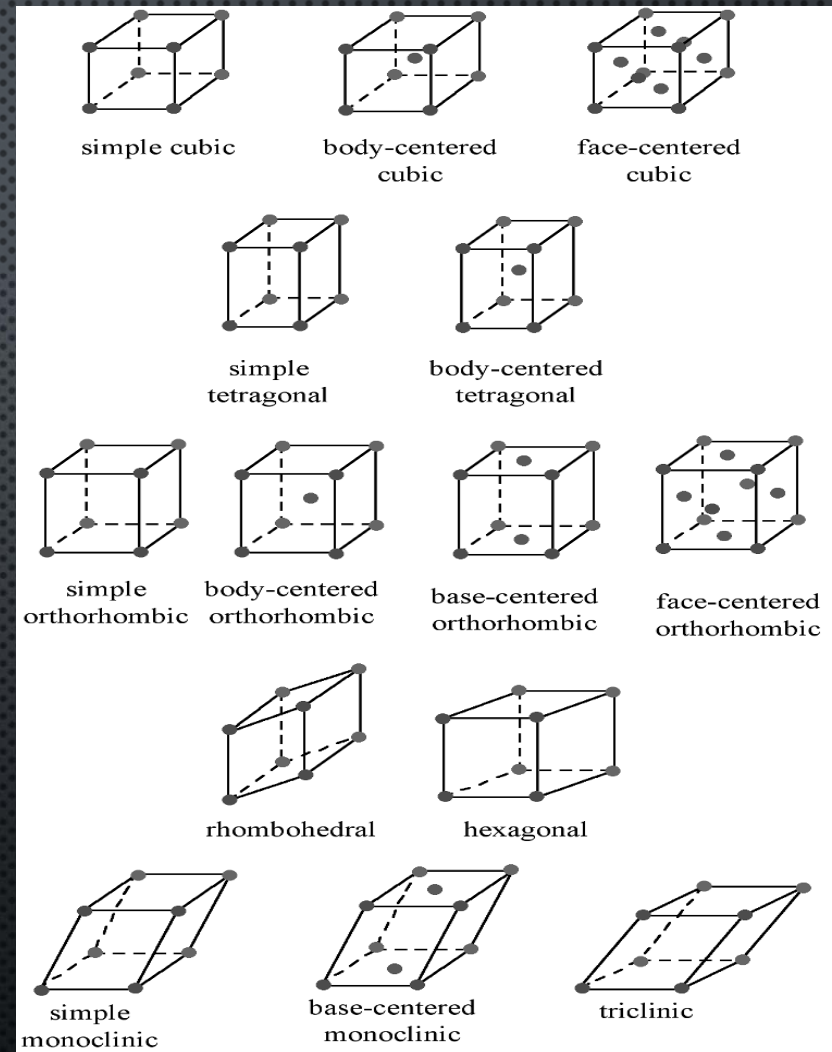
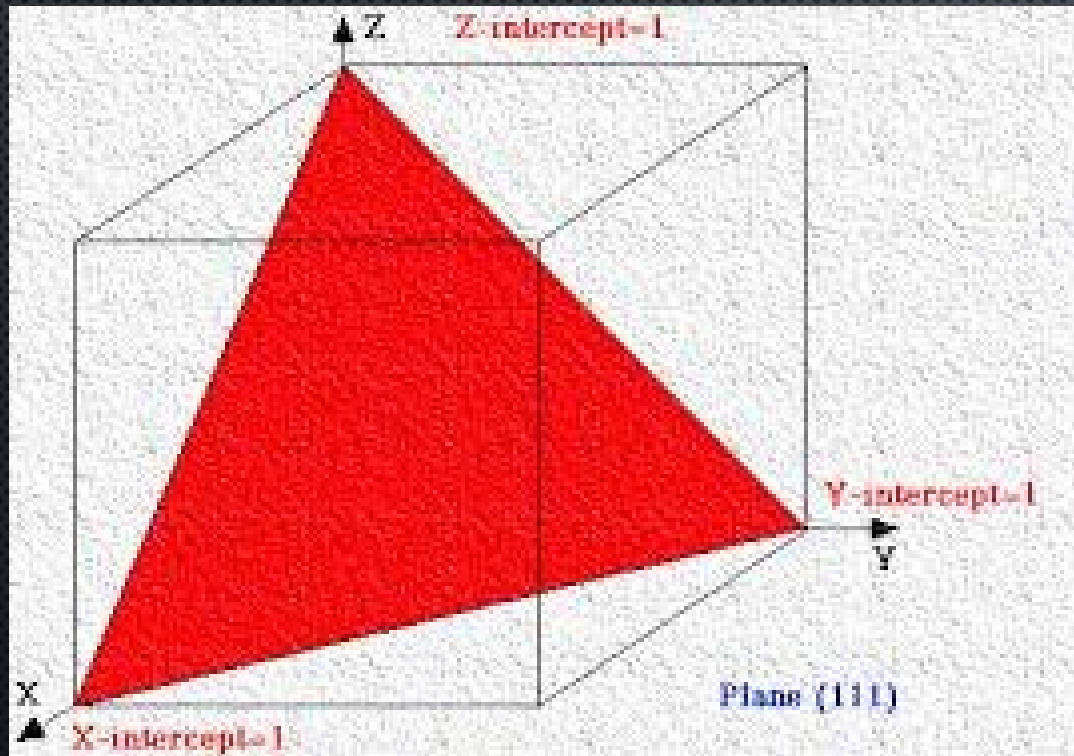
DEFINITION OF MILLER INDICES

- MILLER INDICES - GROUP OF THREE NUMBERS THAT INDICATES THE ORIENTATION OF A PLANE OR SET OF PARALLEL PLANES OF ATOMS IN A CRYSTAL.
- MILLER INDICES - (A METHOD OF DESCRIBING PLANES AND DIRECTIONS WITHIN A CRYSTAL)
- [HTTP://WWW.YOUTUBE.COM/WATCH?V=PMTA_wiY784](http://www.youtube.com/watch?v=PMTA_wiY784)

A BETTER SENSE OF THINGS

- IF EACH ATOM IN THE CRYSTAL IS REPRESENTED BY A POINT AND THESE POINTS ARE CONNECTED BY LINES, THE RESULTING LATTICE MAY BE DIVIDED INTO A NUMBER OF IDENTICAL BLOCKS, OR UNIT CELLS.
- THE INTERSECTING EDGES OF ONE OF THE UNIT CELLS DEFINES A SET OF CRYSTALLOGRAPHIC AXES, AND THE MILLER INDICES ARE DETERMINED BY THE INTERSECTION OF THE PLANE WITH THESE AXES.
- THE RECIPROCAL OF THESE INTERCEPTS ARE COMPUTED, AND FRACTIONS ARE CLEARED TO GIVE THE THREE MILLER INDICES (HKL).

PICTURES OF PLANES, AND DIFFERENT ATOM UNIT CELLS



CONCLUSION

- IF A MILLER INDEX IS ZERO, THE PLANE IS PARALLEL TO THAT AXIS.
- THE SMALLER A MILLER INDEX, THE MORE NEARLY PARALLEL THE PLANE IS TO THE AXIS.
- THE LARGER A MILLER INDEX, THE MORE NEARLY PERPENDICULAR A PLANE IS TO THAT AXIS.
- MULTIPLYING OR DIVIDING A MILLER INDEX BY A CONSTANT HAS NO EFFECT ON THE ORIENTATION OF THE PLANE
- MILLER INDICES ARE ALMOST ALWAYS SMALL.

CITED

- [HTTP://WWW.BRITANNICA.COM/EBCHECKED/TOPIC/382843/MILLER-INDICES](http://www.britannica.com/EBchecked/topic/382843/miller-indices)
- CHEMISTRY.BD.PSU.EDU
- [HTTP://CNX.ORG/CONTENT/M16927/LATEST/](http://cnx.org/content/m16927/latest/)