

Phyllotaxis

Phyllotaxis (leaf arrangement):

– passage from one leaf (on a twig) to the next is given by a **screw displacement** involving a rotation:

Tree	Phyllotaxis	Description
Elm, basswood	$\frac{1}{2}$	alternate on opp. sides
Beech, hazel	$\frac{1}{3}$	rotation of $\frac{1}{3}$ of a turn
Oak, apricot	$\frac{2}{5}$	rotation of $\frac{2}{5}$ of a turn
Poplar, pear	$\frac{3}{8}$	rotation of $\frac{3}{8}$ of a turn
Willow, almond	$\frac{5}{13}$	rotation of $\frac{5}{13}$ of a turn

etc.

Observation: these fractions are quotients of **alternate** Fibonacci numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, ...

Other manifestations of phyllotaxis:

- arrangement of **florets** on a **sunflower**;
- arrangement of **scales** of a **fir cone**;
- arrangement of the **helical whorls** on a **pineapple**:
5 parallel rows sloping gently to the right, 8 to the left, 13 steeply to the right.