



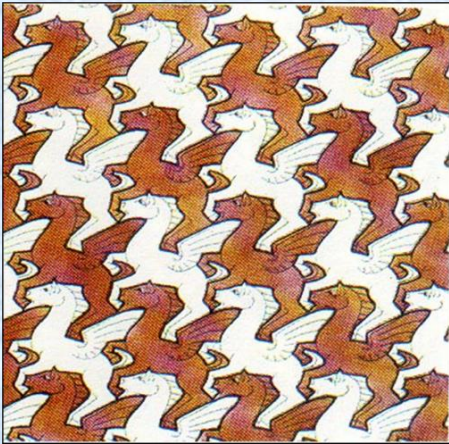
OriNidaZoom

Incontri online sulla didattica con l'origami

Tassellazioni periodiche e aperiodiche

di Francesco Decio e Stefania Serre

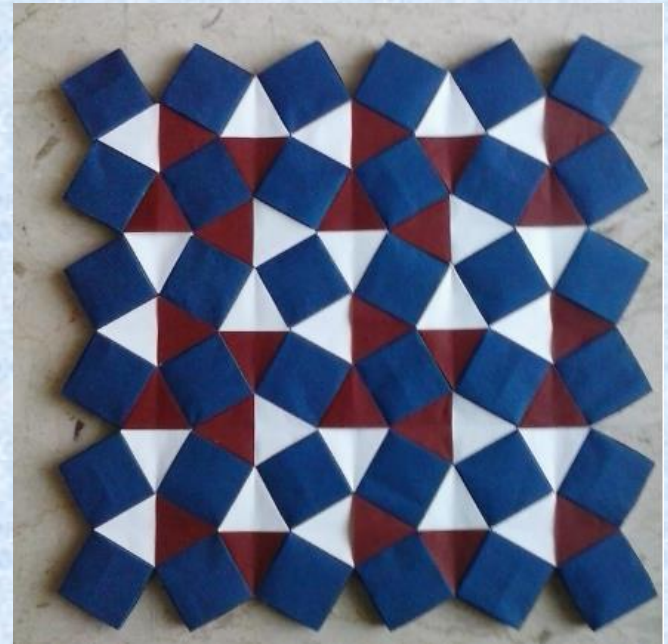
Tassellazioni



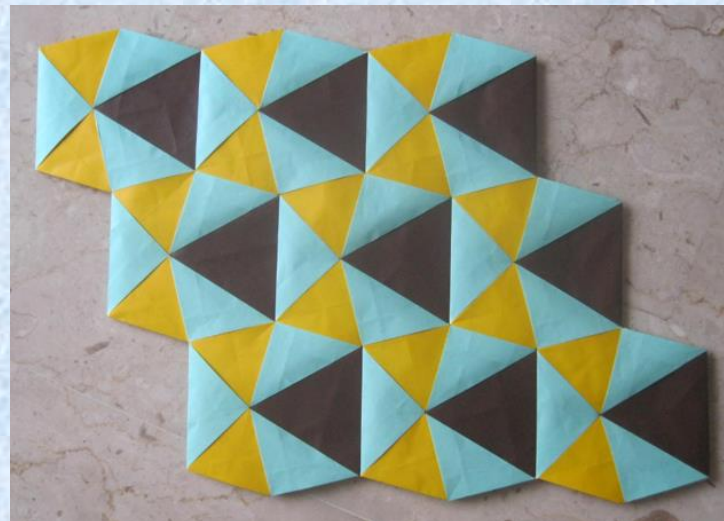
Periodiche



Tasellazioni



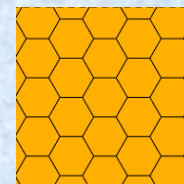
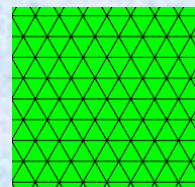
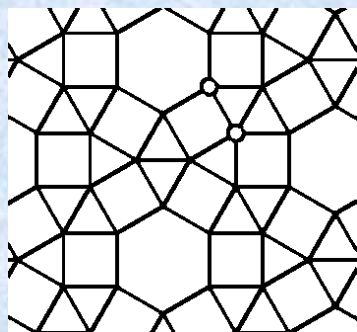
Periodiche



Tasellazioni

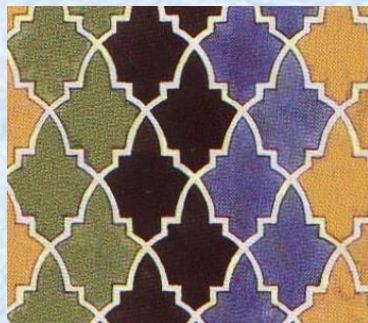
Regolari

Semiregolari

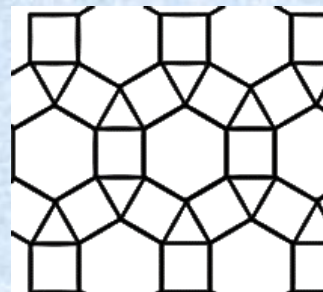


Periodiche

Monoedriche



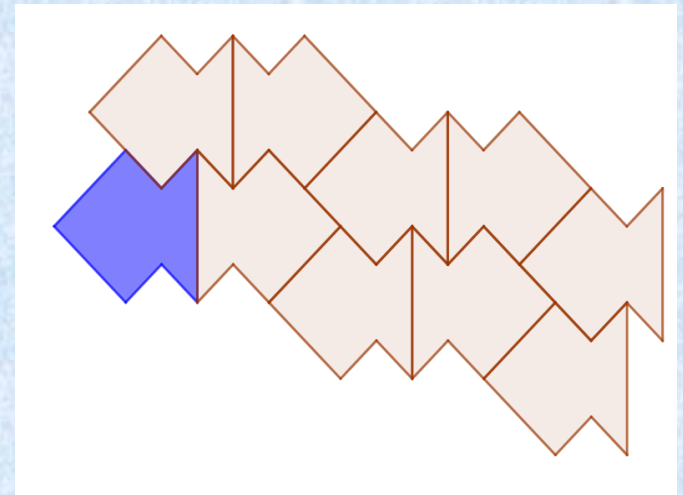
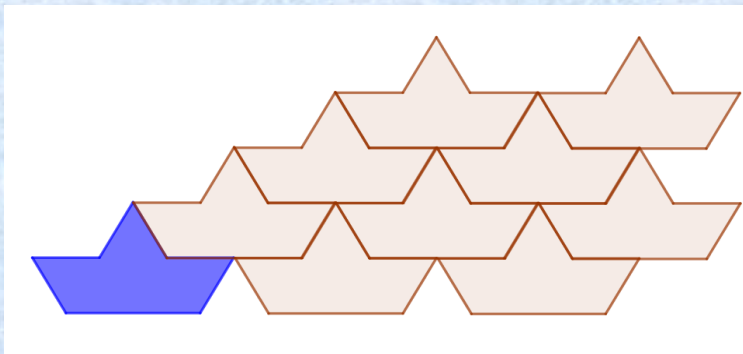
Uniformi



Tasellazioni periodiche

Nessun poligono convesso con più di sei lati può da solo tassellare il piano.

Se un poligono di 7 lati tassella il piano....



Tasellazioni periodiche

Nessun poligono convesso con più di sei lati può da solo tassellare il piano.

Se un poligono di 7 lati tassella il piano....

Tutti i triangoli tassellano il piano.

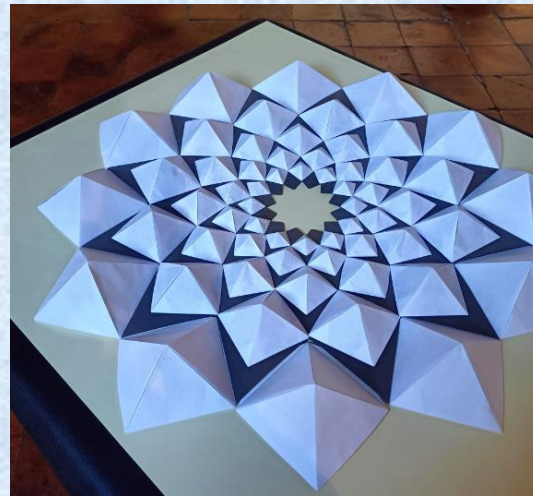
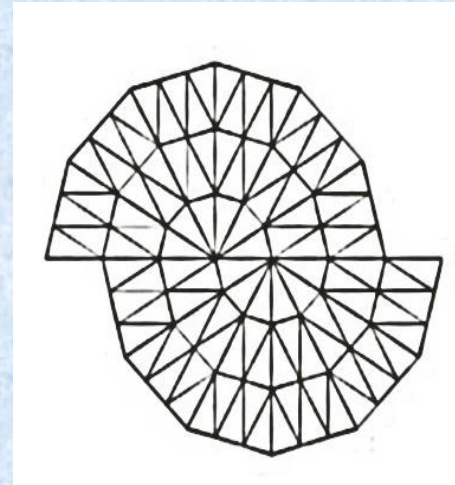
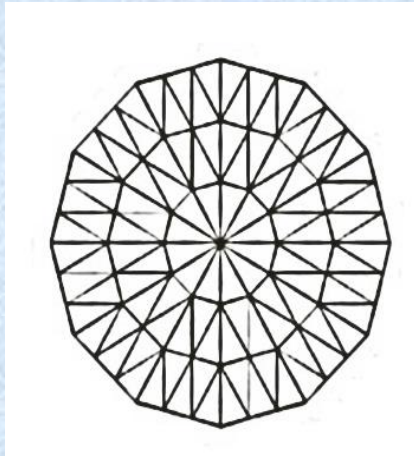
Tutti i quadrilateri tassellano il piano (concavi e convessi)

Non tutti i pentagoni tassellano il piano

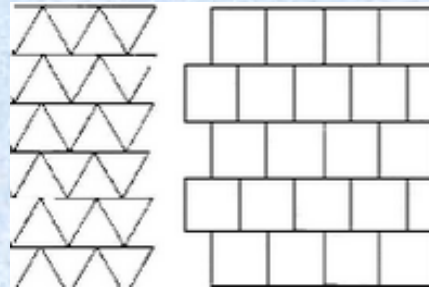
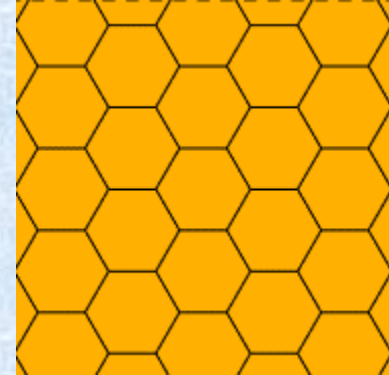
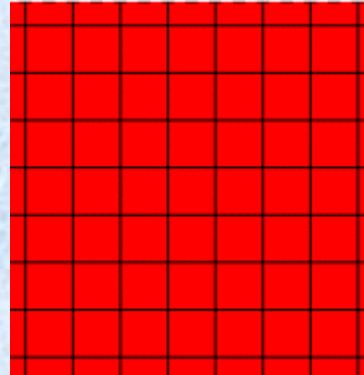
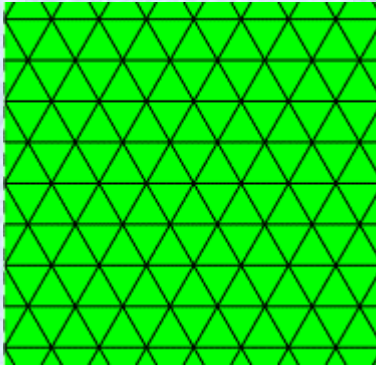
Esistono quindici tipi di tassellazioni pentagonali convesse

Esistono tre tipi di tassellazioni esagonali convesse

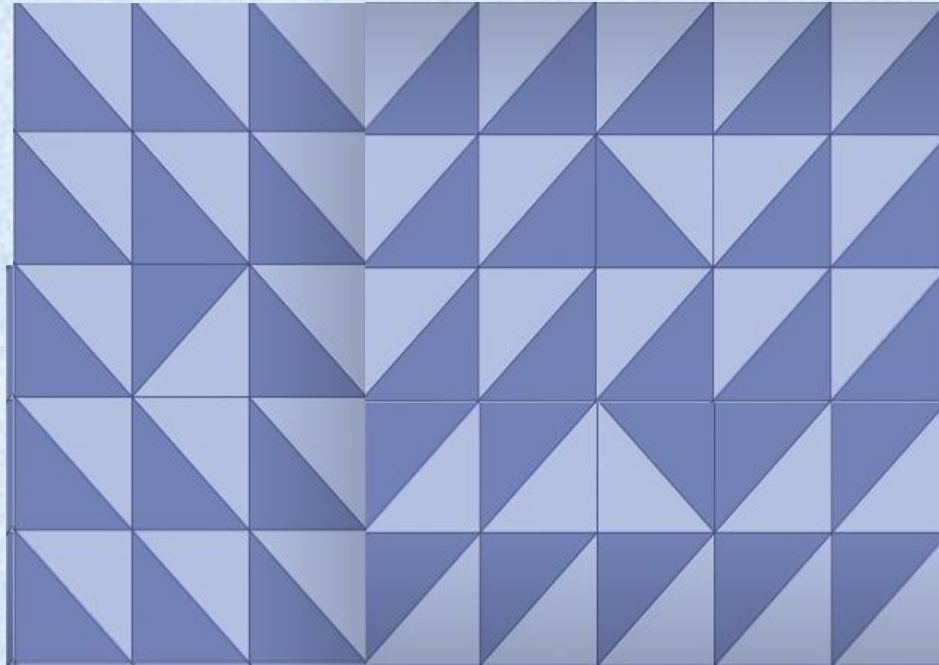
Tassellazioni non-periodiche



Tassellazioni *non-periodiche*

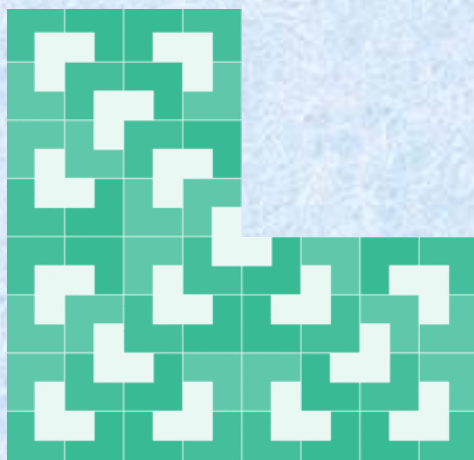


Tassellazioni *non-periodiche*



Modifiche casuali in tassellazione regolare: la tassellazione diventa non periodica

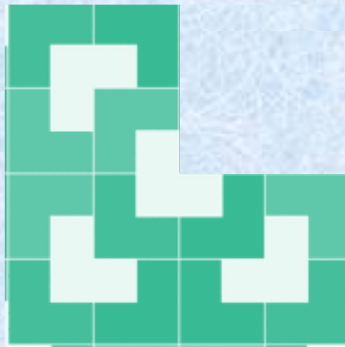
Tassellazioni *periodiche e non-periodiche*



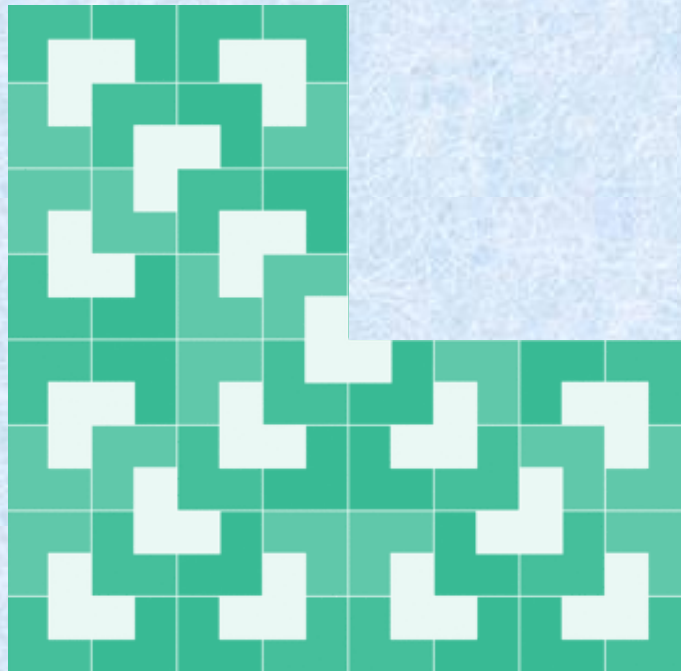
Tassellazioni *non-periodiche*: *i rep-tiles*



Tassellazioni *non-periodiche*: *i rep-tiles*



Tassellazioni *non-periodiche*: *i rep-tiles*



Tassellazioni *a-periodiche*?

Tassellazioni *a-periodiche*

Esistono tasselli che ricoprono il piano **unicamente** in modo **non periodico**?

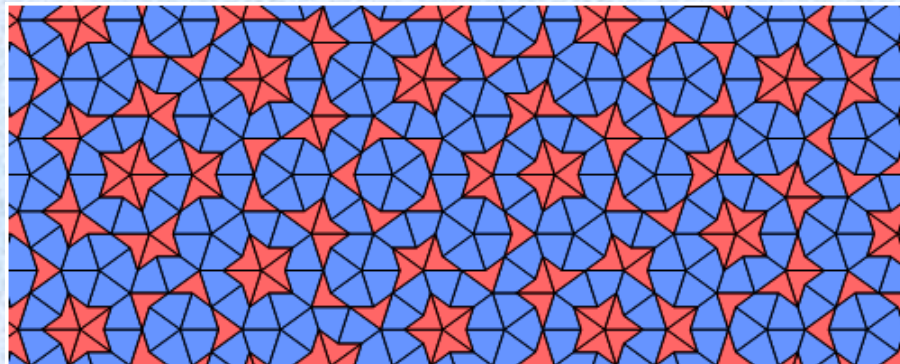
Iniziò a occuparsene Hao Wang nel 1961

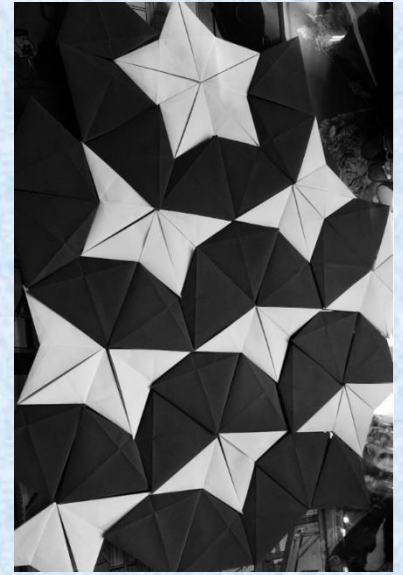
ma il primo a riuscirci fu Berger che nel 1966 ideò un insieme costituito da ben 20426 tessere, riuscendo poi a ridurlo a 104.

Nel 1970 Robinson trovò un insieme formato da solo 6 pezzi:



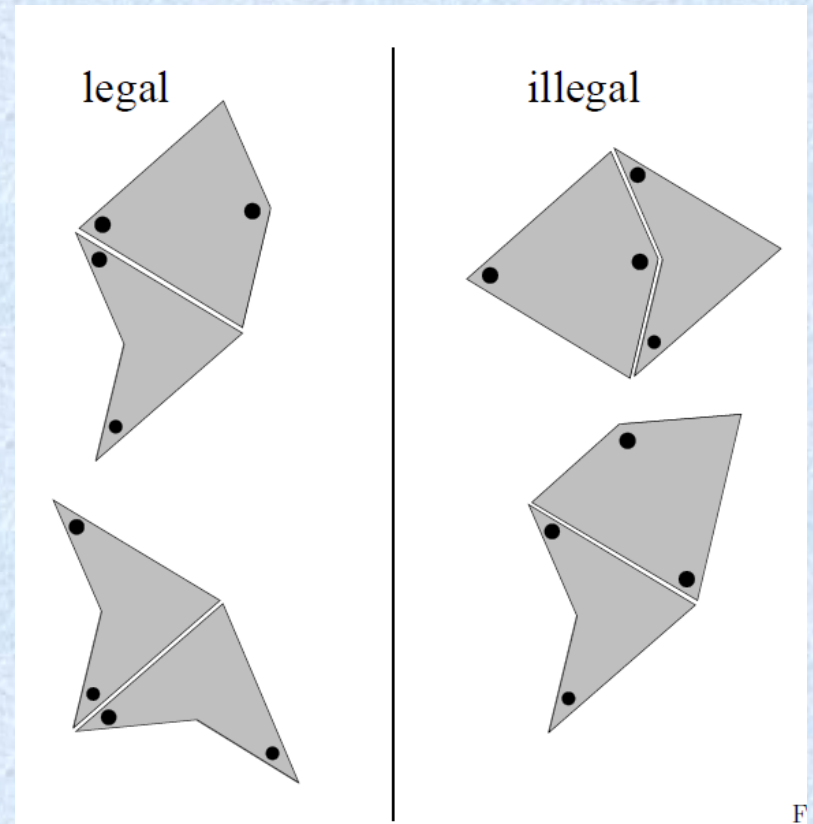
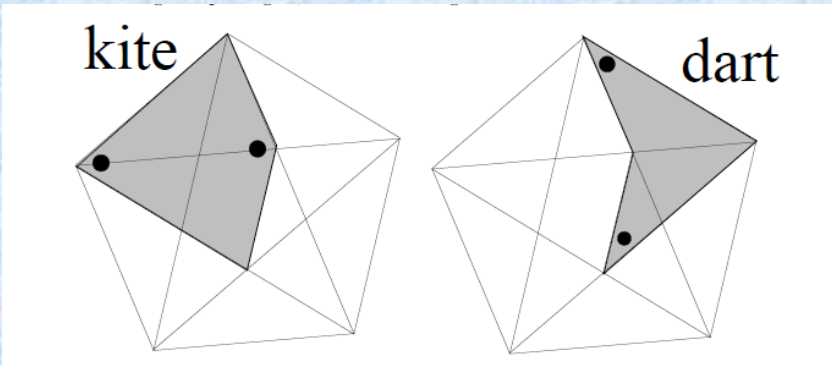
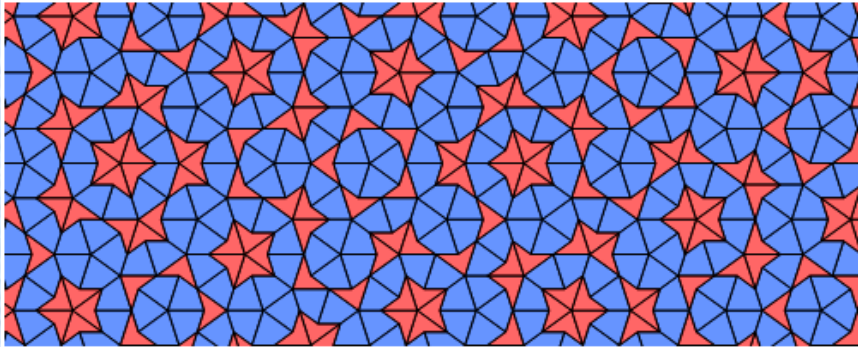
E poi nel 1975 arrivò Penrose...



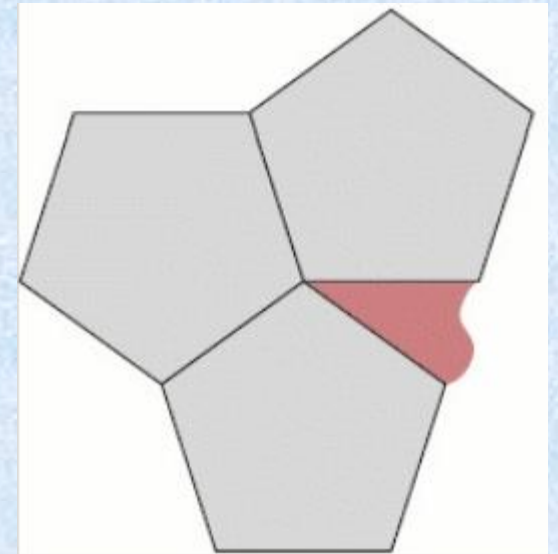
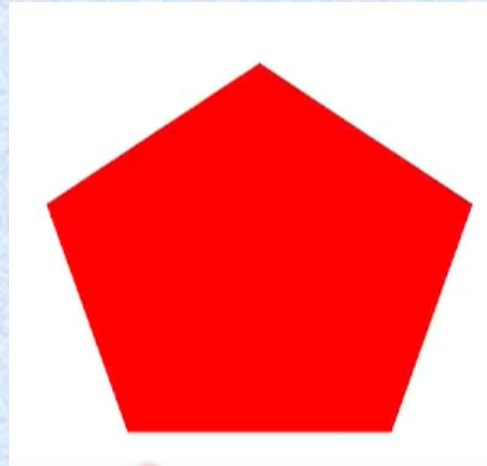




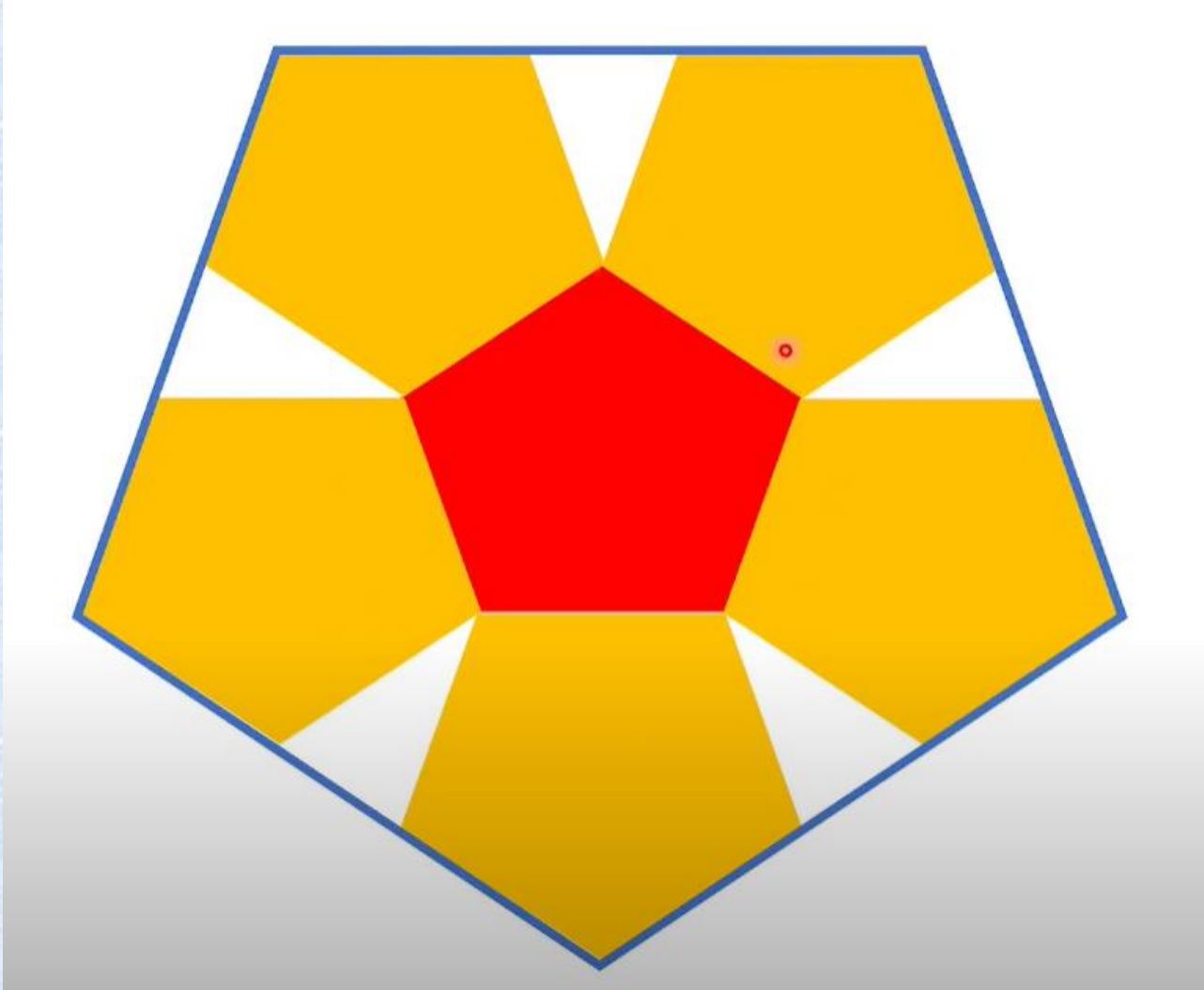
Tassellazioni *a-periodiche*



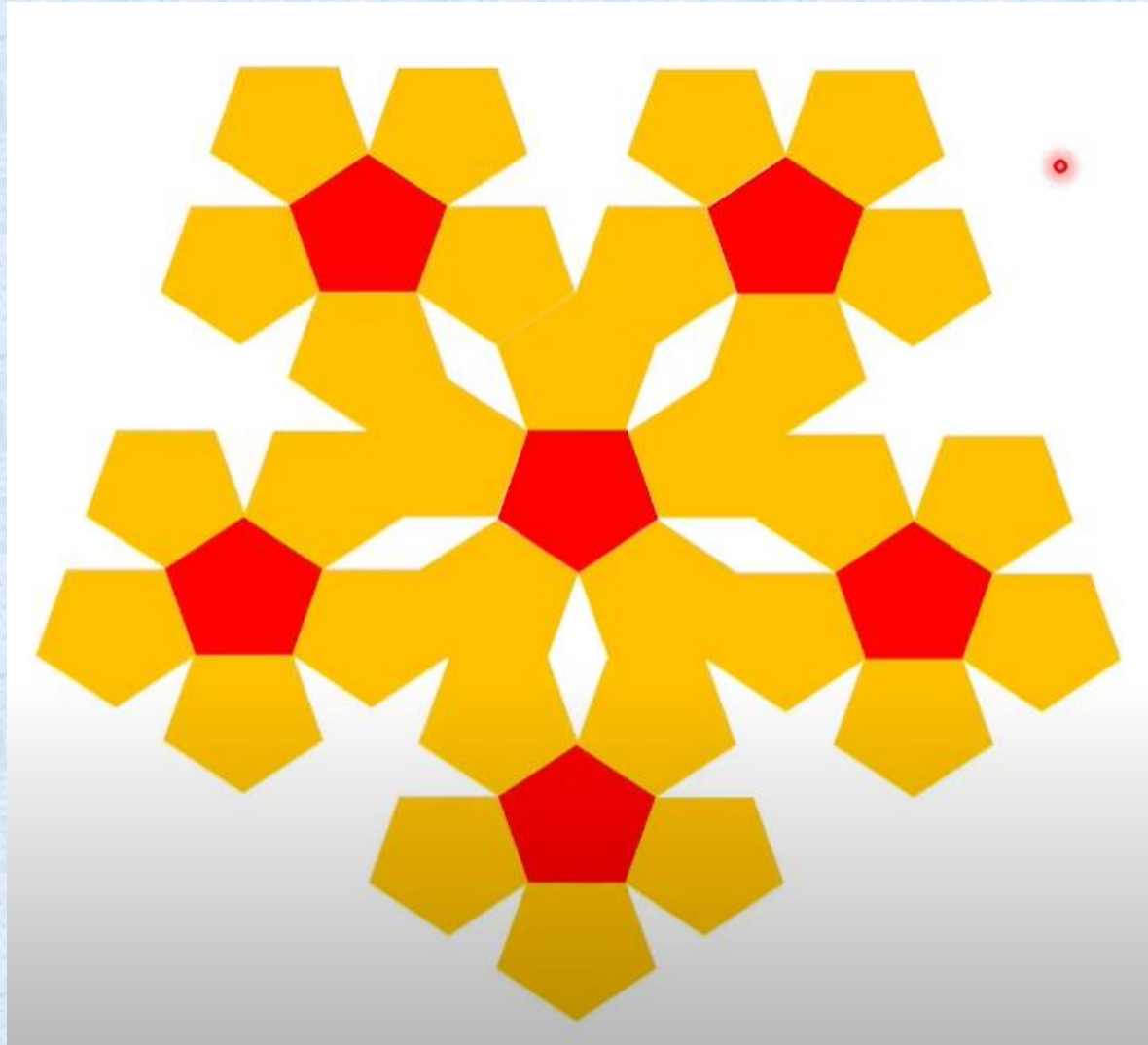
Tassellazioni *a-periodiche*



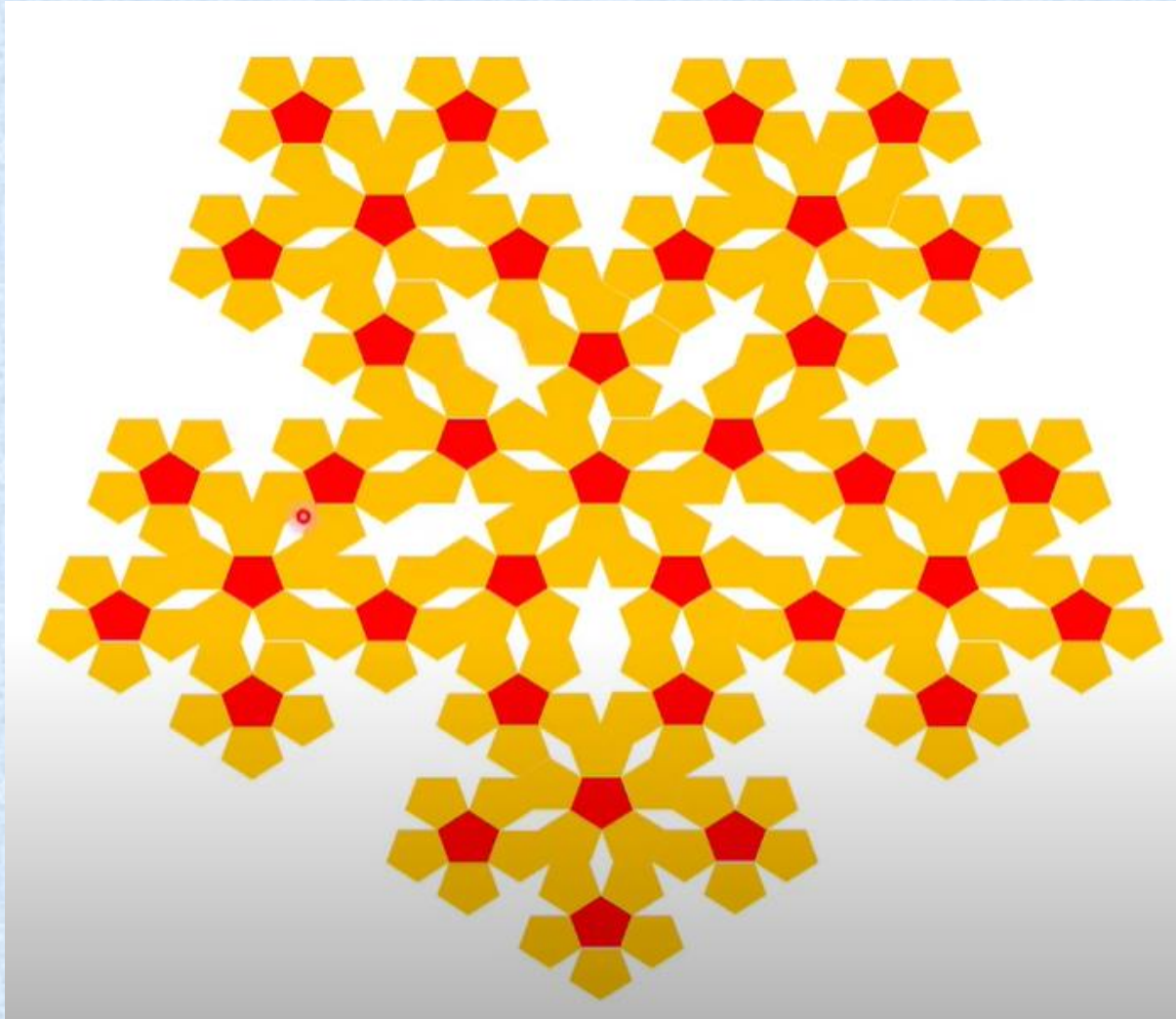
Tassellazioni *a-periodiche*



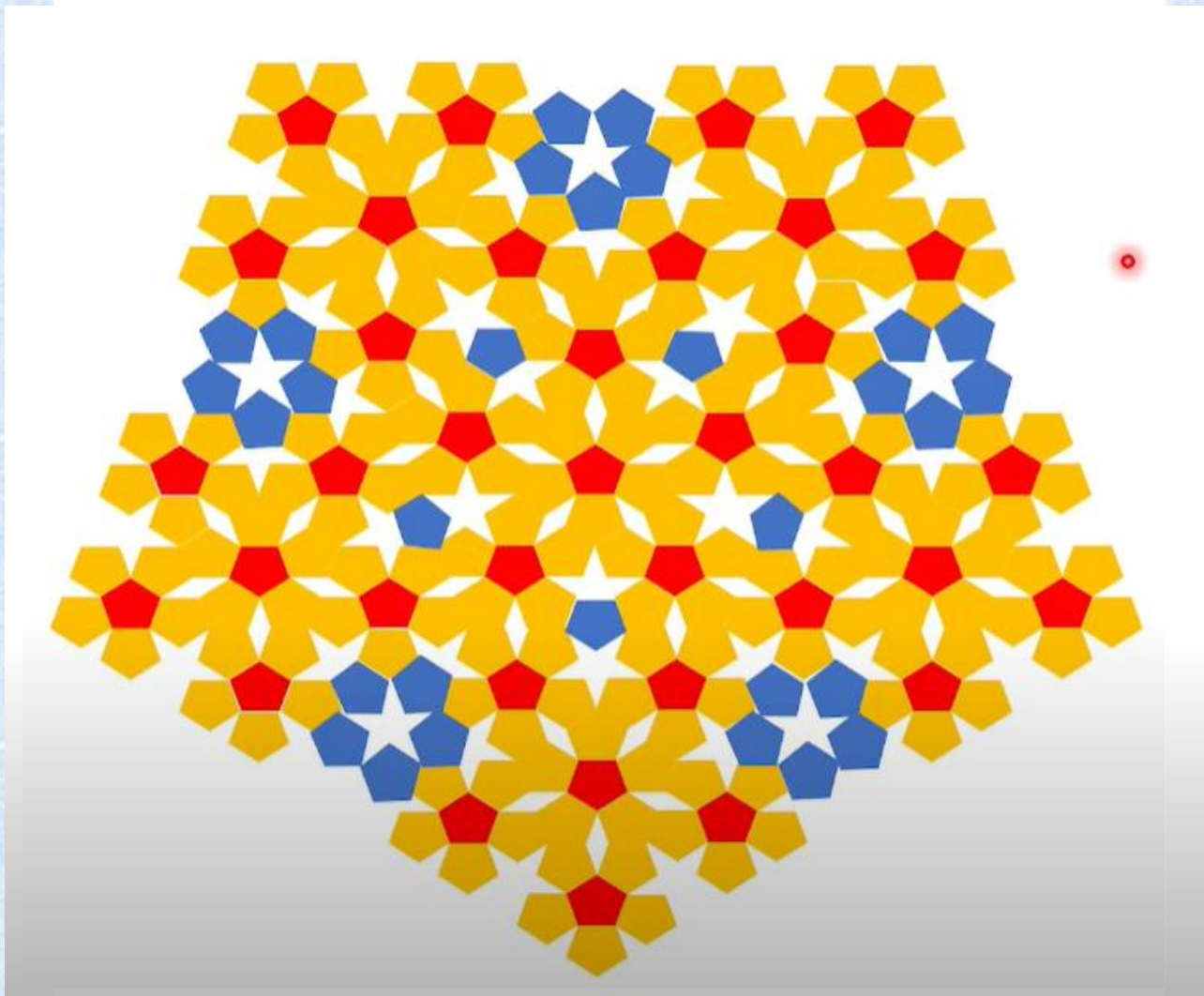
Tassellazioni *a-periodiche*



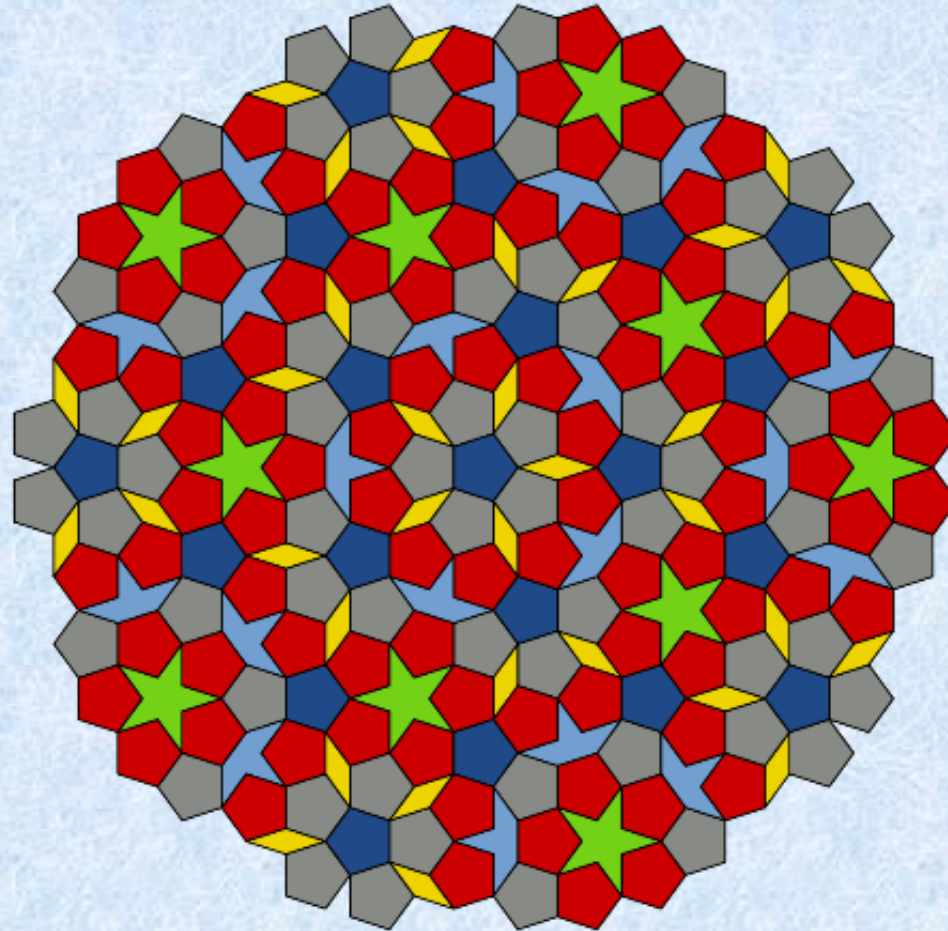
Tassellazioni *a-periodiche*



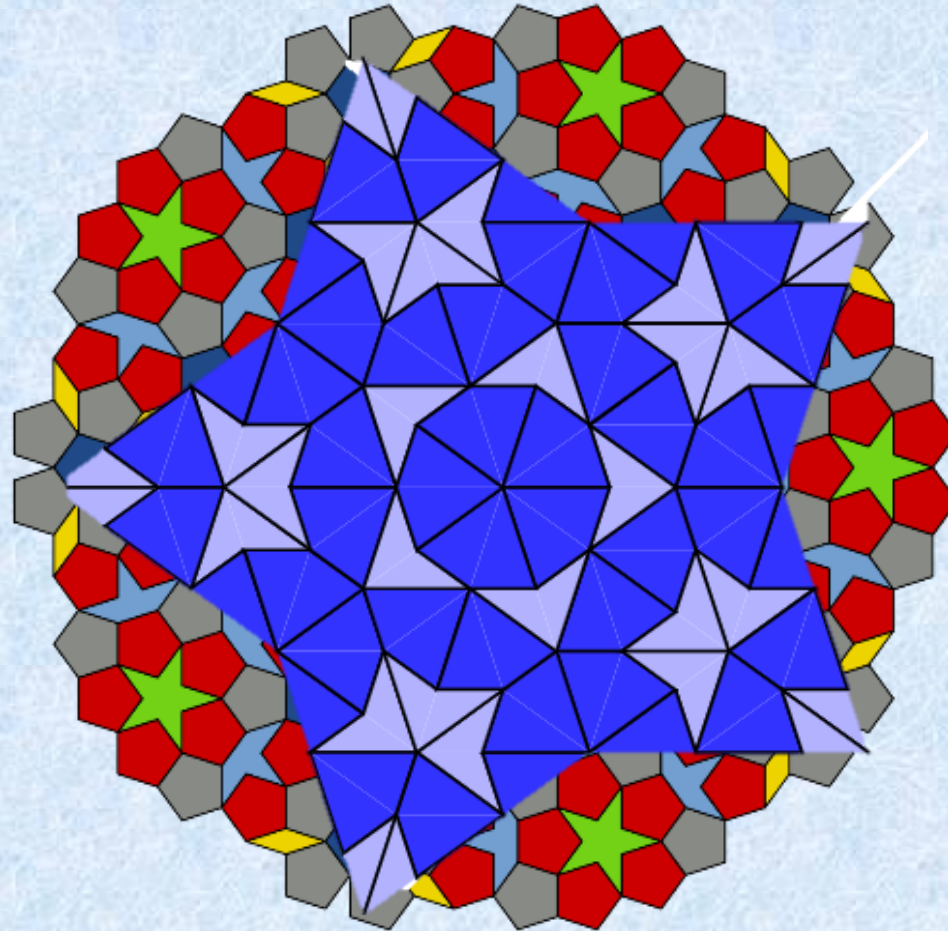
Tassellazioni *a-periodiche*



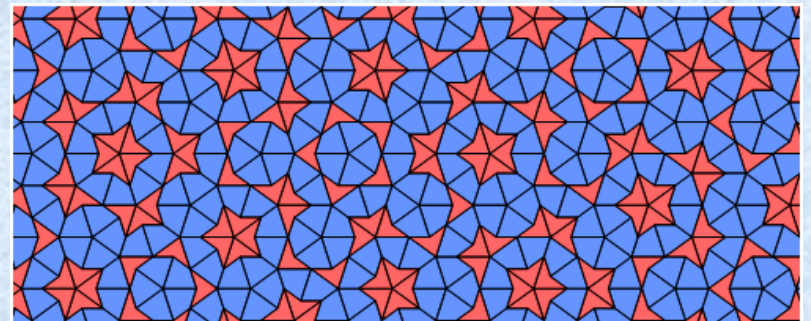
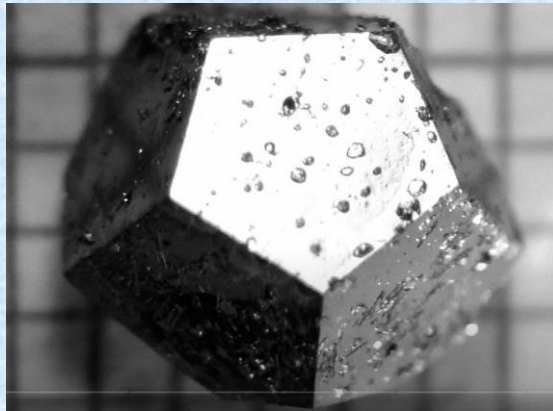
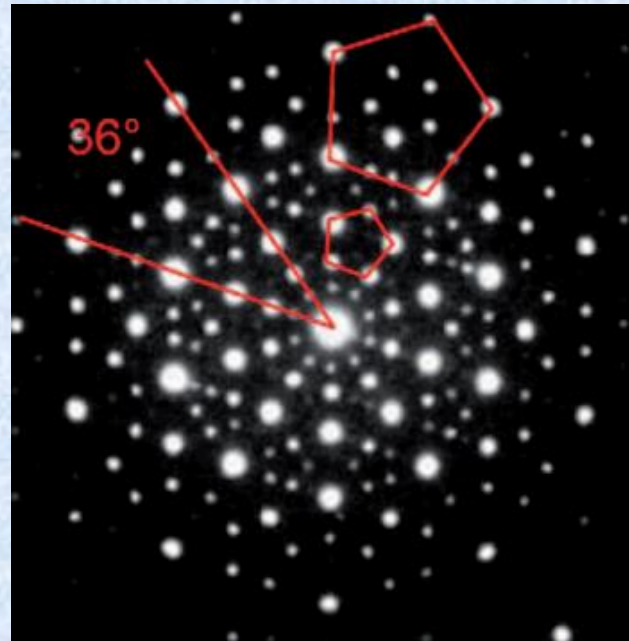
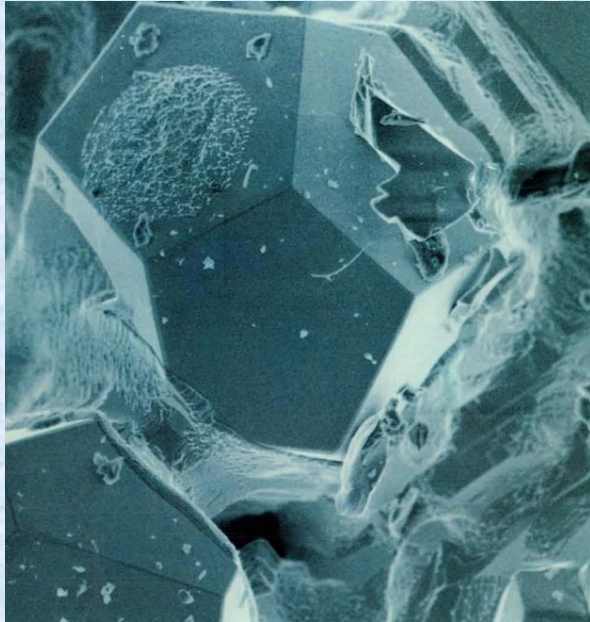
Tassellazioni *a-periodiche*



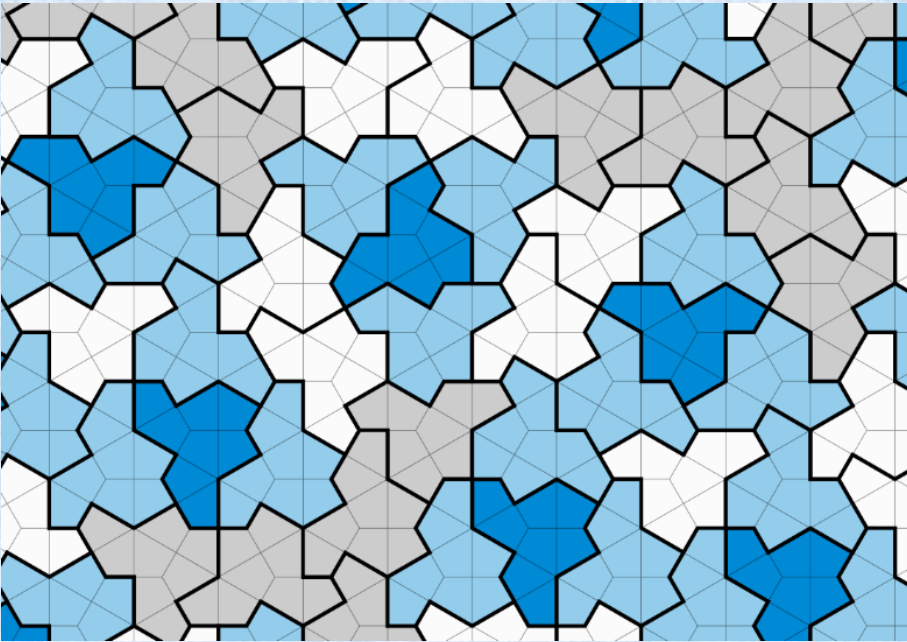
Tassellazioni *a-periodiche*



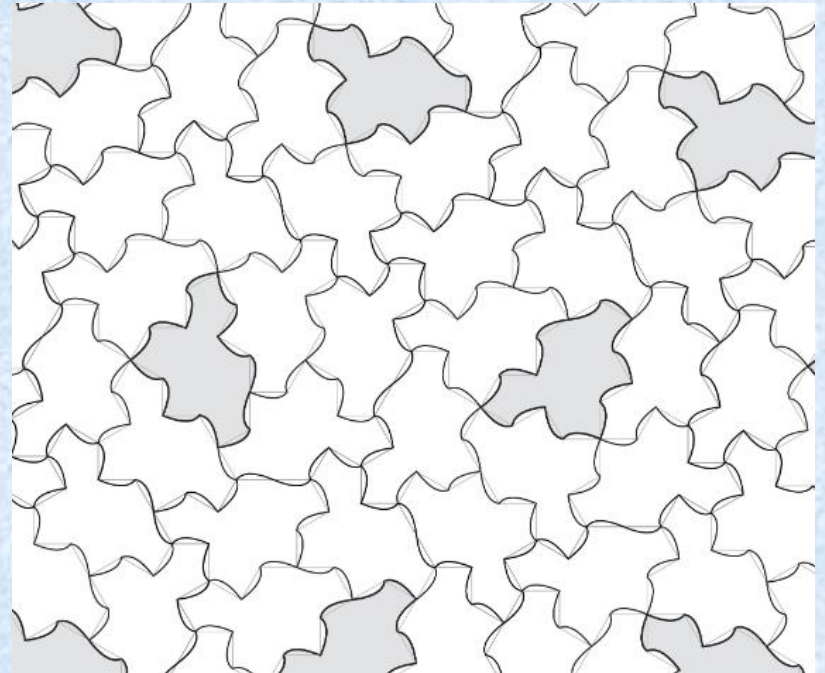
Tassellazioni *a-periodiche*



Tassellazioni *a-periodiche*



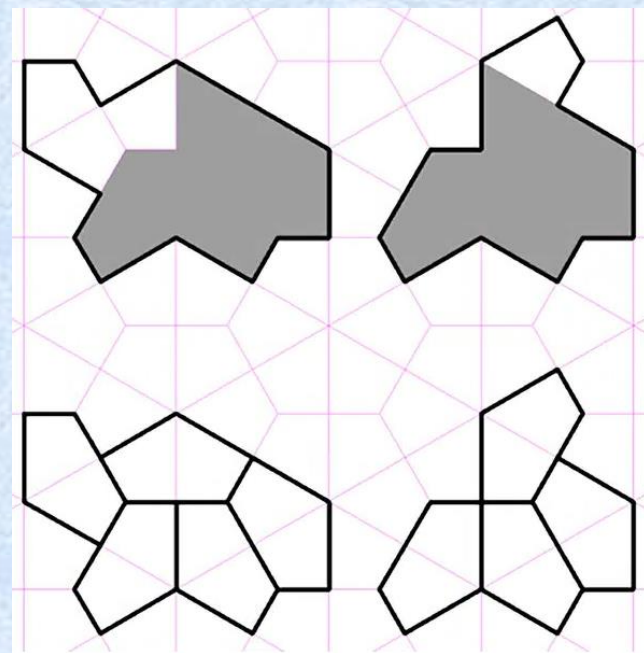
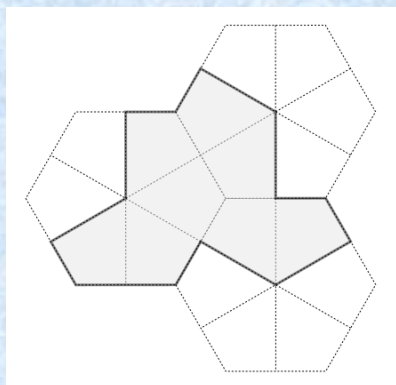
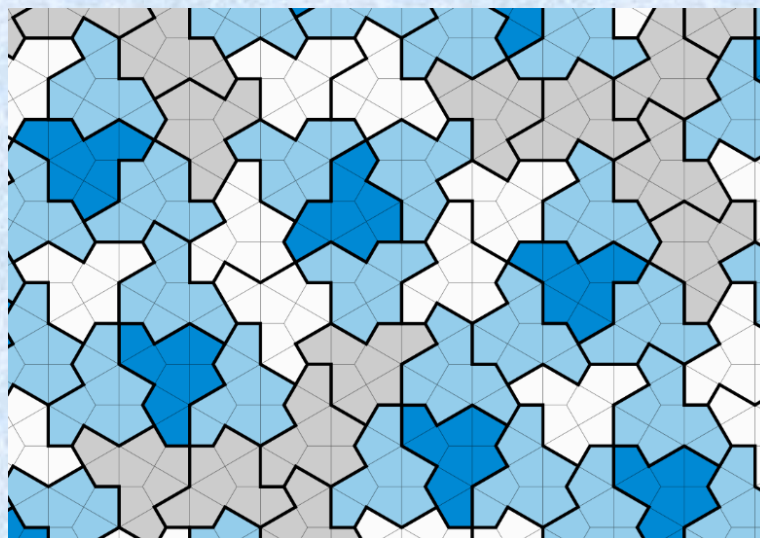
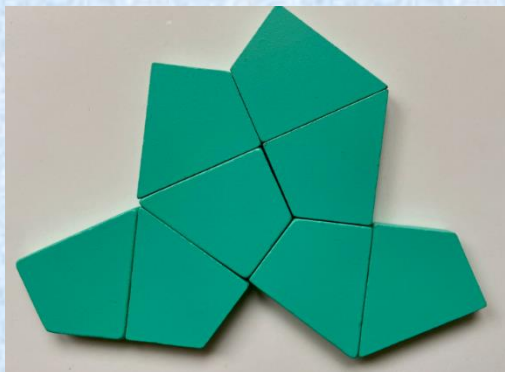
Hat



Spectre

Craig Kaplan, David Smith, Joseph Myers, Chaim Goodman-Strauss

Tassellazioni *a-* *periodiche*



Sitografia

- **Rich Schwartz**, *Penrose tiling Basics*
<https://www.math.brown.edu/reschwar/MFS/handout7.pdf>
- **Wolfram Mathworld**, *Penrose tiles*, <https://mathworld.wolfram.com/PenroseTiles.html>
- **Alessandra Esposito** <https://youtu.be/iNFw8Pj5gUU?si=6WOUcoF9Hjo4-rMR>
- **Veritasium**, <https://www.youtube.com/watch?v=48sCx-wBs34&t=6s>

Grazie a tutti!
Francesco e Stefania