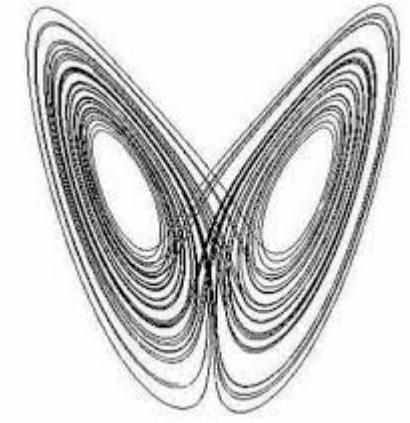
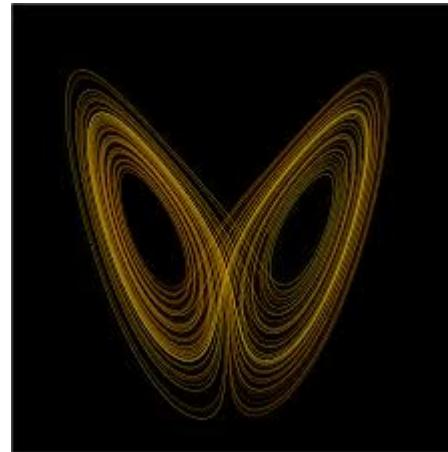
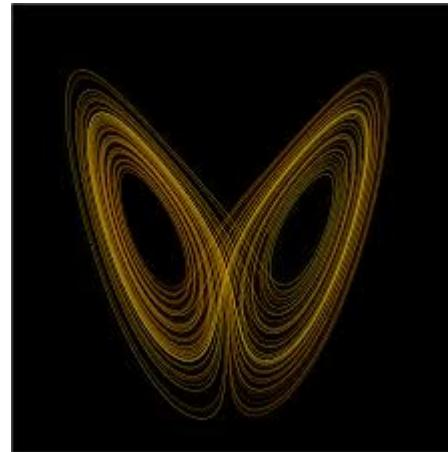
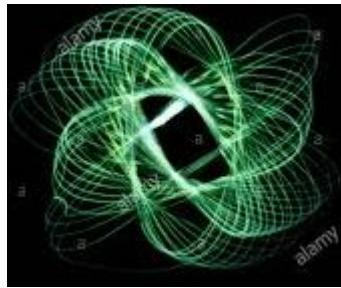


TYPES OF PATTERNS

CHAOS

A dynamical system is chaotic if it is sensitive to initial conditions (butterfly effect), which requires the mathematical properties of topological mixing and dense periodic orbit.



TYPES OF PATTERNS

CHAOS

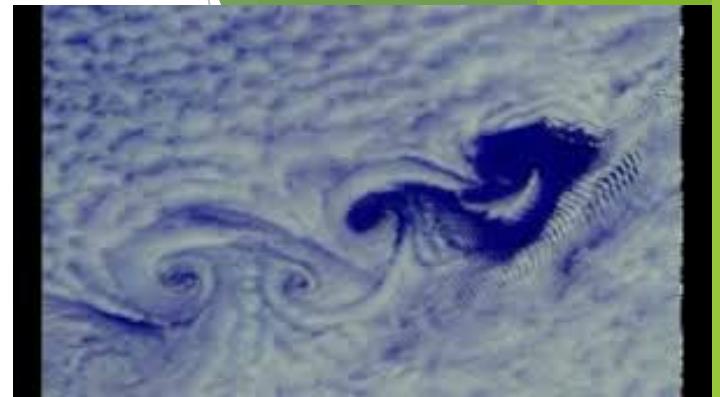
- Shell of gastropod mollusk the cloth of gold cone



TYPES OF PATTERNS

CHAOS

- Vortex street of clouds



TYPES OF PATTERNS

MEANDERS

Meanders are sinuous bends in rivers or other channels, which form as a fluid.



TYPES OF PATTERNS

MEANDERS

- Water flows around bends (sinuous path of Rio Cauto, Cuba)



TYPES OF PATTERNS

MEANDERS

- Snake crawling



TYPES OF PATTERNS

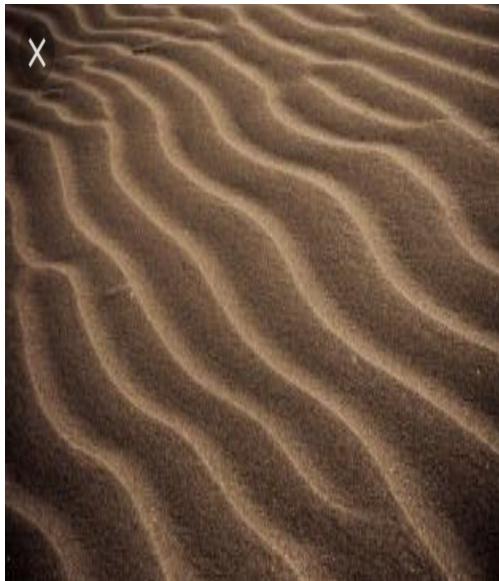
MEANDERS

- Brain coral



TYPES OF PATTERN

WAVES, DUNES



TYPES OF PATTERN

Waves

Waves are disturbances that carry energy as they move

- Mechanical waves - propagate through medium (air or water)
- Wind waves - sea surface waves
- Wind ripples with dislocations in Sistan, Afghanistan



TYPES OF PATTERN

Dunes

When winds blow over large bodies of sand, they create dunes.

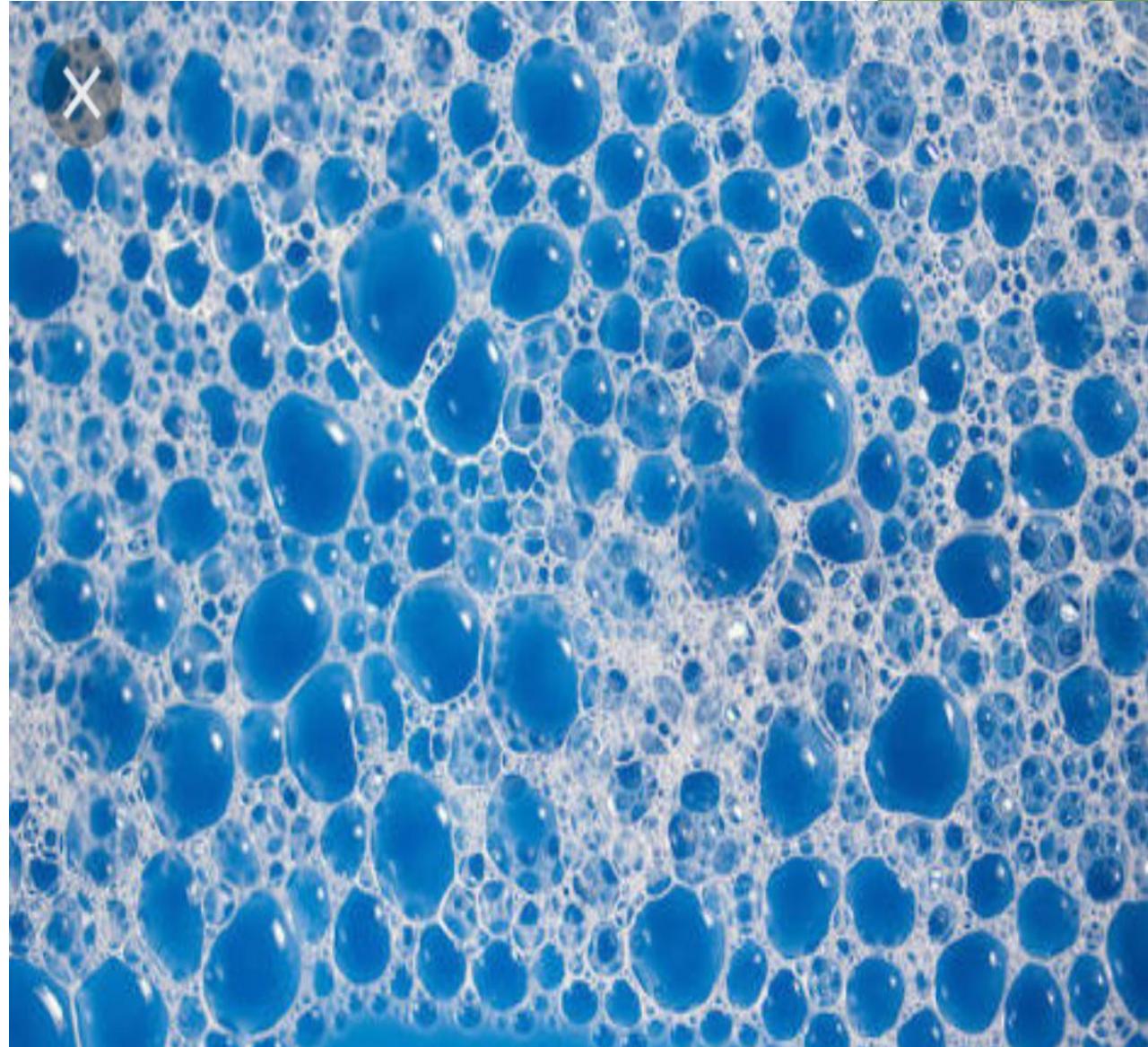
- Dune field in the Taklamakan desert



TYPES OF PATTERN

BUBBLES, FOAM

A soap bubble forms a sphere, a surface with minimal area-the smallest possible surface area for the volume enclosed.



TYPES OF PATTERN

BUBBLES, FOAM

□ Circus Tents

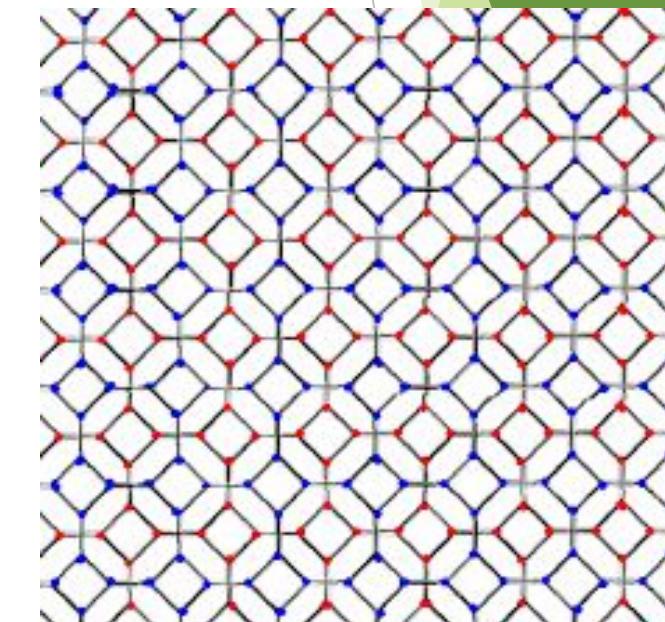
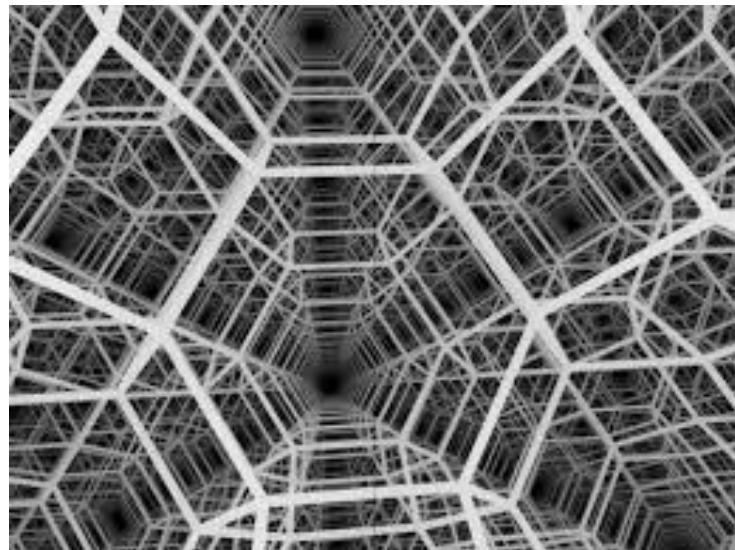
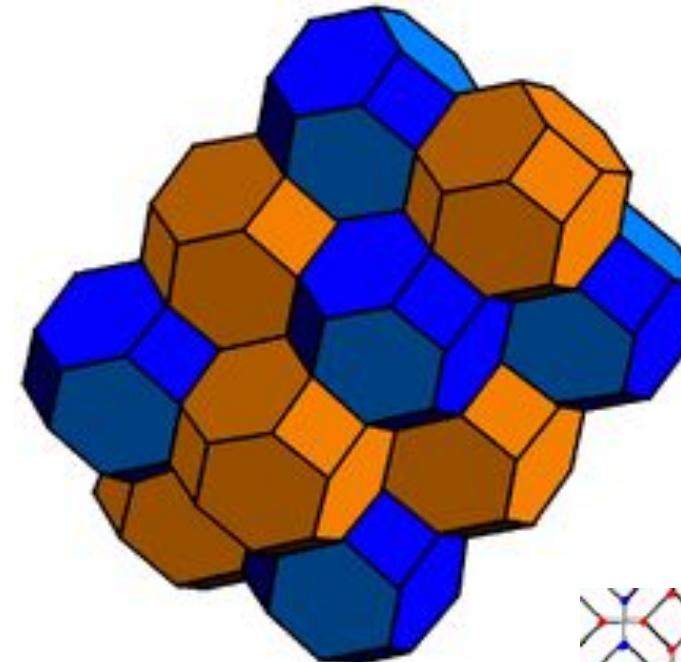


TYPES OF PATTERN

BUBBLES, FOAM

- Bitruncated honeycomb

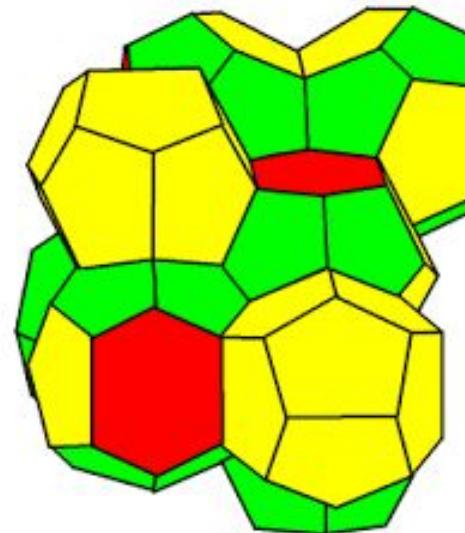
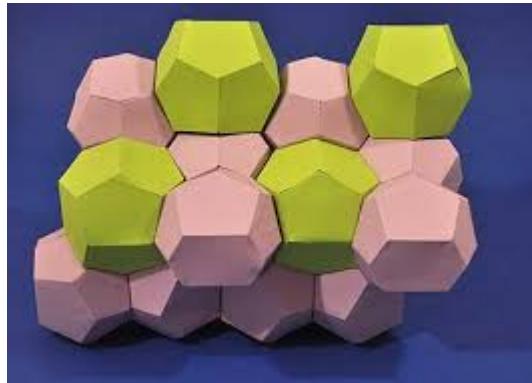
cubic



TYPES OF PATTERN

BUBBLES, FOAM

- Weaire-Phelan structure



TYPES OF PATTERN

BUBBLES, FOAM

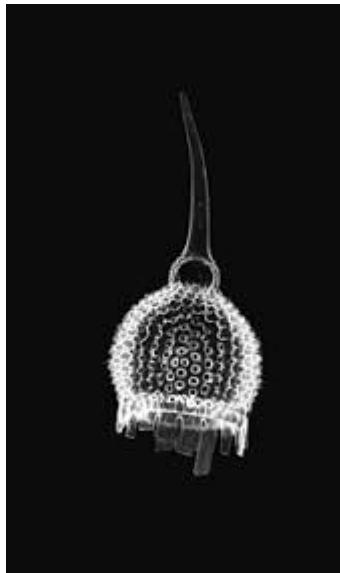
- Scale of living cells



Brochosomes



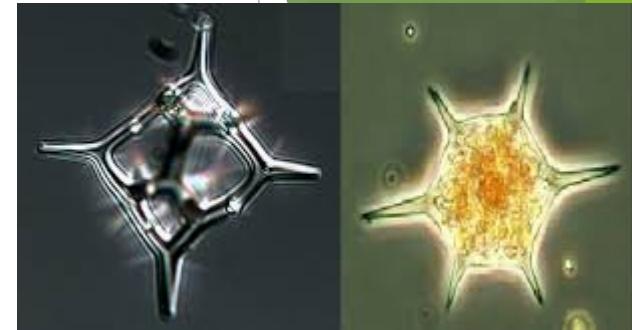
sponge spicules



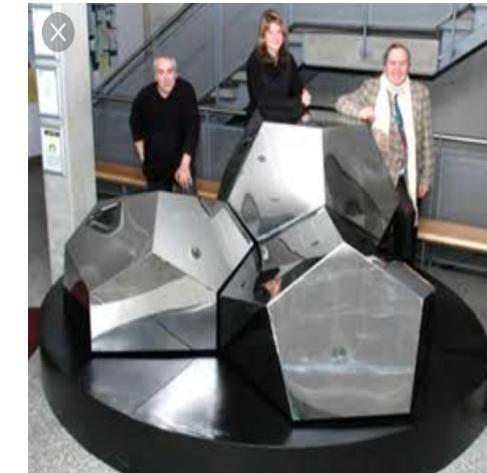
radiolarians



calcite skeleton of sea urchin



silicoflagellate

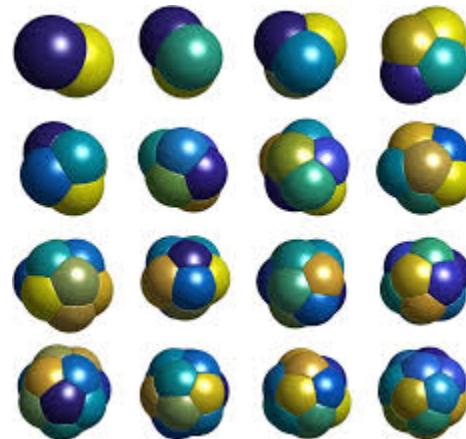
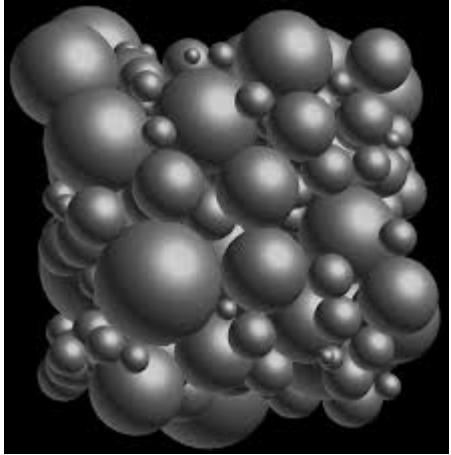


exoskeletons

TYPES OF PATTERN

BUBBLES, FOAM

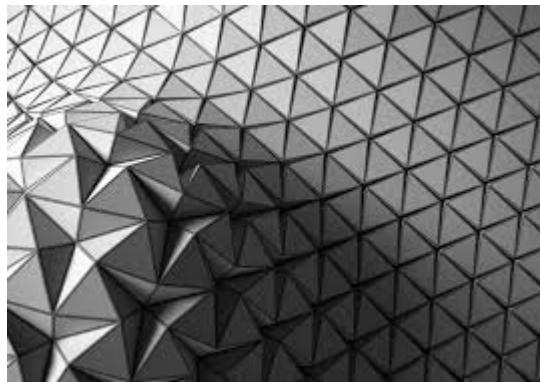
- Equal spheres in a surface foam.



TYPES OF PATTERN

TESSELATION

Tessellations are patterns formed by repeating tiles all over a flat surface.



TYPES OF PATTERN

TESSELATION

- Cells in the paper nests of social wasps



TYPES OF PATTERN

TESSELATION

- Wax cells in honeycomb



TYPES OF PATTERN

TESSELATION

- Scales of animals like bony fish, reptiles or the pangolin



TYPES OF PATTERN

TESSELATION

- Flower of snake's head Fritillary



TYPES OF PATTERN

TESSELATION

- Overlapping scales of snake fruit or salak



TYPES OF PATTERN

TESSELATION

- Tessellated pavement (a rare rock formation on the Tasman Peninsula)



TYPES OF PATTERN

CRACKS

Cracks are linear openings that form in materials to relieve stress.



TYPES OF PATTERN

CRACKS

□ Oak tree bark



TYPES OF PATTERN

CRACKS

- Old pottery surface



TYPES OF PATTERN

CRACKS

- Drying inelastic mud



TYPES OF PATTERN

CRACKS

Veined gabbro



TYPES OF PATTERN

CRACKS

- Cooled basalt



TYPES OF PATTERN

Palm trunk



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TYPES OF PATTERN

SPOTS AND STRIPES

Spots and stripes are common to many species of animals

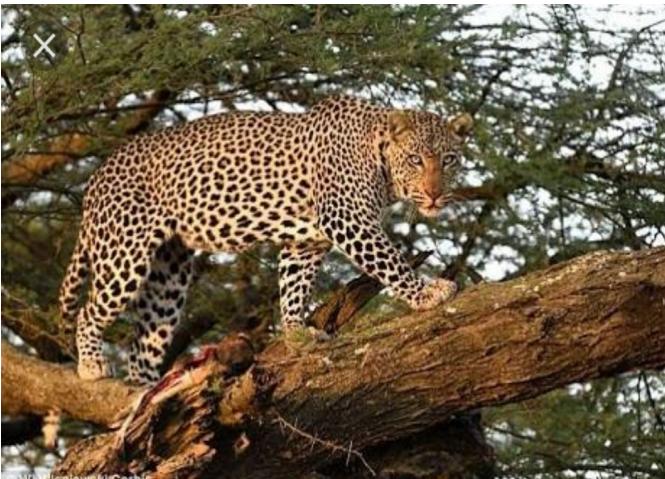
- Leopards and ladybirds are spotted
- Angelfish and zebras are striped
- Dirce beauty butterfly



SPOTS



SPOTS

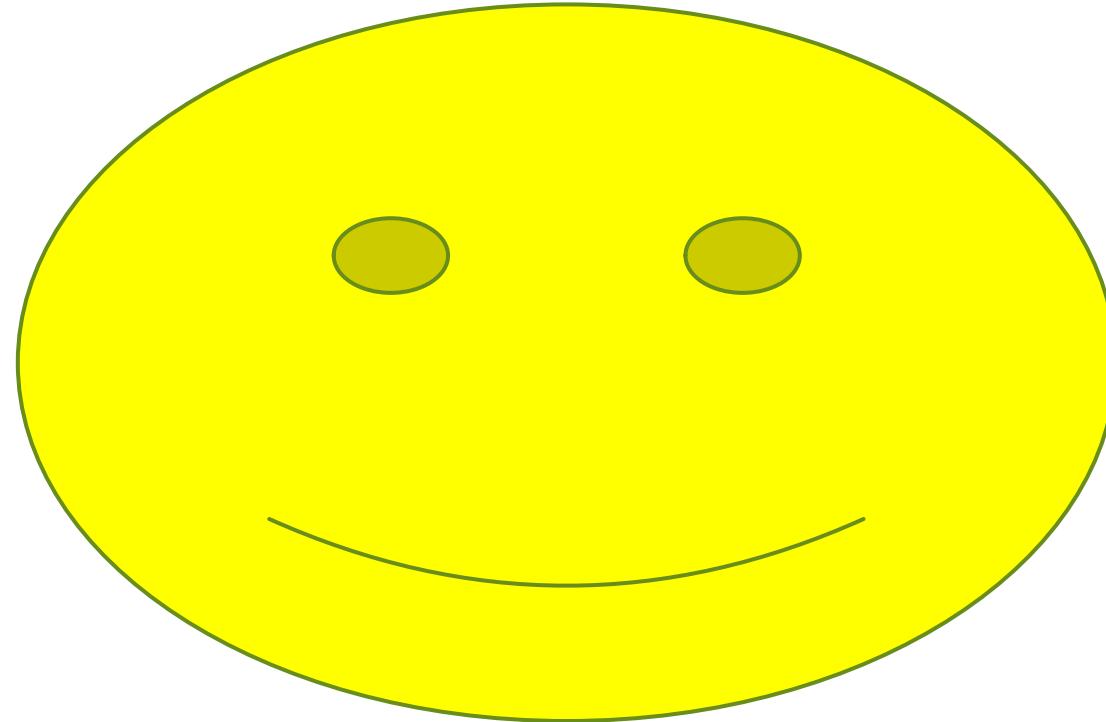


STRIPES



STRIPES





Thank You!!!