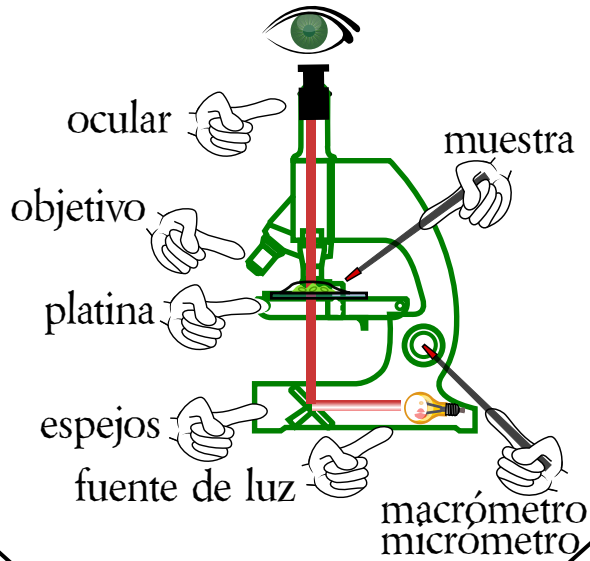


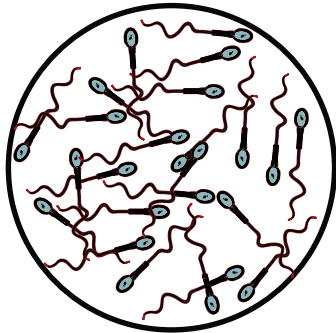


# Microscopios

## MICROSCOPIO ÓPTICO



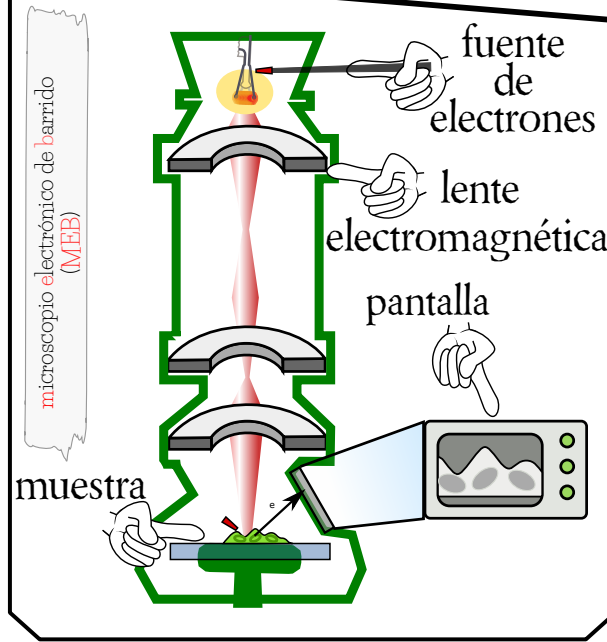
SE OBSERVA UNA COLONIA DE ESPERMATOZOIDES



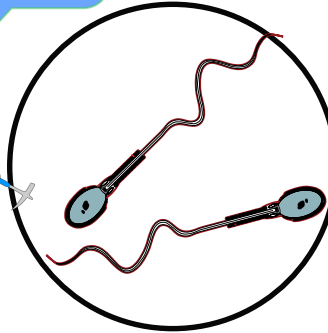
$$\text{Aumentos} = \frac{\text{medida de la imagen}}{\text{medida real del objeto}}$$

$$1200 = \frac{\text{medida de la imagen}}{\text{medida real del objeto}}$$

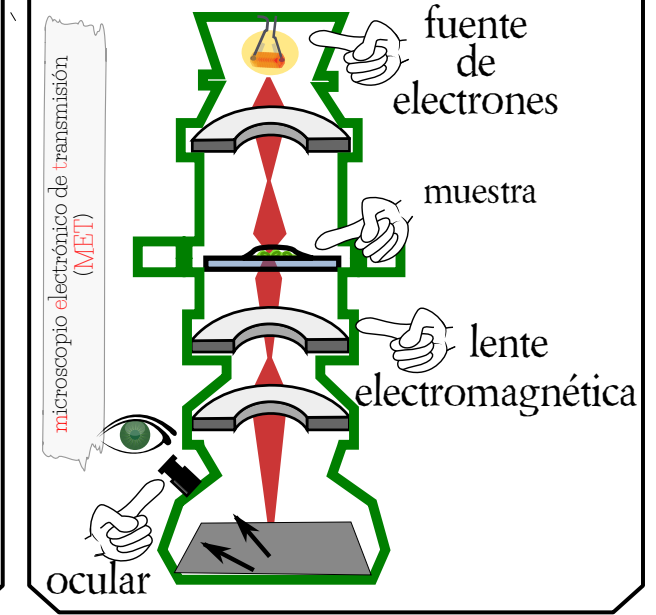
## MICROSCOPIO ELECTRÓNICO



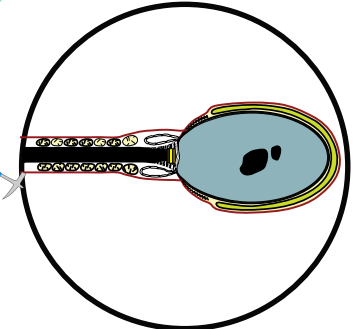
SE OBSERVA LA MORFOLOGÍA DE UN ESPERMATOZOIDE



$$4200 = \frac{\text{medida de la imagen}}{\text{medida real del objeto}}$$

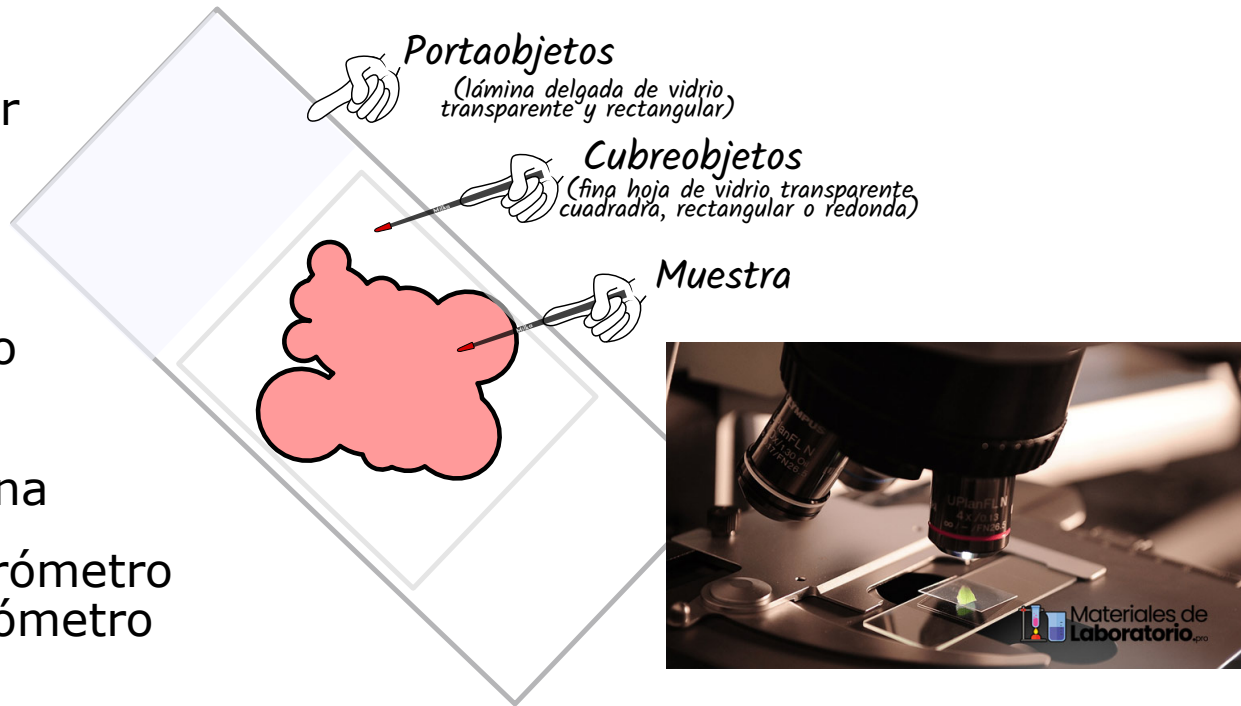
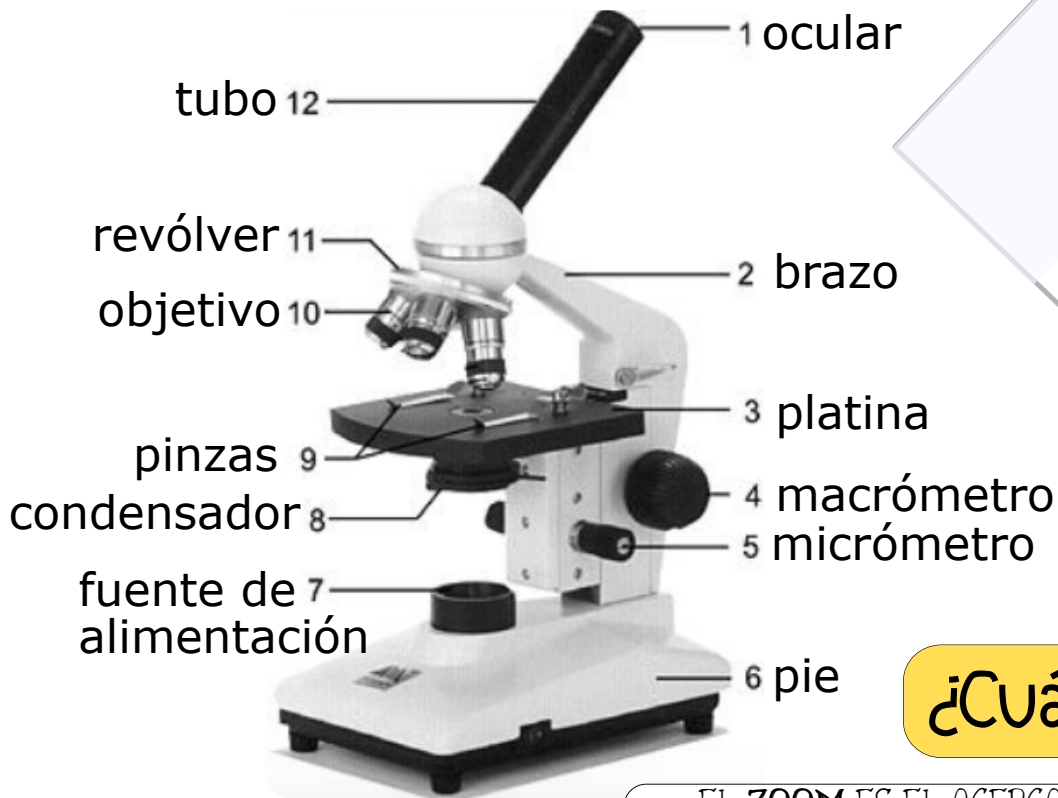


SE OBSERVA LA ESTRUCTURA INTERNA DE UN ESPERMATOZOIDE



$$6200 = \frac{\text{medida de la imagen}}{\text{medida real del objeto}}$$

# Partes de un microscopio



## ¿Cuánto zoom tiene un microscopio?

EL **ZOOM** ES EL ACERCAMIENTO O ALEJAMIENTO DE UNA IMAGEN CUANDO MIRAMOS A TRAVÉS DE UN OBJETIVO (=SISTEMAS DE LENTES). EN BIOLOGÍA, UTILIZAMOS MICROSCOPIOS PARA ACERCAR LA IMAGEN (**AUMENTAR LA IMAGEN**)

LOS MICROSCOPIOS ÓPTICOS DEL LABORATORIO CONSIGUEN UNOS 1000-1500 AUMENTOS (OBJETIVO DE 100X JUNTO CON OCULARES DE 10X o 15X).

SI ESTÁS USANDO UN OBJETIVO DE 20X, QUE AUMENTA 20 VECES, Y UN OCULAR DE 10X, EL AUMENTO TOTAL DEL MICROSCOPIO SERÁ DE 200X.



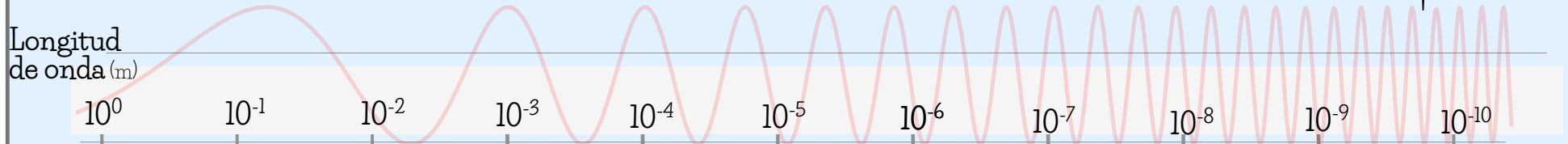
ocular



objetivos

Aumentos totales		Lente del Objetivo			
		4x	10x	40x	100x
Lente del ocular	8x	32	80	320	800
	10x	40	100	400	1000
	15x	60	150	600	1500

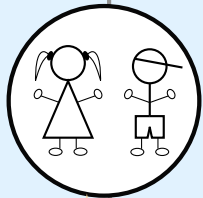
# Poder de resolución de los microscopios



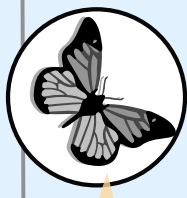
Ojo  $\times 1$

Microscopio óptico  $\times 1200$

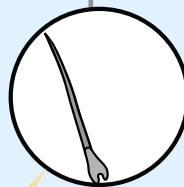
Microscopio electrónico  $\times 100$  mil



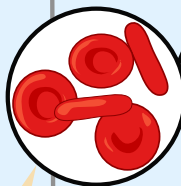
Altura de un niño de 5 años



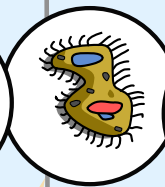
Ancho de una mariposa



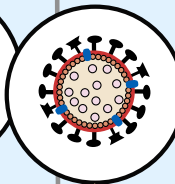
Ancho de un pelo



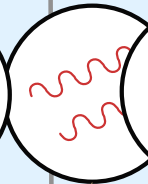
Tamaño de un eritrocito



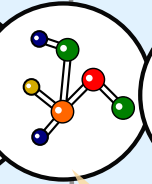
Tamaño de una bacteria



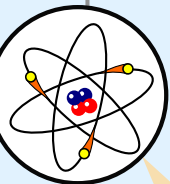
Tamaño de un virus



Tamaño del ADN



Tamaño del aminoácido

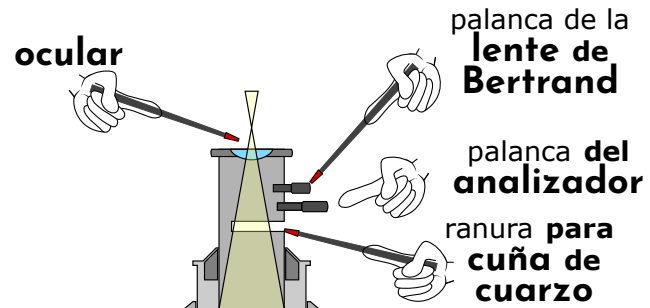
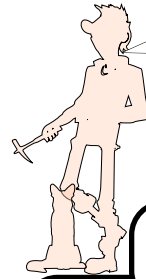


Tamaño del átomo

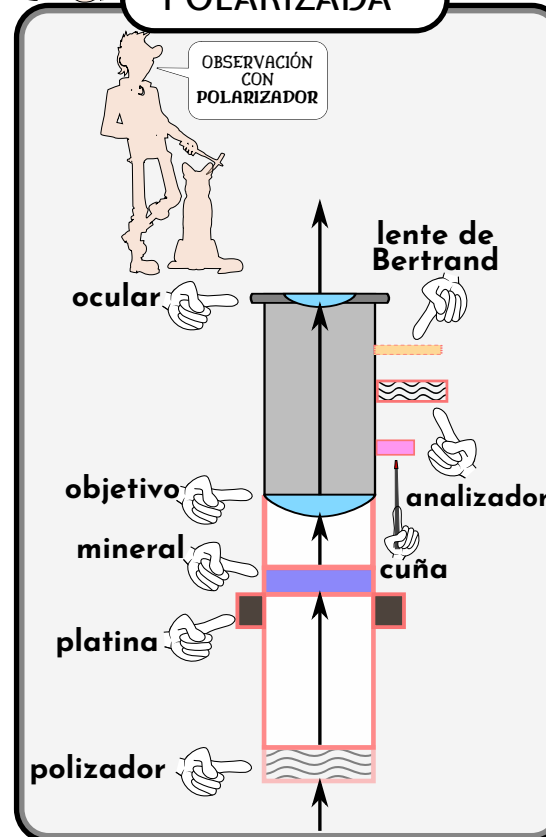
# MICROSCOPIO PETROGRÁFICO



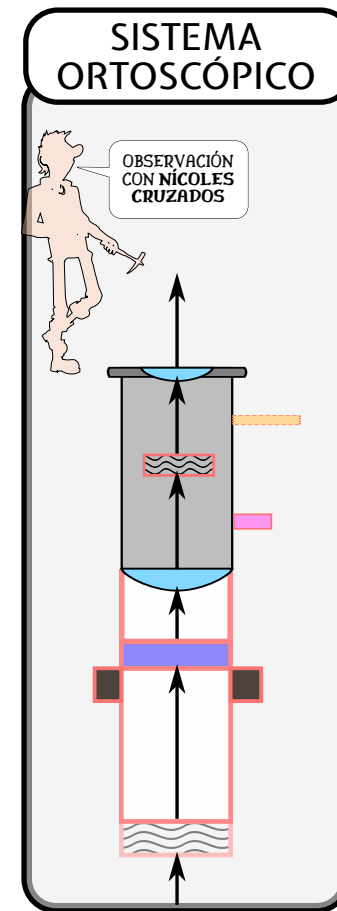
UN MICROSCOPIO PETROGRÁFICO ES UN MICROSCOPIO ÓPTICO CON POLIZADOR, ANALIZADOR Y CUÑA QUE ESTÁ DISEÑADO ESPECÍFICAMENTE PARA EL ANÁLISIS DE ROCAS Y MINERALES.



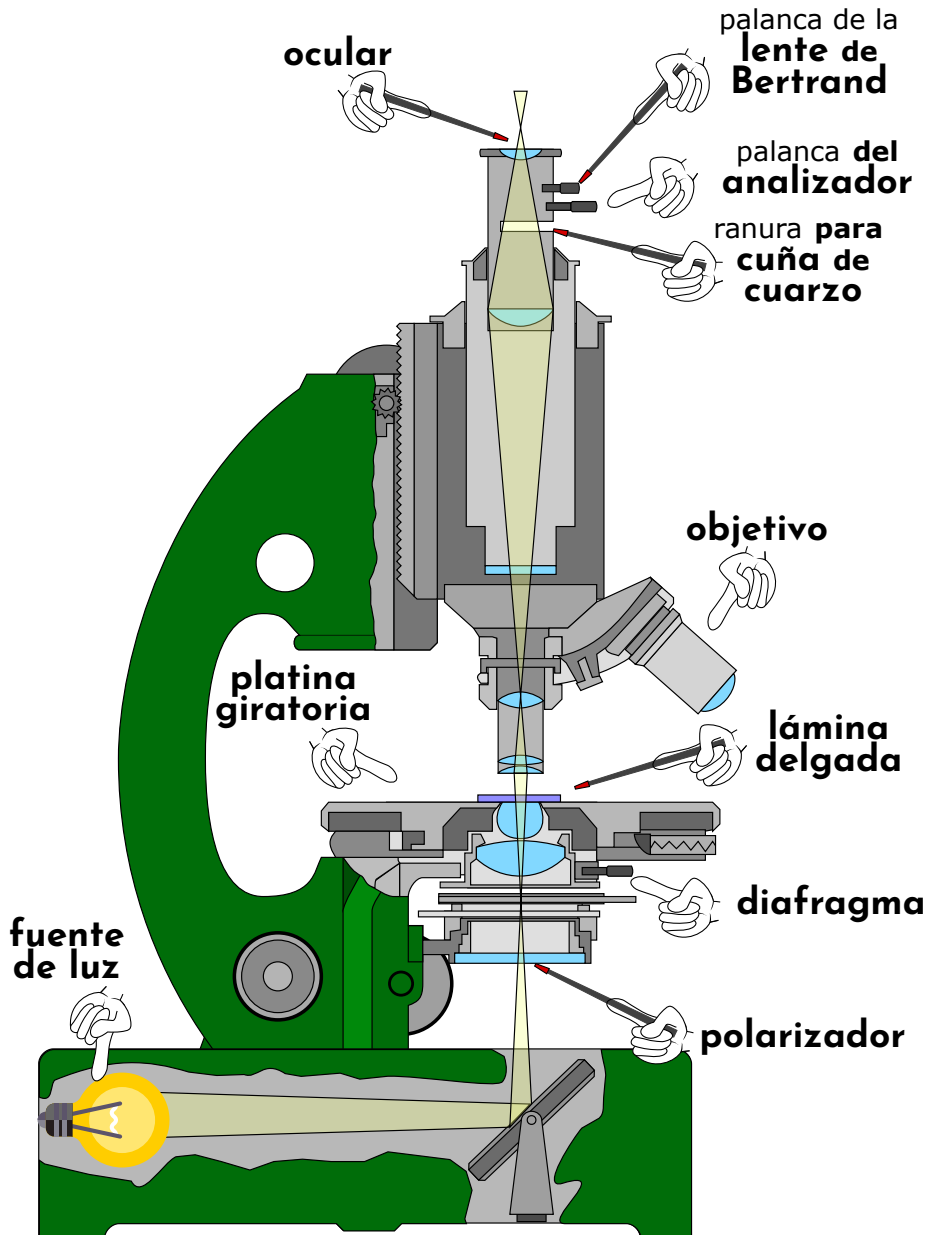
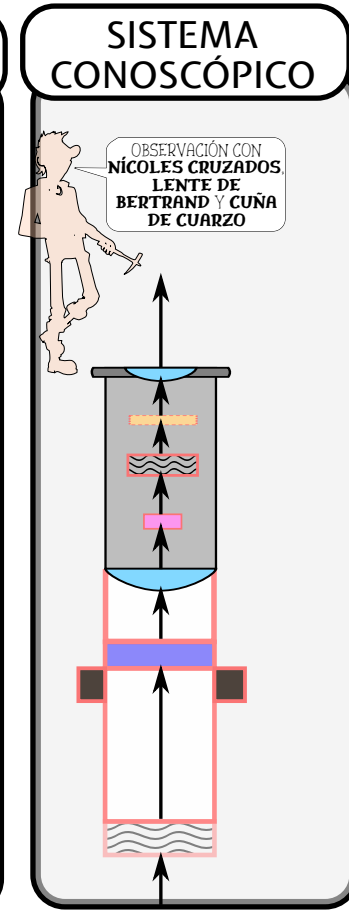
## LUZ POLARIZADA



## SISTEMA ORTOSCÓPICO



## SISTEMA CONOSCÓPICO

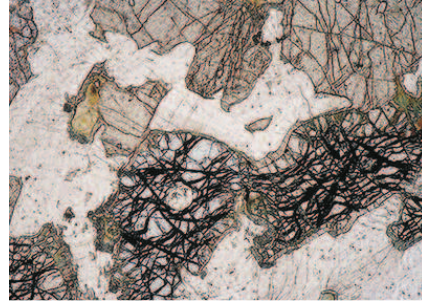




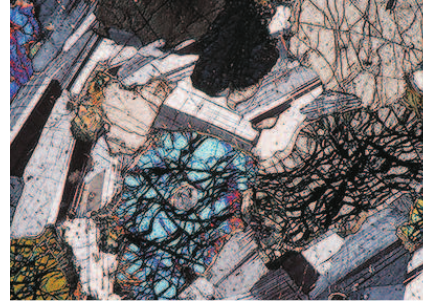
1 cm



Analiza **sin** luz polarizada



Analiza **con** luz polarizada



OLIVINO

PIROXENO (augita)

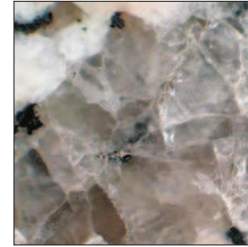
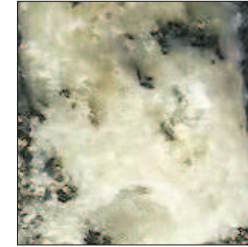
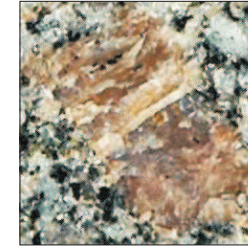
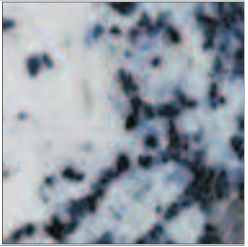
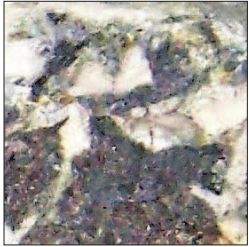
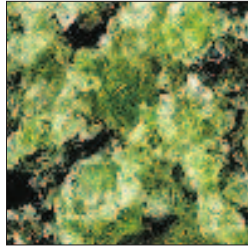
MICA (biotita)

FELDESPATO (ortosa)

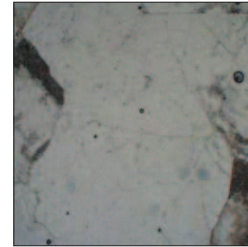
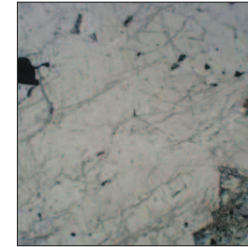
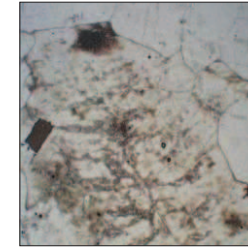
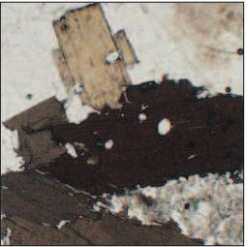
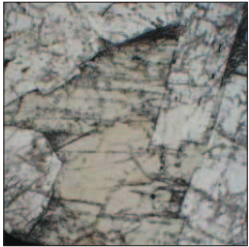
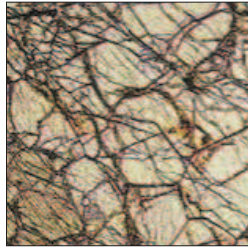
FELDESPATO (plagioclasa)

CUARZO

A simple vista



Analiza **sin** luz polarizada



Analiza **con** luz polarizada

