

Target -

Demonstrate use of a microscope

- I can name the parts of a microscope and state their jobs.
- I can set up a slide, focus, position the slide and change magnification
- I can list the main rules for using a microscope.

A microscope is a piece of equipment used by biologists to make objects **appear bigger**.

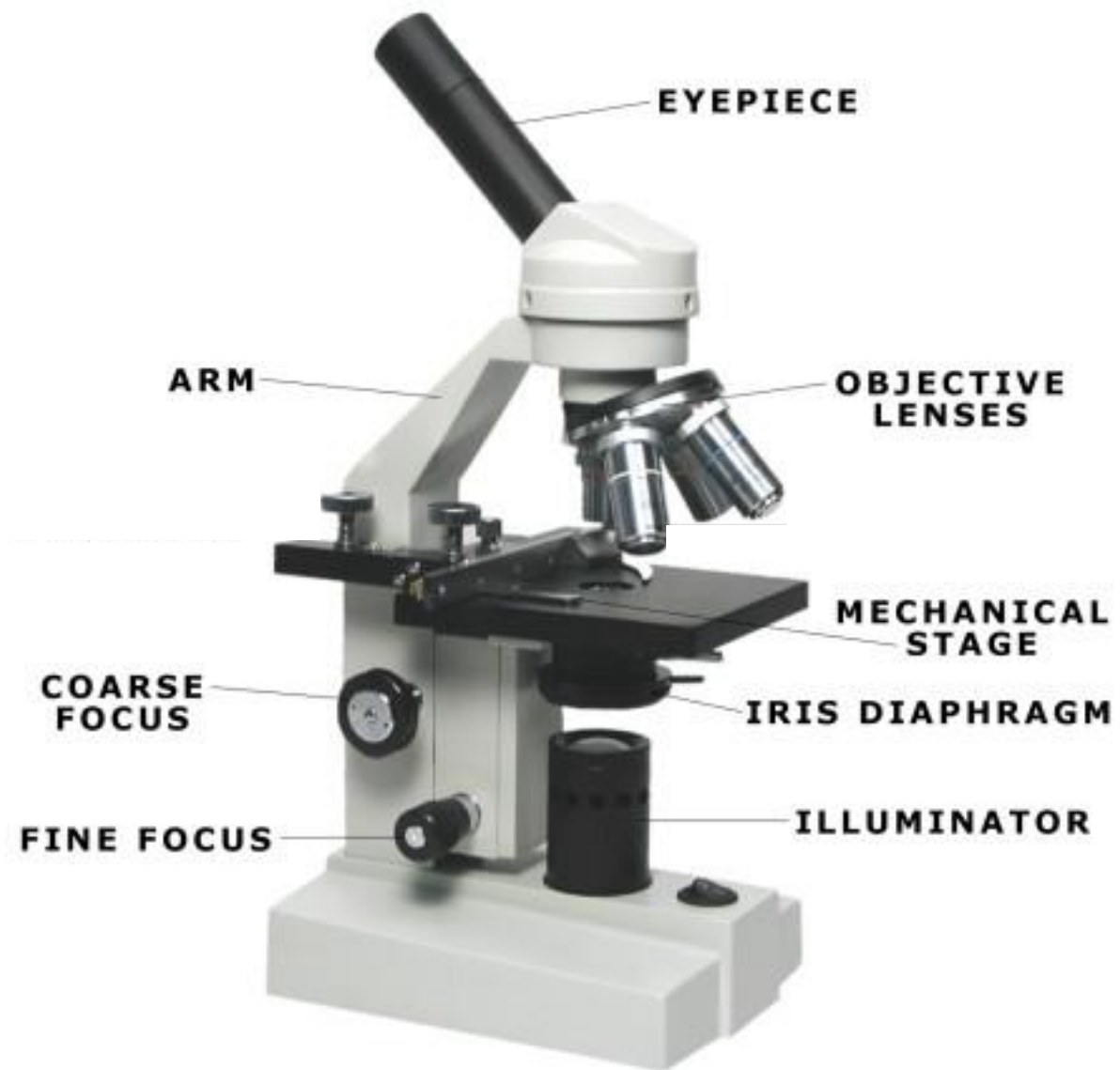
It magnifies the object.

It works by shining light up through the objects, so they must be **thin** enough to let light through.



The microscope has a number of parts and controls which you need to understand to be able to use it properly.





EYEPIECE

ARM

OBJECTIVE LENSES

MECHANICAL STAGE

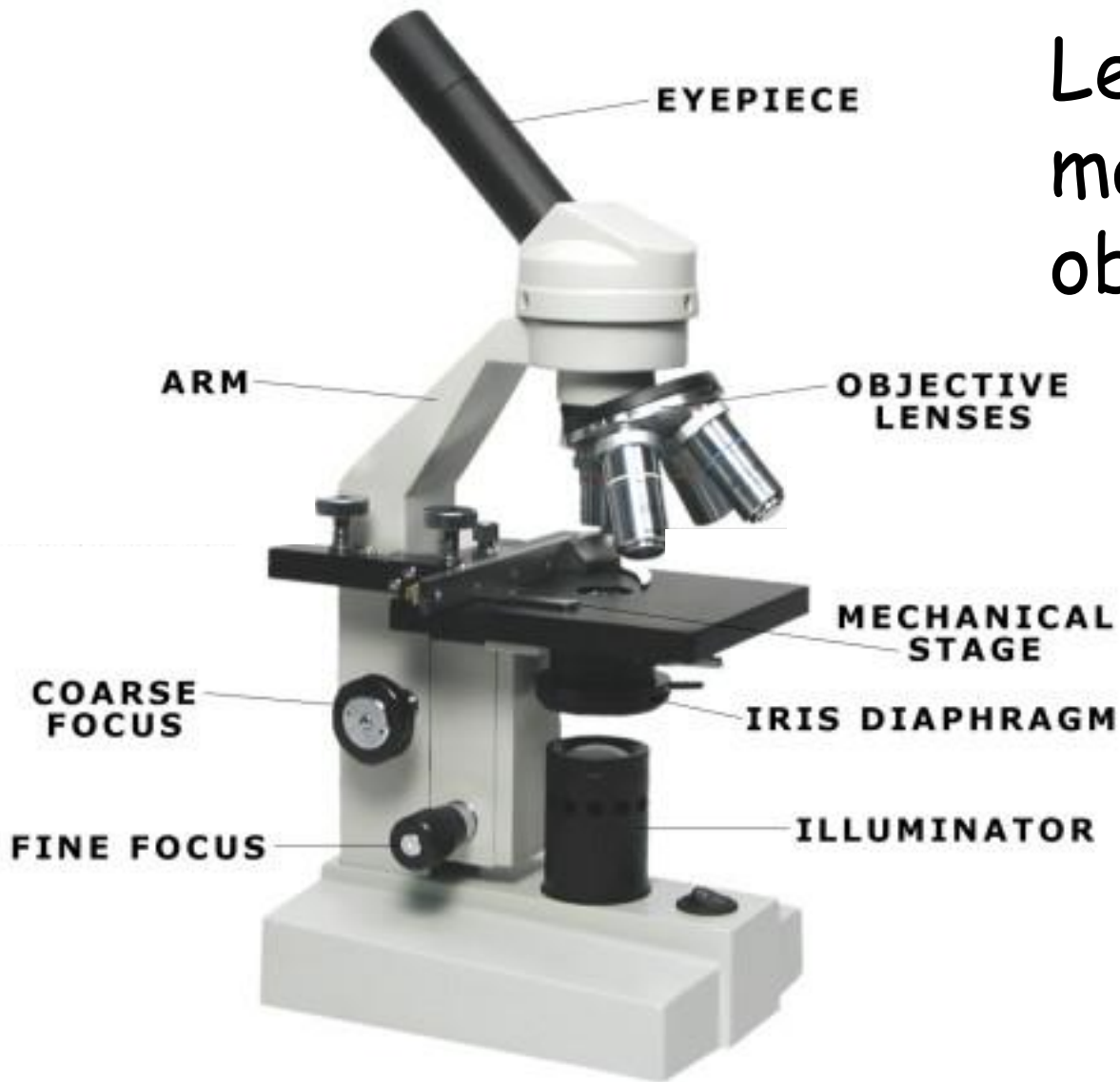
COARSE FOCUS

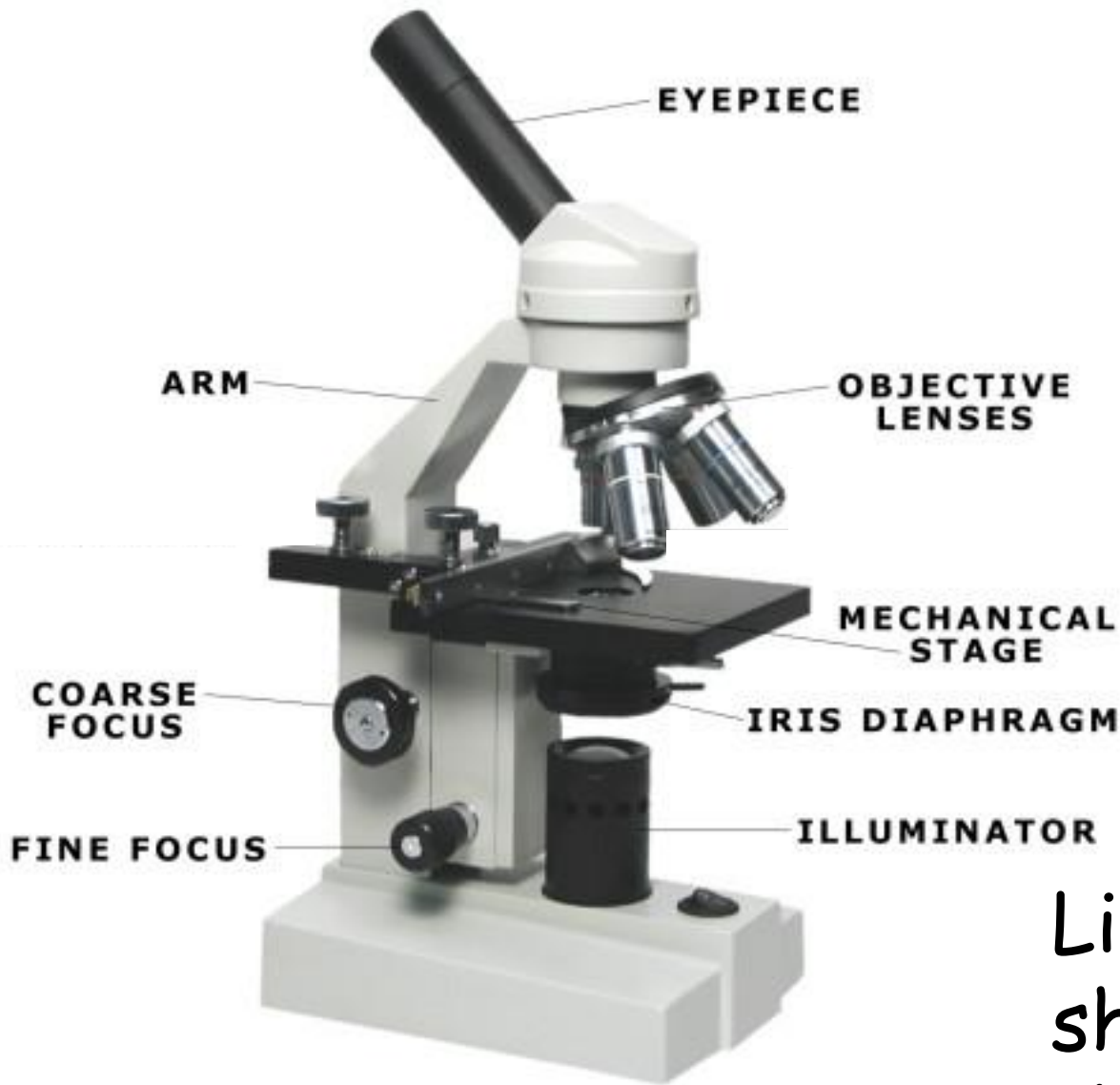
IRIS DIAPHRAGM

FINE FOCUS

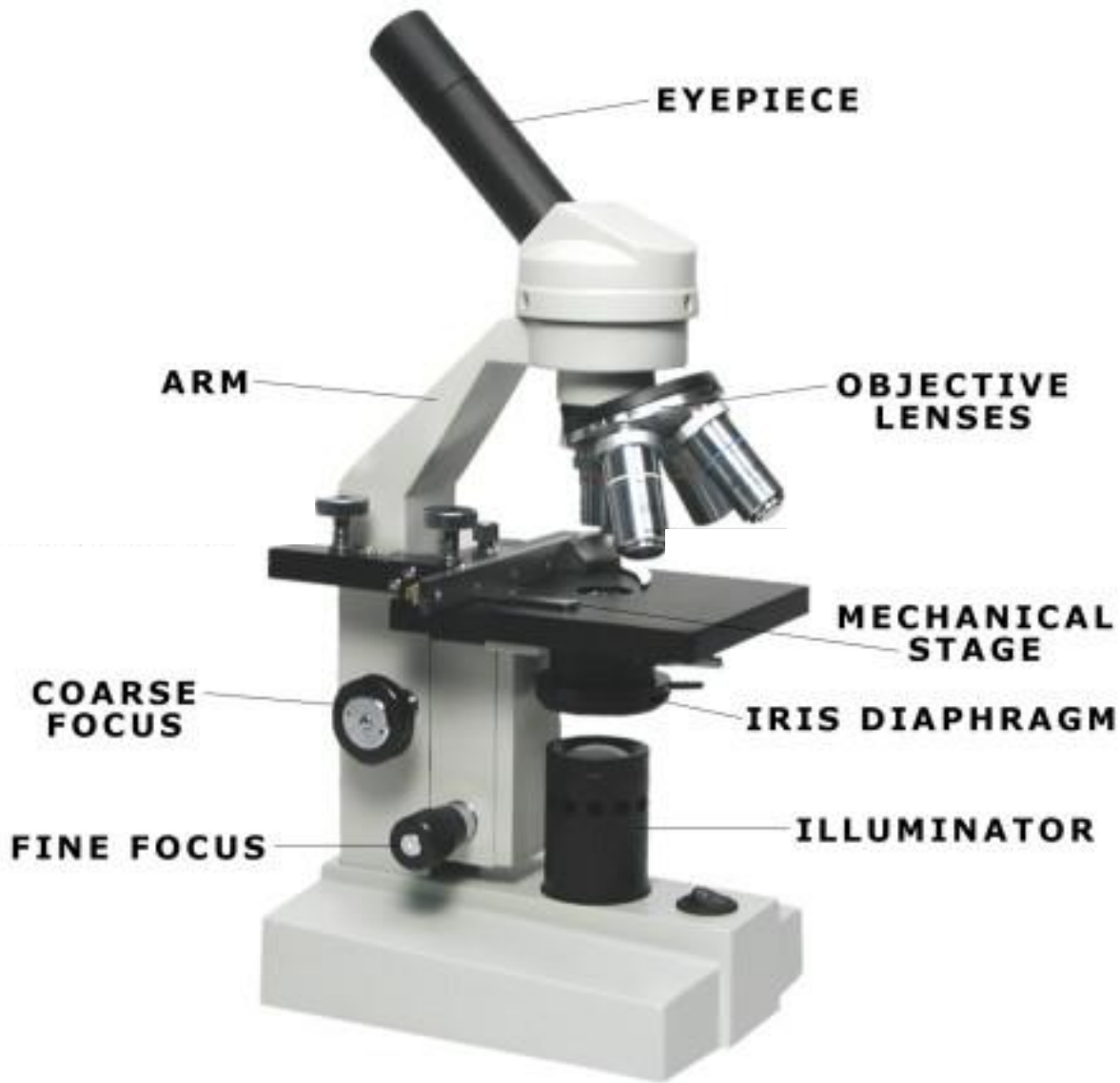
ILLUMINATOR

Lenses to magnify the object.





Light source to
shine light
through the
object



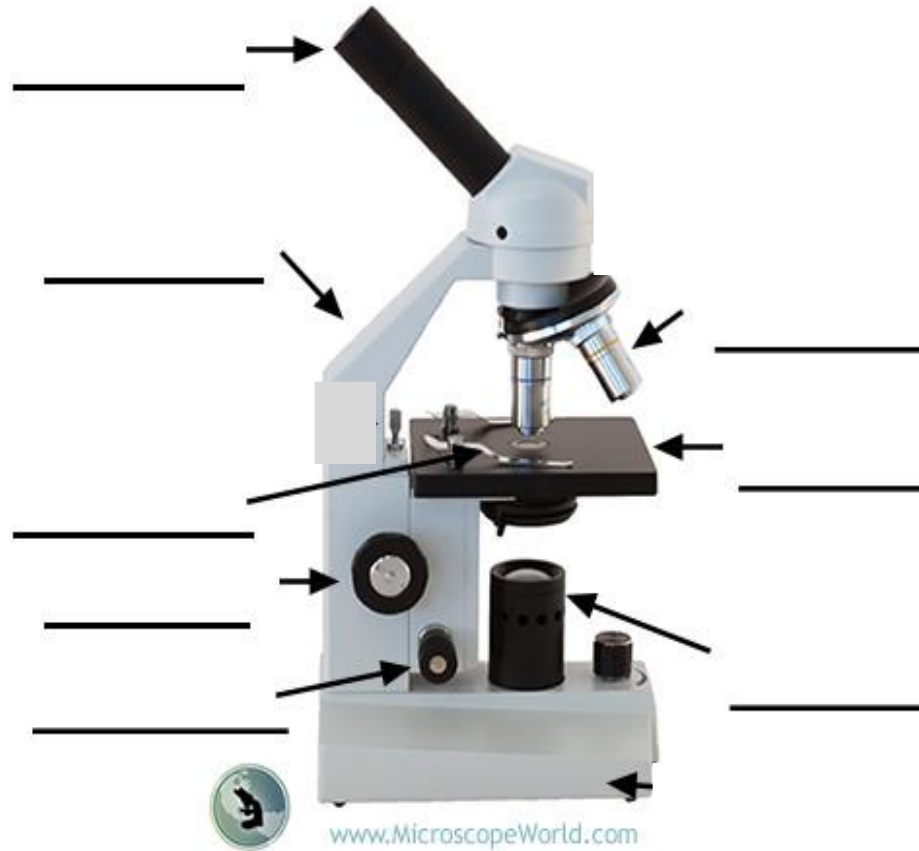
Stage to place the microscope slide on.



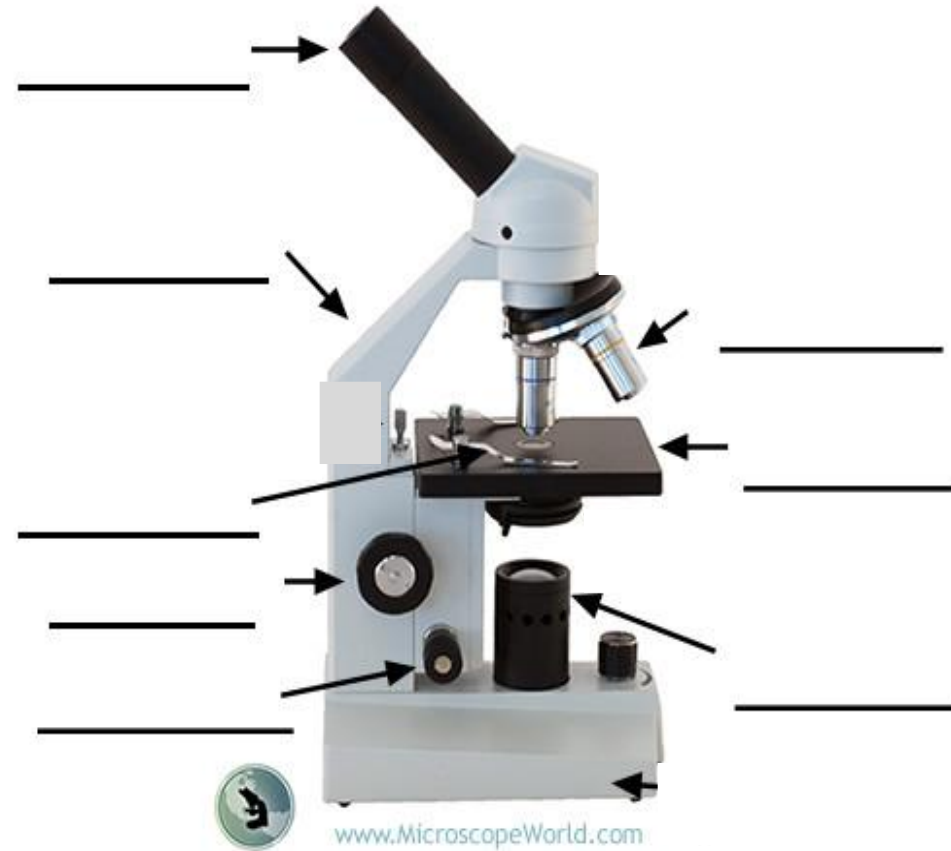
Focus controls to get a clear, sharp picture.

1. Select the smallest objective lens
2. Adjust focus to move the stage and lens apart.
3. Put your eye to the eyepiece
4. Focus slowly by bringing the stage and lens closer together.
5. Centre the object and change objective if required.
6. Re-focus using fine focus control.

Parts of the microscope



Parts of the microscope



Recording -

**Complete the Microscope diagram labels
and stick into jotter**

*Set up the microscope with the microfilm
slide **Teacher check.***

What happens when you move the slide
away from you? Left?

Write a note on what you observe!

Magnification

The microscope has an **eyepiece** lens which magnifies ten times (x10)

There are three **objective** lenses -

X4

X10

x40

The total magnification is the eyepiece times the objective

Copy and complete -

Lens	Size	eyepiece	objective	Total magnification
Low power	smallest	x10	x	x
Medium power	medium	x10	x	x
High power	biggest	x10	x	x

Target - prepare microscope slides

A microscope works by shining light up through an object.

For this to work, the object needs to be very thin.

To make up a slide -

Object - a thin slice or section

slide - glass support to let light through

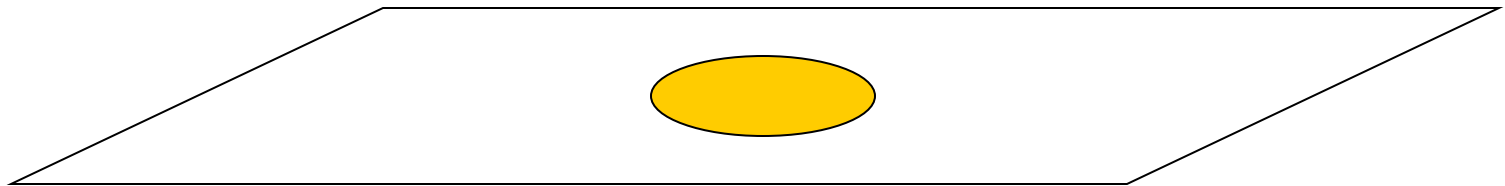
Stain - to help the thin sections show up

Cover slip - to stop stain touching the lens

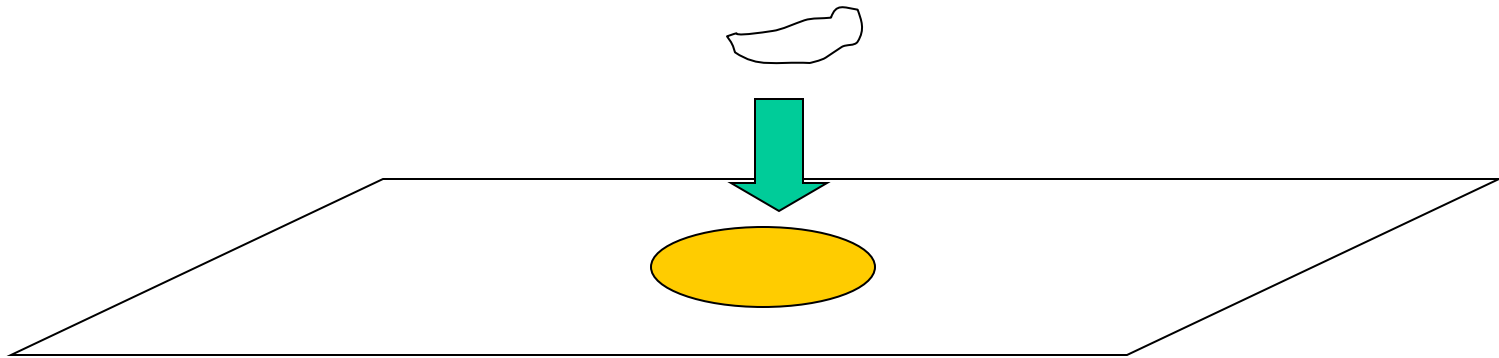


The trick in making slides is to mount your sample in a drop of liquid under a cover slip **without any air bubbles.**

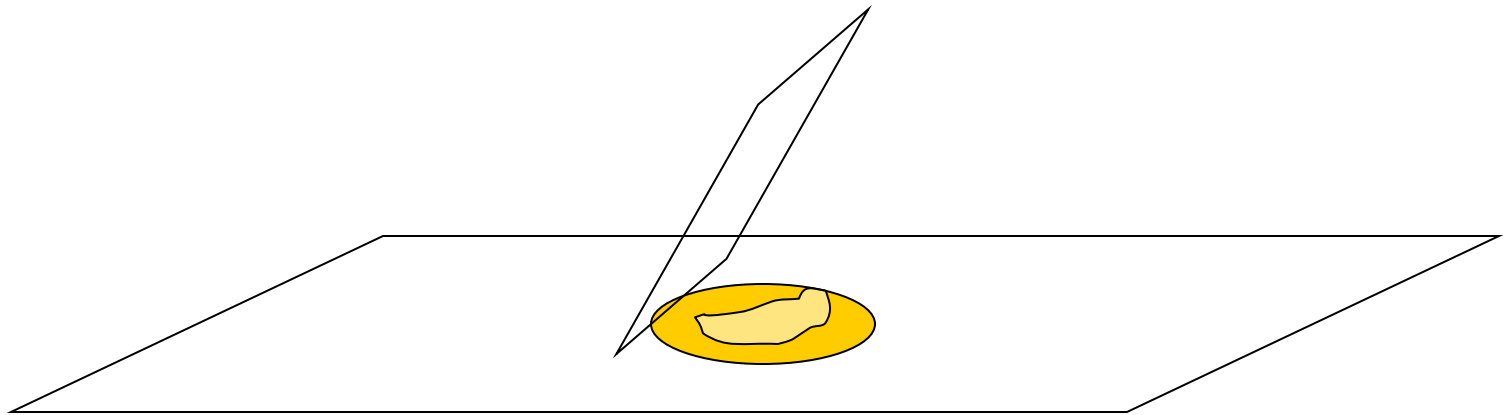
Place a 5p sized drop of iodine stain in the middle of a microscope slide.



Place a small piece of onion skin into the stain.

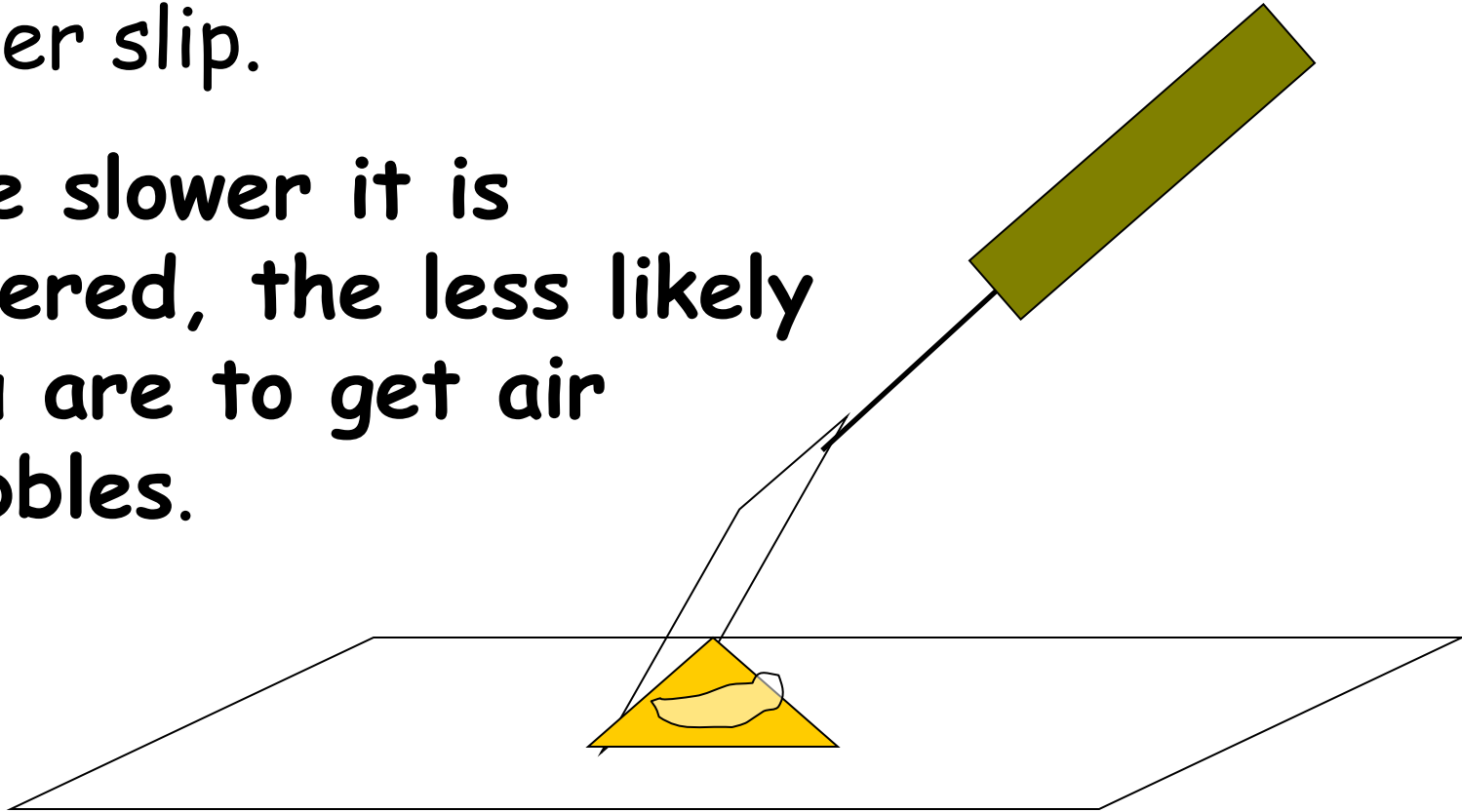


Place a **cover slip** so that its edge just touches the side of the iodine. The iodine will flow along the edge of the cover slip.



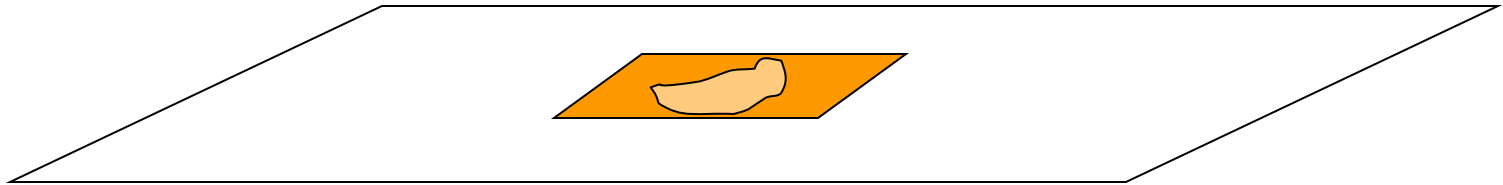
Use a scalpel or mounted needle to slowly lower the cover slip.

The slower it is lowered, the less likely you are to get air bubbles.



Your completed slide should have -

- the stain filling under the cover slip
- no air bubbles



Teacher check!

Look at your slide under low power and medium power.

Title - Making a microscope slide

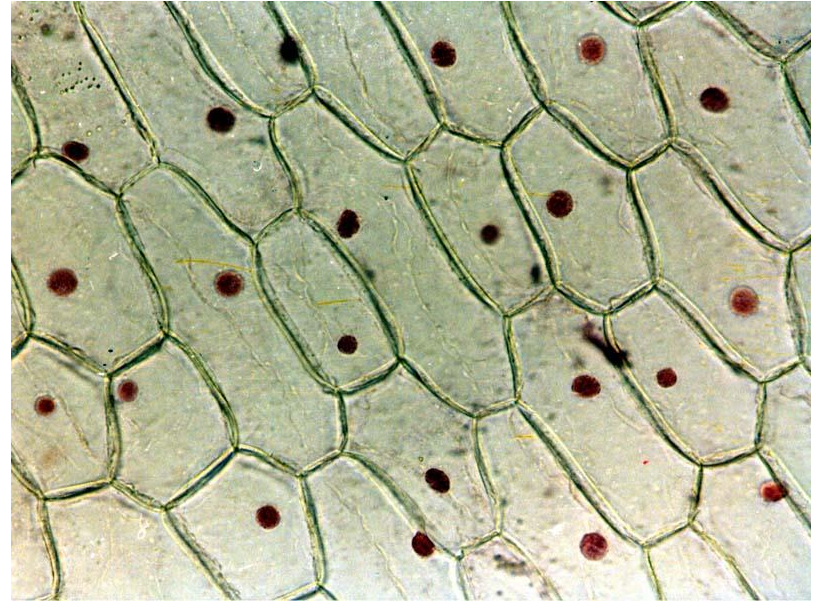
Re-write these statements in the right order

- Place a small piece of onion skin into the stain.
- Place a 5p sized drop of iodine stain in the middle of a microscope slide.
- Use a scalpel or mounted needle to slowly lower the cover slip.
- Place a cover slip so that its edge just touches the side of the iodine.

- Place a 5p sized drop of water in the middle of a slide.
- Add a few strands of pondweed.
- Add a cover slip **slowly** as before.
- Observe under **low power** and **medium power**.

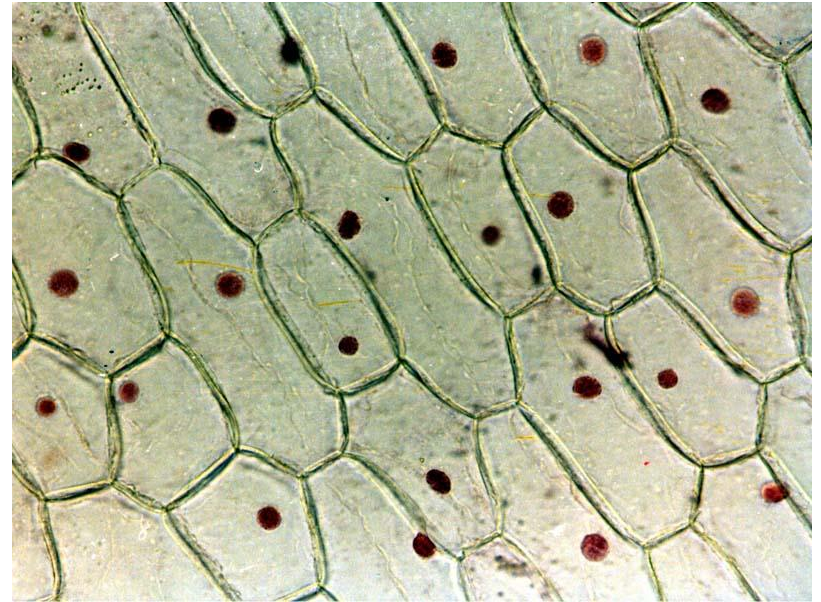
Target - Draw cells

The microscope lets you see things too small to see. This opens up the study of cells. In order to record what you see, biologists need to draw cells.

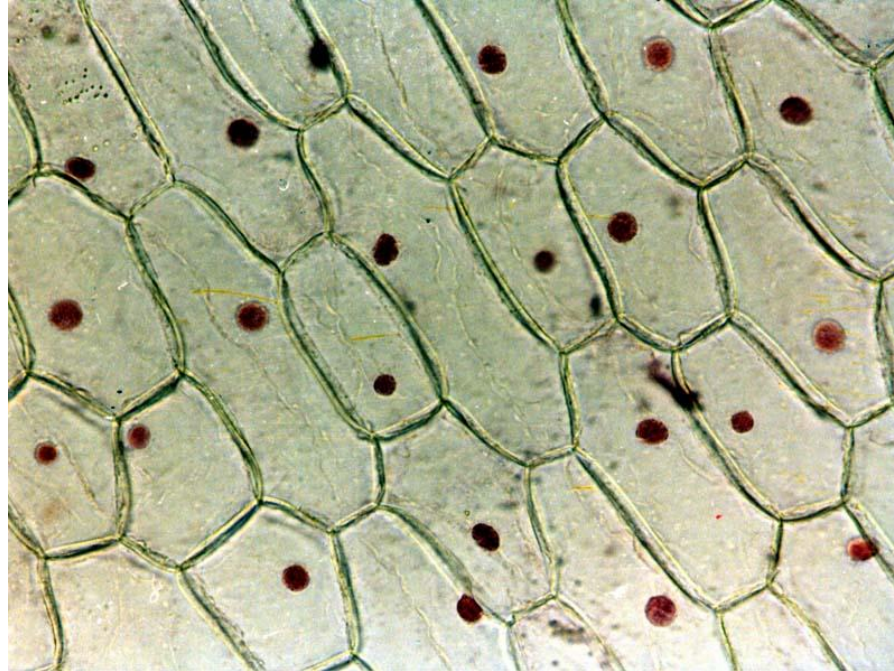


The aim is not to produce a piece of art, but an accurate recording.

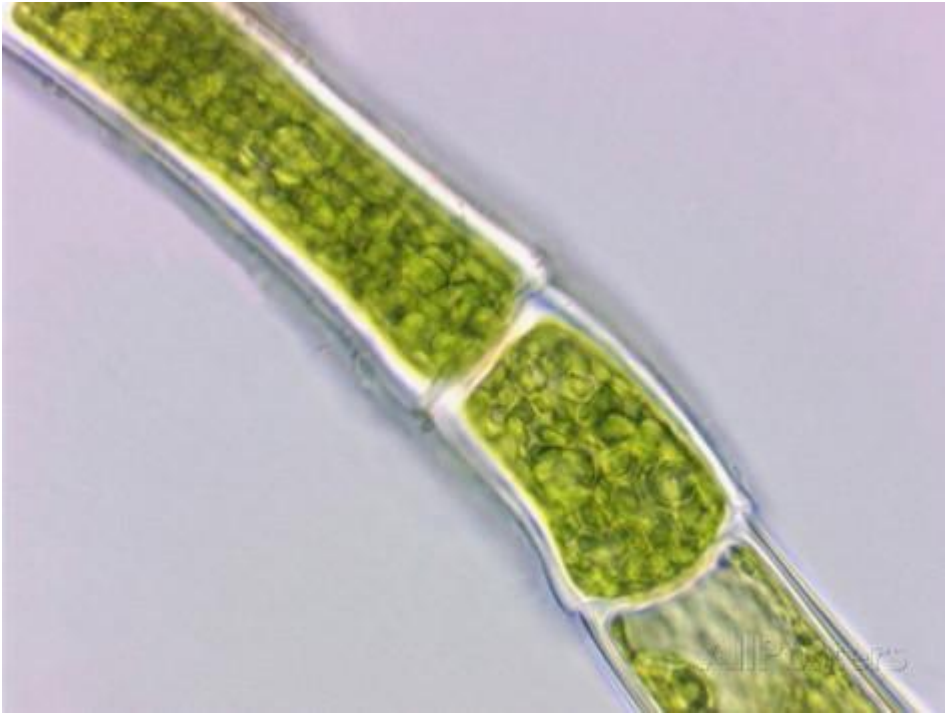
- Use pencil
- Draw big (1/3 page)
- Use lines - not shading
- Show shape, position and arrangement
- Draw all you can see, but nothing you imagine.
- Title and magnification



1. Draw one or two of these onion cells (X 100)



1. Set up a slide with stands of pondweed. Draw one or two cells. (no stain needed - the cells are already coloured!)



Pondweed cells x100

Cheek cells

So far you have looked at a variety of plant cells.

All living things are made of cells - so this means animals too.

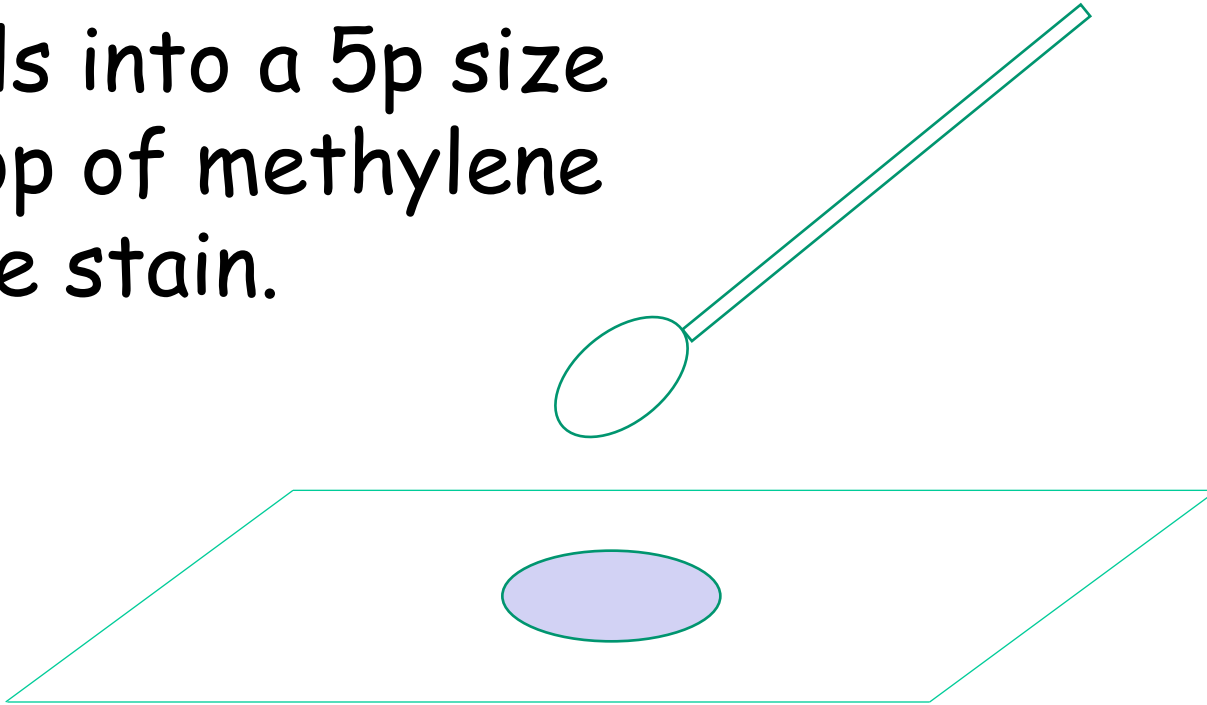
You, for example.

The cells we are going to look at are from the lining on the inside of your cheek.

Use the swab to gently rub off some of the cells.

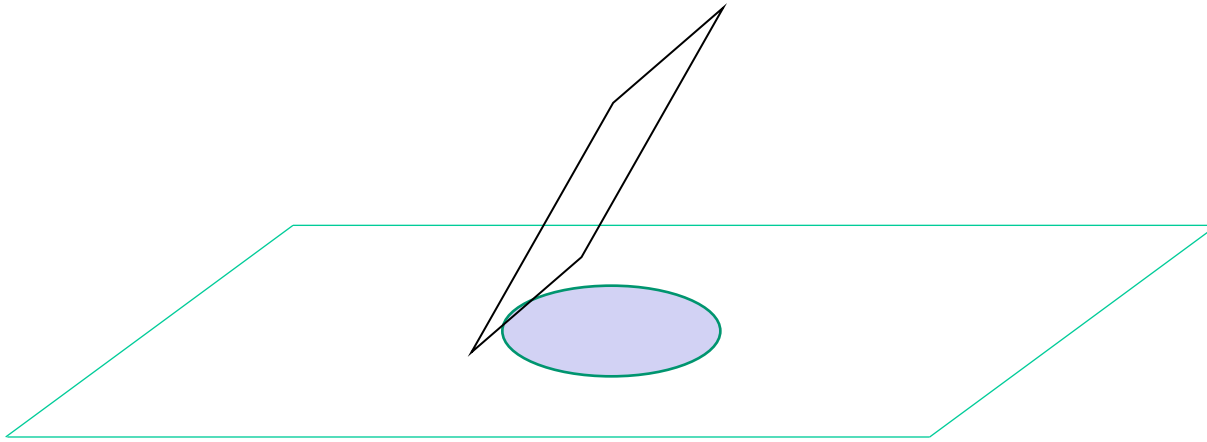


Use the swab to transfer the cheek cells into a 5p size drop of methylene blue stain.



Dispose of your used swab in the clinical waste container.

Put a cover slip edge - on into the dye and lower it gently so that there are no air bubbles.



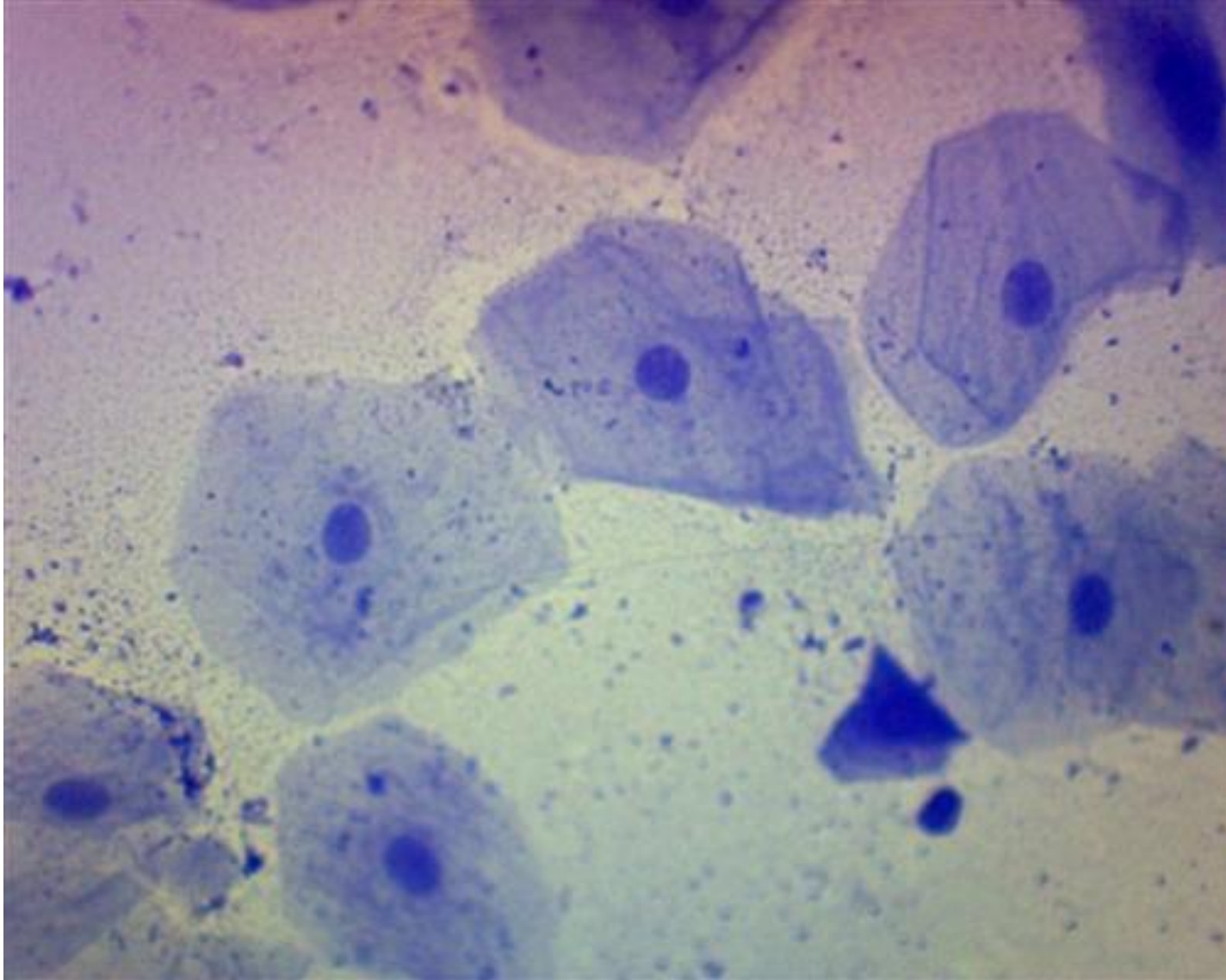
Look at the slide under low power to find the cells, then medium power to see them in more detail.

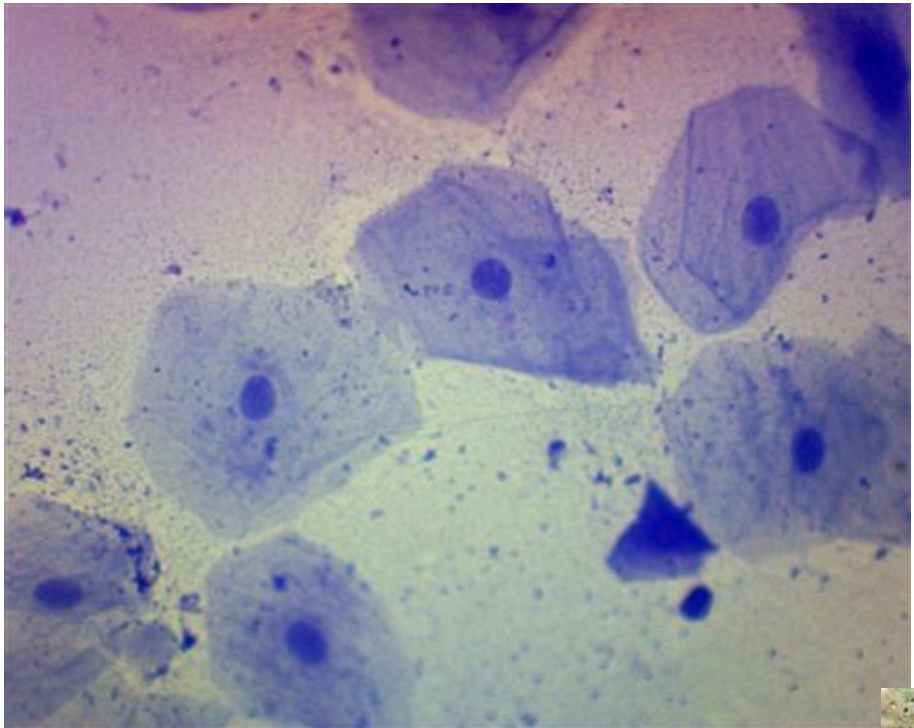
Cheek cells

Draw 3-4 of the cheek cells as you see them under medium power. Remember -

- Use pencil
- Draw big (1/3 page)
- Use lines - not shading
- Show shape, position and arrangement
- Draw all you can see, but nothing you imagine.
- Title and magnification

If you are struggling to find cheek cells, here are some examples -





x400

x40

