

Explore: Mitotic Figures

THE ACTIVITY

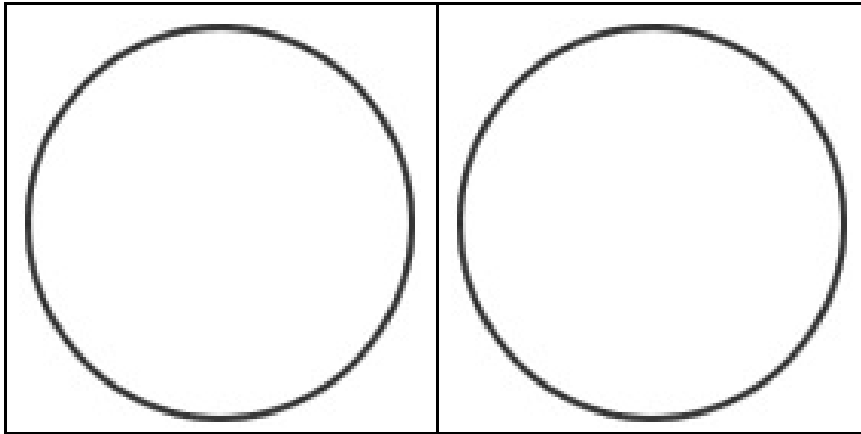
1. Center the fine focus knob. Lower the stage using the coarse focus knob. Select the lowest objective lens (4x). (It usually has the shortest lens).
2. Place the onion root tip slide on the microscope stage. Try to position the end of a root tip directly under the center of your objective lens.
3. Use the coarse focus to bring the stage up as high as it will go. Never use the coarse focus with the higher power objectives – the high powered objectives can come into contact with the slide and break either the slide or the objective lens.
4. Looking through the eyepiece, slowly lower the stage using the coarse focus until the slide appears in focus.
5. At 4x, scan the slide looking for mitotic figures. (Your teacher will show you what to look for on the projection screen).
6. When you find an interesting cell, gently move the slide to put it in the middle of the field and switch the objective to 10x. Using the fine focus only, bring the slide into focus.
7. Center your cell again and switch to the high power (40x) objective.
8. For each of the four stages of mitosis, draw a sketch of the cell with the mitotic figure (and some surrounding cells) and describe what is happening during that stage of mitosis.

FOLLOW UP QUESTIONS

Answer the following questions in your notebook using complete sentences.

1. Onion cells normally have 8 pairs of chromosomes (16 chromosomes). How many chromosomes do the onion cells have just before prophase? How many chromosomes does each daughter cell have after telophase and cytokinesis are finished (when mitosis is all done)?
2. How many pairs of chromosomes do humans have?
3. Are the number of chromosomes related to how advanced an organism is? (Do some research and back up your answer with some data.)
4. During what stage of mitosis do the chromosomes condense and the nuclear membranes start to go away?
5. During what stage of mitosis do the nuclear membranes reform and the chromosomes start to “un”condense?
6. What stage of mitosis includes all the chromosomes lining up in the middle of the cell and the spindle fibers attaching to them?
7. When does the cell make extra copies of the DNA for the new cell that will be formed?

Plant cells (onion root tips)



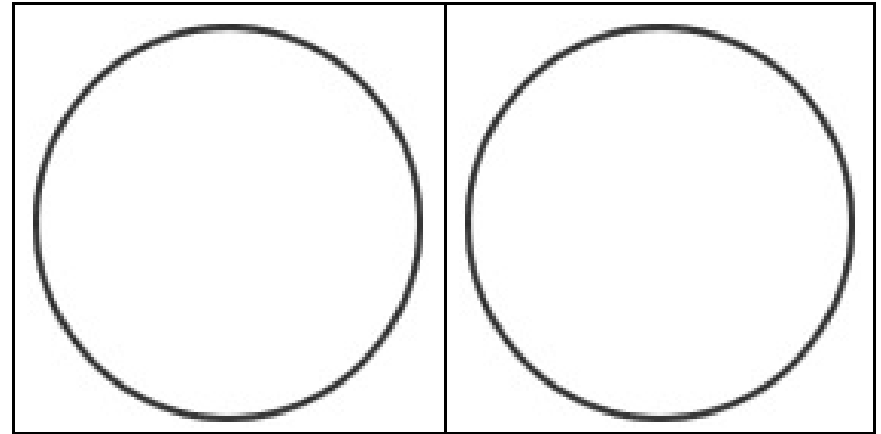
(40x)

(40x)

PROPHASE

METAPHASE

Plant cells (onion root tips)



(40x)

(40x)

ANAPHASE

TELOPHASE