

Embryology

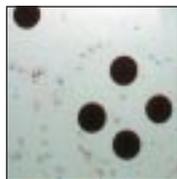
Study Embryology

Frogs let you study embryology. During winter, frogs hibernate and their hearts almost stop beating. Their tissues can go below freezing, but still survive. In the first bright days of spring frogs go back to ponds to copulate and lay eggs. Frogs' spawn consists of embryos surrounded by a ball of jelly. The jelly protects the developing embryo, and also acts like a lens to focus warmth from the sun. Because they collect solar heat, the black egg cells heat up quicker than the water. Under 10x you can watch the change from round egg-cell to oblong embryo. Use top lighting to see how the cells divide. After a week or so (the time depends on the temperature in your room) you will see that the young tadpole has external gills. With the 200x lens you can see blood cells circulating inside the gills as they absorb oxygen from the pond water. After about a week the gills are absorbed by the developing tadpole as it enters the next stage of development - now it gets oxygen through the tail. Under 60x you can see how the tail is thin and flat. It is rich in blood vessels. The 200x lens shows the blood cells circulating and you may even be able to see the pulsation from the frog's

Frogs return to ponds in early spring, ready to breed.



You can find frogs' spawn floating under the pond surface.



Under 10x you can see the egg cells in their protective covering.



After 3-4 days the head and tail are forming.



In the second week the tadpole has developed gills.



60x shows the external gills projecting from the body.



Under 200x you can see blood cells circulating.



During the next week the gills are absorbed.



The V-shaped muscles of the tail are visible at 60x.

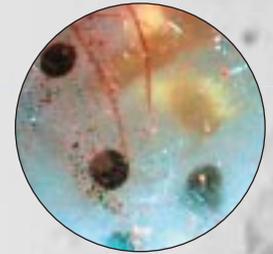


Lay down the microscope body to focus on the spawn.

heart. You can learn a lot more about these developing embryos by making a time-lapse video. Take the microscope from its stand and use it lying flat, pointing at the jar containing the frogs' spawn. Set the controls to take one picture every hour, which will compress an entire 24-hour day into a single second. Make sure that the jar is screened from direct daylight, or the video will change colour when daylight boosts the light from the lamp. The development of a frog's egg gives an idea of how human embryos develop. Less tail, but you get the idea. Every human embryo has a short tail and gill-slits early in its development, reminding us of our origins.



200x shows blood circulation, and the chromatophore cells, which change size, making the frog darker or lighter.



Time-lapse reveals how the early embryo develops.



The video will reveal the development of head and tail.



At 1 frame per hour you can capture 2 weeks of action.



In a warm room development may be so rapid that you may prefer 1 frame per 20 minutes. At that rate playback will condense 5 days of action into less than 1 minute.