SECTION BIOLOGISTS' TOOLS AND TECHNOLOGY 1.4 Power Notes

Tool or Technology	Details :Imaging Technology provides views of life
Light microscope (LM)	1. Light and lenses used to magnify specimens; limited magnification, but can be used to study living specimens. Microscope provides an enlarged image of an object. Used to see live or preserved specimens (cells and bacteria). Can magnify structures up to 1500 times original size.
Scanning electron microscope (SEM)	2. Deflection of electrons used to magnify specimens; provides high magnification and a 3D black-and-white image that can be colored by computer; cannot be used to study living specimens. Magnifies more than 100,000 times.
Transmission electron microscope (TEM)	3. Electrons passing through a specimen used to magnify specimen; provides high magnification and a two-dimensional black-and-white image that can be colored by computer; cannot be used to study living specimens.
X-ray imaging	4. X-rays passing through tissues used to show dense materials (bones, teeth).
Magnetic resonance imaging (MRI)	5. Magnetic field used to show all tissues, including soft tissues such as tendons and ligaments.
Functional magnetic resonance imaging (fMRI)	6. Magnetic field that can be used to shown activity in particular brain regions while a subject is performing a task.
Computer modeling	7. Use of computers to simulate complex systems when actual experiments are not possible, such as heart attacks, the effects of medicines on the human body, movement of water into a cell, spread of a disease through a population.
Molecular genetics	8. Study and manipulation of DNA at the molecular level (genes). A gene is a segment of DNA that stores genetic information.