

Biology for the Global Citizen, A New Non-Majors Biology Text with Laboratories Using Computer Simulations

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We discuss a new non-majors biology text (*Biology for the Global Citizen*, 2021, Cognella Academic Publishing) that offers numerous segments on applying science to life with content relatable to current events, a brief overview of each topic, laboratory exercises using computer simulations, numerous pedagogical features, and active learning assignments.

The laboratory exercises employ the scientific method, enhance quantitative literacy through interpretation of graphs and basic statistics with spreadsheets, employ data to support conclusions, emphasize critical thinking and analysis, and include questions that can be graded automatically on Cognella's Active Learning site as well as open-ended questions appropriate for classroom discussion. Each laboratory contains a video introduction. The widely used simulation software, NetLogo, is free, easy to use, and requires no programming experience. Guided by laboratory exercises, students consider various scenarios, make hypotheses, adjust variables to test the effect of each scenario, run simulations multiple times, generate and interpret data and graphs, make observations, draw conclusions, apply their conclusions to decision making, and gain a deeper understanding of the science that the model simulates.

The authors adapted and added models to the numerous models downloadable with NetLogo. Some of laboratory exercises are: Membrane Formation, Blood Sugar Regulation, Food Insecurity, Spread of Disease, Tumors, DNA Protein Synthesis, X-Linked Inheritance, Lac Operon, Epigenetics, Antibiotic Resistance, Peppered Moths, Fur Patterns, Competition, Community, Carbon Cycle, Climate Change, Smog.

Four schools this fall and additional schools in the spring are class testing the preliminary edition. The first edition will be available for fall, 2021.