|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MathBench  Biology  Modules** | Level\* | Distill Biology into Math | Use Equations | Use Graphs | Fundamental Equations | Magnitude | Unit Conversions | Probability | Statistics | Model Structure/Iteration | Rates & Equilibrium |
| **Measurement** |  |  |  |  |  |  |  |  |  |  |  |
| Basic Lab Techniques (Metric, Micropipettes) | **A** | **X** | **X** | **X** | **X** |  | **X** |  |  |  | **X** |
| Straight Lines/ Standard Curves | **B** | **X** | **X** | **X** | **X** |  |  |  |  |  | **X** |
| Logs and pH | **B** | **X** | **X** |  | **X** | **X** |  |  |  |  | **X** |
| Calculating Molar Weight | **A** | **X** | **X** |  |  |  | **X** |  |  |  |  |
| The Size of Things: The Micro and Nano Worlds | **A** |  |  |  |  | **X** | **X** |  |  |  |  |
| **Visualization** |  |  |  |  |  |  |  |  |  |  |  |
| A Graphing Primer | **A** | **X** | **X** | **X** |  |  |  |  |  |  | **X** |
| Log Transformations | **B** | **X** | **X** | **X** | **X** | **X** |  |  |  |  |  |
| 3D becomes 2D | **A** | **X** |  |  |  | **X** |  |  |  |  |  |
| Chopping Up Plasmids | **B** | **X** |  |  |  |  |  |  |  |  |  |
| **Probability and Statistics** |  |  |  |  |  |  |  |  |  |  |  |
| Normal Distributions and the Scientific Method | **B** | **X** |  | **X** |  |  |  | **X** | **X** | **X** |  |
| Bar Graphs and Standard Errors | **A** | **X** | **X** | **X** |  |  |  |  | **X** |  |  |
| BLAST and (Im)probability | **B** | **X** |  |  |  | **X** | **X** | **X** |  |  |  |
| Basic Rules of Probability | **A** | **X** | **X** |  |  |  |  | **X** |  |  |  |
| Mice with Fangs: Intro to Punnett Squares | **A** | **X** |  |  |  |  |  | **X** |  | **X** |  |
| More Mice with Fangs: Intermediate Punnett Squares | **B** | **X** |  | **X** |  |  |  | **X** | **X** | **X** |  |
| Linked Genes and Recombination: Advanced Punnett Squares | **C** | **X** | **X** | **X** |  |  |  | **X** | **X** | **X** |  |
| **Statistical Tests** |  |  |  |  |  |  |  |  |  |  |  |
| Testing Differences with the T-Test | **B** | **X** |  | **X** |  |  |  |  | **X** |  |  |
| Testing Goodness of Fit with the Chi-Square | **B** | **X** |  |  |  |  |  |  | **X** | **X** |  |
| Simulating Goodness of Fit Tests | **C** | **X** |  | **X** |  |  |  | **X** | **X** |  |  |
| **Cell Processes** |  |  |  |  |  |  |  |  |  |  |  |
| Introduction to Diffusion | **B** | **X** | **X** | **X** | **X** |  |  |  |  | **X** | **X** |
| Diffusion through a Membrane | **C** | **X** | **X** | **X** |  |  |  |  |  | **X** | **X** |
| Osmosis | **B** | **X** | **X** |  |  |  |  |  |  | **X** | **X** |
| The Nernst Potential | **C** | **X** | **X** | **X** |  | **X** |  |  |  | **X** | **X** |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MathBench  Biology  Modules** | Level\* | Distill Biology into Math | Use Equations | Use Graphs | Fundamental Equations | Magnitude | Unit Conversions | Probability | Statistics | Model Structure/Iteration | Rates & Equilibrium |
| **Population Dynamics** |  |  |  |  |  |  |  |  |  |  |  |
| Exponential Growth and Decay | **B** | **X** | **X** | **X** | **X** |  |  |  |  | **X** | **X** |
| Mystery of the Missing Housefly | **B** | **X** | **X** | **X** | **X** | **X** |  |  |  | **X** | **X** |
| Bacterial Dynamics | **B** | **X** | **X** | **X** | **X** | **X** |  |  |  | **X** | **X** |
| Mutation and Equilibrium | **C** | **X** | **X** | **X** | **X** |  |  | **X** | **X** | **X** | **X** |
| **Microbiology** |  |  |  |  |  |  |  |  |  |  |  |
| Frank’s Football Fiasco: Exploring Growth Rate and Meningitis | **B** | **X** | **X** | **X** | **X** | **X** |  |  |  | **X** | **X** |
| Frank Gets Messy: In Search of Exact Doubling Time | **C** |  |  |  |  |  |  |  |  |  |  |
| Methods for Counting Cocci | **B** |  |  |  |  |  |  |  |  |  |  |
| Viable Plate Count … or, How to Count to a Million | **B** | **X** | **X** |  |  | **X** | **X** |  |  |  |  |
| **Environmental Science** |  |  |  |  |  |  |  |  |  |  |  |
| Sampling | **B** | **X** |  | **X** |  |  |  | **X** | **X** | **X** | **X** |
| Tragedy of the Commons | **A** | **X** |  |  |  |  |  |  |  | **X** |  |
| Evolved Immunity | **B** | **X** |  | **X** |  |  |  |  |  | **X** |  |
| What’s in your watershed? | **B** | **X** |  |  |  | **X** |  |  | **X** |  |  |
| Case of the Missing Mountaintop | **B** |  |  |  |  |  |  |  |  |  |  |
| **Climate Change** |  |  |  |  |  |  |  |  |  |  |  |
| Iconic Graphs of Climate Change | **A** | **X** |  | **X** |  |  |  |  |  | **X** | **X** |
| Keeling Nails Carbon Dioxide | **B** | **X** |  | **X** |  | **X** |  |  |  | **X** | **X** |
| Mann Builds a Hockey Team | **A** | **X** |  | **X** |  |  |  |  |  | **X** | **X** |
| **Miscellaneous** |  |  |  |  |  |  |  |  |  |  |  |
| Tricks with Division | **A** | **X** | **X** |  |  | **X** |  |  |  |  |  |
| The 3/4 Scaling Law | **C** | **X** | **X** |  | **X** | **X** | **X** |  |  |  |  |