

Supporting the development of instructive feedback loops within a Questionmark assessment architecture to enhance experimental learning of pharmacokinetics in real life contexts.



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Pharmacokinetics Overview

- Pharmacokinetics is an important part of the UG and MSc curriculum and is commonly thought to be the most difficult component.
- It involves the manipulation of experimental data to derive parameters such as volume of distribution, absorption and elimination rate constants, clearance and bioavailability.
- Whilst most students can apply these parameters to a clinical setting, from course feedback it seems the difficulty lies in attaining parameters from raw data.

Aims

- To design a resource that instructs students on how to manipulate data, beginning with a worked example followed by an interactive scenario.
- To generate interactive feedback loops in Questionmark to guide student learning with constructive advice on wrong answers and reinforcement of correct thinking.

Pharmacokinetics in Questionmark

- The resource is split into four distinct sections;
 - Single IV Administration – One Compartment Model
 - Single IV Administration – Two Compartment Model
 - Single Extravascular Administration
 - Renal Clearance
- This allows students to select the specific concepts they wish to further their understanding in.
- The style involves an interactive feedback loop scenario following a worked example.

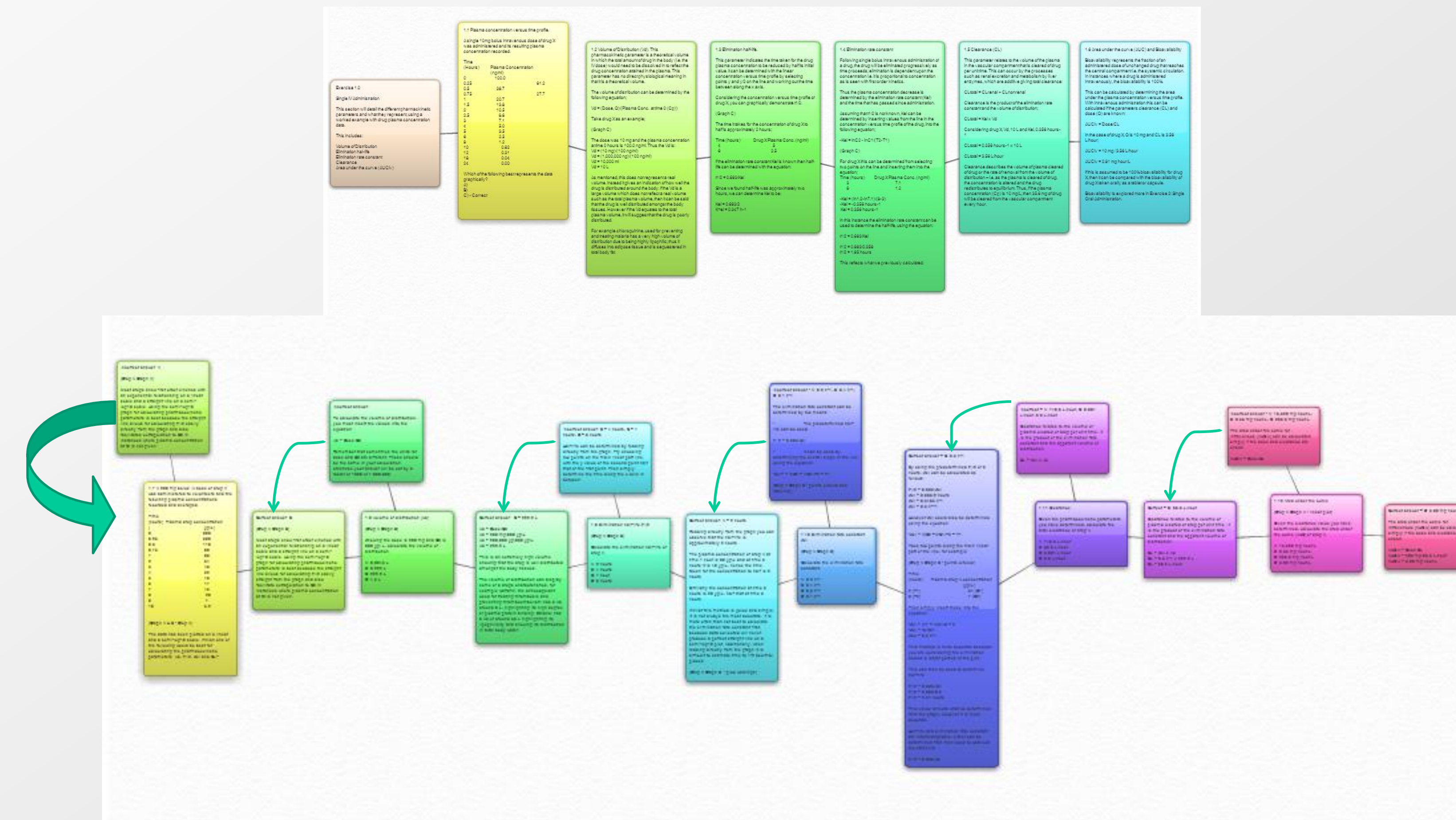


Figure 1. The use of flow diagrams was instrumental in mapping out the flow of the worked example, but most notably in the interactive scenario. The diagram shows the flow through questions linked by correct methodology, with incorrect answers looping back to the question. This will enforce principles as continuation through the exercise is only possible if all stages are handled correctly.

- Linking of correct answers to a detailed explanation of the method involved will reinforce correct thinking and aid student learning.

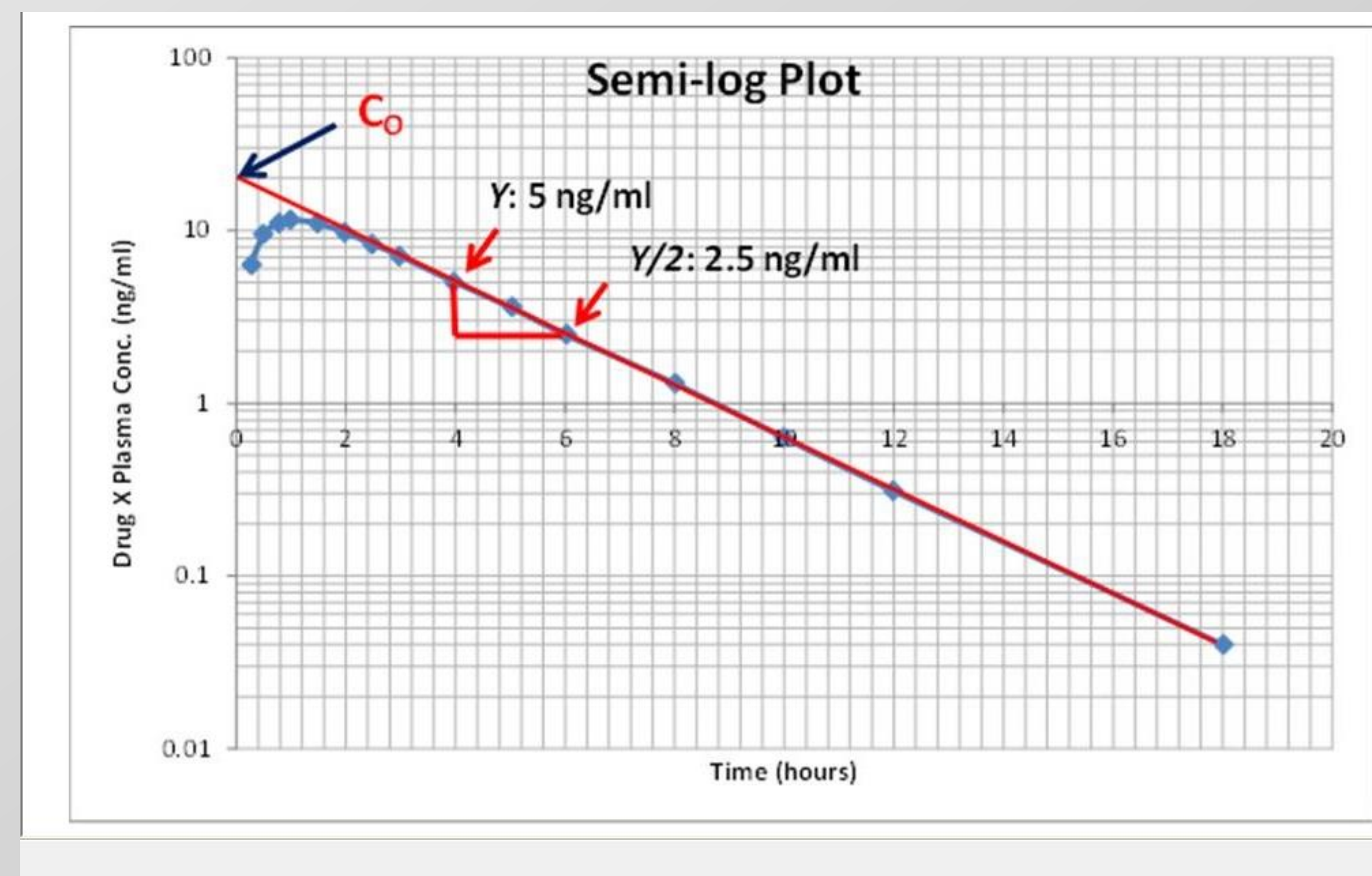


Figure 2. Reinforcing methods for correct answers will enhance student learning and correct handling of data.

- Formula and workings are explicitly described in a step-by-step manner to aid understanding and to demonstrate the correct procedural flow through calculations.

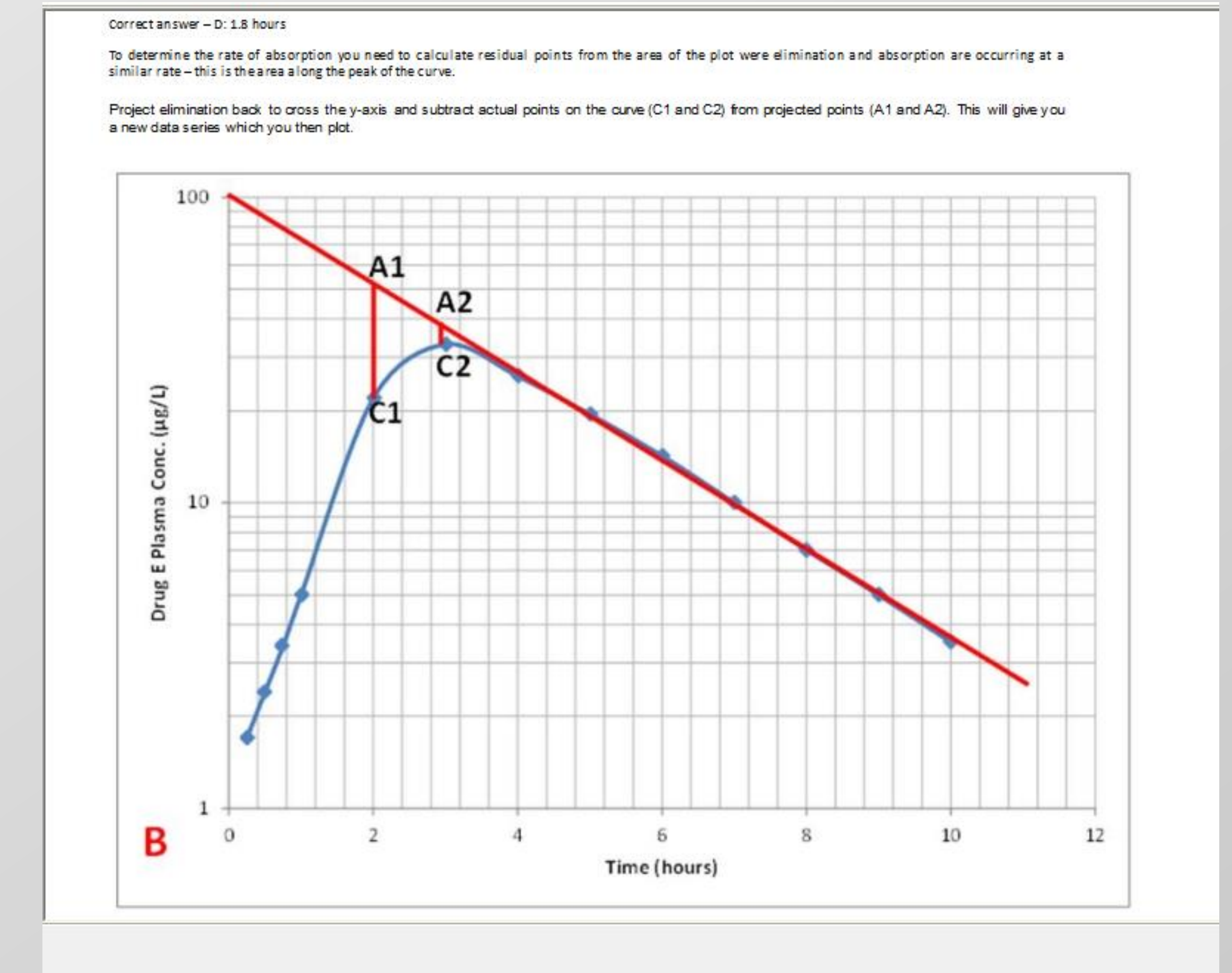


Figure 3. Demonstration of the use of reciprocals to calculate the absorption rate constant. The graph is followed by step-by-step workings so students can learn to associate the plotted data with the necessary formulae.

- Clinical relevance of data is also mentioned throughout to assist understanding in linking pharmacokinetics to real life contexts.

Future of the resource

- The resource provides a foundation which is sustainable and can be built upon year by year with the changing curriculum.
- Once online, student feedback will be garnered to determine what direction to take for further development.
- By tracking student usage, impact of the resource on exam performance will be investigated.
- The long-term goal is that the resource will overcome the perceived difficulty of the subject area to further understanding and accuracy in data manipulation.