

## Optimisation Outreach Activity Ideas

*Thank you to OPTiMA members who participated in the 2023 Outreach Workshop to compile these examples of optimisation and activity ideas for engaging young people. If you would like to run an outreach activity, or share an idea or presentation, please contact OPTiMA ARC Centre Manager: [optima-arc@unimelb.edu.au](mailto:optima-arc@unimelb.edu.au).*

### **Canteen problem**

Tell the story of the diet problem and how tastiness was not considered. Students can generate tastiness ratings for the school canteen items, to explore an optimal lunch decision. Discuss other factors that could be considered in a purchase decision, for example number of fruit/vegetables included, or whether or not it can be shared with friends (number of servings included).

### **Food truck spot**

Use [Gurobi's burrito game](#) to discuss business optimisation. Be aware that a Gurobi sign-up is needed, however this could work as a front-of-class demonstration and group activity, as decisions can be discussed and changed.

### **Knapsack problems**

Packing a bag for a holiday is a relatable example. Real world applications include portfolio management. An Open Day activity could have a knapsack race for two people to try to pack a real bag with weighted items in 1 minute. Prizes could be given to the winners.

### **Machine mindreading**

Use [MIT's mind reader game](#) as a hook to discuss prediction and decision, and how machine learning can be used to solve optimisation problems.

### **Queuing theory**

Run a simulation of an evacuation with two different initial seating arrangements to see if the time taken can be reduced.

### **Scheduling problem**

Help students design an optimal study plan, demonstrating time as a common constraint in optimisation problems. Relate to real applications including hospital scheduling.

### **Social networks**