

■ Job Juggle

STUDENT QUICK-START

SCENARIO

Scheduling problems appear everywhere: from the Olympic Games, to school athletics carnivals; from construction companies, to hospitals, and universities. Millions of dollars and even lives depend on successful, optimal scheduling. In this activity, you will solve two or three problems over three scenarios: an adventure camp, an airport, and a music festival.

Your schedule will be represented with coloured tiles arranged in lanes on a board: the Scheduliser X1000.

- Tiles represent blocks of time
- Lanes on the Scheduliser represent groups of people or venues
- Different colours represent different activities, flight paths, or artists
- White tiles represent “downtime” where nothing is happening for that lane

In each scenario, the bulk of your score will be based on the row with the greatest number of tiles to complete the problem. In scheduling, this is called your “Critical Path”, and you want it to be as short as possible.

AIM

The aim of this half-day activity is to complete and optimise as many schedules as possible.

An optimal solution:

- Uses the shortest possible “critical path” i.e., uses the minimal number of tiles across all lanes of the board.
- Uses few white tiles, though all scenarios will require at least a couple of these
- (From Scenario 1C on) Makes the schedule fair by spreading the white tiles across all lanes evenly
- (From Scenario 1D on) Minimises frustration by avoiding long strings of consecutive white tiles in any given lane

WHAT TO DO

Your team will be given a set of tiles, 20 each, in seven colours. The flip side of each of these tiles is a white “downtime” tile. All white tiles are treated the same, regardless of the colour on the back.

Follow the rules of scenario to complete each schedule, avoiding clashes. Make sure all the colours are grouped together in each lane (**see Rules for illustrated examples**). Make sure you use the correct number of coloured tiles in each lane.

We recommend laying out all the tiles you need at the end of the board first to make sure you’re following the scenario. Avoid moving tiles from one lane to another.

Work through the scenarios in order. There is no time limit for any given scenario, but as a rule of thumb, you should try to finish each scenario in 10-15 minutes to get through as many as you can in the time available.

Use the Clash Detector to make sure you never have more than one of the same colour in the same column – schedules with clashes cannot be scored.

When you have finished a scenario, call a coordinator over to give you a score.

Before calling an event activity coordinator over for scoring:

- Double-check your final result for clashes using the clash detector
- Make sure you've got the right number of tiles for each colour in each lane – it's very easy to accidentally take tiles from one lane and put them in another

TIMETABLE

Half-Day Activity	
Session (1h 45m)	Following a 5-minute briefing by your Activity Personnel, your team will work through the scenarios. You should aim for 10-15 minutes per scenario.

SCORING

In each scenario, you are scored on the length of your critical path compared to a target path length. The critical path is the maximum number of tiles across all lanes on the Scheduliser X1000. It represents the total length of the time taken to complete your schedule. **Note: The target path length is based solely on the number of allocated tiles and may not be achievable.** 1000 points are awarded for meeting the target, and each tile over the target reduces that score.

Schedules with clashes cannot be scored. **Make sure you never have more than one of the same colour in any column on the board.** You can use the Clash Detector to help you.

White tiles represent downtime, where nothing is happening for that lane. Ideally, we want to minimise downtime, so each white tile costs you a penalty that takes away from your final score. **White tiles at the end of a lane are not counted in the downtime tally.**

Scenarios build in complexity over time. Later scenarios take into account fairness (differences in total downtime across lanes), frustration (from grouping too many downtime blocks together in a lane), and the order of events (represented by different colours). Read your scenarios carefully and make sure you've followed the rules.

⚠ At the end, ensure your team's score sheet is with the Activity Personnel.

TIPS

- The writing in bold on the scenario cards tells you what new factors you need to incorporate into your solution.
- **Don't be afraid to use white "downtime" tiles** – the penalties are not very harsh, just try to spread them out and try not to group them together. Schedules frequently involve downtime. We just attempt to keep it to a minimum.
- **You are better off getting through more scenarios than just a few** – optimisation will only get you so far in the scoring. Try to spread out your time across the scenarios.
- **Pick up and swap blocks of colours around to solve conflicts rather than sliding all blocks in a lane** as this will inevitably cause further problems.
- There are lots of different strategies, some of them better than others. Suggestions:
 - Laying all the tiles on the board and then rearranging from there
 - Building up your solution one timeslot at a time (column by column)
 - Try to get all the shortest colour sets lined up in a column first
 - Try to get all the longest colours sets lined up in a column first