Computational Thinking in Action

Connected Cities– Teacher Guide

Principles

This activity focuses on optimisation, trying to minimise the cost per chad by covering as many tokens with a single counter as possible.

Logic

One of the most common ways for students to approach this is to try and cover the maximum number of chads with their first placement, then covering as many of the remaining with each subsequent placement. This is an example of a greedy algorithm, going for the optimal choice at each stage. Depending on the type of problem being solved, this can be a strong way to approach the problem, but is not always optimal, depending on the placement of chads. There may be some circumstances where taking an option with one placement that covers less, may allow for greater total coverage.

Sample Answer

Since this activity includes randomisation, there is no one specific optimal answer. This example answer was created by a random throw of chads onto a printout of the map on the second page of the student sheet.

The counters were placed by following a greedy algorithm, covering the 3 chads that landed close to each other with the first counter, then covering an additional 2 with the second counter. There were no other clusters of counters close enough to group.