

Watering a sports field

(by Martin Homer)

This is an open-ended challenge, there are no right or wrong answers, it can be used as a brainstorming exercise or carried out over a prolonged period of time, like a project.

During a long, hot summer, cricket fields need regular watering. To make sure the grass is in optimal condition, your local club wants to use an automatic pop-up sprinkler system. But how should the sprinklers be laid out to ensure the best possible watering for least cost and inconvenience?

Ideally, every bit of the field would be watered equally, and the club particularly wants to avoid over- and under-watering the grass. Wasting water would be bad, too.

Most pop-up sprinklers can water either a whole circle, or a segment of a circle. You can assume that the club opts for a sprinkler with an 11m coverage radius.

Car Parking

(by Martin Homer)

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Land in cities is in short supply, and so the value of parking spaces is very high; perhaps as much as £100,000 per space in central London. So when making a new car park, it is important to design them so as to fit in as many parking spaces as possible.

Your challenge is to find a way of fitting as many parking spaces as possible into a given area, whilst maintaining the overall usability of the car park.

Two areas to try are shown below. You can move the entrances and exits, provided they stay on the same side of the car park, as shown in the figure.

