

# Aunt Sarah and the Farm



Aunt Sarah wants to help her nephew Jack. However, she does not want to simply give him money. Instead she will provide him with a  $10 \times 10$  plot of land provided he keeps it fenced. At the end of the year she will reduce the width by 1 and increase the length so that in the second year he will have an  $11 \times 9$  plot. This will be done each year until there is nothing left but a fence (i.e.,  $20 \times 0$ ). This way it will be up to Jack to work hard and make the most of this opportunity.

Help Jack explore what to expect over the next 10 years. As a start, for each year find:

1. How much land will Jack lose from the preceding year?
2. How much land will Jack lose from the first year?
3. How will the shape of his farm change over time?
4. How many feet of fencing will it take to fence it in?