## A Helping Mand

 You need: a computer spreadsheet (optional)Taki, the environmental officer for Counter Catastrophe, is working on a project to increase the population of a very rare bird. He is briefing new members of the team.
"We found 2 nests 3 years ago, each containing 1 egg. The eggs were carefully incubated. Both eggs hatched and produced 1 male and 1 female. That female has now laid a clutch of 3 eggs. We've scanned the eggs, and everything's fine. It looks like we will get 3 healthy chicks."

How long will it be before they can be released into the wild, Taki?


|  |  |  | Population increase |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | F9 | fx X $\downarrow$ | = $\mathrm{B} 9+\mathrm{C} 9+\mathrm{D} 9+\mathrm{E} 9$ |  |  |  |
|  | f | B | c | D | E | F |
| 1 | Year | Adult male | Adult female | Young male | Young female | Total birds |
| 2 | 1 |  |  | 1 | 1 | 2 |
| 3 | 2 |  |  | 1 | 1 | 2 |
| 4 | 3 | 1 | 1 | 2 | 1 | 5 |
| 5 | 4 | 1 | 1 | 2 | 1 | 5 |
| 6 | 5 | 3 | 2 | 4 | 2 | 11 |
| 7 | 6 | 3 | 2 | 4 | 2 | 11 |
| 8 | 7 | 7 | 4 | 8 | 4 | 23 |
| 9 | 8 | 7 | 4 | 8 | 4 | 23 |
| 10 | 9 | 15 | 8 | 16 | 8 | 47 |

Taki created a spreadsheet on his computer to predict how long it would take for the population to reach 400.

1. What assumptions has Taki made about:
a. how often the birds lay eggs?
b. how many eggs are laid each time?
c. what gender the chicks are?

2. a. If Taki's assumptions are right, how many years will it take to get 400 of these birds?
b. How many years would it take to get 400 birds if the female birds laid 4 eggs each second year and the chicks were 2 males and 2 females?
