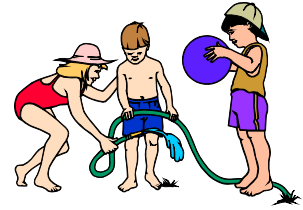


INVESTIGATION #20

Population Control



Various methods of controlling the earth's population have been suggested over the years.

One possible method might be:

“ Families may not produce any more children once they have a boy”.

This means that we could have families like;

Girl, girl, boy or Girl, girl, girl, girl, boy or maybe just Boy

What is the probability of each of these three families occurring?

Work out all the different possible families there are with 5 or less children.

Calculate the probability of each of these families occurring.

Work out how many of 64 families would be expected to be of each sort (and think about where the other two families went to!).

For these 64 families, how many children would you expect there to be using this method of population control?

If we consider that an average of two children per family would keep the population steady, how does the method above seem to work?

Reinvestigate the method above without restricting families to 5 or less children.

Investigate other possible methods of population control.

ASSESSMENT TASK

Population Control

Using the population control law:

“ Families may not produce any more children once they have a boy”.

Complete these questions:

1. List all the different possible families there are with 10 or less children.
2. Write down the probability of each of these types of families occurring.
3. Of a group of 160 families, how many would you expect to have exactly four children?
4. If an average of 2 children per family keeps the population steady, how well does this population law work?
5. Demonstrate the reasoning for your previous answer below:

A new population law:

Using the population control law:

“Families may not produce any more children once they have a boy and a girl”.

Complete these questions:

6. List all the different possible families there are with 2 to 5 children

7. Write down the probability of each of these types of families occurring.

8. Of a group of 160 families, how many would you expect to have exactly four children?

9. Calculate below what size you would expect the average family to be under this law.