****

**Activity 4: Selective breeding**

Coefficient of inbreeding

**First half cousins**

A and B are mated and produce E. B and C are mated and produce F.

Later, D and E are mated and produce H. F and G are mated and produce I.

Later, H and I are mated and produce J.

Draw a diagram and show that the inbreeding coefficient for J is 3.125%.

**Parent and offspring**

A and B are mated and produce C.

Later, A and C are mated and produce D.

Draw a diagram and show that the inbreeding coefficient for D is 25%.

**Full siblings**

# A and B are mated and produce C.

Later they are mated again and produce D.

Later, C and D are mated and produce E.

Calculate E’s inbreeding coefficient.

**Uncle and niece (or aunt and nephew)**

# A and B are mated and produce C.

Later they are mated again and produce D.

Later, D and E are mated and produce F.

Later, C and F are mated and produce G.

Show that G’s inbreeding coefficient is 12.5%.

**Full first cousins**

A and B are mated and produce D. Later they are mated again and produce E.

Later, C and D are mated and produce G; and E and F are mated and produce H.

Later, G and H are mated and produce I.

Show that I’s inbreeding coefficient is 6.25%.

**Full first double cousins**

A and B are mated and produce E. Later they are mated again and produce F.

At the same time, C and D are mated and produce G. Later they are mated again and produce H.

Later, E and G are mated and produce I; and H and F are mated and produce J.

I and J are full first double cousins. I’s 4 grandparents are the same as J’s 4 grandparents.

Later, I and J are mated and produce K.

Show that K’s inbreeding coefficient is 12.5% (which is the same as uncle and niece)

|  |  |  |
| --- | --- | --- |
| First half cousins | |  |
| Parent and offspring | |  |
| Uncle and niece   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **** |  | **** |  | | **** |  | **** |  | **** | |  | **** |  | **** |  | | **** |  | **** |  | **** | |  | |
| Full first cousins |  | |
| Full first double cousins   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | **** |  | **** |  | **** |  | **** |  | | **** |  | **** |  | **** |  | **** |  | **** | |  | **** |  | **** |  | **** |  | **** |  | | **** |  | **** |  | **** |  | **** |  | **** | |  | |