

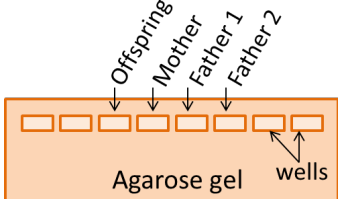
Loading the DNA samples

An agarose gel is like a lump of jelly with holes to put the DNA samples in. When an electric current is run through the gel, DNA can move through the jelly-like substance towards the positive electrode because DNA is negatively charged. Smaller pieces of DNA move faster and larger pieces of DNA move more slowly.

	Your microfuge tubes now contain 8 μl of DNA sample and 2 μl of loading dye. Reset the micropipette to 10 μl and add all 10 μl of each sample, to a different well of an agarose gel.	1 0 0
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Suggested loading order

You should note if you change the order of loading your samples so that you know which lane has DNA from which orang-utan after gel electrophoresis.

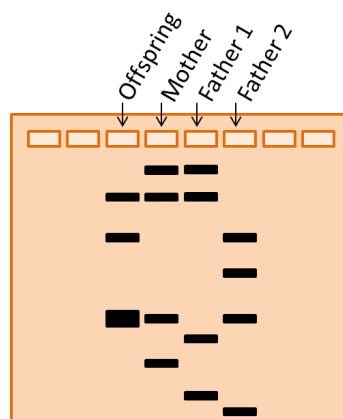


Results analysis



Based on the results shown, and remembering that each individual will have 2 alleles for each region of DNA, who's the Daddy?

Father 1 or Father 2



This is me with my Mum.
Pretty cute, huh?

I am an orangutan, which means 'person of the forest' in Malay. My home is in the tropical forest of Borneo (although Mum says we have more family in northern Sumatra too). Mum also said we are endangered, and that there are only about 15,000 of us in the whole world.

My Mum says we are omnivores, and I certainly do like to eat a lot of different things, especially bark and insects. She is teaching me lots of things like building nests in trees to sleep in and

how to use leaves as an umbrella when it rains. Lucky I'll be with her for 6-7 years, there's so much to learn!

In fact, she's pretty clever my Mum, except that ... she can't remember who my Dad is ... I know, a bit daft, huh? But she says that you could figure it out for us? Could you ... please?

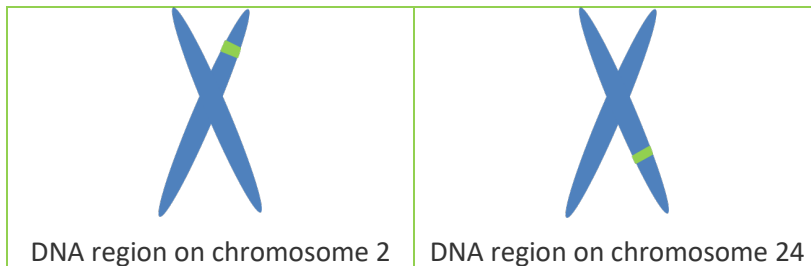
TASK: work out which of 2 orangutans is father to this baby, in order to help the conservation effort, by preventing future inbreeding.

How to work out parentage

1. Collect a sample of DNA from the baby, known and possible parents
2. Use PCR to make lots of DNA in a region that shows variation in size
3. Separate the differently-sized pieces of DNA by gel electrophoresis
4. Stain the DNA to see it and analyse the results

Materials

You are supplied with DNA from 4 orangutans; the offspring (**O**), mother (**M**), possible father 1 (**F1**) and possible father 2 (**F2**). This DNA comes from 2 particular regions on chromosomes 2 and 24, which show variation in size. (Orangutans have 48 chromosomes, 2 more than humans.)



Remember that each individual has 2 copies of each chromosome, one which they get from each parent.

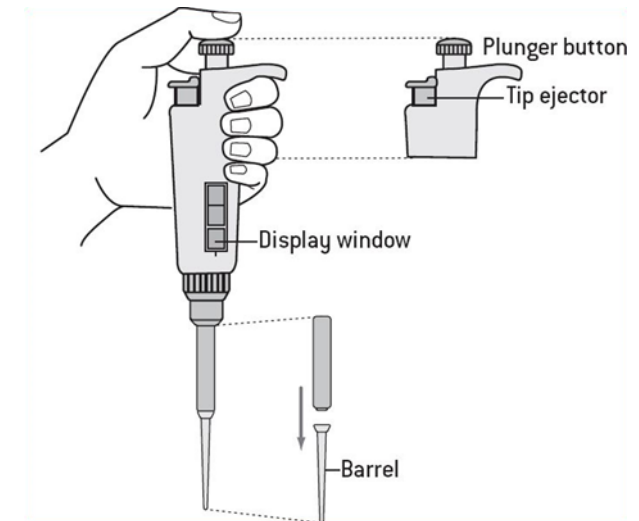
So each individual should have 4 pieces of DNA of different sizes; the alleles of the regions on chromosomes 2 and 24.

Preparing the DNA samples

Measuring small volumes

Micropipettes are used to measure very small amounts of liquids very accurately. It measures in μl – microlitres.

A micropipette is shown opposite.



Using a micropipette

- Adjust the display window to the correct amount
- Put a tip firmly onto the barrel
- Place the tip in the liquid
- Press down on the plunger button, then suck the liquid up by slowly releasing the plunger
- Put the tip where you want to dispense the liquid
- Push the plunger button right down to dispense
- Remove the tip from the liquid
- Release the plunger
- Use the tip ejector to get rid of the tip



Add 2 μl of blue loading dye (**LD**) to each of your DNA samples. The display window on your micropipette should read 0 – 2 – 0. This loading dye helps track the progress of the DNA during gel electrophoresis.

