Activity 3 – Restriction Enzyme Digestion

Who thinks that plants can get sick?

When our food crops get sick a special scientist called a PLANT PATHOLOGIST tries to find out what is wrong and then decides how to try to fix it.

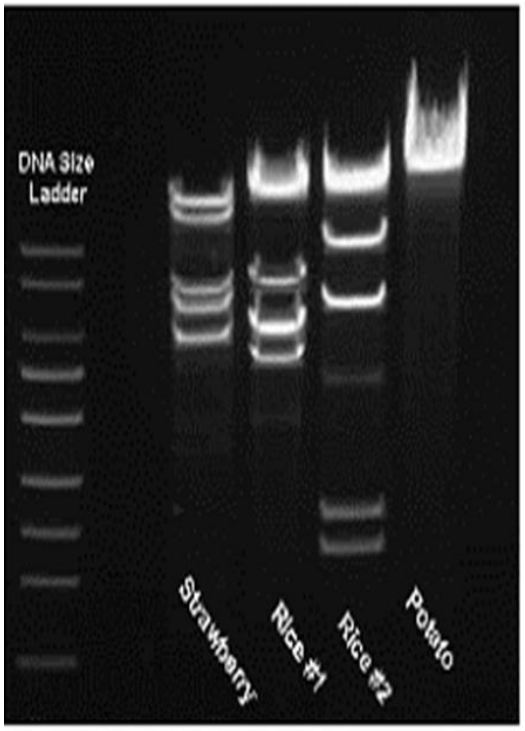
If we don't help our crops to be healthy there will not be enough food for everyone to eat.

Would you like to eat these fruits and vegetable?

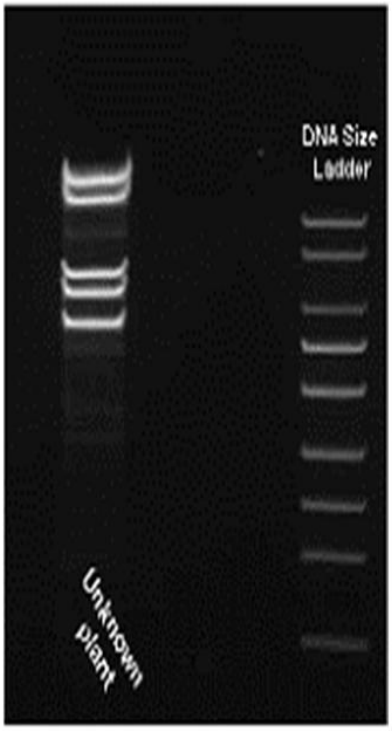
In this activity you will try to determine what plant the pathologist has been studying to find out why it is sick. You have a picture of the fingerprint for the unknown (mystery) plant that is being investigated and a picture of the fingerprints of several known plants.

Can you work out which plant is the sick one?

DNA Profiles of 4 known plants



DNA Profile of "Mystery" plant



Why did you choose this plant?

You can check your answer by working out the puzzle below.

Use the Table of Genetic code to find out which letter goes in each space. The letter you are looking for is in brackets on the table and has a three letter code. The first letter of the code is found in the left side of the Table, the second letter is on the top of the Table. Within the box where the first two letters intersect you have four choices for the last letter of your code. Find the correct one and look at the letter that is in brackets, next to the abbreviated word. It is this letter that you will use to fill in the blanks on the sheet.

Table of Standard Genetic Code

First base		Second base							
		T		**C**		**A**		**G**	
	T	TTT	Phe (F)	TCT	Ser (S)	TAT	Tyr (Y)	TGT	Cys (C)
		TTC	Phe (F)	TCC	Ser (S)	TAC		TGC	
		TTA	Leu (L)	TCA	Ser (S)	TAA	**STOP**	TGA	**STOP**
		TTG	Leu (L)	TCG	Ser (S)	TAG	**STOP**	TGG	Trp (W)
	C	CTT	Leu (L)	CCT	Pro (P)	CAT	His (H)	CGT	Arg (R)
		CTC	Leu (L)	CCC	Pro (P)	CAC	His (H)	CGC	Arg (R)
		CTA	Leu (L)	CCA	Pro (P)	CAA	Gln (Q)	CGA	Arg (R)
		CTG	Leu (L)	CCG	Pro (P)	CAG	Gln (Q)	CGG	Arg (R)
	A	ATT	Ile (I)	ACT	Thr (T)	AAT	Asn (N)	AGT	Ser (S)
		ATC	Ile (I)	ACC	Thr (T)	AAC	Asn (N)	AGC	Ser (S)
		ATA	Ile (I)	ACA	Thr (T)	AAA	Lys (K)	AGA	Arg (R)
		ATG	Met (M) **START**	ACG	Thr (T)	AAG	Lys (K)	AGG	Arg (R)
	G	GTT	Val (V)	GCT	Ala (A)	GAT	Asp (D)	GGT	Gly (G)
		GTC	Val (V)	GCC	Ala (A)	GAC	Asp (D)	GGC	Gly (G)
		GTA	Val (V)	GCA	Ala (A)	GAA	Glu (E)	GGA	Gly (G)
		GTG	Val (V)	GCG	Ala (A)	GAG	Glu (E)	GGG	Gly (G)

Here is the name of the plant that the DNA is from. Can you work out the name using your copy of "TABLE OF STANDARD GENETIC CODE"?

TCT ACT CGT GCT TGG **B** GAA CGT CGT TAT

___ ___ ___ ___ ___ **B** ___ ___ ___ ___

Did you work out the answer correctly using the Restriction enzyme clue?

See if you can work out what these two questions are and then answer them.

TGG CAT GCT ACT ATT TCT GAT AAT GCG?

__ __ __ __ __ __ __ __ __?

TGC GCA AAT TGG GAG ATG GCT AAA GAG GAT AAC GCT

ACA AGG GCA GTA GAG TTG TGG ATT ACA CAC ATA AAT GCG GGC GAG CTG?

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__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ ?