

dna Profiling Virtual Labs

Website: <http://learn.genetics.utah.edu/>

Scroll down and click on the 'Virtual Labs' tab. Complete each of the virtual labs below:

DNA Extraction

- 1- DNA is extracted from human cells for a variety of reasons, what are the three reasons they list?
 - a. _____
 - b. _____
 - c. _____
- Follow the on-screen directions to complete the virtual lab. Answer the questions as you go:
 - 2- Inside each nucleus is about _____ of DNA.
 - 3- What cells are used to extract DNA? _____
 - 4- What 4 steps are needed to purify that DNA?
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - 5- 'Lysis' is a Greek word that means: _____
 - 6- The lysis solution contains what 2 ingredients? _____

 - 7- What happens when salt is added? _____

 - 8- Why is water placed in the centrifuge? _____
 - 9- What solution needs to be added to see DNA with the naked eye? _____
 - 10- How is extracted DNA stored? _____
- Continue to 'How To Extract DNA From Anything Living' (use link at bottom of the page).
 - 11- List the six ingredients needed for the experiment:

a. _____	d. _____
b. _____	e. _____
c. _____	f. _____

12- When salty DNA comes in contact with alcohol it becomes undissolved, what is this called?

PCR

- Click "Home", then "Virtual Labs"- Complete the **PCR Virtual Lab**

13- What does PCR stand for? _____

14- PCR is used every day to do what three things?

a. _____

b. _____

c. _____

- Follow the on-screen directions to complete the virtual lab. Answer the questions as you go:

15- The human genome is made up of _____ chemical base pairs.

16- PCR can generate _____ identical copies of a specific DNA sequence in a matter of hours using only a test tube, a few simple reagents, and a source of _____.

17- Circle- True or False: You need a lot of DNA to start a PCR reaction.

18- What is special about the DNA polymerase used during PCR? _____

19- What machine is used to precisely heat and cool the tube? _____

20- At what temperature does the DNA double helix separate? _____

21- During what cycle do the desired products start to appear? _____

22- After _____ cycles there are over a billion fragments that contain the target DNA sequence

- Scroll down below the virtual PCR lab and read the information, then answer questions:

23- What are primers? _____

24- The DNA Polymerase in our body breaks down at the temperature needed for PCR... so where did they get the enzyme from so that it can function at such a high temperature? _____

Gel Electrophoresis

- Click "Home", then "Virtual Labs"- Complete the **Gel Electrophoresis Virtual Lab**

25- Gel electrophoresis allows scientists to sort DNA strands according to their _____

26- What is used as the filter to sort the strands? _____

27- What makes the DNA move? _____

28- What must be done to the DNA groups to see them with the naked eye? _____

29- What is agarose made from? _____

30- What is in the buffer? Why? _____

31- What are the two reasons for adding loading buffer to your DNA sample? _____

32- Why should you also load a standard? _____

33- DNA has a _____ charge.

34- What chemical is used to stain the DNA? _____

This shows up when? _____

35- Why should you avoid contact with this chemical? _____

36- What are the estimated lengths of the three bands? _____

- Scroll down below the virtual lab and click on 'Can DNA Demand a Verdict?' Read the information, then answer questions:

37- DNA fingerprinting goes by what other names? Why? _____

38- _____ percent of human DNA is the same in everyone.

39- Name one precaution taken by investigators to prevent mistakes. _____

Create a DNA Fingerprint Go to the website below, then click 'view' and follow on screen directions.

<http://www.pbs.org/wgbh/nova/education/body/create-dna-fingerprint.html>

40- Who is the culprit? _____

Extra time?

- Play the Online Game- CSI: Web Adventures

<http://forensics.rice.edu/index.html>

- Begin with Case One: Rookie Training.
- Play as Guest unless you want to register.
- Begin your Checklist by completing the Forensic Biology portion (about DNA profiling) then continue on in any order you'd like.