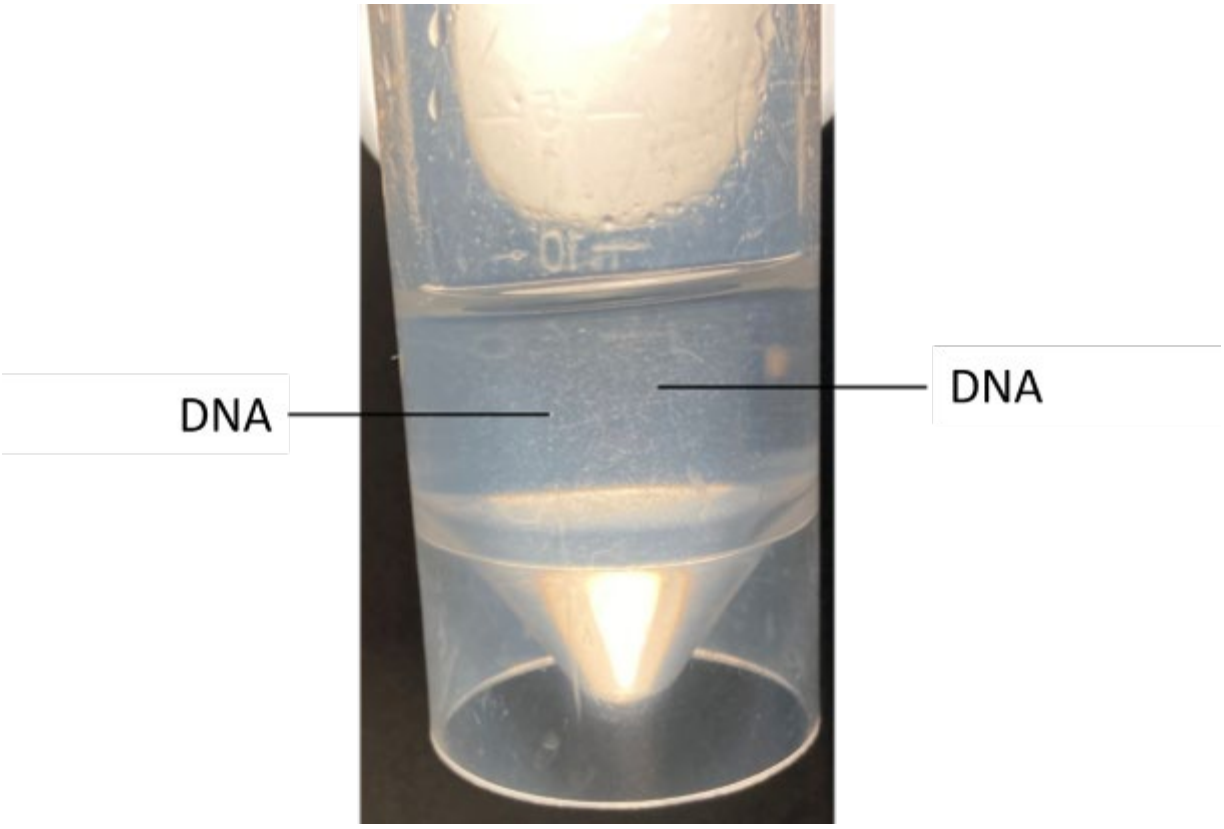
DNA Answer Guide

Exercise 1: DNA Extraction

Photo 1: Extracted DNA



Question 1

What would be your next step if you were performing DNA analysis in a forensics laboratory?

The next step would be to purify the DNA and amplify it using PCR, then analyze the sample using gel electrophoresis.

Question 2

What are some advantages to using a buccal swab to obtain a DNA sample over other potential methods, such as drawing blood?

A buccal swab is a fast, painless method of collecting a DNA sample that requires very little training.

Question 3

Based on your knowledge of DNA extraction, what do you think the DNA extraction solution was most likely composed of?

The DNA extraction solution must contain a detergent of soap and salt.

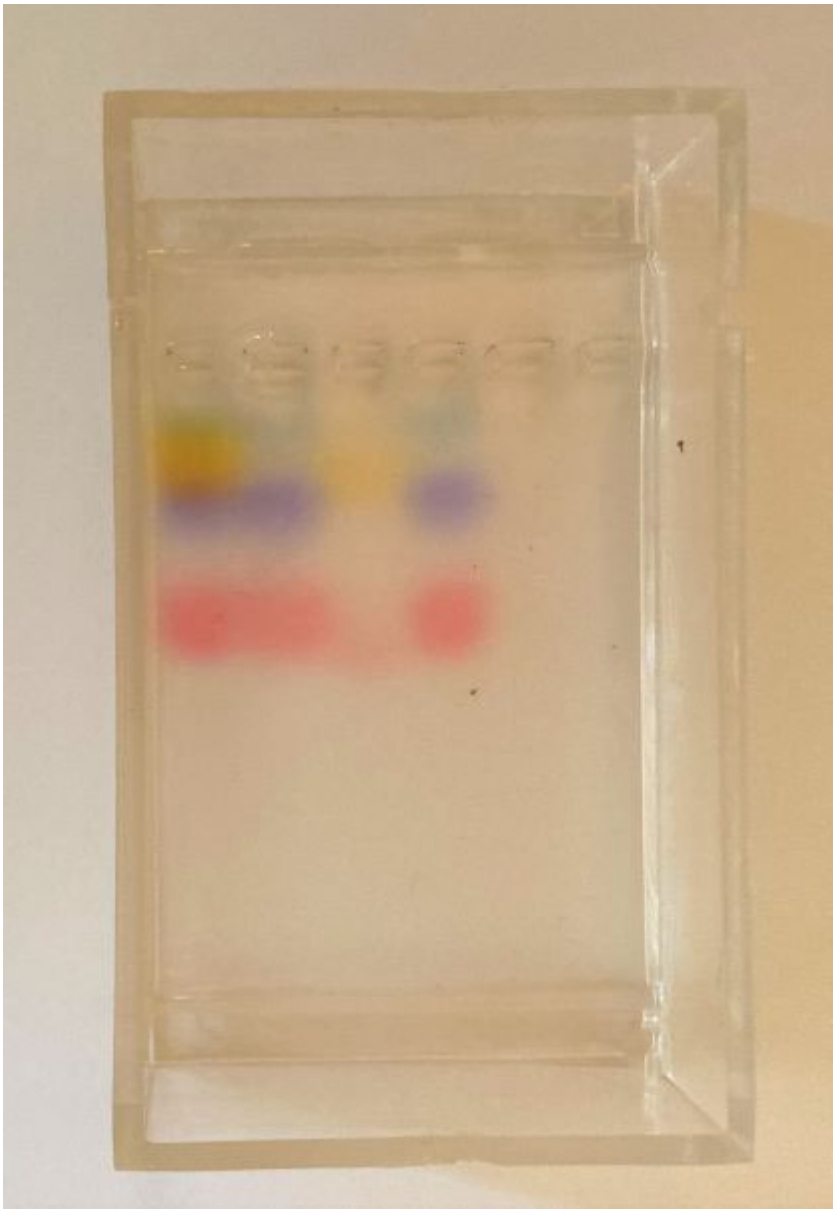
Question 4

Why was your DNA only visible after the addition of ethanol?

DNA is soluble in water but is insoluble in alcohol. Therefore, before the ethanol is added the DNA is dissolved within the water/detergent solution. The addition of the ethanol forces the DNA to precipitate out of the solution.

Exercise 2: Gel Electrophoresis

Photo 2: Gel Electrophoresis Results



Data Table 1: Gel Electrophoresis Measurements

Sample	Number of Bands	Distance of Each Band (mm)
Standard	4	5; 9; 14; 25
Suspect 1	3	5; 14; 25
Suspect 2	2	9; 25
Crime Scene	3	5; 14; 25

Question 1

Did either of the suspects match the sample found at the crime scene? If yes, which one?

Suspect 1 matched the sample found at the crime scene.

Question 2

What purpose does a standard serve when performing gel electrophoresis?

The standard is used to determine the molecular weight of each band, which can help identify what specific genetic component each band represents.

Question 3

What are some differences between the dyes used to model DNA analysis in this experiment compared to running gel electrophoresis on a sample containing actual DNA?

In this experiment, the bands could be differentiated by color as well as by distance traveled through the gel. In a gel run using DNA, all the bands would be the same color. Additionally, a sample run using DNA would likely have a higher number of bands than the samples run in this exercise.