Name _____ Date _____

FORENSIC SCIENCE

Modified from the original version created by Judy Baker

URINE OVER YOUR HEAD

Background: Urine can provide significant information in a criminal investigation. When found at a crime scene, urine can be a useful piece of evidence. Chemicals in urine vary from person to person making it unique enough to identify them as a suspect in an investigation. There are several tests one can complete to determine the characteristics of a urine sample: color, ph, transparency (cloudiness) and glucose amount. During this lab you will perform the following tests:

a. Visually compare urine samples for color and transparency. Urine can have a variety of colors, ranging from colorless to amber. The color of urine is directly related to substances found in it. Diseases affect the color of urine. For example, the presence of blood will produce brown or red color urine. If a person is diabetic, their urine might be a pale green color. Most urine is transparent or clear, but varies from one individual to another. This can change based on the amount of normal bacteria found in urine or from an infection producing pus. The urine sample will become cloudy in these situations.

b. pH is another important test. Urine pH ranges from 4.7 to 8.0. Most urine has a pH less than 7, making it acidic. The pH of urine varies throughout the day due to food and water consumption. Stress, tiredness and rate of respiration can also affect the pH of urine. In the morning, urine is most acidic due to the build up of carbon dioxide in your body. Vegetables may cause urine to become alkaline (basic/pH above 7) where proteins make urine more acidic.

c. Glucose can also be measured in urine. People with diabetics can produce higher glucose amounts. A diabetic can not produce insulin very well. Insulin is a chemical in the body that helps break down glucose. In diabetics, glucose can not be taken from the blood into the cells where it is needed for energy, instead, it travels through the blood stream to the kidneys, where it is removed and excreted in their urine. Diabetics who are not following any treatment plan have glucose in their urine although a diet that contains large amounts of sugar may cause higher glucose amounts in a person's urine at any time.

d. It is also possible to test for the presence of protein. Protein in the urine (poteinuria) may indicate the presence of an infection. It may also result from several diseases including inflammation of the kidneys, hypertension, cardiovascular disease or diabetes.

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Data Table

Sample	Presence of Protein	+ or – Phenopthalein	Color	Transparency	pH	Presence of Glucose
Control						
Test tube #1 Initials						
Test tube #2 Initials						
Test tube #3 Initials						
Test tube #4 Initials						
Test tube #5 (sample found near fish tank) Initials						

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Concluding Questions:

1. Name the suspects who had acidic urine. How did you know this?

2. List the suspect who had sugar in their urine. Does this mean that they are diabetic? Explain your answer.

3. Who was the criminal? How do you know?

4. Now that you have named your criminal, do you have overwhelming evidence to convict your named criminal? In a paragraph or two, explain how you will present your case and evidence the court.