Gel electrophoresis forensics worksheet

Purpose: What is electrophoresis gel? Goals:Students will be able to... 1) List the steps involved in the gel electrophoresi experiment; 2) Describe the role of restriction enzymes and how they function; 3) Explain how electrophoresis gel separates the DNA molecules present in the mixture; 4) Describe the relationship between the size of the fragment and the rate of migration in the gel; 5) Analysis of individual DNA fragments using electrophoresis gel; 6) Explain the impact of the gel's electrophoresis on modern society. Materials: Gel Electrophoresic camera, agaroz gel, buffer solution, food colorings, pipettes, power source, sheets, LCD projector, computer, Smart Board. Motivation: Visit the Nova website, it takes Lickin, and an overview of the crime scenario outlined. Walk students through the steps associated with gel electrophoresis. Lesson: Browse the steps at Gel Electrophoresis with virtual Gel Electrophoresis: Activity: Gel Electrophoresis with food dyes. (This activity can be extended within two days.) Part 1: Prepare 1% Agarosa Gel Add 0.5g agarosa to 50ml distilled water, heat 1 minute 20 seconds. Allow it to cool before pouring into the gel plates. Also make sure that the gel plates have been taped securely and contain well combs before pouring. This is a protocol for one gel Part 2 (Day Two): Preparing food coloring.1. While the gel is cooling, prepare samples of food coloring.2. Label test tubes/vials with the color of the food coloring that will put in them. Label one for red, blue, green and yellow.3. Place one drop of food coloring and three drops of 50% glycerol in each test tube. Repeat this for each sample. Remove the comb from the gel, gently pulling straight up.5. When moving the gel, be very careful to keep the slide flat. If you tilt the slide, the gel can slip off. Part 3 (Day Two): Loading and development of gel 6. Place the gel on top of the slide box in the electrophoresis chamber. Make sure the slide is positioned so that a number of wells are parallel wires7. Pour enough TBE buffer into the electrophoresis chamber so that it covers the gel. Do not pour TBE directly onto the gel; pour it towards the gel in a plastic plate. If the TBE is poured directly onto the gel, it can move the gel away from the slide.8 Decide which sample you are going to put in each well and write it down on a sheet. 9. Gently place the light bulb on the capillary tube. Be very careful when handling capillary tubes because they are very thin glass tubes and they break easily. To fill the capillary tube, place the tip in the sample, and it will automatically prepare a sample. Be careful to keep the sample in the capillary tube and don't let it in Once the tube is almost full you will need to cover the cover on top of the bulb and squeeze the bulb just a little to keep the sample from coming into the bulb. Keep the pressure steady so you don't push the sample out of the tube. It may take a bit of practice. 10. Place the tip of the capillary tube in a buffer directly above the well you are about to fill. Do not put a capillary tube in the well, because if it is bumped, it can punch through well leaving a hole that will leak the sample. Slowly squeeze the bulb more to push the sample out of the capillary tube. The sample is heavier than water (because you added glycerol), so it will go straight into the well. Part of the sample can come out of the well and get into the buffer. It's all right as long as most of them are in the well. Recycling a capillary tube in a container designed to remove glass11. Repeat with a new capillary tube for each of your samples. Once all the samples are loaded, assemble the battery pyramid and connect the wires to the batteries. 13. Clip a black alligator clip on a loop on a wire that is behind the wells and a red alligator clip on a loop on the wire that is in front of the wells. Don't touch the buffer until the clips are attached! You're electrocuted!14. Watch out for bubbles to form on the wires in the TBE. That will tell you that the current is flowing. Allow the gel to develop until you can see the colors separately. Food colorings in food colors will travel through the gel with electric current to the red wire. 16. When the gel is made developing, unclip alligator clips and take the battery pyramid apart.17. Remove the slide from the electrophoresa chamber and place it on a white paper towel or sheet of paper so you can see the colors better. 18. Pour the TBE buffer into the sink. 19. Watch the results of the gels. As the electrophoresis demo works, students complete the sheet, DNA fingerprint: You will be the judge. Each teachEngineering lesson or activity correlates with one or more K-12 educational standards in science, technology, engineering or mathematics (STEM). All K-12 STEM standards covered by TeachEngineering are collected, maintained and packaged by the Achievement Standards Network (ASN), D2L (www.achievementstandards.org). In ASN, standards are hierarchically structured: first by source; For example, by state; Within the source by type; For example, science or mathematics; within type by subtype, then by class, etc. 5, 6, 7, 8, 9, 10, 11, 12, HomeschoolPage 23, 4, 5, 6, 7, 8, 9, 10, 11, 12, Higher Education, Adult Education, Homeschool, StaffPage 3PreK, Kindergarten, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th , 12th, higher education, adult education, homeschool, StaffPage 4PreK, Kindergarten, 1st, 2nd, 3rd, 4th, 5th, 5th 7th, 8th, 9th, 10th, 11th, 12th year 5O No! We found no results on the gel%252520electrophoresis%25252520worksheet. Please check your spelling and try again. Purpose: What is electrophoresis gel? 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