

Family Secrets

Family Secrets Part 4: Testing for the HD Gene Quick Guide for Sample Lesson Sequence

Overview

PBL Part 4	Class #	Check Off	Time	Strategy / Activity Name	
Testing for the HD Gene	Pre-Lab "prep"			Prepare quantities of buffer Run off hand-outs Assemble non-"blue box" lab supplies Dispense dyes for each station Prepare gel box station "baggies" Prepare practice gel loading supplies Arrange for computer use for virtual lab	
		8 Steps A-E Gel Set-up			Narrator's introduction reading
					Gel box assignments
					A = Agarose preparation
					B = Electrophoresis apparatus set-up
					C = Gel pour (and time to set up)
					D = Practice loading dyes
					E = Dams & comb removal
					Gel storage (if not doing lass 9 right away)
				Clean-up	
				Note: This class time may be eliminated if teacher pours (pre-casts) the gels.	
Testing for the HD Gene	9 Steps F-G Gel load and run			Gel replacement from storage	
				F = Load Samples (dry load option)	
				G = Add buffer	
				H = Set up and "run" gel	
				Part 4 script reading	
				I = Observe (and record) results: <i>Electrophoresis Analysis Report</i> diagram	
				J = Clean up	
	10 Report writing			<i>Electrophoresis Analysis Report</i> completion	
				<i>Technician's Gene Testing Report</i> completion	
				Note: This class time may be eliminated if reports are assigned for homework	

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Quick Pre-lab list

1. Prepare 4 liters of electrophoresis buffer (Part 4: Appendix B)
2. Dispense dyes
3. Prepare practice gels (Part 4: Appendix B)
4. Alternative: Prepare agarose or pre-cast 8 gels per class (Part 4: Appendix B)
5. Arrange for Virtual Lab to be seen by students prior to gel setups or during gel “run”

See Part 4: Appendix A: Supplies and Equipment for a detailed list of needed supplies and equipment.

See Part 4: Appendix B: Setting Up the Lab for a more detailed description of laboratory preparations.

Some short cuts

To save classroom time (and increase teacher preparation time), some teachers have used the following short cuts:

1. Prepare pre-melted agarose (see first three bullets below and dispense in eight small bottles or beakers) and have students begin with Step A 3.
2. Prepare pre-cast the gels (see complete procedure below) and have students insert the gels into the gel trays and then begin with Step F.

You will also need

- Plastic bags and permanent markers if students will pour gels in one day and load/run them on another day.
- **1 copy for each student of:**
 - *Family Secrets Part 4: Testing for the HD Gene* script
 - *Genetic Testing Laboratory Procedure*
 - *Electrophoresis Analysis Report*
 - *Technician’s Gene Testing Report: James Lanahan*
- 1 color copy per team of:
 - *Genetic Testing Laboratory Procedure*
 - *Technician’s Gene Testing Report: James Lanahan*(NOTE: You can laminate the color copies or place them in sheet protectors for re-use)
- Optional: Computer access for *Family Secrets Virtual Laboratory*

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Class 8

- Narrator reads introduction at the top of the script
- Coach assigns student to read and complete steps A-E of the Genetic Testing Laboratory Procedure
- Students complete agarose melting, apparatus set-up, and gel pouring
- Coach distributes practice gel loading supplies
- Students take turns practice loading dyes into practice wells (dry load method).
- Students follow procedure for storing gels in baggies for overnight storage, if not continuing to Class 9 immediately.

Class 9

- If gels were stored, distribute gels to students and have them slide the gels back into the gel tray with the wells placed closest to the black electrode.
- Instruct students to complete the remaining parts of the procedure (F through J). Remind them that each student should have an opportunity to load some of the samples into wells.
- Check to make sure buffer completely covers the gel before you turn on the power.
- Turn off and unplug power supplies when dye bands have clearly separated and before students open gel boxes. Hint: if gel box lid is “steamy”, view the gel from the side.
- While the gel is running (approximately 10-15 minutes) have the class listen as selected students read the rest of the script of *Family Secrets Part 4: Testing for the HD Gene*
- Distribute *Electrophoresis Analysis Report*
- Students should be able to complete the laboratory procedure by the end of class.

It is critical that students record their agarose gel data (Part I, step 32) before the end of class. They should draw the positions of the bands in each of the lanes of the gel using the question # 1 diagram at the top of the *electrophoresis Analysis Report*. If the gels sit for several hours, the dye in the bands will diffuse out of the gel, making the gel data unreadable.

Class 10

- Teams work together (or students individually) to complete the *Electrophoresis Analysis Report*.
- Each student should place her/his own completed copy of this lab report in her/his folder.

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- Distribute one black and white copy (per student) and one colored copy (per team) of the *Technician's Gene Testing Report: James Lanahan* to each team.
- Students work in teams and come to consensus on the answers to the *Technician's Gene Testing Report: James Lanahan*. A **new** recorder should complete a colored team copy with the names of all of the team members at the top.
- Students work in lab teams and come to consensus on the answers to the *Technician's Gene Testing Report: James Lanahan*. Other students should complete a similar copy to place in their folder.
- Colored copies of the *Technician's Gene Testing Report: James Lanahan* from each team should be collected and graded.