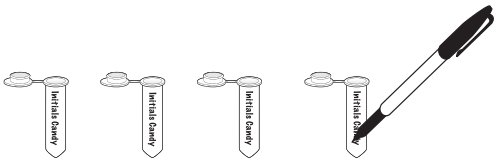
Dye Extraction From Candies

Student Workstation	Quantity
Dye extraction solution	2 ml
2 ml microcentrifuge tubes	4
Microcentrifuge tube rack	1
Marking pen	1
Plastic cups or small beakers	4
Eyedropper	1
Colored candies	4 varieties, 1–4 candies per variety*

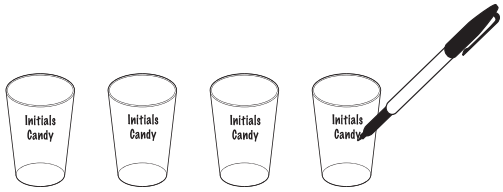
*Candy example: 3 green Skittles, 3 orange jelly beans, 4 Red Hots, 1 brown gumball

Protocol

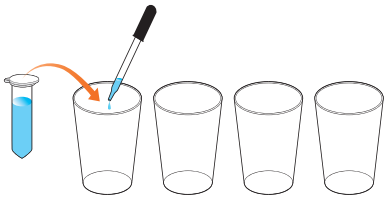
1. Label the four microcentrifuge tubes with your initials and the names and colors of the candies you are using.



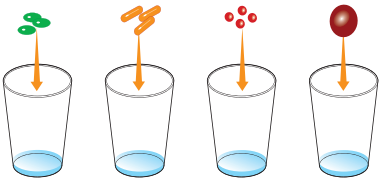
2. Label four cups with your initials and the names and colors of the candies you are using.



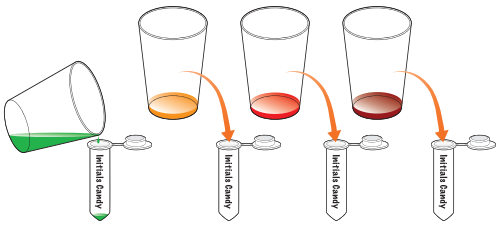
3. Using an eyedropper or pipet, add 0.5 ml of dye extraction solution to each cup. Use the volume marks on the 2 ml microcentrifuge tube to measure the correct volume.



4. Place your candy into the appropriately labeled cup and swirl the candy in the dye extraction solution. If using a candy such as M&M'S or Skittles, just dissolve the color coating off until you get to the white layer of the candy. For all other candies, try to get as dark a solution of dye as possible.



5. Remove your candy from the cup. Pour the solution containing the dissolved colored candy coating into the appropriately labeled microcentrifuge tube.

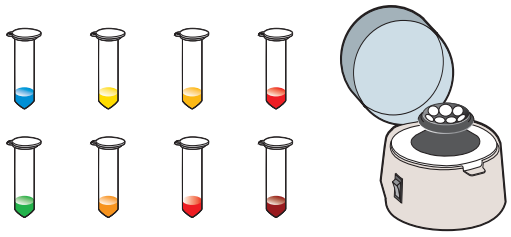


Agarose Gel Electrophoresis

Student Workstation	Quantity
Agarose gel electrophoresis system	1
Agarose gel	1
Power supply (may be shared by multiple workstations)	1
Electrophoresis buffer, 1x TAE	275 ml
Blue 1 reference dye	15 µl
Yellow 5 reference dye	15 µl
Yellow 6 reference dye	15 µl
Red 40 reference dye	15 µl
Dyes extracted from candies from Lesson 1	4 labeled tubes
2–20 µl adjustable-volume micropipet	
or 10 µl fixed-volume micropipet and 8 tips	1
Marking pen	1

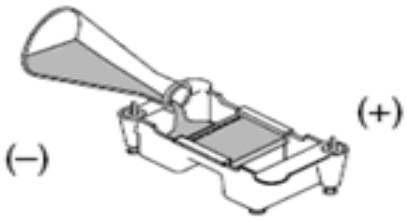
Protocol

1. Prepare your extracted candy dye samples. If a centrifuge is available, pulse spin the microcentrifuge tubes in the centrifuge to bring all the liquid to the bottom of the tube and to settle any insoluble particles. Spin down your dye standard samples as well, if necessary.



2. Obtain a prepoured agarose gel from your teacher or, if your teacher instructs you to do so, prepare your own gel.

3. Place the casting tray with the solidified gel in it into the platform in the gel box. The wells should be at the (–) cathode end of the box, where the black lead is connected. If the comb is still in the tray, remove it very carefully from the gel by pulling it straight up.

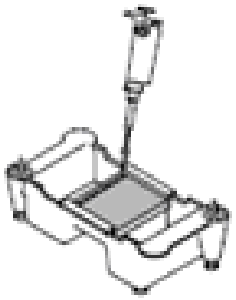


4. Fill the electrophoresis chamber with 1x TAE buffer to cover the gel, using approximately 275 ml of buffer.

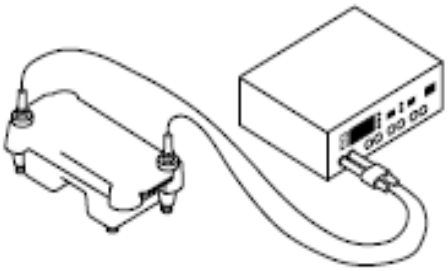
Protocol (cont.)

5. Using a separate tip for each sample, load 10 µl of your reference dyes and candy dye extracts into the gel, with one sample per well. The first sample is loaded in the well at the left hand corner of the gel.

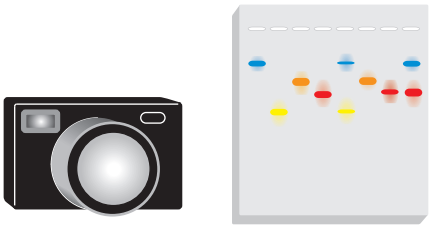
    Lane 1: Blue 1 reference dye
    Lane 2: Yellow 5 reference dye
    Lane 3: Yellow 6 reference dye
    Lane 4: Red 40 reference dye
    Lane 5: Candy 1 dye extract
    Lane 6: Candy 2 dye extract
    Lane 7: Candy 3 dye extract
    Lane 8: Candy 4 dye extract



6. Place the lid on the electrophoresis chamber. The lid will attach to the base in only one orientation. The red and black jacks on the lid will align with the red and black jacks on the base. Plug the electrodes into the power supply.
7. Turn on the power supply. Set it for 100 V and electrophorese your samples for 15 min.
8. When the electrophoresis is complete, turn off the power and remove the top of the gel box. Carefully remove the gel and tray from the gel box. Be careful — the gel is very slippery!



9. Take a photograph of the gel for your records immediately.



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