

Workshop Model Example Lesson Plan for a Biology Lab: A DNA Extraction

Goals/Objectives for class period

- Students are introduced to the concept that all living organisms contain DNA.
- All students complete three separate Quick-Draws on how the lab experiment is conducted.
- All students discuss the lab instructions with a partner BEFORE starting the lab.
- All students complete the hands-on lab experiment and witness a DNA extraction.
- All students complete a Quick-Write summary on the results of the experiment.

Common Core (if applicable), State or National Standards the lesson is related to.

Keystone State Assessment Anchor BIO.A.1.1: Explain the characteristics common to all organisms.

Materials

Student White-boards and markers	Coffee Filters
Hand-out with 2 inch end margin – How to Extract DNA from just about anything	Baby Food Jars
Various fruit samples – Bananas, Strawberries, Kiwis	Test tubes
Ziploc snack bags	Dish soap
Salt	Meat Tenderizer powder with small spatula
Water	Popsicle sticks
	Isopropyl Alcohol on Ice

Opening (include any introductory questions, at the bells, rituals & routines, etc.) – (8 min)

Student Work Period (include groupings, activity description, etc.)

Pre-Lab – 15 minutes

- Students are seated in pre-arranged groups of 4. Students have a shoulder buddy and a face buddy. Students should each have a white-board and marker. Students divide the white-board into three regions: 1st, 2nd, 3rd.
- Teacher begins a demonstration on extracting DNA from a fruit.
 1. *Start with the following materials: a zip-loc bag, a piece of fruit, salt, and a water source. Combine the fruit, salt and two tablespoons of water into the Ziploc bag and seal it.*
 2. *Gently mash the fruit with your hands to make it the consistency of baby food.*
TPT* – Individually, on the whiteboard, Quick-Draw the first part of the experiment. Pair-Share with your shoulder buddy and explain what will be done in the lab. (3-5 min)
Note: Students have not yet begun the lab experiment.
 3. *Obtain a coffee filter, baby food jar and test tube.*
 4. *Assemble the filter over the jar and transfer the fruit mixture from the Ziploc bag.*
 5. *Pour the liquid into a test tube until 1/3 full.*
 6. *Add soap and gently stir.*
 7. *Add meat tenderizer and gently stir.*
TPT – Individually, on the whiteboard, Quick-Draw the second part of the experiment. Pair-Share with your face buddy and explain what will be done in the lab. (3-5 min)

Note: Students have not yet begun the lab experiment.

8. *Tilt your test tube at a 45-degree angle and pour alcohol down the side so the liquid and alcohol do not mix. Your test tube should now be 2/3 full.*
9. *Allow the DNA to migrate into the alcohol layer. Use a wooden stick to spool the DNA around.*

TPT – Individually, on the whiteboard, Quick-Draw the third part of the experiment. Pair-Share with your shoulder buddy and explain what will be done in the lab. (3-5 min)

Note: Students have not yet begun the lab experiment.

- Teacher asks if there are any questions.

Lab Period – 15 minutes

- Students begin the experiment and clean up when finished. Teacher circulates to assist students.

Closing (Questions, exit ticket, formative assessments, etc.)

Quick-Write on 2 inch section at the bottom of hand-out?

*TPT = Total Participation Techniques which are designed to ensure that all students are actively engaged during the lesson.