470213-822

Ink Chromatography Lab Activity

Aligned With All Published National Standards

ward's science

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overview

In this lab activity, students will master the techniques of paper chromatography. Using paper chromatography, students will separate the inks of several water soluble pens, calculate the relative rate of flow (R_f) for each color dye on the chromatogram, and identify a type of pen based upon the quantitative measurements obtained.

materials included:

- 32 Chromatography vials with caps
- 50 Chromatography paper strips
- 4 Pens, water soluble ink
- 8 Rulers
- 30 Microfuge tubes
- 15 Pipets

materials not provided:

- Distilled water, 100 mL
- Scissors
- Pencils
- Notebook paper
- Plain white paper

number of uses:

This lab activity can be successfully performed once for eight groups of students with the materials provided.

Visit wardsci.com for replacement materials.

framework for K-12 science education © 2012

* The Dimension I practices listed below are called out as **bold** words throughout the activity.

DIMENSION 1 Science and Engineering Practices

X	Asking questions (for science) and defining problems (for engineering)	X	Use mathematics and computational thinking
X	Developing and using models	X	Constructing explanations (for science) and designing solutions (for engineering)
X	Planning and carrying out investigations	X	Engaging in argument from evidence
X	Analyzing and interpreting data	X	Obtaining, evaluating, and communicating information

DIMENSION 2 Cross Cutting Concepts

X	Patterns		Energy and matter: Flows, cycles, and conservation
	Cause and effect: Mechanism and explanation	X	Structure and function
X	Scale, proportion, and quantity		Stability and change
	Systems and system models		

DIMENSION 3 Core Concepts

Discipline	Core Idea Focus
Physical Science	PS1: Matter and Its Interactions

x Indicates standards covered in activity

next generation science standards © 2013

Middle School Standards Covered	High School Standards Covered
MS.PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.	HS.PS1-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

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standards/learning objectives

national science education standards © 1996

Content Standards (K-12)			
	Systems, order, and organization		Evolution and equilibrium
x	Evidence, models, and explanation	x	Form and Function
x	Constancy, change, and measurement		

Physical Science Standards Middle School		Physical Science Standards High School	
x	Properties and Changes of Properties in Matter	x	Structure and Properties of Matter

x Indicates standards covered in activity

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
4. The Physical Setting	4D: Structure of Matter
9. The Mathematical World	9A: Numbers
11.Common Themes	11B. Models

activity objectives:

- Perform and understand the process of paper chromatography.
- Calculate the relative rate of flow (R_f) for each color dye on the chromatogram.
- Identify a type of pen based upon the quantitative measurements obtained from a chromatogram.

time requirement:

45 minutes

general safety:

- Consider establishing a safety contract that students and their parents must read and sign. This is a good way to identify students with allergies (e.g., latex) so that you (and they) will be reminded of specific lab materials that may pose risks to individuals.
- Require students to remove all dangling jewelry and tie back long hair before they begin.
- Remind students to read all instructions before starting the lab activities, and to ask questions about safety and safe laboratory procedures.

at the end of the lab:

- Remind students to wash their hands thoroughly with soap and water before leaving the laboratory.

teacher notes

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