366839

LC_{50}: How Much is Too Much? Lab Activity

Aligned With All Published National Standards

ward's science

IMGN2508050 (2508073)

table of contents

Ward's in-house scientists are always on call to assist you with your questions. Our expert can provide personal solutions and product advice for your curriculum.
Email sciencehelp@vwreducation.com
or call 800-962-2660 to get started.

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

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

DIMENSION 2 Cross Cutting Concepts

×	Patterns		Energy and matter: Flows, cycles, and conservation
×	Cause and effect: Mechanism and explanation	×	Structure and function
×	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
Earth and Space Science	ESS3: Earth and Human Activity

× Indicates standards covered in activity

next generation science standards © 2013

NGSS STANDARDS

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.PS1-5: Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
MS.ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	HS.ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

(continued on next page)

standards and learning objectives

national science education standards © 1996

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

Physical Science Standards Middle School		Physical Science Standards High School	
×	Properties and Changes of Properties in Matter	×	Structure and Properties of Matter
		×	Chemical Reactions
Science in Personal and Social Perspectives Standards Middle School		**Science in Personal and Social Perspectives Standards High School**	
×	Populations, resources, and environments	×	Natural Resources
×	Risks and benefits	×	Environmental quality
		×	Natural and human-induced hazards

× Indicates standards covered in activity

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
4. The Physical Setting	4B: The Earth
5. The Living Environment	5A: Diversity of Life
11. Common Themes	11A: Systems
	11C: Constancy and Change

activity objectives:

- Study the effect of various concentrations of copper sulfate on Daphnia.
- Observe how healthy Daphnia will glow under UV light after being fed a fluorescently-tagged sugar, while unhealthy Daphnia will not glow.
- Predict the lethal concentration to cause 50% mortality and determine the LC_{50} value.

time requirement:

45 minutes