

# Preparing Solutions

**Grade Level:** 11 & 12  
Summer  
Intern

**Subject:** Biotechnology / Molecular  
Biology/ Techniques

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<b>Overview &amp; Purpose</b>  How to prepare percent and molar solutions. These reagents are used in many experiments.	<b>Education Standards Addressed</b>
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	<b>Teacher Guide</b>	<b>Student Guide</b>	
<b>Objectives</b> (Specify skills/information that will be learned.)	How to prepare percent solution. How to prepare molar solution. How to weigh chemicals. How to adjust pH.	Chemical safety. Proper labeling. Proper percent and molar computations.	<b>Materials Needed</b> <ul style="list-style-type: none"> <li>• Beakers</li> <li>• Reagents</li> <li>• Heating block</li> <li>• Magnetic stirrer</li> <li>• pH Meter / paper</li> </ul>
<b>Information</b> (Give and/or demonstrate necessary information)	Definitions of percent and molarities. Use chemical weight to prepare molar solution. Use of HCl and NaOH to adjust pH.	Prepare solutions required for internship. Proper handling. <b>Note: MgCl solution exothermic reaction.</b> Use this to reinforce chemical safety.	
<b>Verification</b> (Steps to check for student understanding)	Check percent and molar calculations. Check pH of solutions.	Label final products. Demonstrate how to use MSDS sheets. Safety equipment: lab coats, gloves and goggles. Test pH of solutions using meter or paper.	<b>Other Resources</b> (e.g. Web, books, etc.) Short Protocols in Molecular Biology
<b>Activity</b> (Describe the independent activity to reinforce this lesson)			
<b>Summary</b>	To perform basic experiments in molecular biology requires ability to make proper percent and molar solutions.	Skill to efficiently and safely generate solutions.	<b>Additional Notes</b>