

# AP Biology Lab 1c: Calculation of Water Potential from Experimental Data

$i =$	The number of particles the molecule will make in water; for NaCl this would be 2; for sucrose or glucose, this number is 1
$C =$	Molar concentration (from your experimental data)
$R =$	Pressure constant = 0.0831 liter bar/mole K
$T =$	Temperature in degrees Kelvin = 273 + °C of solution

1. The solute potential of this sucrose solution can be calculated using the following formula:

$$\text{Solute potential } (\Psi_s) = -iCRT$$

The units of measure will cancel as in the following example:

- A 1.0 M sugar solution at 22 °C under standard atmospheric conditions  
 $\Psi_s = -i (C) (R) (T)$

$$\Psi_s = -(1) \left( 1.0 \frac{\text{mole}}{\text{liter}} \right) \left( 0.0831 \frac{\text{liter bar}}{\text{mole K}} \right) (295 \text{ K})$$

$$\Psi_s = -24.51 \text{ bars}$$

- In an open system with only atmospheric pressure, the same amount of force is acting on both the beaker and the cells in it. That allows us to assume that the **pressure potential ( $\Psi_p$ ) of any open system is Zero**. Knowing the solute potential of the solution ( $\Psi_s$ ) and knowing the pressure potential of the solution is zero ( $\Psi_p = 0$ ) allows you to calculate the water potential of the solution. The water potential will be equal to the solute potential of the solution.

$$\Psi = \Psi_p + \Psi_s$$

$$\Psi = 0 + \Psi_s$$

$$\Psi = \Psi_s$$

The water potential of the solution at equilibrium will be equal to the water potential of the potato cells. What is the water potential of the potato cells? Show your calculations here.

- Water potential values are useful because they allow us to predict the direction of the flow of water. Suppose that a student calculates the water potential of a solution inside a bag is -6.25 bar and the water potential of a solution surround the bag is -3.25 bar. In which direction will the water flow?.....Water will flow into the bag. This occurs because there are more solute molecules inside the bag (therefore a value further away from zero) than outside the solution.

# Ap Biology Lab Answers

**Thomas Griffiths**



## **Ap Biology Lab Answers:**

*America's Lab Report* National Research Council, Division of Behavioral and Social Sciences and Education, Center for Education, Board on Science Education, Committee on High School Laboratories: Role and Vision, 2006-01-20 Laboratory experiences as a part of most U S high school science curricula have been taken for granted for decades but they have rarely been carefully examined What do they contribute to science learning What can they contribute to science learning What is the current status of labs in our nation s high schools as a context for learning science This book looks at a range of questions about how laboratory experiences fit into U S high schools What is effective laboratory teaching What does research tell us about learning in high school science labs How should student learning in laboratory experiences be assessed Do all student have access to laboratory experiences What changes need to be made to improve laboratory experiences for high school students How can school organization contribute to effective laboratory teaching With increased attention to the U S education system and student outcomes no part of the high school curriculum should escape scrutiny This timely book investigates factors that influence a high school laboratory experience looking closely at what currently takes place and what the goals of those experiences are and should be Science educators school administrators policy makers and parents will all benefit from a better understanding of the need for laboratory experiences to be an integral part of the science curriculum and how that can be accomplished

**Bio Lab Basics** Speedy Publishing, 2014-08-06 A bio lab might be host to a number of dangerous lifeforms and substances including diseases and other biological threats Even when it is not good sanitation and a thorough understand of lab safety is an essential part of keeping the lab in good working order For a new biology student getting the right understanding of lab safety procedures is something that can make a huge difference to how smoothly they work in the lab and how they can protect themselves and others

*Reconceptualizing STEM Education* Richard A. Duschl, Amber S. Bismack, 2016-01-08 Reconceptualizing STEM Education explores and maps out research and development ideas and issues around five central practice themes Systems Thinking Model Based Reasoning Quantitative Reasoning Equity Epistemic and Ethical Outcomes and STEM Communication and Outreach These themes are aligned with the comprehensive agenda for the reform of science and engineering education set out by the 2015 PISA Framework the US Next Generation Science Standards and the US National Research Council s A Framework for K 12 Science Education The new practice focused agenda has implications for the redesign of preK 12 education for alignment of curriculum instruction assessment STEM teacher education and professional development postsecondary further and graduate studies and out of school informal education In each section experts set out powerful ideas followed by two eminent discussant responses that both respond to and provoke additional ideas from the lead papers In the associated website highly distinguished nationally recognized STEM education scholars and policymakers engage in deep conversations and considerations addressing core practices that guide STEM education

**Essential Questions in Adolescent Literacy** Jill Lewis, 2009-05-04 In each

chapter of this unique volume an exemplary teacher collaborates with a prominent scholar to present real world strategies for putting literacy research to work in grades 5-12. These lively dialogues tackle key questions in adolescent literacy including issues of motivation, critical thinking skills, content area writing, differentiated instruction, assessment, English language learning and technology. Suggestions for incorporating adolescents out of school literacies and working with reading specialists and coaches show how to build connections between the classroom and wider communities. In-depth portraits of challenges and successes in the classroom, practical instructional tips and stimulating questions for reflection make the book a valuable resource for inservice and preservice teachers.

**Biology**, 1998 *Annual Report of the Biological Laboratory* Biological Laboratory (Cold Spring Harbor, N.Y.), 1924 Carolina Science and Math Carolina Biological Supply Company, 2003 Exploring Genetics and Developmental Biology Using Multidimensional[multidimensional] Manipulatives and Biotechnology Laboratories Danida Dawn Saffron, 2001 *Mapping Science* Arno Henrik Chrispeels, 2001 **AP Biology** Mark Anestis, 2006-12 Provides a study plan to build knowledge and confidence, discusses study skills and strategies, provides two practice exams and includes a review of the core concepts covered by the material. **The American Biology Teacher**, 2001 **Employment and Training Reporter**, 1997 **Turtox News**, 1923 **Biology** Neil A. Campbell, Jane B. Reece, 2005 Neil Campbell and Jane Reece's BIOLOGY remains unsurpassed as the most successful majors biology textbook in the world. This text has invited more than 4 million students into the study of this dynamic and essential discipline. The authors have restructured each chapter around a conceptual framework of five or six big ideas. An Overview draws students in and sets the stage for the rest of the chapter; each numbered Concept Head announces the beginning of a new concept and Concept Check questions at the end of each chapter encourage students to assess their mastery of a given concept. New Inquiry Figures focus students on the experimental process and new Research Method Figures illustrate important techniques in biology. Each chapter ends with a Scientific Inquiry Question that asks students to apply scientific investigation skills to the content of the chapter. **Developing Biotechnology and Plant Technology Laboratory Skills and Attitudes in High School Students** Robert D. Eicher, 1996 **Report of the Proceedings** Pennsylvania State Educational Association, 1918 **An Introductory Guide to EC Competition Law and Practice** Valentine Korah, 1994 Lab World, 1979 **Science**, 1926 Vols for 1911-13 contain the Proceedings of the Helminthological Society of Washington. ISSN 0018-0120 1st-15th meeting **Technical Report**, 1966

## Adopting the Song of Term: An Emotional Symphony within **Ap Biology Lab Answers**

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