

SPM Chemistry (Form 5) - Chapter 5: Chemicals for Consumers (Worksheet 01)

Soaps

1. Cleansing agents are chemical substances used to remove **grease** and dirt.
2. There are two types of cleansing agents:
 - a. **Soaps**
 - b. **Detergents**
3. In ancient times, soaps were made from ashes of plants which contain **sodium** carbonate and **potassium** carbonate.
4. The ashes were boiled with lime (calcium oxide) to produce caustic **potash** (potassium hydroxide). Caustic potash is then boiled with animal **fats** to produce soap.
5. In 1816, the French chemist **Michel Chevreul** 米歇尔·谢弗勒尔 (1786 – 1889) discovered that animal fats are composed of **fatty acids** and **glycerol**. This discovery contributed to the rapid development of the soap and candle industry.
6. In 1861, the Belgian chemist **Ernest Solvay** 欧内特斯·索尔维 (1838–1922) discovered the process to make soda (sodium carbonate) from common salt (sodium chloride) and calcium carbonate. This process is known as the **Solvay** Process which produces sodium carbonate which is used for making glass, soaps and detergents.
7. Soaps are sodium or potassium **salts** of long chain fatty acids with **12** to **18** carbon atoms per molecule. The general formula of soap is **RCOO^-Na^+** or **RCOO^-K^+** .
8. Soap is produced by the reaction between sodium hydroxide or potassium hydroxide with animal **fats** or vegetable **oils**. This reaction is known as **saponification**. **Saponification** is the alkaline hydrolysis of esters using alkali solutions.
9. Fats and vegetable oils are large, naturally occurring **ester** molecules. When fats or oils are boiled with concentrated alkalis, such as sodium hydroxide or potassium hydroxide, **saponification** occurs and the ester molecules are broken down into **soap** and **glycerol**.
10. The soap produced can be precipitated by adding common salt to the reaction mixture. **Sodium chloride** reduces the solubility of soap in aqueous solution and causes the soap to be precipitated out.
11. The properties of soap depend on:
 - a. the type of **alkali** used for saponification,
 - o Soaps produced from sodium hydroxide are **hard** whereas soaps produced from potassium hydroxide are **soft**.
 - b. the type of **animal fats** or **vegetable oils** used.
 - o Animal fats (**tallow**) from cows and **vegetable** oils (such as palm oil or olive oil) are used for making soap.
12. When a sodium soap is dissolved in water, it will dissociate and produce **sodium** ions and **carboxylate** ions (RCOO^-). For example, **sodium stearate** (soap) dissolves in water to form **sodium** ions and **stearate** ions.
13. The **stearate** ions take part in the removal of dirt but the **sodium** ions do not.
 - a. The stearate ion consists of **two** parts: the '**head**' and the '**tail**'. The '**head**' is **negatively**-charged and the '**tail**' is a long **hydrocarbon** chain.
 - b. The '**head**' contains the $-\text{COO}^-$ ion which dissolves readily in water (**hydrophilic**) but does not dissolve in oil.
 - c. Conversely, the '**tail**' contains a long hydrocarbon chain which is insoluble in water (**hydrophobic**) but dissolves readily in oil.
14. Soaps made from palmitic acid are known as **sodium palmitate**.

Bernanke Answers Chapter 5

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Never Let a Serious Crisis Go to Waste Philip Mirowski, 2014-04-15 At the onset of the Great Recession as house prices sank and joblessness soared many commentators concluded that the economic convictions behind the disaster would now be consigned to history Yet in the harsh light of a new day attacks against government intervention and the global drive for austerity are as strong as ever *Never Let a Serious Crisis Go to Waste* is the definitive account of the wreckage of what passes for economic thought and how neoliberal ideas were used to solve the very crisis they had created Now updated with a new afterword Philip Mirowski's sharp and witty work provides a roadmap for those looking to escape today's misguided economic dogma

Guide to U.S. Economic Policy Robert E. Wright, Thomas W. Zeiler, 2014-06-30 *Guide to U.S. Economic Policy* shows students and researchers how issues and actions are translated into public policies for resolving economic problems like the Great Recession or managing economic conflict like the left-right ideological split over the role of government regulation in markets Taking an interdisciplinary approach the guide highlights decision-making cycles requiring the cooperation of government, business, and an informed citizenry to achieve a comprehensive approach to a successful growth-oriented economic policy Through 30 topical, operational, and relational essays the book addresses the development of U.S. economic policies from the colonial period to today the federal agencies and public and private organizations that influence and administer economic policies the challenges of balancing economic development with environmental and social goals and the role of the U.S. in international organizations such as the IMF and WTO Key Features 30 essays by experts in the field investigate the fundamental economic, political, social, and process initiatives that drive policy decisions affecting the nation's economic stability and success Essential themes traced throughout the chapters include scarcity, wealth creation, theories of economic growth and macroeconomic management, controlling inflation and unemployment, poverty, the role of government agencies and regulations to police markets, Congress vs. the president, investment policies, economic indicators, the balance of trade, and the immediate and long-term costs associated with economic policy alternatives A glossary of key economic terms and events, a summary of bureaus and agencies charged with economic policy decisions, a master bibliography, and a thorough index appear at the back of the book This must-have reference for students and researchers is suitable for academic, public, high school, government, and professional libraries

Principles of Economics Robert H. Frank, Ben Bernanke, 2004 Using a short list of core principles in depth this book presents concepts intuitively through examples drawn from familiar contexts The authors introduce a short list of core principles and reinforce them by illustrating and applying each in many contexts

Principles of Macro-economics Robert H. Frank, Ben Bernanke, 2004 In recent years innovative texts in mathematics, science, foreign languages, and other fields have achieved dramatic pedagogical gains by abandoning the traditional encyclopedic approach in favor of attempting to teach a short list of core principles in depth Two well-respected writers and researchers, Bob Frank and Ben Bernanke, have shown that the less-is-more approach affords

similar gains in introductory economics Although recent editions of a few other texts have paid lip service to this new approach Frank Bernanke is by far the best thought out and best executed principles text in this mold Avoiding excessive reliance on formal mathematical derivations it presents concepts intuitively through examples drawn from familiar contexts The authors introduce a well articulated short list of core principles and reinforcing them by illustrating and applying each in numerous contexts Students are periodically asked to apply these principles to answer related questions exercises and problems The text also encourages students to become Economic Naturalists people who employ basic economic principles to understand and explain what they observe in the world around them An economic naturalist understands for example that infant safety seats are required in cars but not in airplanes because the marginal cost of space to accommodate these seats is typically zero in cars but often hundreds of dollars in airplanes Such examples engage student interest while teaching them to see each feature of their economic landscape as the reflection of an implicit or explicit cost benefit calculation The Second Edition of Frank Bernanke follows the successful First Edition with several pedagogical improvements Based on reviewer feedback this edition offers 1 even more streamlined coverage of the cost benefit approach in the introductory chapter 2 exercises that are more closely tied to the examples 3 expanded narrative explanations of important principles making them more accessible to average students and 4 expanded coverage of several key topics The result is a revision that is motivating to students an effective text for teaching and an exciting first course in Economics

Empirical Development Economics

Måns Söderbom, Francis Teal, Markus Eberhardt, Simon Quinn, Andrew Zeitlin, 2014-10-03 Understanding why so many people across the world are so poor is one of the central intellectual challenges of our time This book provides the tools and data that will enable students researchers and professionals to address that issue Empirical Development Economics has been designed as a hands on teaching tool to investigate the causes of poverty The book begins by introducing the quantitative approach to development economics Each section uses data to illustrate key policy issues Part One focuses on the basics of understanding the role of education technology and institutions in determining why incomes differ so much across individuals and countries In Part Two the focus is on techniques to address a number of topics in development including how firms invest how households decide how much to spend on their children s education whether microcredit helps the poor whether food aid works who gets private schooling and whether property rights enhance investment A distinctive feature of the book is its presentation of a range of approaches to studying development questions Development economics has undergone a major change in focus over the last decade with the rise of experimental methods to address development issues this book shows how these methods relate to more traditional ones Please visit the book s website at www.empiricalde.com for online supplements including Stata files and solutions to the exercises

Study Guide to Accompany Macroeconomics

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Parkin, 2022-03-31 For 1 semester principles of macroeconomics courses An intuitive and grounded approach to economics Macroeconomics gets students to think like economists by incorporating the latest policy data and discussions on important global issues The 14th Edition emphasizes real world applications the development of critical thinking skills diagrams renowned for their pedagogy and clarity and path breaking technology Hallmark features in the chapter openings and endings encourage students to think critically about a news article relating to the issue demonstrating how thinking like an economist can bring a clearer perspective to and deeper understanding of today's events Hallmark features of this title Concepts connect to economics in the real world Economics in Action and Economics in the News boxes have students link models and chapter tools to the economic world around them Interviews with Economists feature leading economists from diverse backgrounds who share what inspired them to pursue a career in economics Ample opportunities for practice Worked Problems consisting of questions solutions and key figures help students to learn by doing and actively rather than passively review the chapter content In text Review Quizzes reinforce major concepts and test students knowledge of the topics just discussed New and updated features of this title Coverage of the impact of a changing macroeconomic market UPDATED All chapters are updated to include the latest data on the national accounts Ch 4 the labor market and price indexes Ch 5 economic growth Ch 6 interest rates and loanable funds Ch 7 banks and the money market Ch 8 the exchange rate and balance of payments Ch 9 the short run Phillips curve tradeoff Ch 12 fiscal policy Ch 13 and monetary policy Ch 14 NEW 8 chapters have an analysis of news reports about the macroeconomic effects of COVID 19 and the policy responses it triggered These include nowcasting GDP through the pandemic Ch 4 measuring unemployment Ch 5 massive bond buying by the Federal Reserve Ch 8 the Covid recession viewed through the lens of the AS and AD Ch 10 inventories in the Covid recession Ch 11 post Covid inflation fears Ch 12 and the effects of fiscal and monetary stimulus in the Covid recession Ch 13 and 14 NEW Other changes include an explanation of the Fed's new operating procedures with ample reserves a look at China's slowing growth rate Ch 6 the growth of fintec in financial markets Ch 7 and currency manipulation Ch 9

Global Climate Change and Public Policy David Lewis Feldman, 1994 This fascinating volume focuses on the relationship between normative and practical challenges in policy making for global climate change The contributors address national international and subnational problems issues responses and constraints regarding global climate change The collection aims both to contribute to policy debates over long term risk management and to identify appropriate tools available to policymakers The prospects for resolving equity and public acceptability issues in international agreements are explored as well

Corporate Finance, Governance and Business Cycles R. Krainer, 2003-01-15 Corporate Finance Governance and Business Cycles describes a model of how a financial system coordinates and shapes certain stylised facts of business cycles The model is based on a conflict of interest between more risk averse bondholders and less risk averse stockholders whose risk aversion changes over time The corporate governance resolution of this conflict

assigns the operating decisions of the firm to stockholders and the financing decisions to bondholders Financing decisions are then linked to operating decisions in a way that coalesces the welfare of bondholders and stockholders over the business cycle Evidence from the nonfinancial business sector of the G 7 countries does not reject the predictions of the model

Macroeconomics Study Guide Charles Johnson, Andrew B. Abel, Ben Bernanke, 1992 International Economics Robert C. Feenstra, Alan M. Taylor, 2020-10-06 Available for the first time with Macmillans new online learning tool Achieve the new edition of Feenstra and Taylor s International Economics provides engaging balanced coverage and applications of key concepts Developed in the classroom by two of the most prominent researchers in the field it seamlessly blends theory and empirical data with real world policies events and evidence And with Achieve the new edition adds an enhanced interactive dimension to investigating the global economy **Study Guide to Accompany Principles of Macroeconomics** Jack Mogab, 2006 Written by Jack Mogab of Texas State University San Marcos this book provides the following elements for each chapter a Pretest a Learning Objective Grid a Key Point Review with Learning Tips some Self Tests Key Term Matching Multiple Choice Problems with answers and an extension of the guide to the Web Site where students may practice with graphing **Economic Review** , 1994 **Where Does the Money Go?** Scott Bittle, Jean Johnson, 2011-04-12 Revised and Updated to Include the Probable Effects of the Great Recession the Government Stimulus and President Obama s Health Care Overhaul Federal debt will affect your savings your retirement your mortgage your health care and your children How well do you understand the government decisions that will end up coming out of your pocket Here is essential information that every American citizen needs and has the right to know This guide to deciphering the jargon of the country s budget problem breaks down into plain English exactly what the fat cats in Washington are arguing about Where Does the Money Go covers everything from the country s exploding federal debt to the fact that for thirty one out of the last thirty five years the country has spent more on government programs and services than it has collected in taxes It also explores why elected leaders on both sides of the fence have so far failed to address this issue effectively and explains what you can do to protect your future **Monetary Theory and Policy** Milton H. Marquis, 1996 This text includes most of the material covered in a money and banking course along with more advanced topics Part I provides the basis for understanding issues in monetary theory and policy then focuses on institutions Part II gives an intermediate level treatment of monetary economics and includes significant current research in the field Part III addresses further aspects of policymaking The modern general equilibrium model is emphasized throughout the book A graphical model of a representative economy replaces IS LM in the core theory chapters **International Economics** Paul R. Krugman, Maurice Obstfeld, 1997 Focusing on international economics this work provides an analytical framework for understanding the international economy The first half of the text deals with trade the second half with the monetary aspect of international economics Each half starts with a step by step formulation of the analytical model followed by applications chapters where the model is applied to issues and policy

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