



education

Department of
Education
FREE STATE PROVINCE

PHYSICAL SCIENCES PAPER 1 (PHYSICS)

GRADE 12

TERMS & DEFINITIONS, QUESTIONS & ANSWERS PER TOPIC

2019

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14 September Physical Science Paper Memorandum

Kathleen Armour



14 September Physical Science Paper Memorandum:

Federal Register ,2000-07-07 *Scientific and Technical Aerospace Reports* ,1992 **Freedom's Laboratory** Audra J. Wolfe,2018-11-15 The Cold War ended long ago but the language of science and freedom continues to shape public debates over the relationship between science and politics in the United States Scientists like to proclaim that science knows no borders Scientific researchers follow the evidence where it leads their conclusions free of prejudice or ideology But is that really the case In *Freedom's Laboratory* Audra J Wolfe shows how these ideas were tested to their limits in the high stakes propaganda battles of the Cold War Wolfe examines the role that scientists in concert with administrators and policymakers played in American cultural diplomacy after World War II During this period the engines of US propaganda promoted a vision of science that highlighted empiricism objectivity a commitment to pure research and internationalism Working both overtly and covertly wittingly and unwittingly with governmental and private organizations scientists attempted to decide what exactly they meant when they referred to scientific freedom or the US ideology More frequently however they defined American science merely as the opposite of Communist science Uncovering many startling episodes of the close relationship between the US government and private scientific groups *Freedom's Laboratory* is the first work to explore science's link to US propaganda and psychological warfare campaigns during the Cold War Closing in the present day with a discussion of the 2017 March for Science and the prospects for science and science diplomacy in the Trump era the book demonstrates the continued hold of Cold War thinking on ideas about science and politics in the United States **Tunnel Visions** Michael Riordan,Lilian Hoddeson,Arienne W. Kolb,2015-11-20 A detailed and engaging account of the development of the superconducting supercollider one of the largest scientific undertakings in the United States *Journal of American History* Starting in the 1950s US physicists dominated the search for elementary particles aided by the association of this research with national security they held this position for decades In an effort to maintain their hegemony and track down the elusive Higgs boson they convinced President Reagan and Congress to support construction of the multibillion dollar Superconducting Super Collider project in Texas the largest basic science project ever attempted But after the Cold War ended and the estimated SSC cost surpassed ten billion dollars Congress terminated the project in October 1993 Drawing on extensive archival research contemporaneous press accounts and over one hundred interviews with scientists engineers government officials and others involved *Tunnel Visions* tells the riveting story of the aborted SSC project The authors examine the complex interrelated causes for its demise including problems of large project management continuing cost overruns and lack of foreign contributions In doing so they ask whether Big Science has become too large and expensive including whether academic scientists and their government overseers can effectively manage such an enormous undertaking Focusing on the scientific technical and political conflicts that led to delays ever rising costs and eventually the SSC's cancellation by Congress *Tunnel Visions* is a true techno thriller Burton Richter winner of the Nobel Prize in Physics

Most good science stories are tales of discovery and success but failure can be just as riveting Here two historians and an archivist describe the greatest particle physics experiment that never was Scientific American **Deadly Cultures** Mark Wheelis,2006-01-30 Deadly Cultures offers an historical analysis of biological weapons since 1945 and addresses three central issues why states have continued or begun programs for acquiring biological weapons why states have terminated such programs and how states have demonstrated that they have truly terminated their biological weapons programs

How We Teach Science John L. Rudolph,2019-06-01 A former Wisconsin high school science teacher makes the case that how and why we teach science matters especially now that its legitimacy is under attack Why teach science The answer to that question will determine how it is taught Yet despite the enduring belief in this country that science should be taught there has been no enduring consensus about how or why This is especially true when it comes to teaching scientific process Nearly all of the basic knowledge we have about the world is rock solid The science we teach in high schools in particular laws of motion the structure of the atom cell division DNA replication the universal speed limit of light is accepted as the way nature works Everyone also agrees that students and the public more generally should understand the methods used to gain this knowledge But what exactly is the scientific method Ever since the late 1800s scientists and science educators have grappled with that question Through the years they've advanced an assortment of strategies ranging from the laboratory method to the five step method to science as inquiry to no method at all How We Teach Science reveals that each strategy was influenced by the intellectual cultural and political circumstances of the time In some eras learning about experimentation and scientific inquiry was seen to contribute to an individual's intellectual and moral improvement while in others it was viewed as a way to minimize public interference in institutional science John Rudolph shows that how we think about and teach science will either sustain or thwart future innovation and ultimately determine how science is perceived and received by the public *Resources in Education* ,1988-11 **National Library of Medicine Current Catalog** National Library of Medicine (U.S.),1971 First multi year cumulation covers six years 1965-70 *Millennial Biology: The National Science Foundation and American Biology, 1975-2005* Donald J. McGraw,2021-01-25 National Science Foundation NSF is a unique federal agency because it supports scientific research financially but does not engage in scientific work itself Its history is known only in part because the NSF is a vibrant expanding and living entity that makes the final telling of its story impossible Much can be learned from its beginning as well as its component parts If the founding of the NSF in 1950 was couched in an era of physics especially atomic physics certainly by the end of the 20th century and the beginning of the 21st biology was and remains the queen of sciences for the predictable future This book highlights the elite status of America's biological sciences as they were funded affected and to a very real degree interactively guided by the NSF It examines important events in the earlier history of the Foundation because they play strongly upon the development of the various biology directorates Issues such as education applied research medical science the National Institutes of Health the

beginnings of biotechnology and other matters are also discussed *Meeting the Demands of Reason* Jay Bergman, 2011-03-15 The Soviet physicist dissident and human rights activist Andrei Sakharov 1921 1989 was awarded the Nobel Peace Prize in 1975 The first Russian to have been so recognized Sakharov in his Nobel lecture held that humanity had a sacred endeavor to create a life worthy of its potential that we must make good the demands of reason by confronting the dangers threatening the world both then and now nuclear annihilation famine pollution and the denial of human rights *Meeting the Demands of Reason* provides a comprehensive account of Sakharov s life and intellectual development focusing on his political thought and the effect his ideas had on Soviet society Jay Bergman places Sakharov s dissidence squarely within the ethical legacy of the nineteenth century Russian intelligentsia inculcated by his father and other family members from an early age In 1948 one year after receiving his doctoral candidate s degree in physics Sakharov began work on the Soviet hydrogen bomb and later received both the Stalin and the Lenin prizes for his efforts Although as a nuclear physicist he had firsthand experience of honors and privileges inaccessible to ordinary citizens Sakharov became critical of certain policies of the Soviet government in the late 1950s He never renounced his work on nuclear weaponry but eventually grew concerned about the environmental consequences of testing and feared unrestrained nuclear proliferation Bergman shows that these issues led Sakharov to see the connection between his work in science and his responsibilities to the political life of his country In the late 1960s Sakharov began to condemn the Soviet system as a whole in the name of universal human rights By the 1970s he had become with Alexander Solzhenitsyn the most recognized Soviet dissident in the West which afforded him a measure of protection from the authorities In 1980 however he was exiled to the closed city of Gorky for protesting the Soviet invasion of Afghanistan In 1986 the new Gorbachev regime allowed him to return to Moscow where he played a central role as both supporter and critic in the years of perestroika Two years after Sakharov s death the Soviet Union collapsed and in the courageous example of his unyielding commitment to human rights skillfully recounted by Bergman Sakharov remains an enduring inspiration for all those who would tell truth to power

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