

Pixl June 2013 Predicted Paper Mark Scheme

Exam Board: AQA Level: A-level Subject: Sociology First teaching: September 2015 First exam: June 2017 Need more exam practice? Letts will get you through your A-Level exam.

One night in August 1323, a captive rebel baron, Sir Roger Mortimer, drugged his guards and escaped from the Tower of London. With the king's men-at-arms in pursuit he fled to the south coast and sailed to France. There he was joined by Isabella, the Queen of England, who threw herself into his arms. A year later, as lovers, they returned with an invading army: King Edward II's forces crumbled before them and Mortimer took power. He removed Edward II in the first deposition of a monarch in British history. Then the ex-king was apparently murdered, some said with a red-hot poker, in Berkeley Castle. Brutal, intelligent, passionate, profligate, imaginative, and violent, Sir Roger Mortimer was an extraordinary character. It is not surprising that the Queen lost her heart to him. Nor is it surprising that his contemporaries were terrified of him. But until now no one has appreciated the full evil genius of the man. This first biography, *The Greatest Traitor* by Ian Mortimer, reveals not only Mortimer's career as a feudal lord, a governor of Ireland, a rebel leader, and a dictator of England, but also the truth of what happened that night in Berkeley Castle.

You don't have to starve to be an artist. Build a career doing what you love. In this practical guide book, professional artist Lisa Congdon reveals the many ways you can earn a living by making art—through illustration, licensing, fine art sales, print sales, teaching, and beyond. • Including industry advice from such successful art-world pros as Nikki McClure, Mark Hearld, Paula Scher, and more • This art and business book will equip you with the tools—and the confidence—to turn your passion into a profitable business. • Chapters on setting actionable goals, diversifying your income, copyrighting your work, promoting with social media, and so much more A thoughtful gift for young artists, people interesting in making their passion a profession, and art and design school graduates. Lisa Congdon's bestselling books, online classes, and Instagram feed (beloved by 375,000+ fans) have inspired so many people to follow their creative passions. In this book Congdon does what she does best—bring bold and colorful flair to smart, creative, down-to-earth advice and inspiration.

Portrays the lives of politicians, soldiers, and slaves during the Civil War

A groundbreaking introduction to vectors, matrices, and least squares for engineering applications, offering a wealth of practical examples. Legions of self-help authors rightly urge personal development as the key to happiness, but they typically fail to focus on its most important objective: hardiness. Though that which doesn't kill us can make us stronger, as Nietzsche tells us, few authors today offer any insight into just how to springboard from adversity to strength. It doesn't just happen automatically, and it takes practice. New scientific research suggests that resilience isn't something with which only a fortunate few of us have been born, but rather something we can all take specific action to develop. To build strength out of adversity, we need a catalyst. What we need, according to Dr. Alex Lickerman, is wisdom—wisdom that adversity has the potential to teach us. Lickerman's underlying premise is that our ability to control what happens to us in life may be limited, but we have the ability to establish a life-state to surmount the suffering life brings us. *The Undeclared Mind* distills the wisdom we need to create true resilience into nine core principles, including: --A new definition of victory and its relevance to happiness --The concept of the changing of poison into medicine --A way to view prayer as a vow we make to ourselves. --A method of setting expectations that enhances our ability to endure disappointment and minimizes the likelihood of quitting --An approach to taking personal responsibility and

moral action that enhances resilience --A process to managing pain—both physical and emotional—that enables us to push through obstacles that might otherwise prevent us from attaining our goals --A method of leveraging our relationships with others that helps us manifest our strongest selves Through stories of patients who have used these principles to overcome suffering caused by unemployment, unwanted weight gain, addiction, rejection, chronic pain, retirement, illness, loss, and even death, Dr. Lickerman shows how we too can make these principles function within our own lives, enabling us to develop for ourselves the resilience we need to achieve indestructible happiness. At its core, *The Undefeated Mind* urges us to stop hoping for easy lives and focus instead on cultivating the inner strength we need to enjoy the difficult lives we all have.

In recent years, planetary science has seen a tremendous growth in new knowledge. Deposits of water ice exist at the Moon's poles. Discoveries on the surface of Mars point to an early warm wet climate, and perhaps conditions under which life could have emerged. Liquid methane rain falls on Saturn's moon Titan, creating rivers, lakes, and geologic landscapes with uncanny resemblances to Earth's. *Vision and Voyages for Planetary Science in the Decade 2013-2022* surveys the current state of knowledge of the solar system and recommends a suite of planetary science flagship missions for the decade 2013-2022 that could provide a steady stream of important new discoveries about the solar system. Research priorities defined in the report were selected through a rigorous review that included input from five expert panels. NASA's highest priority large mission should be the Mars Astrobiology Explorer-Cacher (MAX-C), a mission to Mars that could help determine whether the planet ever supported life and could also help answer questions about its geologic and climatic history. Other projects should include a mission to Jupiter's icy moon Europa and its subsurface ocean, and the Uranus Orbiter and Probe mission to investigate that planet's interior structure, atmosphere, and composition. For medium-size missions, *Vision and Voyages for Planetary Science in the Decade 2013-2022* recommends that NASA select two new missions to be included in its New Frontiers program, which explores the solar system with frequent, mid-size spacecraft missions. If NASA cannot stay within budget for any of these proposed flagship projects, it should focus on smaller, less expensive missions first. *Vision and Voyages for Planetary Science in the Decade 2013-2022* suggests that the National Science Foundation expand its funding for existing laboratories and establish new facilities as needed. It also recommends that the program enlist the participation of international partners. This report is a vital resource for government agencies supporting space science, the planetary science community, and the public.

It is being increasingly accepted that gems and crystals possess incredible healing powers. They have the capacity to aid us in our spiritual transformation and speed up the healing processes of the body by correcting any imbalances within. Based on the wisdom of the ancients, the author discusses and shares how gemstones can help add years of buoyant health to your life. This complete introduction to the healing properties of gems and crystals discusses how to choose, clean and prepare crystals and gems for healing. The book has been published in US, Germany and France, and this is the first Indian edition.

This clear and lively introduction to probability theory concentrates on the results that are the most useful for applications, including combinatorial probability and Markov chains. Concise and focused, it is designed for a one-semester introductory course in probability for students who have some familiarity with basic calculus. Reflecting the author's philosophy that the best way to learn probability is to see it in action, there are more than 350 problems and 200 examples. The examples contain all the old standards such as the birthday problem and Monty Hall, but also include a number of applications not found in other books, from areas as broad ranging as genetics, sports, finance, and inventory management.

Photon Transfer is designed for a wide audience - from the novice to the advanced user already familiar with the method. For first-time users, the book's primary purpose is to give sufficient guidelines to accurately generate, calibrate, and understand imaging data products through the photon transfer method. The book contains more than 230 figures that present experimental CCD and CMOS data products and modeling simulations connected to photon transfer. Contents also provide hundreds of relations that support photon transfer theory, simulations, and data.

A new collection by the much praised poet whose second book *THE DEAD AND THE LIVING*, was both the Lamont Poetry Selection for 1983 and winner of the National Book Critics Circle Award.

In this book the Groupe des Dombes a widely respected yet unofficial dialogue of Reformed, Lutheran, and Catholic scholars from French-speaking Europe undertakes a comprehensive study of the complex issue of doctrinal authority in the church. This includes the role of Scripture, of confessional texts, of decision-making bodies, and of individual persons entrusted with authority in service to the unity of faith. / While a number of previous ecumenical dialogues have studied the question of authority with a particular focus on the ministry of the Bishop of Rome, the Groupe des Dombes lays out the complex constellation of questions that is at issue in the differing ethos of Protestant and Catholic traditions. Its challenge to the churches reflects the agenda of ecumenical dialogue for decades to come.

Project Oberon contains a definition of the Oberon Language and describes its relation to Modula-2 and the software tools developed with the system. This definitive, first-hand account of the design, development, and implementation of Oberon completes the Oberon trilogy.

A nationally acclaimed sewing expert provides simple, step-by-step directions and more than 1,000 illustrations for making clothes for work, home, and play — everything from stylish skirts, dresses, and jackets to children's clothing.

To feed a world population that will exceed 9 billion by 2050 requires an estimated 60% increase over current primary agricultural productivity. Closing the common and often large gap between actual and attainable crop yield is critical to achieve this goal. To close yield gaps in both small and large scale cropping systems worldwide we need (1) definitions and techniques to measure and model yield at different levels (actual, attainable, potential) and different scales in space (field, farm, region, global) and time (short and long term); (2) identification of the causes of gaps between yield levels; (3) management options to reduce the gaps where feasible and (4) policies to favour adoption of sustainable gap-closing solutions. The aim of this publication is to critically review the methods for yield gap analysis, hence addressing primarily the first of these four requirements, reporting a wide-ranging and well-referenced analysis of literature on current methods to assess productivity of crops and cropping systems.

IN THE NEXT DECADE, NASA will seek to expand humanity's presence in space beyond the International Space Station (ISS) in low Earth orbit to a new habitation platform around the Moon. By the late 2020s, astronauts will live and work far deeper in space than ever before. As part of our push outward into the solar system, NASA is working to help commercialize human spaceflight in low Earth orbit. After the government pioneers, develops, and demonstrates a space capability—from rockets to space-based communications to Earth observation satellites—the private sector realizes its market potential and continues innovating. As new companies establish a presence, the government often withdraws from the market or becomes one of many customers. In 2016, we are once again at a critical stage in the development of space. The most successful long-term human habitation in space, orbiting the Earth continuously since 1998, is the ISS. Currently at the apex of its capabilities and the pinnacle of state-of-the-art space systems, it was developed through the investments and labors of more than a dozen nations and is regularly resupplied by cargo delivery services. Its occupants include six astronauts and numerous other organisms

from Earth's ecosystems, from bacteria to plants to mice. Research is conducted on the spacecraft from hundreds of organizations worldwide, ranging from academic institutions to large industrial companies and from high-tech start-ups to high school science classes. However, its operational lifetime may be exceeded by the late 2020s, compelling its retirement to make way for new spacecraft and new missions.

This book provides comprehensive coverage of corneal collagen cross-linking (CXL), a major management modality for keratoconus and ectatic corneal disorders. All aspects are covered, including refractive and non-refractive surgery indications, models of application, safety, efficacy, performance, outcome measures, evidence of CXL, complications, contraindications, use in children, and controversies. The discussion reflects the considerable progress that has been made in understanding of the modality since its development in the late 1990s. Detailed attention is paid to new concepts, changing surgical techniques and indications, the latest evidence-based science and research, and the future of CXL. Guidance is also provided on the use of CXL in combination with other modalities, such as LASIK, PRK, intracorneal ring implantation and others. The text is accompanied by numerous high-quality color illustrations. Corneal Collagen Cross Linking will provide the reader with a sound grasp of the technique and its use and will hopefully also serve as a stimulus to further research and advances.

Praise for the First Edition: "Bill Rogers has an entertaining style and communicates his ideas in a way that will be easily accessible to teachers." —Behaviour UK "This is an extremely readable book on children's behavior and the management of behavior in a classroom and school context. Provides a useful guide to developing a whole-school approach to positive behavior." —Amazon Review In this revised and updated edition of the bestseller, the author draws on his extensive experience as an educational consultant and trainer to help teachers and managers develop a whole-school strategy for dealing with student behavior. In a distinctive accessible and entertaining style, the book offers practical suggestions to support teachers as they face the pressures of accountability, assessment and rising concerns about student behavior. This resource covers: Positive discipline and the importance of consistency Specific skills in the language of discipline, both verbal and non-verbal Techniques for managing bullying, aggression, rudeness, and violence Methods to use with behaviorally disordered students The 4Rs--rights, rules, responsibilities, and routines Behavioral consequences including 'time-out' Behavior agreements or 'contracts' Playground management Setting up a behavior management plan and expressing it in policy This book helps strengthen a school's capacity to work as a cohesive, cooperative unit linked with parents and the community to manage behavior successfully.

The application of solid-state detectors of high energy resolution to x-ray spectrometry, and the increasing use of computers in both measurement and data evaluation, are giving a new stimulus to x-ray techniques in analytical chemistry. The Twentieth Annual Denver X-ray Conference reflects this renewed interest in several ways. The invited papers, grouped in Session I, review the characteristics of the detectors used in the measurement of x-rays. One paper is dedicated to the detection of single ions. Although such a subject may appear to be marginal to the purposes of the Denver Conference, we must recognize the affinity of techniques applied to similar purposes. Ion probe mass spectrometry is dedicated to tasks similar to those performed by x-ray spectrometry with the electron probe microanalyzer. Scientists and technologists will see these two techniques discussed in the same meetings. The discussion of automation and programming is not limited to the two invited speakers, but extends to papers presented in more than one session. The matter of fluorescence analysis by isotope- and tube-excitation will also be of great interest to those concerned with the practical applications of x-ray techniques. The communications contained in this volume, and the lively discussions which frequently followed the presentation of papers, attest to the vitality

of the subjects which are the concern of the Annual Denver X-ray Conference.

Exam Board: WJEC Level: GCSE Subject: Science First Teaching: September 2016 First Exam: Summer 2018 Target success in Science with this proven formula for effective, structured revision; key content coverage is combined with exam-style tasks and practical tips to create a revision guide that students can rely on to review, strengthen and test their knowledge. With My Revision Notes, every student can: - Plan and manage a successful revision programme using the topic-by-topic planner - Consolidate subject knowledge by working through clear and focused content coverage - Test understanding and identify areas for improvement with regular 'Now Test Yourself' tasks and answers - Improve exam technique through practice questions, expert tips and examples of typical mistakes to avoid - Get exam ready with extra quick quizzes and answers to the practice questions available online Please note that some of the quizzes from the WJEC GCSE My Revision Notes series are also used in the WJEC GCSE Teaching and Learning resources.

International Law has transformed and much transfused with other unknown fields in various sciences per se. AI Ethics is one of the emerging fields, where, policy intervention, in line with the idea of multilateralism has emerged merely recently. This emergence is not something pre-decided, but is usually gauged by some countries and some special non-state actors like the UN, for example, and non-state actors, which includes startups, NGOs and civil society actors most of the times. Works such as the Beijing Consensus on AI and Education, 2019, the 2017 Asilomar Conference on Beneficial AI, DARPA's conception of Explainable AI & many more have endorsed a sense of research aptitude and rationalization of the field of AI Ethics in Law, Policy and International Affairs. Our team of research contributors and analysts at the Indian Society of Artificial Intelligence and Law, have therefore at our very best, prepared a Handbook, in two parts, which caters to some important and influential fields of international law, and its synergy with AI Ethics. This handbook, with utmost humility is not some research encyclopedia. It serves to ignite curiosity and make people rethink or think differently about the way we see AI in our lives. It is a researched handbook, which has been edited by Professor Suman Kalani, Chief Research Expert of ISAIL (also the Assistant Professor at the SVKM's Pravin Gandhi College of Law, Mumbai, India), Kshitij Naik, Chief Strategy Advisor of ISAIL, Akash Manwani, Chief Innovation Officer of ISAIL and me. We have tried to give crisp and detailed case studies on various dynamic fields of AI and international governance, which consist in AI & International Affairs, AI & Society, AI & Ecology, AI & Governance & other miscellaneous chapters, such as on Emerging Technologies and Applied Sciences. When you read the book, please do not treat it as some mere answer to all of your questions. Instead, relish the ideas and realities which have been expressed in this work. The chapters reflect some generic notions of international law, which have been widely accepted worldwide, and at the same time, might be an attempt to compel the readers to maybe come up with a reasonable policy intervention per se. We hope the readers would have a suitable time reading this book per se.

The past is a foreign country: this is your guidebook. Take a step back into Ian Mortimer's guide and experience the middle ages like never before.

The inside track to India's most powerful tycoons The eight business maharajas profiled here are among Asia's most powerful industrial tycoons, Their combined turnover runs into billions of rupees, and between them they employ some 650,000 people, while indirectly affecting the lives of millions more. Sip a cup of tea, drive to work, listen to music, build a house and the chances are that in these and a myriad other ways you are using products that they manufacture or market. By any yardstick, the achievements of these men would rank among the great business stories of our time. How did these men build their enormous empires? What are their management secrets? How did they thrive and prosper even as others failed? What is their vision for the future? Top business writer and industry insider Gita Piramal draws on exhaustive

interviews and in-depth research to discover the answers to these and related questions in her profiles of the men who will lead the country's push to become an industrial superpower in the 21st century.

Approach your WJEC/Eduqas GCSE 9-1 English Language exam with confidence using this write-in workbook full of annotated exam-style questions, sample answers and exam tips. Step-by-step guidance will help you to improve your exam technique so that your answers are clear, relevant and well-developed. Use the carefully chosen questions to get used to the kind of questions you can expect to see in your exam and the different ways that you should approach them. The easy to understand advice will help you to: - Understand what exam questions are asking you to do in each question - Evaluate, develop and explain your personal responses to extracts - Remember to spend the right amount of time on each question and avoid other common mistakes - Show examiners that you understand key terms and techniques

A Practical Guide to SysML: The Systems Modeling Language is a comprehensive guide to SysML for systems and software engineers. It provides an advanced and practical resource for modeling systems with SysML. The source describes the modeling language and offers information about employing SysML in transitioning an organization or project to model-based systems engineering. The book also presents various examples to help readers understand the OMG Systems Modeling Professional (OCSMP) Certification Program. The text is organized into four parts. The first part provides an overview of systems engineering. It explains the model-based approach by comparing it with the document-based approach and providing the modeling principles. The overview of SYsML is also discussed. The second part of the book covers a comprehensive description of the language. It discusses the main concepts of model organization, parametrics, blocks, use cases, interactions, requirements, allocations, and profiles. The third part presents examples that illustrate how SysML supports different model-based procedures. The last part discusses how to transition and deploy SysML into an organization or project. It explains the integration of SysML into a systems development environment. Furthermore, it describes the category of data that are exchanged between a SysML tool and other types of tools, and the types of exchange mechanisms that can be used. It also covers the criteria that must be considered when selecting a SysML. Software and systems engineers, programmers, IT practitioners, experts, and non-experts will find this book useful. *The authoritative guide for understanding and applying SysML *Authored by the foremost experts on the language *Language description, examples, and quick reference guide included

Part history, part science and part philosophy and spirituality, "Water Is..." combines personal journey with scientific discovery that explores water's many identities and ultimately our own. Written by internationally published author, teacher and limnologist Nina Munteanu.

Federal Register Introduction to Applied Linear Algebra Vectors, Matrices, and Least Squares Cambridge University Press
"Lose up to 16 lbs. in 14 days!"--Cover.

A guidebook for K-6 teachers offers tips for structuring the first six weeks of school to provide a foundation for a productive year of learning.

This book presents new technologies which are available now for the rehabilitation of visual acuity in patients suffering from

keratoconus and for arresting the progression of this frustrating disease. All these current treatment options in differing combinations aim to improve the quality of life of the patients and although successful, they are causing confusion for the ophthalmologists; what procedure to do and when? How to perform? Which combination of treatments to choose? Controversies in the Management of Keratoconus provides the widely used treatment options for keratoconus including collagen corneal cross-linking (CXL) covering all the available techniques, intrastromal corneal ring segments (ICRS), phakic intra-ocular lenses (IOLs), photorefractive keratectomy (PRK) combined or not with CXL penetrating keratoplasty (PK) and deep anterior lamellar keratoplasty (DALK). Each treatment is addressed by more than one author with different points of view in order to present the various approaches, the logic behind them and the most relevant clinical data available. A chapter by the editor tries to put some light on how to navigate among these controversies. This book will be of interest to trainees as well as the specialized ophthalmologists.

In 2011, I began creating online tutorial videos on Youtube, with a vision to share my GCSE expertise in English language and literature. As I write, these videos have been viewed over 10 million times across 214 different nations. My GCSE English Youtube channel has over 60,000 subscribers. To accompany these videos, I have published over 20 revision guide eBooks—one of which you are currently looking at! My guide to the previous GCSEs in English language and literature sat at the top of the Amazon bestseller's list for over 45 weeks and achieved huge acclaim; this book aims to build on those strengths. In this eBook, you'll receive detailed guidance on every question in the AQA GCSE English Language exams. Please note that this eBook is not endorsed by or affiliated to any exam boards; I am simply an experienced teacher using my expertise to help students. However, if you read some of the 100+ reviews for this guide, you will see that it has already helped students, teachers and parents across the UK. As an extra bonus, this eBook contains links to five special video tutorials which are only available to those who purchase this guide. These links appear later in the text. I hope you enjoy the eBook. You should also purchase the accompanying eBook which covers the English Literature exams.

In this time of quarantine and global uncertainty, it can be difficult to deal with the increased stress and anxiety. Using ancient self-care techniques rediscovered by Herbert Benson, M.D., a pioneer in mind/body medicine for health and wellness, you can relieve your stress, anxiety, and depression at home with just ten minutes a day. Herbert Benson, M.D., first wrote about a simple, effective mind/body approach to lowering blood pressure in *The Relaxation Response*. When Dr. Benson introduced this approach to relieving stress over forty years ago, his book became an instant national bestseller, which has sold over six million copies. Since that time, millions of people have learned the secret—without high-priced lectures or prescription medicines. *The Relaxation Response* has become the classic reference recommended by most health care professionals and authorities to treat the harmful effects of stress, anxiety, depression, and high blood pressure. Rediscovered by Dr. Benson and his colleagues in the laboratories of Harvard Medical School and its teaching hospitals, this revitalizing, therapeutic tack is now routinely recommended to treat patients suffering from stress and anxiety, including heart conditions, high blood pressure, chronic pain, insomnia, and many other

physical and psychological ailments. It requires only minutes to learn, and just ten minutes of practice a day.

The only complete guide to all aspects and uses of simulation—from the international leaders in the field There has never been a single definitive source of key information on all facets of discrete-event simulation and its applications to major industries. The Handbook of Simulation brings together the contributions of leading academics, practitioners, and software developers to offer authoritative coverage of the principles, techniques, and uses of discrete-event simulation. Comprehensive in scope and thorough in approach, the Handbook is the one reference on discrete-event simulation that every industrial engineer, management scientist, computer scientist, operations manager, or operations researcher involved in problem-solving should own, with an in-depth examination of:

- * Simulation methodology, from experimental design to data analysis and more
- * Recent advances, such as object-oriented simulation, on-line simulation, and parallel and distributed simulation
- * Applications across a full range of manufacturing and service industries
- * Guidelines for successful simulations and sound simulation project management
- * Simulation software and simulation industry vendors

COMPREHENSIVE COVERAGE OF NONLINEAR PROGRAMMING THEORY AND ALGORITHMS, THOROUGHLY REVISED AND EXPANDED Nonlinear Programming: Theory and Algorithms—now in an extensively updated Third Edition—addresses the problem of optimizing an objective function in the presence of equality and inequality constraints. Many realistic problems cannot be adequately represented as a linear program owing to the nature of the nonlinearity of the objective function and/or the nonlinearity of any constraints. The Third Edition begins with a general introduction to nonlinear programming with illustrative examples and guidelines for model construction. Concentration on the three major parts of nonlinear programming is provided: Convex analysis with discussion of topological properties of convex sets, separation and support of convex sets, polyhedral sets, extreme points and extreme directions of polyhedral sets, and linear programming Optimality conditions and duality with coverage of the nature, interpretation, and value of the classical Fritz John (FJ) and the Karush-Kuhn-Tucker (KKT) optimality conditions; the interrelationships between various proposed constraint qualifications; and Lagrangian duality and saddle point optimality conditions Algorithms and their convergence, with a presentation of algorithms for solving both unconstrained and constrained nonlinear programming problems Important features of the Third Edition include: New topics such as second interior point methods, nonconvex optimization, nondifferentiable optimization, and more Updated discussion and new applications in each chapter Detailed numerical examples and graphical illustrations Essential coverage of modeling and formulating nonlinear programs Simple numerical problems Advanced theoretical exercises The book is a solid reference for professionals as well as a useful text for students in the fields of operations research, management science, industrial engineering, applied mathematics, and also in engineering disciplines that deal with analytical optimization techniques. The logical and self-contained format uniquely covers nonlinear programming techniques with a great depth of information and an abundance of valuable examples and illustrations that showcase the most current advances in nonlinear problems.

This book provides glimpses into contemporary research in information systems & technology, learning, artificial intelligence (AI), machine learning, and security and how it applies to the real world, but the ideas presented also span the domains of telehealth, computer vision, the role and use of mobile devices, brain–computer interfaces, virtual reality, language and image processing and big data analytics and applications. Great research arises from asking pertinent research questions. This book reveals some of the authors’ “beautiful questions” and how they develop the subsequent “what if” and “how” questions, offering readers food for thought and whetting their appetite for further

research by the same authors.

This book explores the practicality of using the existing subsurface geology on the Moon and Mars for protection against radiation, thermal extremes, micrometeorites and dust storms rather than building surface habitats at great expense at least for those first few missions. It encourages NASA to plan a precursor mission using this concept and employ a "Short Stay" Opposition Class mission to Mars as the first mission rather than the "Long Stay" concept requiring a mission that is too long, too dangerous and too costly for man's first missions to Mars. Included in these pages is a short history on the uses of caves by early humans over great periods of time. It then describes the ongoing efforts to research caves, pits, tunnels, lava tubes, skylights and the associated technologies that pertain to potential lunar and Mars exploration and habitation. It describes evidence for existing caves and lava tubes on both the Moon and Mars. The work of noted scientists, technologists and roboticists are referenced and described. This ongoing work is more extensive than one would think and is directly applicable to longer term habitation and exploration of the Moon and Mars. Emphasis is also given to the operational aspects of working and living in lunar and Martian caves and lava tubes.

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