Apprenticing students into science: doing, talking & writing scientifically by John Polias. Melbourne, Lexis Education, 2016. 507.1 POL

This book “features: sample science texts with analyses of their structure, visuals and language; explanations and illustrations of macro-scaffolding, meso-scaffolding and micro-scaffolding; examples of cycles of teaching and learning based on theories of language and thought; illustrations of pedagogical resonance – synchronising the patterns in what is being taught with how it is taught; easy-to-understand-and-use examples of teaching using the language patterns of science.” – Back cover. (K-12)


“[I]ncludes new chapters which address the requirements of the national documents on science curriculum on engaging students in science, ICT in the science classroom and developing a ‘thinking’ science classroom. Throughout the book, the authors reflect a student-centred approach to science teaching as advocated in reform curriculum documents throughout the world.” – Back cover. (Secondary)


This book “includes 16 units of work developed from the Australian Curriculum for years 7 to 10. The units address scientific issues vital to the development of scientifically literate citizens and incorporate the content descriptions of all three curriculum strands of Science Understanding, Science as a Human Endeavour and Science Inquiry Skills in an integrated way.” – Back cover. (Years 7-10)


“How can a long metal needle pass through a balloon without popping it? How can water flow at very different rates through two identical funnels? How can a stick, placed on a table under several sheets of newspaper and extended over the edge of a table, snap when quickly struck – without lifting or tearing the paper? Author Thomas O’Brien takes these and 30 more science inquiry activities to a higher level in this book for educators who love to surprise and challenge their students with unanticipated results.” – Back cover. (Secondary)

The Library also holds two follow-up books, More brain-powered science and Even more brain-powered science.


“The first section of Discussions in science explains the theoretical basis for the approach used ... The second section presents a wide range of purpose written stories to read with your class and discuss. In each story, the young protagonists discuss their experiences in science, trying to make sense of the world. They raise scientific conceptual puzzles, methodological concerns and issues relating science beyond the classroom.” – Back cover. (Years 5-9)


“The experiments in this book use a range of everyday materials. Hopefully any parent or teacher should feel confident tackling any of these tasks. The experiments are deliberately graded into three levels of difficulty … Teacher notes are provided.” – p. 4. (Years 5-8)


“This book ‘tells the inside stories of 24 science, technology, engineering, and mathematics programs ... [Chapter titles include] STEM Starters: an effective model for elementary teachers and students ; STEMRAWS: after-school STEM research clubs ; Urban STEM: watch it grow ! ; Mission Biotech: using technology to support learner engagement in STEM ; Mixed-reality labs: combining sensors and simulations to improve STEM education ; A state STEM initiative takes root and blossoms ; Developing STEM site-based teacher and administrator leadership.” – Back cover. (K-12)


“Each chapter explores practical ways to bring flipped learning into the Science classroom, including: How to flip your class and the four hurdles to flipping (thinking, technology, time and training). How your approach to planning changes as you implement flipped learning. How flipping will enhance the Science laboratory experience for students. How you can use traditional resources such as textbooks and the internet. What to do in class once you have flipped your class. How to implement the flipped-mastery model into a Science classroom. How flipped learning can work alongside learning through scientific inquiry.” – Back cover. (K-12)
Hot topics

Secondary science

From STEM to STEAM: brain-compatible strategies and lessons that integrate the arts by David A. Sousa & Tom Pilecki. 2nd ed. Thousand Oaks, CA: Corwin, 2018. 507.1 SOU

The authors “demonstrate how arts activities enhance creativity, problem solving, memory systems, motor coordination, and analytical skills – all critical elements to achieving STEM objectives [and provide] [c]lassroom-tested strategies and techniques for integrating the arts into STEM instruction, including sample K-12 lessons plans and planning templates.” – Publisher website. (K-12)

Independent science challenges: fascinating science projects to challenge and extend able students by Hawthor, Vic: Cengage Learning Education, 2006. 372.35 SAM

The challenges “are stand-alone, long-term, in-depth, open-ended science research projects designed to challenge and extend students … [There are] over 40 interesting and sometimes controversial topics such as: global warming, nuclear power, tsunamis, GM food, cloning, weapons of mass destruction, evolution, and much, much more! These science challenges are great learning experiences because they can be differentiated to suit your students using multiple intelligences and learning styles.” – Back cover. (Years 5-9)


“Students need help in developing process skills to investigate, and communication skills to question and discuss findings. Inside the black box: science sets out in detail the research findings on four main ways of practising formative assessment found to be both workable and productive with teachers of science, and it shows teachers how to develop formative work within a science faculty in a school.” – Back cover. (K-12)

Nelson iScience 7 for NSW by Elizabeth McKenna et al. Melbourne: Cengage Learning Australia, 2013. 500 NEL

Textbook and activity book available for year 7. The printed activity book “features activities which reinforce specific aspects of the syllabus. They help to develop prescribed skills, values and scientific knowledge and understanding. Group, paired and individual tasks are represented, as are guided and open-ended experimental investigations.” – Publisher website. (Year 7)


“Each idea can be adapted to meet the needs of the individual, and follows the successful 100 ideas format, featuring a catchy title, a brief summary, and a step-by-step guide for implementation” – Back cover. (Secondary) Some of the ideas are online: https://bloomsbury.com/cw/100-secondary-science/teacher-resources/


“Print, cut and fold your way through meaningful, hands-on science activities. Let your students explore all areas of science with 60 technology-rich activities using Microsoft PowerPoint to create unique graphic organisers, study aids and desktop publications. The step-by-step lesson plans will allow you to integrate technology into the science curriculum with ease and style.” – Back cover. (Years 3-8)


“[T]he authors reveal that it’s not which strategy, but when, and where they plot a vital K-12 framework for choosing the right approach at the right time, depending on where students are within the three phases of learning: surface, deep, and transfer. Synthesizing state-of-the-art science instruction and assessment with more than fifteen years of John Hattie’s cornerstone educational research, this framework for maximum learning spans the range of topics in the life and physical sciences.” – Back cover. (K-12)

DVDs

Backyard science 2. Fitzroy, Vic: Australian Children’s Television Foundation, 2012. DVD BAC

“[C]hildren experiment with everyday items in a fun and creative way, developing interesting scientific insights. Each segment contains teaching activities and aligned student activity sheets; video clips with demonstrations of and discussions about the scientific experiments; investigative activities and short quizzes; material and equipment lists, with safety advice; a teacher information sheet explaining the science concepts within the activities; links to the Australian Curriculum.” – Distributor website. (Years 4-8)


“Observe Hewitt teach in a classroom with real students, using engaging demonstrations and artwork.” – Publisher website.

Available: DVD 1: Linear motion, vectors and projectiles. DVD 2: Newton’s 1st, 2nd and 3rd laws. DVD 3: Momentum, energy, center of gravity, rotation. DVD 4: Gravity 1, gravity 2, satellite motion. DVD 5: Special relativity 1, special relativity 2, atoms. DVD 10: Electrostatics, electric current, magnetism and E&M induction, bloopers, more goodies; Paul G. Hewitt, a personal view. Segments typically 30-40 minutes. (Secondary)

Mangroves: a local ecosystem: a documentary by and for YR11 science students. 42 min. Illawarra Environmental Education Centre, 2010. DVD MAN

This DVD includes resources from the Illawarra Environmental Education Centre to assist teachers and students of Stage 6 Biology and Senior Science. (Year 11)