

Resources

There is a wide range of relevant resources that support and complement a social and holistic approach to numeracy teaching and learning.

Resources are divided into the following categories for easy reference:

- Key Resources with weblinks
- Practical Resources
- Research and Reports
- Websites

Key Resources

1. *A Handbook on Rich Learning Tasks*, 2003, Kingston, Canada
 - Gary Flewelling and William Higginson
 - Centre for Mathematics, Science and Technology Education, Queen's University
 - <http://www.badseypublications.co.uk/aamt/op03.htm>

This book looks in detail at rich learning tasks: what makes them “rich”, what makes them important, and what learning, teaching and assessment look like when both students and teachers are engaged in them. It contains a wealth of information and practical advice, along with plenty of examples of tasks and suggestions for how to use and explore the ideas in practice. It examines problem-solving in the context of sense-making, and suggests useful Internet sites. While it uses mathematical examples from mainly middle school content, the book would be useful to teachers across disciplines and at all levels.

2. *Beyond Worksheets: A Social and Holistic Approach to Numeracy*, 2007, Toronto, Canada
 - Tom Ciancone, Flora Hood, Joy Lehmann
 - Metro Toronto Movement for Literacy
 - <http://library.nald.ca/item/8317>

This project report develops an approach for contextualizing numeracy instruction in adult literacy and workforce literacy environments. The social and holistic approach advocated in this report emphasizes context rather than content, processes rather than skills, change in identity not just behaviour. The central principle of the approach is that the learner is a whole person — mind, body and spirit — interacting with the world around and connecting to a larger whole. The project scanned the literacy field to determine practices in numeracy instruction, reviewed recent literature on numeracy teaching and learning, and offered workshops on the approach in order to gather practitioner feedback.

3. *Changing the Way We Teach Math: A Manual for Teaching Basic Math to Adults*, 2006, British Columbia, Canada
 - Kate Nonesuch
 - Malaspina University-College, Cowichan Campus
 - National Office of Literacy and Learning (NOLL), HRSDC
 - <http://library.nald.ca/item/6562>

Chapter 1 - literature and the field – interest in hands-on, group work, using real-life situations and giving students responsibility for their learning: student resistance and time constraints as major barriers

Chapter 2 - addressing student resistance

Chapter 3 - emotions in teaching and learning math

Chapter 4 - hands-on learning, using manipulatives and visual and practical presentations to teach math concepts

Chapter 5 - examples of group activities

Chapter 6 - real-life math and more strategies

Chapter 7 - strategies for taking on responsibility for one's own learning

4. ***Connecting Literacy, Learning and Work***, 2008, Ottawa, Canada

- Christine Pinsent-Johnson
- Employment Preparation and Upgrading Program, Ottawa-Carleton District School Board, Continuing Education
- <http://library.nald.ca/item/8194>

This research-in-practice report combines theoretical ideas and practical application. It attempts to capture the thinking and doing of an approach to literacy learning that shifts from a skill and task-based activity to literacy as a practice-based activity. It includes research-based discussion, curriculum ideas, a sample of ready-to-use tools, interviews with practitioners and learner photo stories. “It is a book that tells a story about an adult literacy program that made changes to the way it thought about and taught literacy for adults who want to make changes to their working lives.” (p. 1)

5. ***Family Math***, 1986, California, USA

- Jean Kerr Stenmark, et al
- The Regents of the University of California
- <http://www.lawrencehallofscience.org/equals/EQbkfmClassic.html>

How can parents help their children with math at home? With over 300 pages of lively activities, the classic ***Family Math*** book represents one of the greatest strides taken to involve parents in the mathematics education of their children. Using easy instructions and simple objects such as beans, blocks, pennies, buttons, and string, parents and kids solve problems together. The ***Family Math*** program is a rich resource of math curriculum including number and estimation, logical thinking, probability and statistics, geometry, measurement, and calculators. The stimulating games, puzzles, and projects entice kids in playful ways to master math concepts.

6. ***Head, Heart, Hands and Self: A Holistic Approach to Teaching Math to Adult Learners***, 2008, British Columbia, Canada

- Kate Nonesuch

This series of PowerPoint slides focuses on all aspects of a person when considering learning. The four basic ideas to keep in mind when teaching numeracy to adults are: safety, manipulatives, metacognition and automaticity. Practice and review are essential in the learning process, however it can be boring. Kate Nonesuch suggests that practitioners make it social, physical and thoughtful.

7. ***LEAP Daily Journal, Daily Reflection*** (*sample self-assessment tools*), 2006, Nova Scotia, Canada
- Community College Organizational Learning, Nova Scotia

Leadership Exploration and Awareness Program (LEAP) developed by the Nova Scotia Community College acknowledges and empowers support staff (i.e. administrative, clerical, daycare, food services) to enhance their individual and collective value and competence, and to influence the progress of the college. The program is experiential and portfolio-based. LEAP enhances learning opportunities for all support staff, to support their working relationships and to promote a healthy work-life balance.

8. ***Learning to Learn: A Living Resource for Literacy Practitioners and Adult Educators***, 2004, Nunavut, Canada
- Nunavut Literacy Council
 - <http://library.nald.ca/item/6804>

This resource provides tools for instructors and learners to facilitate the active process of learning through discovery and creating meaning from different experiences. The material is a sampling of available information on learning to learn, divided into three major sections: Recognizing Differences; Learning and Teaching Strategies; and Other Places to Find Information.

9. ***Math That Matters: A Teacher Resource Linking Math and Social Justice***, 2006, Toronto, Canada
- David Stocker
 - Canadian Centre for Policy Alternatives
 - http://www.ctf-fce.ca/publications/pd_newsletter/PD2007_Volume7-1English_Article7.pdf

This resource provides a practitioner with math activities that can be used to teach skills at the same time as providing content that “captures and increases student interest and awareness in justice, fairness and kindness.” (p. 11) *Math That Matters* questions the current content in texts.

It challenges students to become more attentive to the world around them and explore ways to make it a better place for everyone. It offers ways to use math to engage students more fully in a democratic society.

10. ***More Complicated Than It Seems: A Review of Literature About Adult Numeracy Instruction***, 2006, British Columbia, Canada
- Kate Nonesuch
 - Malaspina University-College, Cowichan Campus
 - <http://library.nald.ca/item/6221>

In this review of numeracy literature, Kate Nonesuch tries to connect research with her own teaching experiences and those of other practitioners. The question she attempts to answer is, “How can ABE math instructors in BC apply research findings to their practice?” While the question and each of its many parts is big, it comes from a personal question: “How can I apply research findings to my own teaching practice?”

The review is meant for adult numeracy practitioners. It focuses on topics related to instructional methods and not so much on issues such as general educational policy or program administration, frameworks, and curriculum. Although these latter issues have a huge impact on the work of the numeracy instructor, they are largely “givens” in the work of practitioners, and beyond the scope of this review.

11. ***Rethinking Assessment: Strategies for holistic adult numeracy assessment***, 2003, Australia
 - Beth Marr, et al
 - Royal Melbourne Institute of Technology (RMIT)
 - http://www.voced.edu.au/td/alnp_85.11

This is one of two resources from the Holistic Adult Numeracy Assessment project (HANA) funded by the Australian National Training Authority. The aim of the project was to research current assessment practices of experienced practitioners and document issues and concerns that emerged through consultation. Models and methods of assessment were developed and extended to produce an assessment resource. This included key assessment issues, provided a bank of models of good practice and demonstrated how holistic assessment can be undertaken within a set criteria of accredited frameworks. This resource addresses the thinking and rationale of the assessment strategies and their application via sample tasks and materials.

12. ***Seeds for Change: A Curriculum Guide for Worker-Centred Literacy***, 2001, Ottawa, Canada
 - Jean Connon-Unda
 - Canadian Labour Congress (CLC)
 - <http://library.nald.ca/item/6610>

A social and holistic approach to numeracy parallels and strengthens a worker-centred educational process as proposed by Connon-Unda in this curriculum guideline. It is a process that:

- is participatory, inclusive and deeply democratic in both its aims and objectives
- acknowledges and builds on the experiences and skills of workers
- involves hearts as well as minds
- promotes solidarity and respect among workers
- enhances workers’ capacities for critical reflection and action
- links education with action in the world in a project of social transformation

13. ***Supporting Learning, Supporting Change: A Research Project on Self-Management & Self-Direction, (Research Report and Field Report)***, 2003, Ontario, Canada
 - Katrina Grieve
 - Ontario Literacy Coalition
 - <http://library.nald.ca/item/928>

The purpose of the project was to gain a better understanding of the importance of self-management and self-direction to the learning process. Research opened up broader perspectives of knowledge, literacy and learning to move beyond the idea that skills can be taught in isolation to a social view of learning that depends on context, meaning and relationships. From an interview to literature review to wider research exploration, the report offers a model called, *Building Self-Awareness and Self-Direction*. At the centre of the model is “Rekindling Spirit.” The four aspects of building self-awareness and self-direction are:

creating meaning/making connections; action - reflection; practical strategies; and reflection and learning.

14. ***Thinking beyond numbers: Learning numeracy for the future workplace***, 2007, Australia

- Beth Marr, Jan Hagston
- An Adult Literacy National Project Report, National Centre for Vocational Education Research
- <http://www.ncver.edu.au/publications/1795.html>

In Australia, government, industry and employers see numeracy as an essential employability skill. However, it is also recognized as an equity issue. Adults with poor numeracy skills are more likely to be unemployed or hold relatively low work positions with lower wages. At a policy and research level, numeracy is understood to include the confident and thoughtful application of a broad range of mathematical skills to real life purposes at home, in the workplace and in the community. It also includes the ability to interpret, analyze and communicate mathematically-related information. “Research into the workplace has identified a phenomenon described as the ‘invisibility of numeracy’ at work, meaning that numeracy is often used in a *tacit or unconscious way*, embedded within other tasks, although not acknowledged as numeracy.” (p. 7)

Practical Resources

1. ***Adding to My Skills***, 2011, Kitchener, Canada
 - Sandy Coughlin
 - Project READ Literacy Network Waterloo-Wellington
2. ***Basic Occupational Math***, 2002, Maine, USA
 - David Newton
 - J. Weston Walch Publisher, Portland
3. ***Breaking the Maths Barrier: a kit for building staff development skills in adult numeracy***, 1991, Australia
 - Beth Marr, Sue Helme
 - Department of Employment, Education and Training
4. ***Calculators at work in daily living***, 2nd. ed., 2001, USA
 - Susan Brendel
 - Macmillan Publishing
5. ***Changing McWorld***, 2001, Ottawa, Canada
 - Tony Clarke and Sarah Dopp
 - Canadian Centre for Policy Alternatives
6. ***Document Use Refresher for Apprentices***, 2005, Halifax, Canada
 - Nova Scotia Partners for Workplace Education
 - Human Resources Canada, Nova Scotia Dept. of Education Apprenticeship and Skill
7. ***Educating for a Change***, 1991, Toronto, Canada
 - Rick Arnold, et al
 - Doris Marshall Institute for Education and Action
8. ***EMPower Series: Teacher and Student Books***, 2006, USA
 - TERC, Mary Jane Schmitt, Marilyn Steinback, Tricia Donovan, Martha Merson
 - Key Curriculum Press

Everyday Number Sense: Mental Math and Visual Models

Keeping Things in Proportion: Reasoning in Ratios

Many Points Make a Point: Data and Graphs

Operation Sense: Even More Fractions, Decimals, and Percents

Over, Around, and Within: Geometry and Measurement

Split It Up: More Fractions, Decimals, and Percents

Using Benchmarks: Fractions, Decimals, and Percents

9. ***Essential Skills and Success in Apprenticeship***, 2001, British Columbia, Canada
 - Lynda Fownes and Julian Evetts
 - SkillPlan, BC Construction Industry Skills Improvement Council
10. ***Essential Skills: for Fun - for Work - for Life***

- description of Essential Skills in context of families
 - Northwest Territories Literacy Council
11. ***Everyday Math Skill: Home Math***, 2009, Yellowknife, Canada
 - Lisa Campbell
 - Northwest Territories Literacy Council
 12. ***Everyday Math Skill: Kitchen Math***, 2009, Yellowknife, Canada
 - Lisa Campbell
 - Northwest Territories Literacy Council
 13. ***Everyday Math Skill: Money Math***, 2009, Yellowknife, Canada
 - Lisa Campbell
 - Northwest Territories Literacy Council
 14. ***Family Math (K - 6 Program)***, 1998, California, USA
 - Virginia Thompson, et al
 - The Regents of the University of California
 15. ***Family Math Fun***, 2008, Duncan, Canada
 - Kate Nonesuch
 - Manual for project, “Parents Teach Math: A Family Literacy Approach,” Office of Literacy and Essential Skills, HRSDC
 - Vancouver Island University, Cowichan Campus
 16. ***Learning to learn: cognitive education workshops, teaching guide and, activity book***, 2006, Montreal, Canada
 - Louise Lemieux, et al
 - Centre DEBAT
 17. ***Math in Daily Living: tutor training resource***, 1994, Alberta, Canada
 - Susan Devins
 - Prospects Adult Literacy Association, Edmonton
 18. ***Mathematics: A New Beginning: a resource book for teachers of adults returning to study***, 1987, Melbourne, Australia
 - Beth Marr, Sue Helme
 - State Training Board of Victoria
 19. ***Measurement and data analysis***, 2003, New York, USA
 - Robert Mitchell
 - New Readers Press, Syracuse
 20. ***Metrics at Work***, 1994, Oregon, USA
 - John L.P. McCabe
 - Garlic Press
 21. ***Numeracy at Work***, 2002, British Columbia
 - Lynda Fownes, Elizabeth Thompson, Julian Evetts

- Skillplan, BC Construction Industry Skills Improvement Council
22. ***Numeracy on the Line: language based numeracy activities for adults***, 1994, Australia
 - Beth Marr, Chris Anderson, Dave Tout
 - National Automotive Industry Training Board
 23. ***On the Job, The Essential Skill of Numeracy***, 2006, Ottawa, Canada
 - Centre for Canadian Language Benchmarks/Essential Skills
 24. ***Strength in Numbers: a resource for teaching adult numeracy***, 1991, Australia
 - Ruth Goddard, Beth Marr, Judith Martin
 - Holmesglen College of TAFE
 25. ***The Blueprint for Life/Work Designs***, 2000 (adapted from National Career Development Guidelines K - Adult handbook, 1996)
 - Lorraine Hache, et al
 - Human Resources Canada
 26. ***The math of homes and other buildings***, 1999, Maine, USA
 - Hope Martin
 - J. Weston Walch Publisher, Portland
 27. ***Tools for the Trade – Numeracy***, 2003, Saskatoon, Saskatchewan
 - Cypress Hills Regional College, Saskatoon
 - Funded by National Literacy Secretariat
 28. ***Workwrite Series: Graphs and Charts***, Book 6, 2008, Toronto, Canada
 - Marisa Mazzulla and Karen Geraci
 - PTP Adult Learning and Employment Programs
 29. ***Workwrite Series: Numeracy***, Book 7, 2008, Toronto, Canada
 - Marisa Mazzulla and Karen Geraci
 - PTP Adult Learning and Employment Programs

Research and Reports

1. “**Adult Numeracy curriculum and assessment: How they shape and are shaped by our vision of ‘competence’**”, *Literacy Across the Curriculum* **media Focus**, Vol. 16, No. 2, 2002, Montreal, Canada
 - Beth Marr
 - Center for Research into Post Compulsory Education and Training. RMIT University, Melbourne, Australia
2. *Adult Numeracy Teaching: making meaning in mathematics*, 1995, Melbourne, Australia
 - Betty Johnston, Dave Tout
 - National Staff Development Committee for Vocational Education and Training
3. *An Exploration of Collaborative Materials Development in numeracy teaching*, 2004, Ottawa, Canada
 - Lisa Hagedorn
 - LBS Program, Ottawa-Carleton District School Board
4. *Beyond the Daily Application: Making Numeracy Teaching Meaningful to Adult Learners*, 2005, London, United Kingdom
 - J. Swain, et al
 - National Research and Development Centre for Literacy And Numeracy
5. *Impact Math: focus on the future, Number Senses and Numeration*, 1999, Ontario, Canada
 - Brendan Kelly
 - Ontario Ministry of Education and Training
6. *Integrating Equity, Addressing Barriers: Innovative Learning Practices by Unions*, second edition, updated and expanded, 2009, Toronto, Canada
 - Labour Education Centre
7. *Literacies: Building effective numeracy practice*, #5, Spring 2005, Edmonton, Canada
 - Tannis Atkinson, Editor
 - National Literacy Secretariat, HRSDC
8. “**Marking for Confidence in Math**”, 2010, online video, Nova Scotia, Canada
www.ns.literacy.ca/ttvideo_mcmath.htm
 - Kate Nonesuch
 - Literacy Nova Scotia
9. *Meeting the Numeracy Challenge – Report: A development strategy for numeracy in Adult Basic Education*, 2004, Ireland
 - National Adult Literacy Agency
10. *Redefining How Success is Measured in First Nations, Inuit and Metis Learning and Summary Report*, 2007, Ottawa, Canada
 - Canadian Council on Learning

11. **“The Components of Numeracy”**, *NCSALL Occasional Paper*, 2006, Cambridge, Massachusetts, USA
 - Ginsburg, et al
 - National Centre for the Study of Adult Learning and Literacy (NSCALL)
12. **“We Need Learning Tasks That Support Sense Making”**, *Proceedings of the International Conference, The Humanistic Renaissance in Mathematics Education*, Sept. 2002
 - Gary Flewelling
 - Main reference, same author, *A Handbook on Rich Learning Tasks*, 2002, Kingston, Canada
13. **“What counts as evidence? Experiences from Ireland”**, *National Research and Development Centre for Adult Literacy and Numeracy (NRDC) International Conference Papers*, March 2003
 - Inez Bailey
 - National Adult Literacy Agency (NALA), Ireland
14. *Workplace literacy and essential skills: increasing student success through contextualized learning*, 2007, Toronto, Canada
 - Karin Meinzer
 - PTP Adult Learning and Employment Programs
15. *Workplace Literacy and Essential Skills: What Works? and Why?* Literature Review, 2009, Quebec, Canada
 - Maria Salomon
 - Centre for Literacy

Websites

The internet is an amazing source of information. You can access many numeracy resources simply by entering keywords into a search engine. Sometimes it can be frustrating when internet sites no longer exist, the case for many of the valuable Australian resources which have informed so much of our research and practice. Below are four websites that offer an opportunity to explore the field of adult numeracy more deeply:

- NALD – a vast database of adult literacy resources based in Canada
- ANN – a network of numeracy practitioners in USA
- ALM – an international forum of numeracy research based in the UK
- DAN – an online course for numeracy practitioners based in Canada

National Adult Literacy Database

<http://nald.ca/>

The National Adult Literacy Database (NALD) provides internet-based literacy and essential skills information and resources in both of Canada’s official languages. To find a few hundred annotated titles on adult numeracy from the NALD website, simply go to the “Library” page <<http://library.nald.ca/>>, find the “Search” box for learning materials and research materials, and enter keywords, like “Math” or “Numeracy”.

Adult Numeracy Network

<http://www.adulturnumeracynetwork.org/>

The Adult Numeracy Network (ANN) aims to be a community dedicated to quality mathematics instruction at the adult level – to support each other, to encourage collaboration and leadership, and to influence policy and practice in adult math instruction. ANN conducts pre-conferences at the annual National Council of Teachers of Mathematics national meetings; publishes the [Math Practitioner Newsletter](#) and sponsors the [Numeracy List](#), an adult electronic forum.

Adults Learning Mathematics

<http://www.alm-online.net/>

Adults Learning Mathematics (ALM) is an international organization which brings together practitioners and researchers who are involved in mathematics education for adult learners to inform policy and practice. ALM conducts an annual [ALM Conference](#) in various countries, puts out a periodic [ALM Newsletter](#) on current issues and publishes a bi-annual [ALM Journal](#).

Developing Adult Numeracy: Practitioner Training Course

<http://www.nald.ca/tools/practitioner/dan/index.htm>

Developing Adult Numeracy (DAN) is an online training course for practitioners. It is an interactive website allowing one to find learning materials and teaching strategies, theory and practice, interesting questions and answers, “with room for you and your learners’ feelings and thoughts about math and numeracy”. The training modules include:

- What is Numeracy, Exactly?
- Numeracy in Literacy and Basic Skills
- Renewing our Relationships with Math
- Using Ready-made Learning Materials
- Beyond Ready-made Learning Materials