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| **Minor Award Name** | **Shape and Space** |
| **Minor Award Code** | M2N07 |
| **Level** | 2 |

**Some suggested resources to support delivery:**

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| **Theme/Topic** | **Type** | **Relevance** | **Author/Source** | **Web Link** |
| Definitions of key terms and concepts of Shape and Space | Book | The Usborne Illustrated Dictionary of Maths.  Very good resource to have in class, not to be confused with the children’s version called *The First Usborne Illustrated Dictionary of Maths* which is quite similar, but has childish cartoons unsuitable for adults. It holds all the essential definitions without too many unnecessary examples. Over one third of its content is on Shape, Space and Measures. | By Tori Large and Adam Constantine, Edited by Kirsteen Rogers,  Usborne Books, UK  ISBN 978-1-4095-4696-2 | <https://www.myubam.com/p/419/illustrated-dictionary-of-math-ir> |
| Definitions of key terms and concepts of Shape and Space | Book | Chambers Adult Learners’ Guide to Numeracy is a simple and practical guide for adults who lack confidence in their numeracy skills. It has a separate chapter on Measurement and Shapes. | Geoff Mainwearing, Chambers Harrap Publishers Ltd, Edinburgh, UK, 2007  ISBN 978-0-550-10321-5 | [www.chambers.co.uk](http://www.chambers.co.uk)  <https://www.thedyslexiashop.co.uk/chambers-adult-learners-guide-to-numeracy.html> |
| Basics of Shape and Space | Downloadable Workbook | Brushing up: 1 A Maths Workbook:  An easy introduction to Shape and Space, p35-45. Good for beginners to start with the basics. | National Adult Literacy Agency, Dublin, 2015  ISBN 978-1-907171-24-6 | <https://www.nala.ie/resources/brushing-maths-workbook> |
| More basics of Shape and Space | Downloadable Workbook | Brushing up: 2 A Maths Workbook:  This is one of the best workbooks as the Shape and Space section (Part 2, p40-48) is right at Level 2. This is a springboard for teachers to start from and they can base the core of their Shape and Space programme on this book. | National Adult Literacy Agency, Dublin, 2016  ISBN: 978-1-90717127-7 | <https://www.nala.ie/resources/brushing-2> |
| Functional Maths skills relating to Shape and Space | Photocopiable  Workbooks | AxisLife Skills series: A series of 7 workbooks set in everyday contexts ranging across health, housing, DIY and financial skills*. A Place of your Own, Coping with Cooking, Doing it Yourself, Everyday Health, Making Ends Meet books 1 and 2.* | Axis Education, UK  ISBN: 978-1-84618-271-6  Sheila Evans et al | <http://www.axiseducation.co.uk/products/10168/life_skills/coping_with_cooking.aspx> |
| The best ones are; *Coping with cooking* for weights and measurements and *Doing it Yourself* for area and space. | ISBN: 978-1-84618-272-3  Sheila Evans et al | <http://www.axiseducation.co.uk/products/10169/life_skills/doing_it_yourself.aspx> |
| Functional Maths skills relating to Shape and Space | Workbooks | AxisFair Play Maths series of 6 workbooks for Functional Maths Skills on motivational activities: *Maths in* *Athletics, Extreme Sports, Fishing, Football, Motorsports, Racquet Sports.* | Axis Education, UK  ISBN: 978-1-84618-331-7  Sheila Evans et al | <http://www.axiseducation.co.uk/products/10505/fair_play_maths/athletics.aspx> |
| The best two are *Athletics* and *Extreme Sports.*They are good signposts for worksheets on Irish sport. | ISBN: 978-1-84618-332-4  Sheila Evans et al | <http://www.axiseducation.co.uk/products/10508/fair_play_maths/extreme_sports.aspx> |
| Functional Maths skills relating to Shape and Space | Workbooks | Axis Mathsseries in a bundle of 8: *Building Design, Fashion, Food, Television, the Body, the Home, The Environment and The Workplace.* These are not specifically directed at Level 2, *but Maths in Building Design i*s the best of them and there are some relevant pages here and there in *Maths in Food* and *Maths in the Home.* Depending on the interests of the class, pages could be selected to facilitate discussions around shape and space on a key theme like cooking a meal or renovating a home. | Axis Education, UK  ISBN: 978-1-84618-185-6  Sheila Evans et al | <http://www.axiseducation.co.uk/products/10599/Maths_in_building_design.aspx> |
| General Worksheets | Free worksheets | If you choose to register your details with Axis, you can access free worksheets and read the workbooks you may wish to buy online. | Axis Education, UK  Sheila Evans et al | <http://www.axiseducation.co.uk/free_resources/index.aspx> |
| Functional Maths skills relating to Shape and Space | Books | Canadian literacy website: nwliteracy.ca. Their books are: *Simply Math, Money Math, Home Math, Kitchen Math* run along the same lines as the Axis books. One disadvantage is that teachers would have to do currency changes on many worksheets to avoid confusing students. | NWT Literacy Council  Joyce Gilchrist (Ed.) | [www.nwtliteracy.ca/](http://www.nwtliteracy.ca/) |
| All areas of Shape and Space | Online resources | PDST website (Professional Development Service for Teachers)  This is worth browsing through as it is regularly updated with ideas for primary and secondary students which could be adapted for adults. See some selections below. | Manuals, work samples and web links are sourced by members of the PDST service.  PDST.ie | [www.pdst.ie/](http://www.pdst.ie/) |
| All areas of Shape and Space Learning Outcomes | Teachers’ Handbook | PDST Handbook (Professional Development Service for Teachers)  This manual is for the strand of Shape and Space (up to 6th class at primary level) but is very appropriate for beginner adults too.  It could be very helpful for maths teachers who may be ‘out of field’ and need to revise mathematical terms.  For teachers in a hurry, see *Fundamental Facts* on p12-16 for the essentials and read the Glossary on pp178-185.  Information on misconceptions involving shape and space is essential reading on p17. It shows easy ways of explaining the differences between 2-D and 3-D shapes. | Manual designed by members of the PDST.  Professional Development Service for Teachers | <https://www.scoilnet.ie/uploads/resources/19607/19330.pdf> |
| Shapes in everyday life | Textbook | At Home with Family Learning  This textbook is over a decade old but the quality remains. It has excellent tips and ideas for families to learn together, especially in Chapter 4’s *Looking at Maths Around Us* p17-21. This encourages adults to observe their own surroundings and see shapes they never noticed in their kitchens or gardens. | National Adult Literacy Agency  ISBN 1-871737-51-6 | <http://www.nala.ie>  It goes in and out of print, but it should be available to borrow from the Resource Room in most Adult Education Centres. |
| General Geometry | Interactive website | mathsisfun.com. Good descriptions of Plane Geometry and Solid Geometry with interesting activities. It gives a clear step by step explanation of measuring area in a garden and the further activity of re-turfing the garden. This could be used to integrate this module with Horticulture.  Optional multiple choice questions are on the website. | Mathsisfun.com website company, UK | <http://www.mathsisfun.com/geometry/index.html> |
| <http://www.mathsisfun.com/activity/garden-area.html> |
| All areas of Shape and Space | Interactive website and printable worksheets | mathsdrills.com. A popular website for teachers worldwide because it is so quick and convenient for repeating practice tests. Good for identifying shapes and angles but the basic drills only are best suited for students doing a Level 2 course. | mathsdrills.com website, UK | <https://www.math-drills.com/geometry.php#blm> |
| All areas of Shape and Space | Video clips | bbc.co.uk/skillswise.  One of the most popular websites for sourcing material in English and Maths for adults. The interactive online 1 minute video clips on shapes, angles, perimeters, maps and plans are good sources of different material to show a class and could be interlinked with a computer module. This website is worth browsing as it contains many kinds of sample classes. | BBC Skillswise, UK | <http://www.bbc.co.uk/skillswise/topic-group/shapes> |
| Drawing 2D and 3D shapes on computer | Highly interactive website | geogebra.org. This is a website which has a Geometry Calculator, a Graphic Calculator, a 3-D Calculator and more online tools ready for immediate use. It is one of the rare uncluttered websites available, but students would need to have reasonably good IT skills before beginning to learn how to draw shapes on computer. | GeoGebra Institute of California, US | <https://www.geogebra.org/> |
| Triangles and rectangles | Downloadable powerpoints | mathscentre.co.nz website. Two lovely powerpoints on getting the areas of triangles and rectangles. Clear and colourful. Their simplicity says it all. | mathscentre.co.nz website, New Zealand | <http://www.mathscentre.co.nz/Other-Resources/1/> |
| Shapes and designs in Art | Downloadable Powerpoint presentation | scoilnet.ie. This is an informative presentation on making lino prints, which gives students a feel for shapes and textures. It would be a good opportunity to introduce them briefly to tessellation as they will study repeated patterns if they do the Level 2 Pattern and Relationship maths module. | scoilnet.ie website  Contributor: Caroline Mc Corriston | <https://www.scoilnet.ie/uploads/resources/19782/19505.pptx> |
| Shapes in a garden | e-learning website | bbc.co.uk/skillswise. Good visual teaching video clips with examples in a garden and other places. Quizzes on topics and tips for teachers | bbc.co.uk/skillswise UK | <http://www.bbc.co.uk/skillswise/video/areas-of-shapes> |
| Space visualisation | Online exercises on shape and space | www.learner.org website. Teachers can probe their own space visualisation skills and then get students to try it if they are ready for it. The map exercise where photos are taken from different angles is a good challenge. It helps the participants to think in three dimensions as they imagine where they are on the map. | Annenberg Foundation 2017 American Teachers’ website | <https://www.learner.org/teacherslab/math/geometry/space/index.html> |
| Making shapes from paper | Online shapes to download | senteacher.org website. This generator prints a useful selection of nets for the construction of common 3D shapes. The names of the shapes can be printed on them. | senteacher.org website | <http://www.senteacher.org/worksheet/12/NetsPolyhedra.html> |
| Revision tool | Online shapes test which can be printed out for a class group or individual test | atlasabe.org website. A selection of shapes in sets of four where the students must decide which is the odd one out. A good exercise to use after they have learnt the names of shapes. It could be used as a short revision exercise or as a discussion prompt. | ATLAS is part of the Hamline University School of Education in  St. Paul, Minnesota. | <http://atlasabe.org/resources/mni-toolkit/geometry-measure/shapes> |
| Teaching Geometry | Downloadable report | This report includes three interesting case studies from three adult education tutors who describe how they teach measurement and shapes. It gives tips on teaching 2D and 3D shapes through art and real-life examples. It is a great guide for new and practising maths tutors. | NALA Report 2015 | <https://www.nala.ie/resources/what-really-counts-next-action-learning-project-numeracy-tutors> |
| Planning maths classes | List of resources | This is a useful list of mainly free lesson plans and worksheets (which are hard to find nowadays). Unfortunately, many potentially good ones have primary school designs or children’s ages embedded in them so they cannot be used with adults. However, the ideas are good and they can be taken and adapted to suit adults. | classroomaid.com website | <http://classroom-aid.com/educational-resources/mathematics> |
| Ideas for teachers | Downloadable class plans | [www.nzmaths.co.nz](http://www.nzmaths.co.nz) This website has a graded series of class plans for primary maths in New Zealand. Each section (click on the headings for Shape or Area for example) has plenty of practical ideas and has generous attachments with supporting printable handouts. It ends with the questions, ‘Why teach Geometry? Why teach measurement?’ and gives teachers a helicopter view of the subject. | nzmaths.co.nz website, New Zealand | <https://nzmaths.co.nz/welcome-geometry-and-measurement> |
| Reference material for teachers and students | Online maths data | [www.mathopenref.com](http://www.mathopenref.com) The author of this website set it up when he saw his son carrying a heavy schoolbag with books which he believed could be data on a flash drive. It has comprehensive descriptions of maths terms and is good for teachers and students to refer to for information.  See his story here: http://www.mathopenref.com/site/author.html | John Page, software engineer, Silicon Valley | <http://www.mathopenref.com/> |
| Special Needs in Maths | Downloadable checklists | [www.sess.ie](http://www.sess.ie) The Special Education Support Service website has a Curriculum Access Tool for General Learning Disability in three categories: Mild, Moderate or Severe and Profound. Under Mild, click the Maths option and the Shape and Space Strand, where there are comprehensive checklists for teachers to ensure that students have grasped all the basics in this strand before progressing to another level.  Under the Teacher Reflection section there are 20 checklists for maths. For adult maths teachers, these show you what the essentials are for adult students to understand maths concepts. | Special Education Support Service, Cork | <http://cat.sess.ie/tool/area/7>  <http://cat.sess.ie/teacher-reflection> |
| Special Needs in Maths | Learning Support Workbook | This is designed for students who need extra learning support in the mainstream school, but it is highly suitable for adults for this Level 2 module. All the essential information is presented clearly on photocopiable pages without designs for children. On p38 there is a good map of the layout of a house which should interest adults. This book should be in every adult education centre as a core or back up resource. | Outside The Box (OTB) Learning Resources Ltd. Naas.  (The Irish distributors for User Friendly Resources, New Zealand)  ISBN 978-1-876968-218-7 | <http://www.otb.ie>  or  <https://www.userfriendlyresources.co.nz/maths-reinforcers-series>  for a new edition |
| Student support | Online bookshop | This online bookshop is well worth a look because it contains many books to help students to get over their fear of maths. Book titles include: *The Fear of Maths, What to do when you can’t add and subtract, Overcoming difficulty with numbers, Dyslexia and Maths,* and *The Trouble with Maths* | The Dyslexia Shop, UK | <https://www.thedyslexiashop.co.uk/dyslexia-books/numeracy-and-mathematics.html> |
| General Information on learning difficulties | Online article and checklists | [www.annarbor.co.uk](http://www.annarbor.co.uk) This website is from a publishing company which gives a short description of Dyscalculia and checklists for Dyscalculia, Adult Dyslexia, and Dyspraxia which would be useful for teachers to know why some adult learners find shape and space particularly difficult. | Ann Arbor Publishers Limited Belford UK | <http://www.annarbor.co.uk> |
| <http://www.annarbor.co.uk/images/PDF/DyscalculiaChecklist.pdf> |
| An enjoyable overview of maths terms | Book | Maths – A book you can count on!  This is a funny little book which adds humour to a subject which may be stressful for many students. Each term has a cartoon personality, e.g. Subtract is an unhappy character who describes himself as an old misery guts and criticises Add for being a smirking ball of positivity. The Shape-Shifters include the 2D flatlands and the 3D topdogs. It has 60 pages with a different personality on each page, recommended for light relief and an interesting way of making maths terms come alive with a bit of humour. | Created by ‘Basher’ and written by Dan Green  ISBN 978—7534-1965-6 | [www.basherbooks.com](http://www.basherbooks.com) |
| Background reading for teachers | Book | That’s Maths by Peter Lynch is a collection of nearly 100 articles based on his popular *Irish Times* column. It has a good range of humorous anecdotes about the wonders of maths and is a good source of additional information to freshen up a class. Sometimes he blends both useful and useless information to keep his readers interested. His titles include: *Earth’s Shape and Spin Won’t Make You Thin, Sproutology, Highway Geometry and Heavy Metal or Blue Jeans?* He does a lot of blogging and recommends more unusual websites for like-minded maths experts. | Peter Lynch, Gill Books, Dublin. also available as an ebook  ISBN 978-0-7171-6955-9 | Sourced at Popular Science at <https://www.easons.com>  or  <https://thatsmaths.com/> |

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| Other: Maths Week is a programme which has been running for over 10 years and promotes maths countrywide through the schools and the media. Its website gives a good insight to how successful this has been. See [www.mathsweek.ie](http://www.mathsweek.ie) |

**Useful Organisations:**

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| **Name** | **Contact Information** |
| National Adult Literacy Agency (NALA) | h[ttp://www.nala.ie](https://www.nala.ie) |
| National Council for Curriculum and Assessment (NCCA) | http://[www.ncca.ie](http://www.ncca.ie) |
| Quality and Qualifications Ireland (QQI) | http://[www.qqi.ie](file:///\\CETB-FPSRV\OfficeFolders$\FESS\FET%20Development%20Resource%20Lists\Phase%204%20Resource%20List\Submitted%20Resource%20Lists\To%20be%20Sccreened\Level%202\www.qqi.ie) |
| Further Education Support Service (FESS) | http://[www.fess.ie](http://www.fess.ie) |
| Special Education Support Service (SESS) | http://[www.sess.ie](file:///\\CETB-FPSRV\OfficeFolders$\FESS\FET%20Development%20Resource%20Lists\Phase%204%20Resource%20List\Submitted%20Resource%20Lists\To%20be%20Sccreened\Level%202\www.sess.ie) |
| Skills Workshop | http://[www.skillsworkshop.org](http://www.skillsworkshop.org) |
| BBC Skillswise | <http://www.bbc.co.uk/skillswise/maths> |