

# Numeracy By Measure

Building the Workplace Measurement Skills  
of VET Practitioners



## Shoe Fitting

### FOOT MEASURES

Many jobs require workers to work with measurements. Measurement underpins the success and welfare of a modern workplace and touches almost every part of working life. To develop and sell products and services, to manage quality and safety, and to enhance productivity workplaces need to measure processes, products and performance.

The example used in this Snapshot is a job task performed by retail assistants in a shoe store. The job task involves interpreting foot measurements and shoe sizes to fit shoes. It involves understanding and working with linear dimensions.

The numeracy skills required include the ability to read, interpret and understand the mathematical information in written specifications (and/or oral if instructions are also given verbally) – the application of ACSF numeracy indicator .09, *identifying*

*mathematical information and meaning in activities and texts.*

The numeracy skills also include the ability to use and apply a range of mathematical skills to undertake the task, including using tools to measure feet and then compare the results with shoe size specifications – the application of ACSF numeracy indicator .10, *using and applying mathematical knowledge and problem solving processes.*

The numeracy skills also include the ability to communicate orally with customers – the application of ACSF numeracy indicator .11, *communicating and representing mathematics.*

Workers responsible for undertaking such measurement tasks must also have a range of other complementary skills, such as the skills to work safely (follow safety procedures and identify and report hazards) and the skills to follow workplace procedures (identify what must be

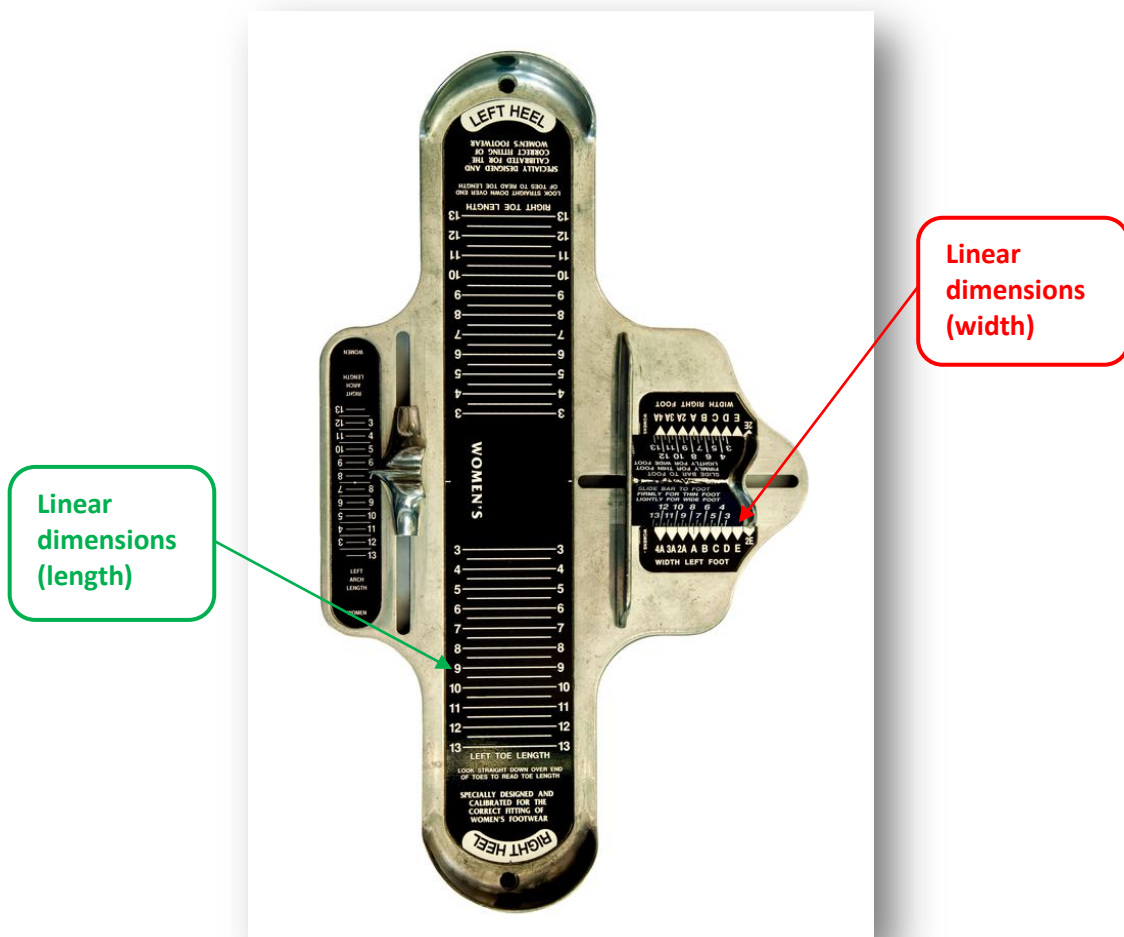
measured and what tools to use, how often and when, where and how it needs to be recorded, identify the need to take action and take appropriate action). Other skills

may include those needed to explain measurement information to other staff, supervisors or customers.

## THE CONTEXT

A retail assistant needs to be able to measure feet and use a conversion chart to determine a customer's correct shoe size. A specialised foot measuring device illustrating the types of measurement information involved is shown below.

The ability to interpret measurements using the specialised foot measuring device is needed to complete this task.



Along with the use of the above Brannock specialist foot measuring device or equivalent to measure feet, the job task also requires knowledge and understanding of Australian shoe sizes in relation to shoe sizes in other countries. The tables on the next page show the relationships between the four common shoe sizes for men and women: Australian (Au), United States (US),

United Kingdom (UK) and European (Eu). The same information is also shown in the conversion chart.

**Women's Shoes Size Scale:**

AU / US	Eu	Length (cm)
5 5.5	35	21.6 22.2
6	36	22.5
6.5	37	23.0
7 7.5	38	23.5 23.8
8 8.5	39	24.1 24.6
9	40	25.1
9.5 10	41	25.4 25.8
11	42	26.5

**Men's Shoes Size Scale:**

AU / UK	Eu	US	Length (cm)
6	39	7	24.6
6.5	40	7.5	24.8
7 7.5	41	8 8.5	25.4 25.7
8	42	9	25.8
8.5 9	43	9.5 10	26.7 27.0
9.5 10	44	10.5 11	27.3 27.8
10.5 11	45	11.5 12	28.3 28.6
11.5 12	46	12.5 13	29.0 29.4
12.5 13	47	14	30.2 31.1

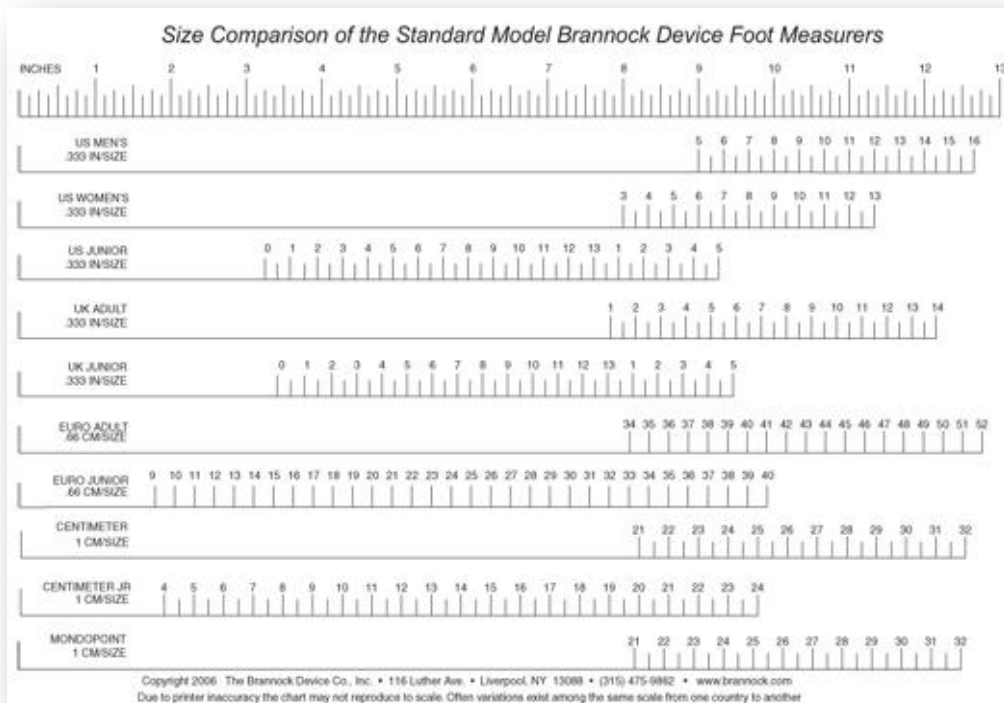


Chart provided with the written consent of The Brannock Device Co Inc.

## ACSF NUMERACY MAPPING

*The process of mapping the numeracy skills demands of a job task to the ACSF is imprecise. That is, there is no absolute right or wrong. Professional judgement is needed. Consult the ACSF as you reflect on the numeracy skills mapping presented in this Snapshot. Do you follow and agree with the logic? What is your reasoning?*

This task maps to **ACSF numeracy level 2**, with the mathematical content mainly related to the focus area *Mathematical knowledge and skills: measurement and geometry*. A worker needs to be at **exit** numeracy level 2 to successfully and competently undertake a task such as this – that is, they need to be working at ACSF numeracy level 3.

To undertake the whole task of measuring feet and fitting shoes requires the understanding and application of a range of measures and measurement activities relating to linear dimensions and numbers. Individually some of the components of the task are at level 1, for example reading whole numbers related to shoe sizes. However, as the job task demands a combination of a range of measurement skills and mathematical skills and their application, it requires using higher level skills aligned to ACSF numeracy level 2.

At level 2, the first indicator specifies that tasks at this level require comprehension of mathematical information in ‘familiar activities and texts’. This is true in this case as a retail assistant working in a shoe shop will find these measurements familiar. Similarly, the second indicator describes the mathematical application aspects as familiar while the third indicator describes the use of ‘informal and some formal oral and written mathematical language and representation’.

The following pages illustrate and explain the unpacking and mapping of one of the measurement skills required in this task (linear dimensions) to the relevant ACSF numeracy indicators, focus areas and performance features.

## LINEAR DIMENSIONS

In this job task, the understanding and use of linear dimensions underpins the process of fitting the correct shoe size. Misunderstanding of foot measurements and shoe specifications could lead to poorly fitted shoes and customer dissatisfaction and complaints.

**Working through this PD resource will support you to confirm and strengthen your measurement teaching skills.**

The information in the following table shows how the measurement of linear dimensions applies to this job task and aligns to ACSF numeracy level 2.

ACSF numeracy indicator 2.09	
Focus areas and performance features	Comment
<p><b>Explicitness of mathematical information</b></p> <ul style="list-style-type: none"> <li>Identifies and interprets simple mathematical information in familiar and simple oral instructions and written texts where the mathematics is partially embedded</li> </ul>	<p>The worker needs to be able to read and understand different shoe sizes and related values as documented in a range of sources including the shoes themselves, conversion tables, and on the specialist foot measuring instrument.</p>
<p><b>Complexity of mathematical information</b></p> <ul style="list-style-type: none"> <li>Identifies and interprets familiar and simple length, mass, volume/capacity and temperature measures</li> </ul>	<p>The linear dimensions values are only represented in centimetres (cm) to one decimal place. No other measures are used. All the other data is in effect ordinal number scales, including an alphabetical scheme for feet and shoe widths.</p>

ACSF numeracy indicator 2.10	
Focus areas and performance features	Comment
<p><b>Problem solving processes including estimating and reflecting</b></p> <ul style="list-style-type: none"> <li>Relies substantially on hands-on (concrete) and real life materials, personal experience and prior knowledge to:               <ul style="list-style-type: none"> <li>make estimations and check reasonableness of processes and outcomes in relation to the context</li> </ul> </li> </ul>	<p>The worker needs to be able to use a specialist measuring instrument to measure people's feet and interpret its scales and values. The Brannock is a familiar and routine tool for someone working in the industry. The skills include estimating and checking the correct shoe size and then identifying the relevant size printed on the shoes and/or the shoe box.</p>

ACSF numeracy indicator 2.10	
Focus areas and performance features	Comment
<p><b>Mathematical methods and use of tools</b></p> <ul style="list-style-type: none"> <li>Identifies appropriate tools and uses them in familiar applications, e.g. uses a familiar measuring instrument</li> </ul> <p><b>Mathematical knowledge and skills: measurement and geometry</b></p> <ul style="list-style-type: none"> <li>Measures and estimates length ... using simple instruments graduated in familiar units, e.g. cm, m, ml, °C or hours/min/sec</li> </ul> <p><b>Mathematical knowledge and skills: number and algebra</b></p> <ul style="list-style-type: none"> <li>Identifies and uses whole numbers, including numbers into the 1000s, money and simple everyday fractions, decimals and percentages, e.g. 1/4, 1/10, 50% or 0.25</li> </ul>	<p>The shoe size values are represented either in numbers (simple – whole numbers or as .5 decimals only) or as centimetres (cm) to only one decimal place for length and as an alphabetical code for width.</p>

ACSF numeracy indicator 2.11	
Focus areas and performance features	Comment
<p><b>Written mathematical language</b></p> <ul style="list-style-type: none"> <li>Uses a combination of mainly informal and some formal written mathematical and general language to represent the mathematical and problem solving process</li> </ul> <p><b>Oral mathematical language</b></p> <ul style="list-style-type: none"> <li>Uses a combination of mainly informal and some formal oral mathematical and general language to report on and discuss the mathematical and problem solving process</li> </ul> <p><b>Complexity of mathematical symbolism, representation and conventions</b></p> <ul style="list-style-type: none"> <li>Uses a combination of both formal and informal symbolism and conventions relevant to the mathematical knowledge of the level</li> </ul>	<p>The worker needs to be able to use written and oral language to record and communicate the shoe measurement information appropriately.</p> <p>This involves recording the information in writing or entering the sizes into a computer. A major task is to communicate orally about shoe sizes in discussions with customers and suppliers.</p> <p>Given the simplicity of the numbers and measures being used here, and the need to communicate with the public, there is little need for specialised or formal mathematical language or representations.</p>

## ABOUT THIS RESOURCE

*Numeracy by Measure: Building the Workplace Measurement Skills of VET Practitioners* is a professional development resource to support the development of VET practitioner numeracy proficiency skills and numeracy training skills. It has been developed in response to a National Centre for Vocational Education and Research (NCVER) report titled *Seeking the N in LLN*. This report found that there may be a need to increase the capacity of the vocational education and training (VET) workforce to meet the numeracy skills needs of existing workers in Australia. A copy of the full report is available for download at [www.ncver.edu.au](http://www.ncver.edu.au).

*Numeracy by Measure: Building the Workplace Measurement Skills of VET Practitioners* includes a [Guide](#) with professional development activities and six Snapshots exploring different workplace numeracy skills based on measurement. This is one of the Snapshots.

Measurement topics covered in the Snapshots include:

- [Bicycle Fitting](#)
- [Cabinet Fitting](#)
- [Health Monitoring](#)
- [Shoe Fitting](#)
- [Smallgoods Packing](#)
- [Tyre Wall Markings](#)

**Working through this PD resource places you in the role of the learner.**

VET practitioners interested in increasing their awareness of numeracy skills in the workplace may also like to access the companion resources [Numeracy in Focus: Building VET Practitioner Awareness of Numeracy in the Workplace](#) and [Numeracy in Practice: Building Workplace Numeracy Proficiency and Training Skills of VET Practitioners](#).

[Numeracy by Measure](#), [Numeracy in Practice](#) and [Numeracy in Focus](#) are available for download from [www.oggiconsulting.com/resources/](http://www.oggiconsulting.com/resources/).

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