



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **LMFPT3008A Understand piano tuning theory and basic acoustics**

**Revision Number: 1**

## LMFPT3008A Understand piano tuning theory and basic acoustics

### Modification History

Not applicable.

### Unit Descriptor

<b>Unit descriptor</b>	This unit describes the skills and knowledge required to understand piano tuning theory and basic acoustics.
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### Application of the Unit

<b>Application of the unit</b>	<p>This unit applies to the skills and knowledge required to understand the theory of piano tuning and basic acoustics and the important relationship between this and how a piano is tuned.</p> <p>The type of work tasks performed in acquiring knowledge of piano tuning theory and basic acoustics will include research, investigation and some computing skills. Participation in teams including group or team coordination may be included and may be conducted in small to medium scale enterprises.</p>
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### Licensing/Regulatory Information

Not applicable.

### Pre-Requisites

<b>Prerequisite units</b>	Nil	

## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Acquire knowledge of basic acoustics	1.1. Elements of <i>basic acoustics</i> are explained 1.2. Acoustical laws of sounding strings are explained
2. Acquire knowledge of piano tuning	2.1. Elements of <i>piano tuning theory</i> are explained 2.2. Affect of inharmonicity on piano tuning is explained
3. Acquire knowledge of musical scales	3.1. Elements of <i>musical scale theory</i> are explained 3.2. The behaviour of piano strings and their proper dimensions are explained 3.3. The <i>laws of strings</i> are explained 3.4. Musical scales are identified aurally

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

#### Required skills

- read and understand documentation
- ask questions to gain information
- collect, organize and understand information related to piano tuning
- work collaboratively with others to complete tasks in a timely manner
- apply knowledge of tuning and repair processes to problem solving
- show independence and initiative in making decisions
- collect and organize information for the purpose of:
  - planning tasks and identifying task outcomes
  - planning use of resources
  - assessing and prioritizing tasks
  - managing time and resources
- assess own skills and knowledge
- research and apply new ideas and techniques
- use IT to organize, report and record information

#### Required knowledge

- State or Territory OHS legislation, regulations, standards and codes of practice relevant to piano tuning
- understanding of basic acoustics
- understanding of piano tuning theory
- understanding of musical scale theory
- established lines of communication and protocols
- problem identification and resolution

## Evidence Guide

### EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

#### Critical aspects for assessment and evidence required to demonstrate competency in this unit

- Locate, interpret and apply information relevant to piano tuning
- Basic acoustics are identified and understood
- Piano tuning theory is explained and understood
- Musical scale theory is explained and understood
- All notes on a piano are identified a minimum of two times
- Communicate and work with others in the work area
- Apply safe handling practices and safe operating procedures for equipment, products and materials to:
  - minimise the risk of injury to self or others
  - prevent damage to goods, equipment and products

#### Context of and specific resources for assessment

- Assessment may occur on the job or in a simulated workplace environment in accordance with work practices and safety requirements
- Assessment is to occur under standard work practices, and to comply with legislative and regulatory requirements.
- The following resources should be made available:
  - upright or grand pianos
  - workplace location or simulated workplace

#### Method of assessment

Assessment must confirm consistency (over time and in a range of workplace relevant contexts) in application of skills and knowledge when:

- organising work
- completing tasks according to instructions
- working systematically with attention to detail
- identifying improvements and avoiding damage
- using workplace practices
- using OHS practices
- assessing operational readiness of tools and equipment
- recognising and adapting to cultural differences in the workplace, including modes of behaviour and interactions

**EVIDENCE GUIDE**

Assessment must include a variety of project or work activities that allow the candidate to demonstrate competency in the unit

Assessment should be by direct observation of tasks and include questioning on required knowledge and skills to ensure correct interpretation and application.

Assessment should be conducted over time and may be in conjunction with assessment of other units of competency

The following examples are appropriate for this unit:

oral and written questions about piano tuning theory, basic acoustics and musical scale theory and their application to piano tuning

practical demonstration of identifying piano notes aurally

review of portfolios of evidence and third party workplace reports of the candidate's on-the-job performance

## Range Statement

<b>RANGE STATEMENT</b>	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<b>Legislative/regulatory requirements</b>	All work must comply with relevant Federal and State or Territory legislative or regulatory requirements.
<b>Basic acoustics may include</b>	Sound waves, beats, frequencies, harmonics, cycles, partials, overtones, nodes, fundamentals, sine waves, intonation, transients, cents, commas, compound tones, inharmonicity.
<b>Piano Tuning Theory may include:</b>	<ul style="list-style-type: none"> <li>• how wire vibrates</li> <li>• what happens when two or more wires vibrate simultaneously</li> <li>• how vibrations are organised into a tuning scale</li> <li>• how vibrations are related mathematically</li> <li>• pitch, beat rates, intervals, octave stretching.</li> </ul>
<b>Musical scale theory may include:</b>	Diatonic scale, equal temperament and why, mean tone.
<b>Laws of Strings may include:</b>	First law, Third law, Combined law and Taylor's Formula, Need for wrapped strings

## Unit Sector(s)

<b>Unit sector</b>	Piano Technology
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## Competency field

<b>Competency field</b>	
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## Co-requisite units

<b>Co-requisite units</b>		