

Fractions

This paper outlines background information to guide teaching and learning of fractions to support Year 4 Mathematics QCAT implementation.

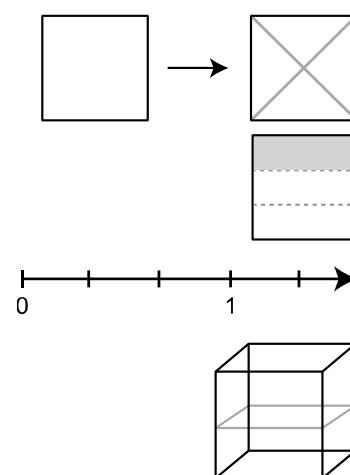
The **continuous** (area, linear) and **discrete** (set) fraction models are explained to show how evidence of fractional thinking and understanding (both “part” and “whole”) is gathered.

Fractions are **equal parts** of a whole and can be generated by **partitioning** that whole into equal parts. The **number of equal parts** generates the **fraction name**.¹ It is essential that students engage in a variety of materials and fraction models if successful development and depth of fractional thinking and understanding is to occur.²

Continuous model (area, linear, volume)

Continuous fraction models demonstrate how a whole can be continuously partitioned into equal parts.

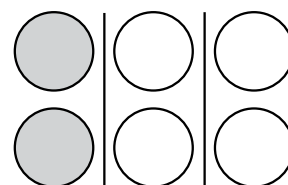
- Area — identifies the *whole* and *parts* of the whole (most familiar model for students).
- Linear — identifies discrete points on a line and provides opportunities for students to see how mixed numbers can be represented.
- Volume — not targeted in this assessment.



Discrete model (set)

Discrete fraction **models** demonstrate how one **set** of objects can be partitioned into equal parts.

- Set — enables students to partition a discrete set of objects.



Useful terms and definitions

Representation	images, numbers or words describing a fractional concept
Improper fraction	has a numerator larger than its denominator and represents a quantity greater than the whole (1)
Mixed number	has a whole number part and a fractional number part
Decimal notation	equal parts of a whole number, usually identified in tenths, hundredths or thousandths, using whole and part numbers separated by a decimal point
Equivalent fraction	mixed number, improper fraction, decimal or fraction having the same value, but represented differently

1 Australian Government 2004, *Developing Mathematics Understanding Through Cognitive Diagnostic Assessment Tasks, Cross sector project*, Education Queensland, Queensland Catholic Education Commission and Independent Schools Queensland.

2 Dienes, ZP (ed.) 1969, *Journal of Structural Learning and Intelligent Systems*, June vol. 39 no. 4, Gordon and Breach USA.