# Le mappe concettuali nell'apprendimento della MATEMATICA

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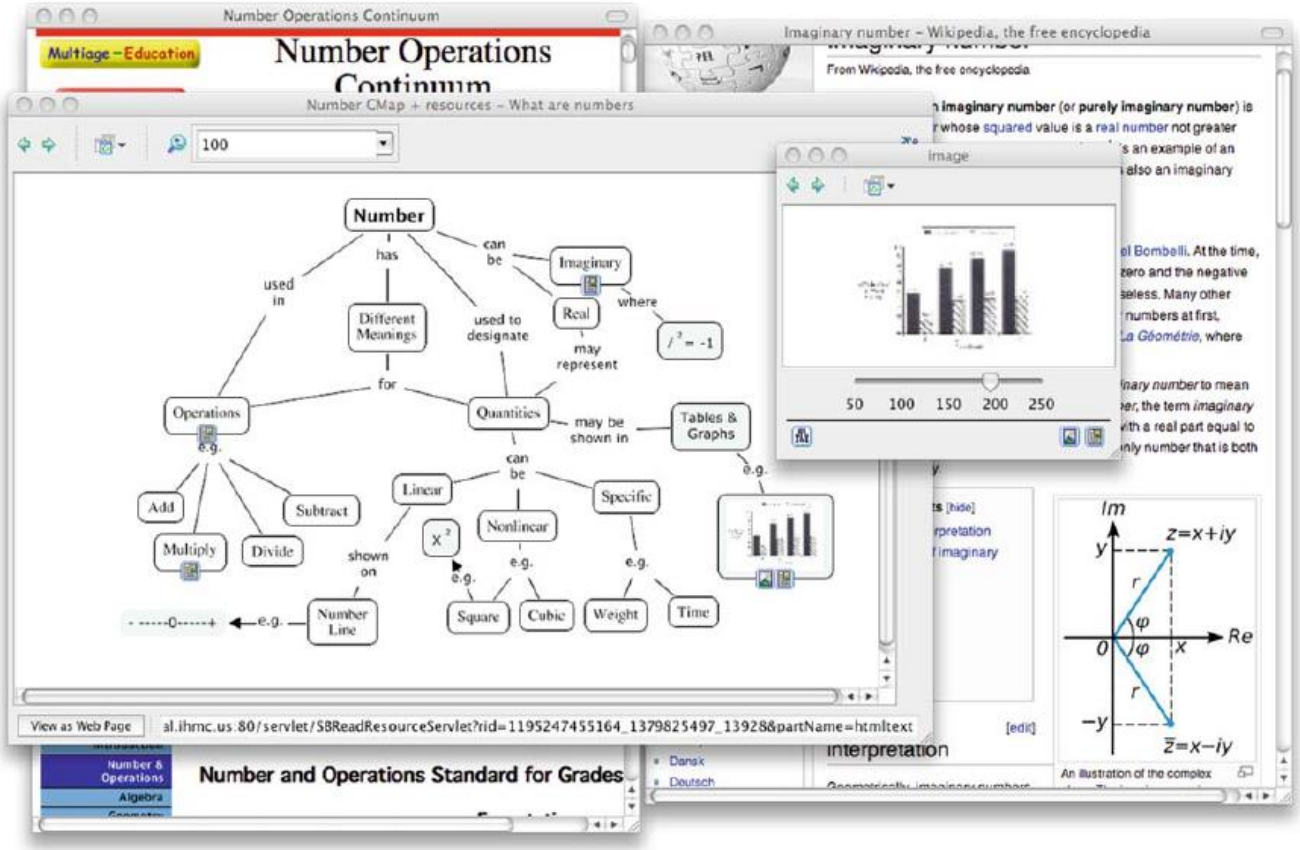
*Editor*

# Concept Mapping in Mathematics

## Research into Practice

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## *"Mappatura" dei concetti in matematica*

Lo strumento meta-cognitivo delle mappe concettuali può essere utilizzato in modo innovativo e strategico per migliorare la progettazione, l'insegnamento, l'apprendimento e la valutazione a diversi livelli educativi.

Il libro esamina l'utilità delle mappe concettuali nel contesto educativo, con applicazioni ed esempi che vanno dalle classi elementari fino alla secondaria . Serve anche  per la formazione degli insegnanti.

Le basi teoriche delle mappe concettuali sono riferibili: 1) alla teoria cognitiva di Ausubel sull'apprendimento significativo ; b) alla psicologia costruttivista e vygotskiana .

Le evidenze della ricerca cognitiva dimostrano che sia l'alfabetizzazione matematica sia le capacità di problem solving possono essere migliorate attraverso la la COOPERAZIONE e l'interazione degli studenti mentre lavorano, dialogano e comunicano "matematicamente".

In questo senso il libro propone la strategia metacognitiva delle mappe concettuali come mezzo importante per promuovere, comunicare e spiegare pubblicamente il pensiero matematico e il ragionamento in contesti sociali di apprendimento reciproco.

**Seguono 13 mappe esemplificative.**
**Sono da proporre in ambienti collaborativi. Buon lavoro!**

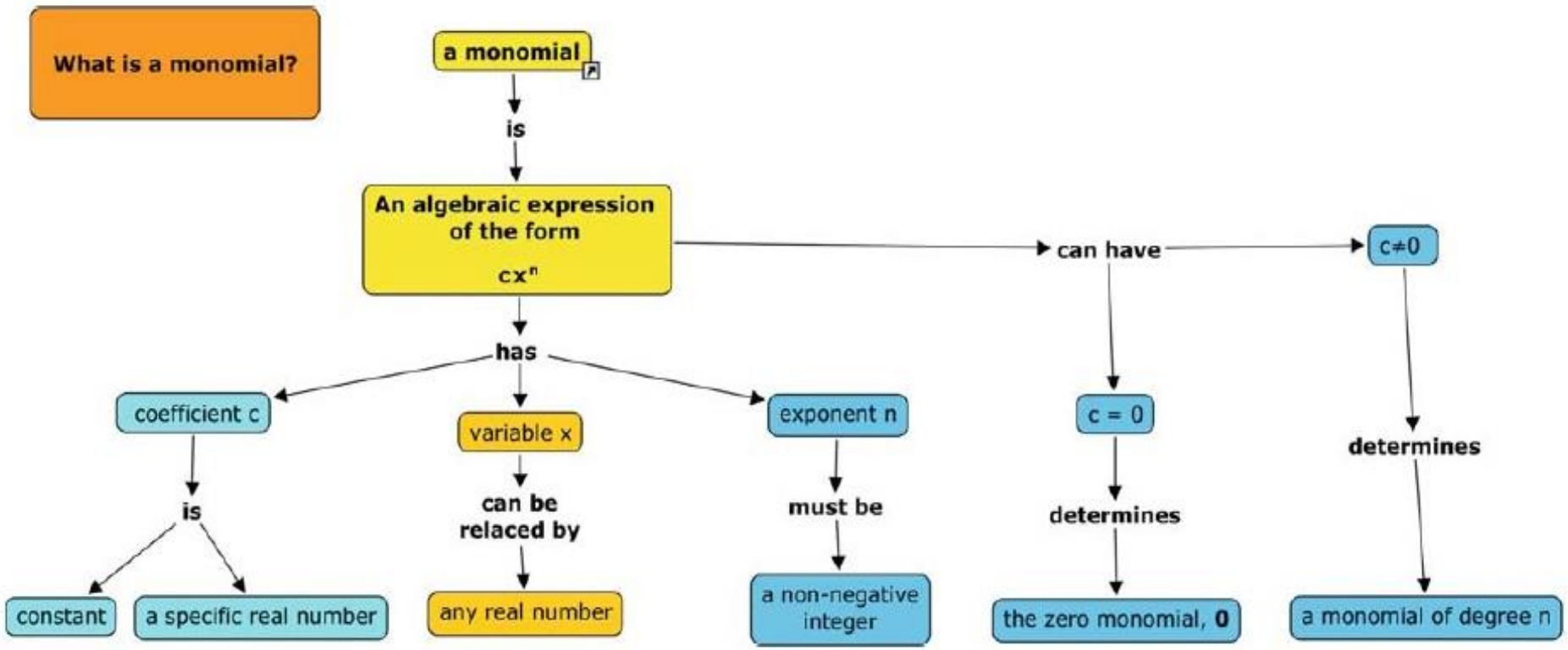



Fig. 11.1 Definition and characteristics of a monomial

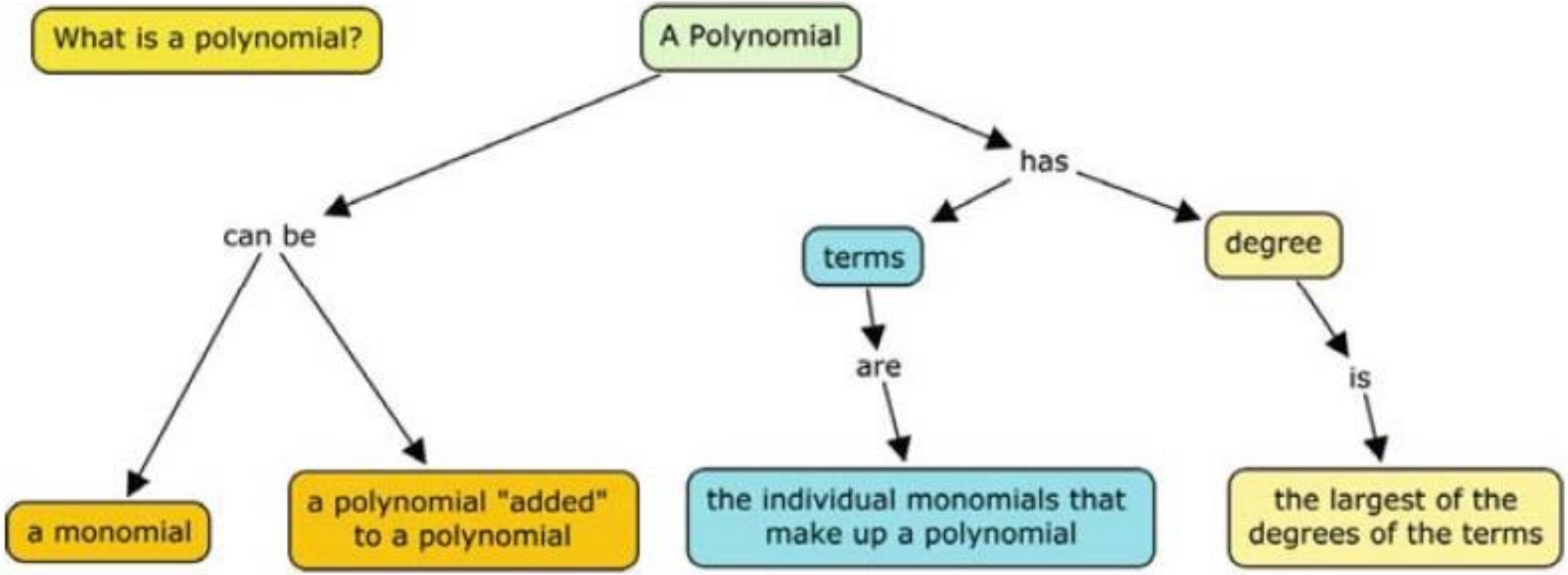



**Fig. 11.3** Definition of a polynomial

**Fig. 4.1** Early Stage 1 *Fractions* concept map

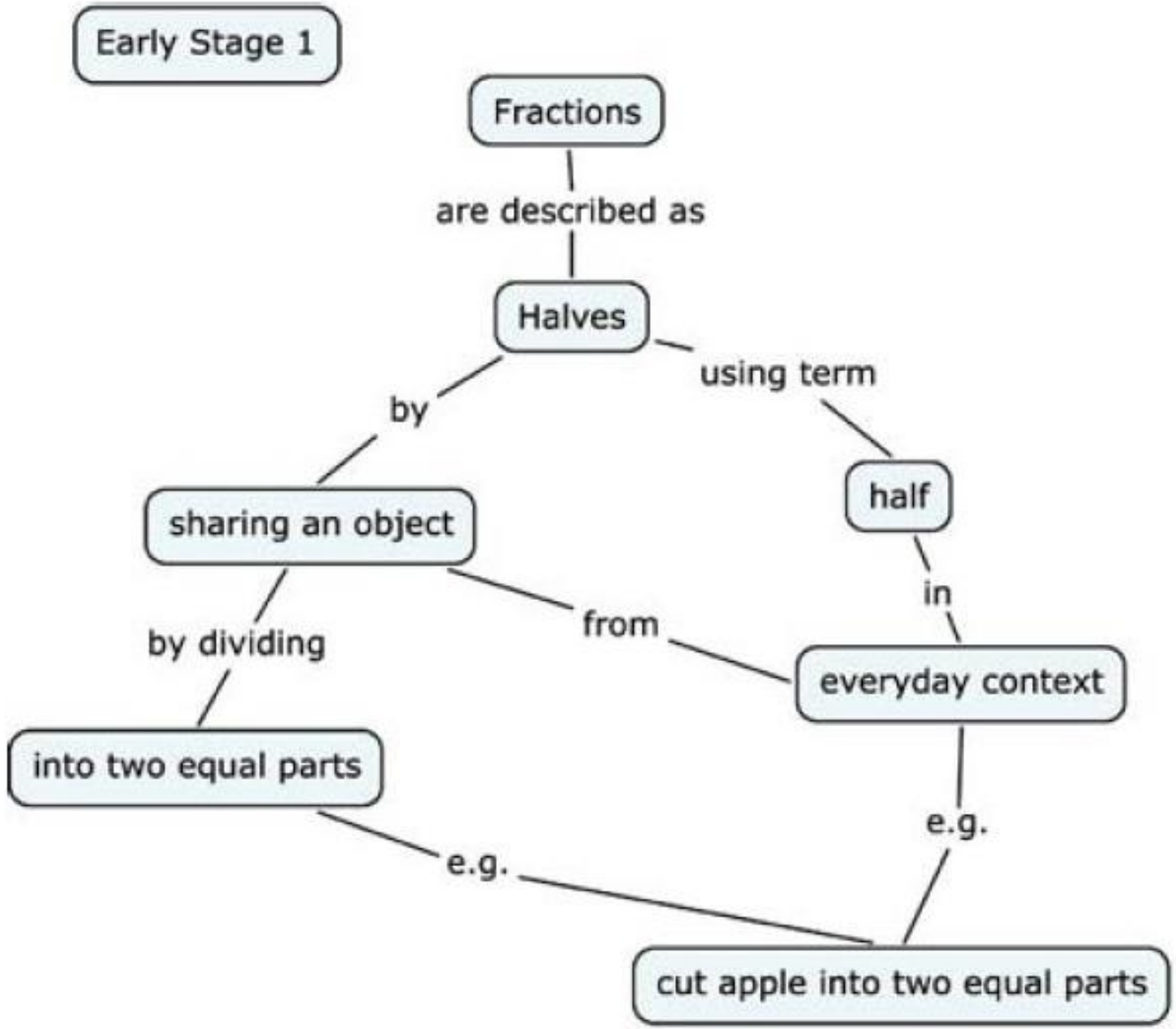
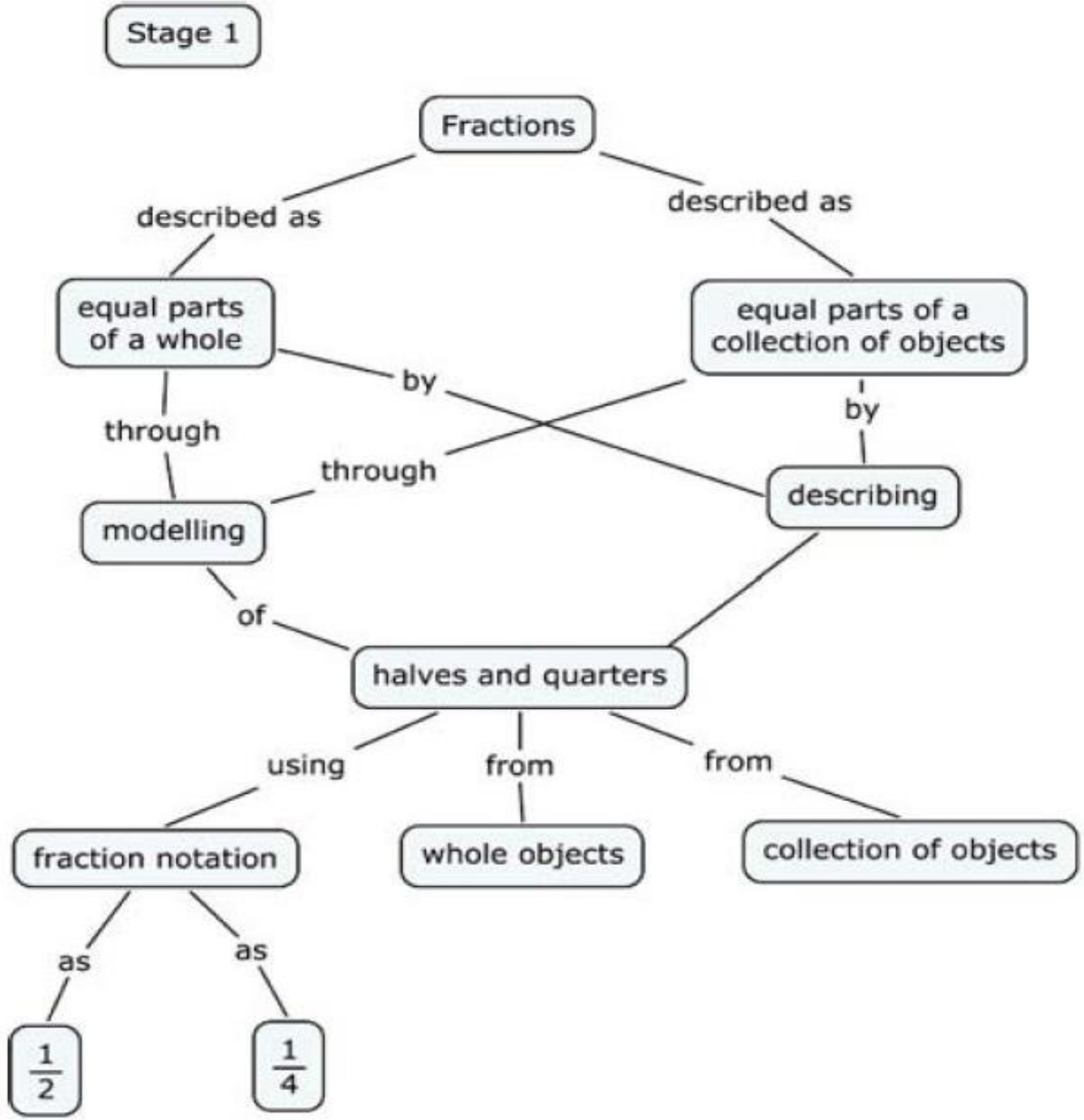
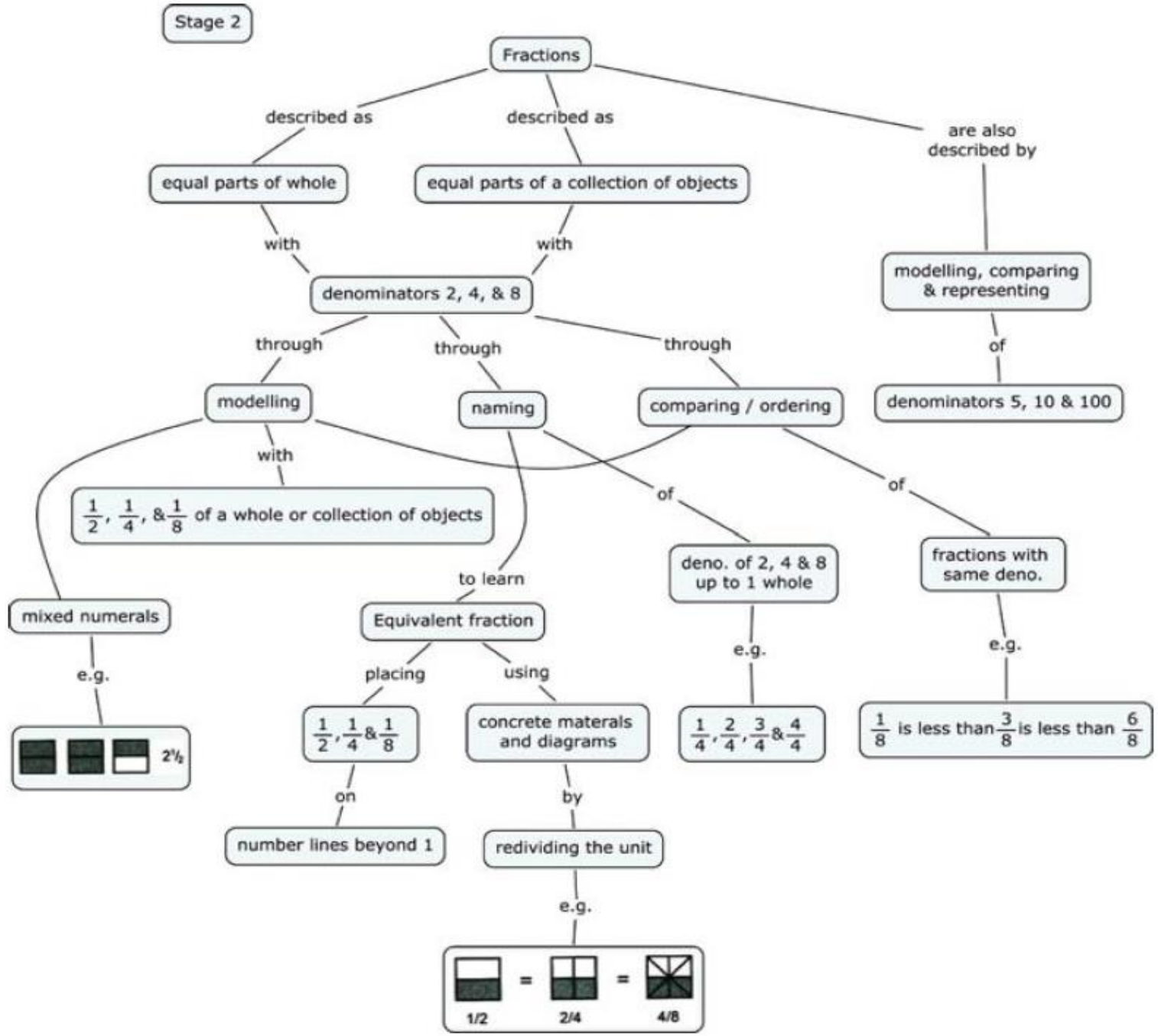


**Fig. 4.2** Stage 1 *Fractions* concept map




Stage 2
Fractions
described as
equal parts of whole
with
described as
equal parts of a collection of objects
with
are also described by
modelling, comparing & representing
of
denominators 5, 10 & 100
denominators 2, 4, & 8
through
modelling
with
$\frac{1}{2}$, $\frac{1}{4}$, & $\frac{1}{8}$ of a whole or collection of objects
mixed numerals
e.g.
2½
through
naming
to learn
Equivalent fraction
placing
$\frac{1}{2}$, $\frac{1}{4}$ & $\frac{1}{8}$
on
number lines beyond 1
using
concrete materals and diagrams
by
redividing the unit
e.g.
1/2 = 2/4 = 4/8
through
comparing / ordering
of
deno. of 2, 4 & 8 up to 1 whole
e.g.
$\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ & $\frac{4}{4}$
of
fractions with same deno.
e.g.
$\frac{1}{8}$ is less than $\frac{3}{8}$ is less than $\frac{6}{8}$

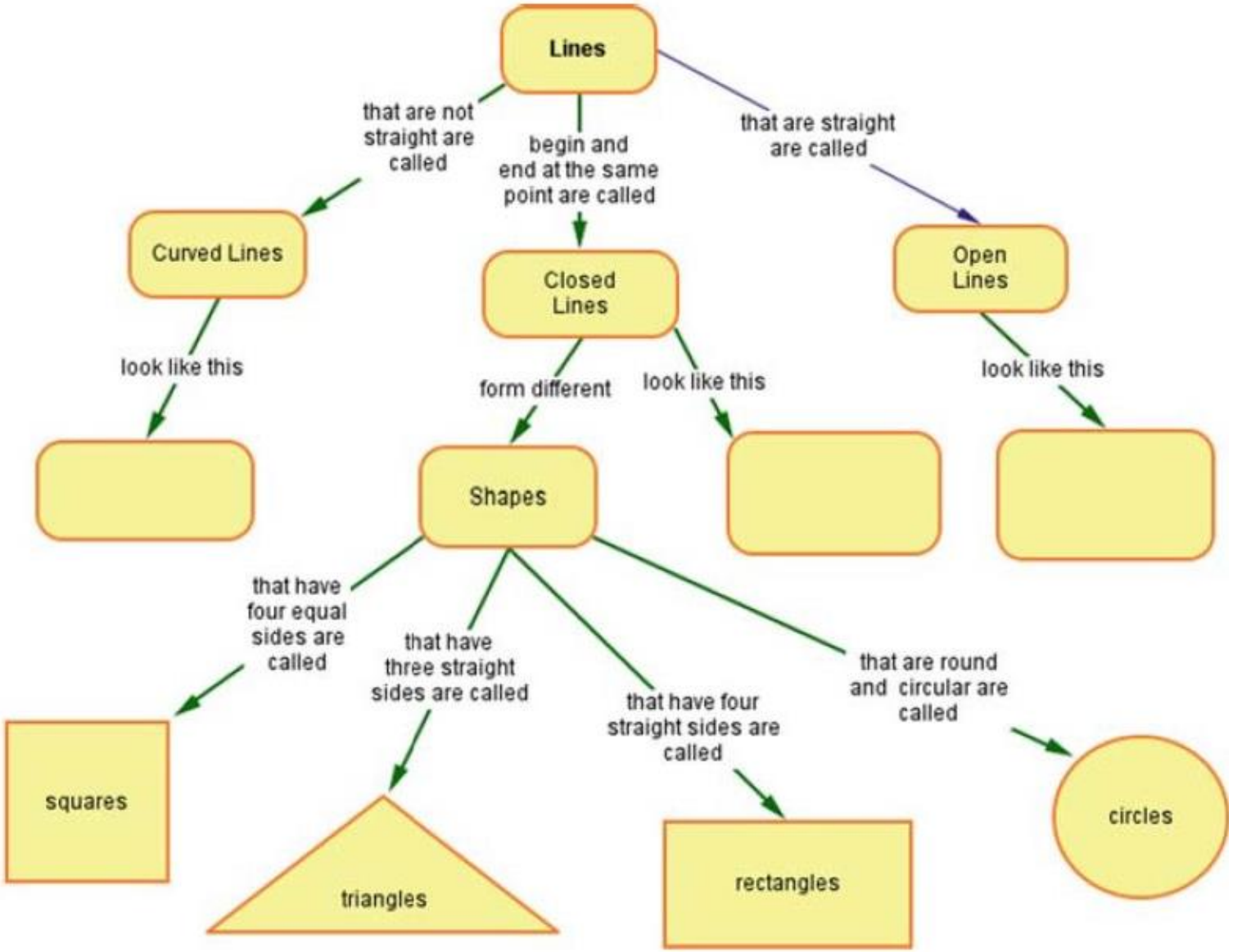



**Fig. 5.3** A *Fill-in-Nodes* concept map – *Lines*

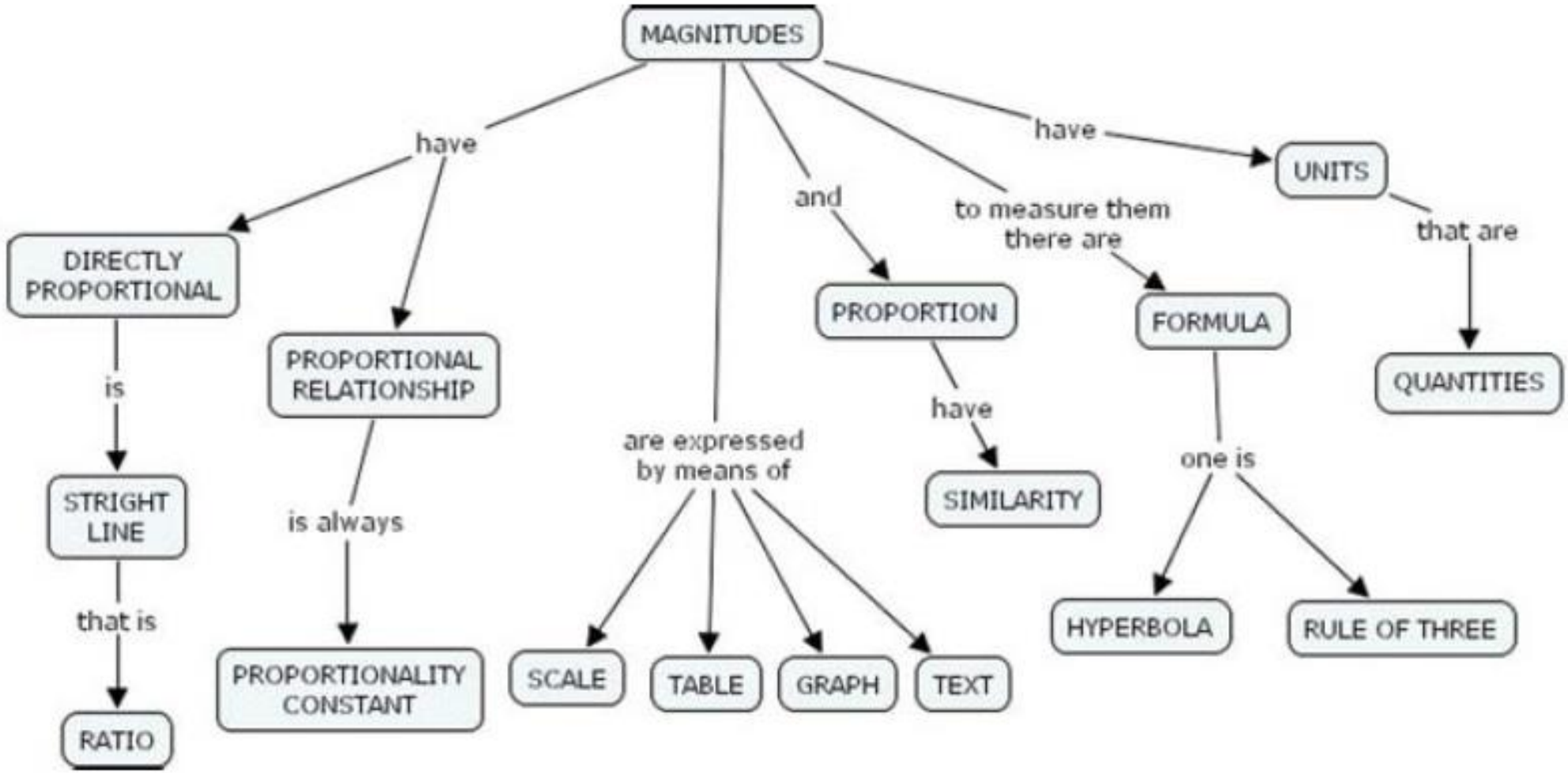



**Fig. 6.4** I.M.'s first map

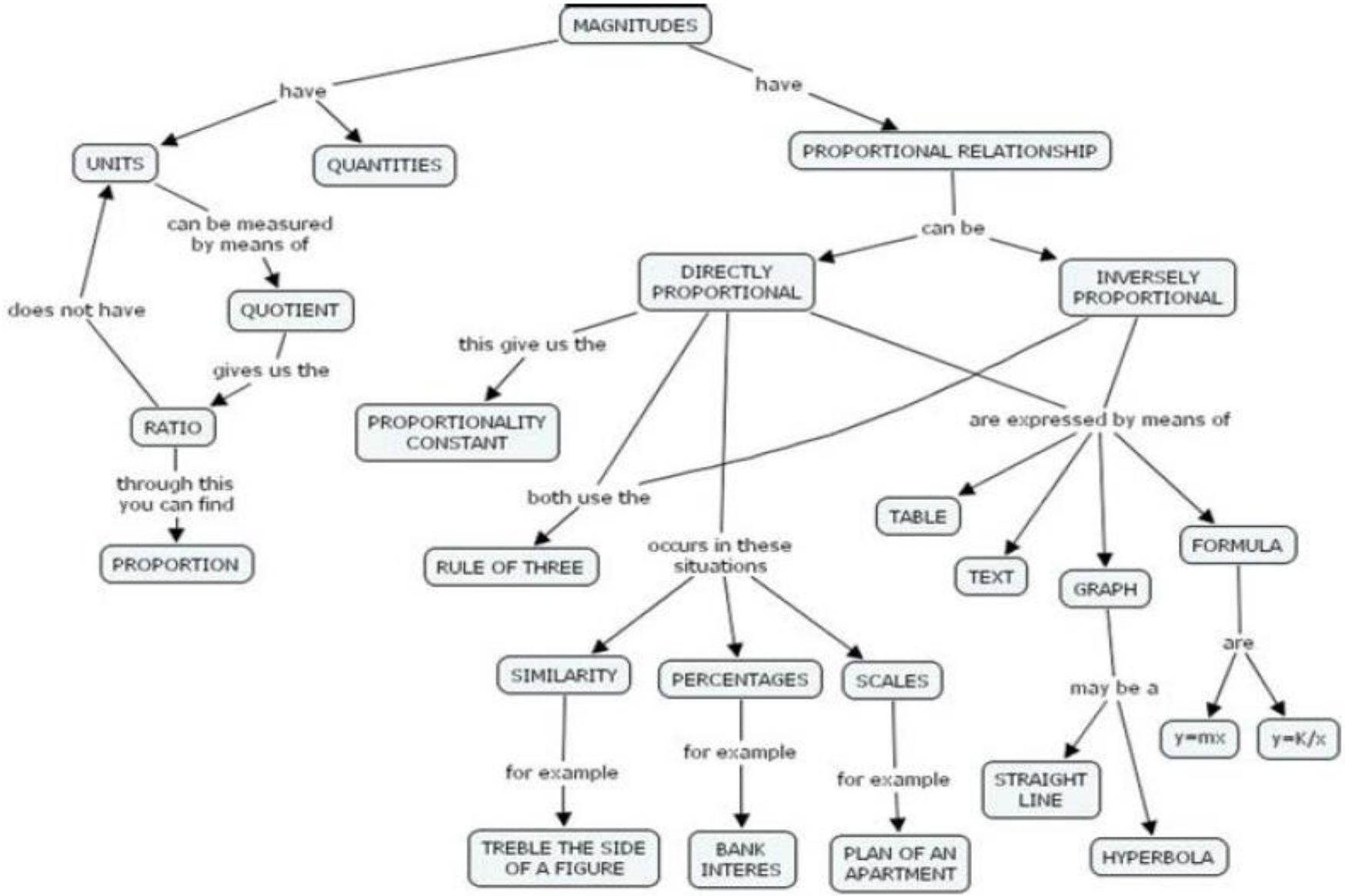



**Fig. 6.5** I.M.'s final map

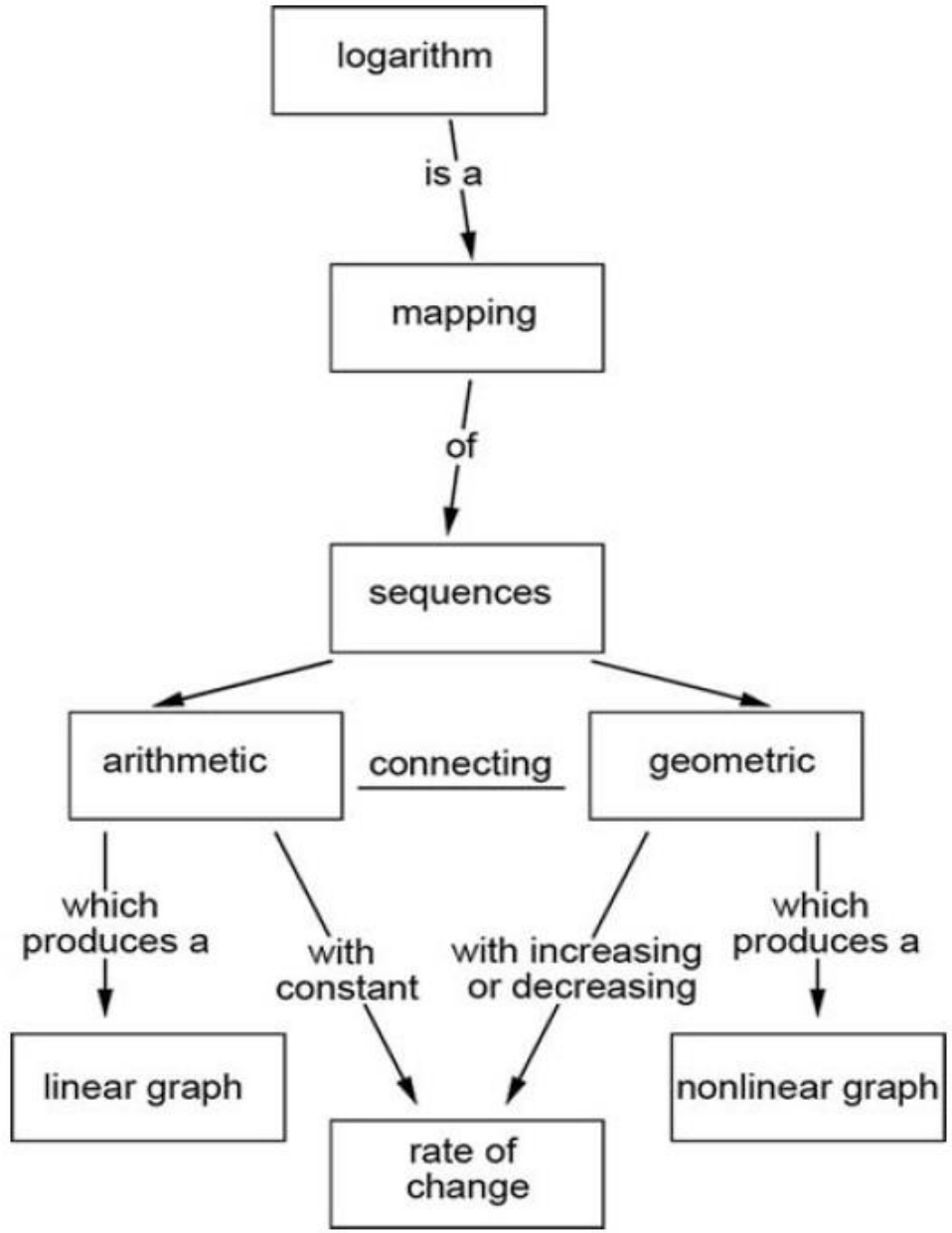



**Fig. 9.3** Concept map of logarithm showing the historical conceptual crosslink, genesis of a new mathematical idea

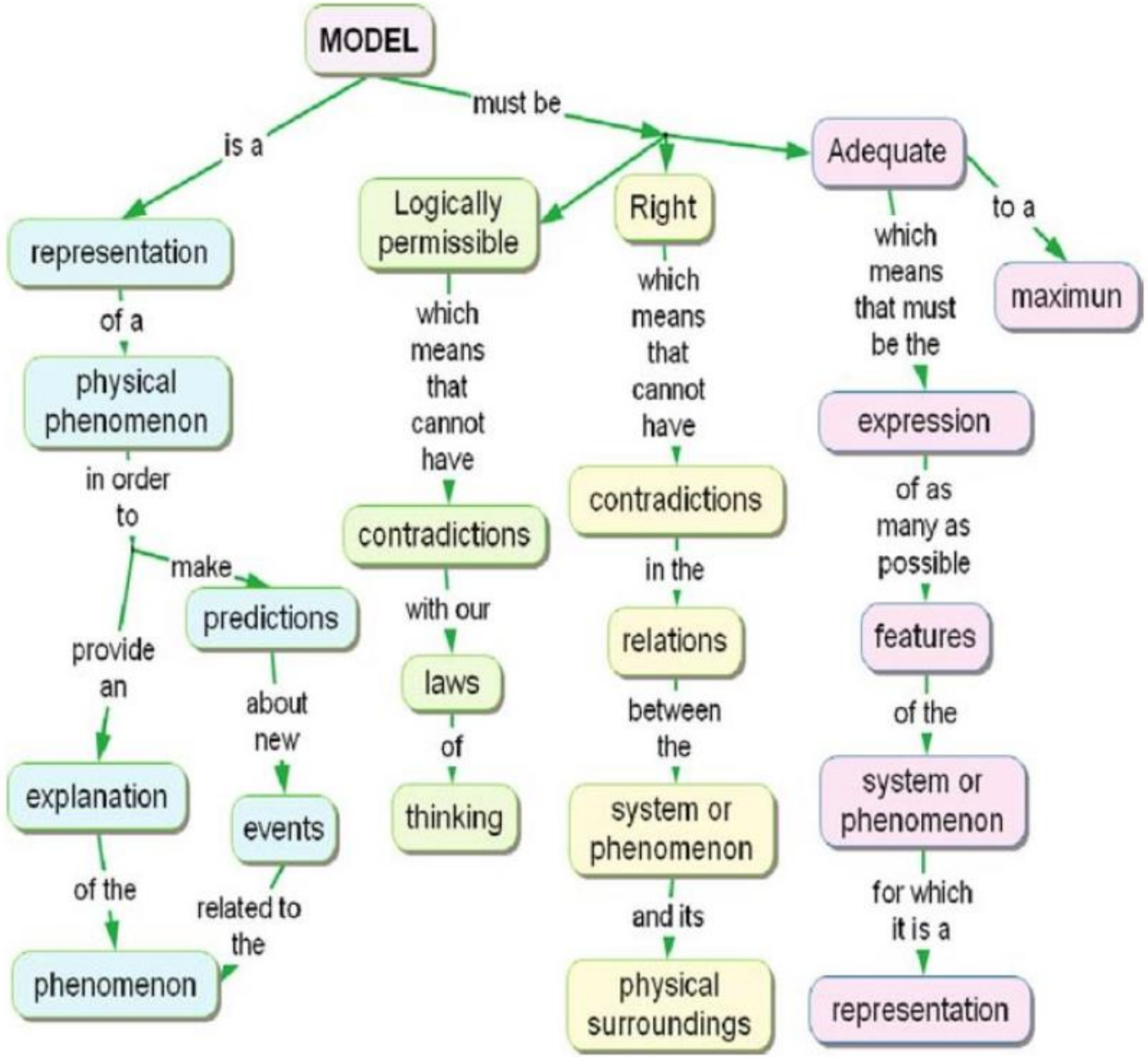



**Fig. 10.13** Concept map about *model*

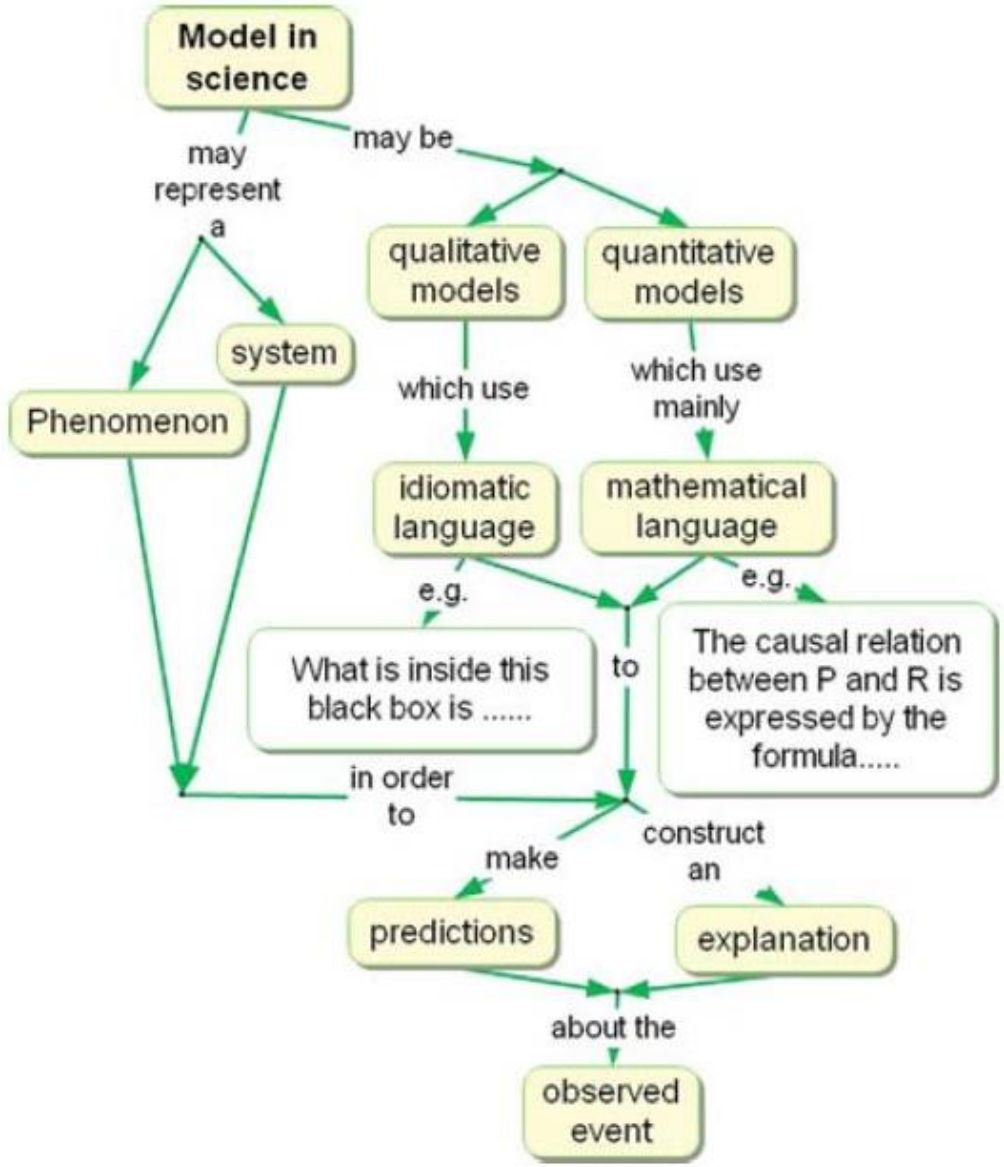



**Fig. 10.14** Concept map about *model* in science

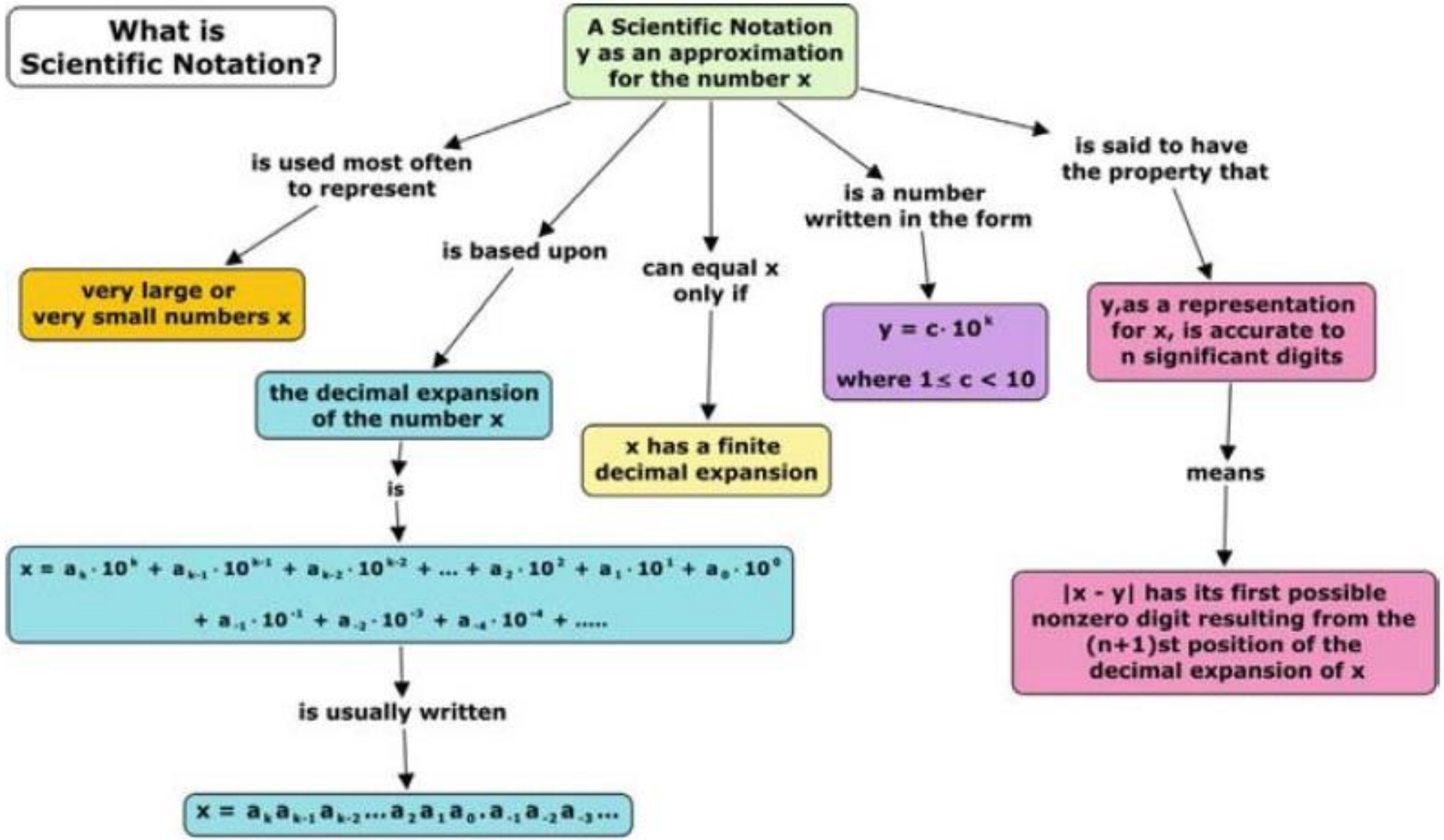



**Fig. 11.11** A formal concept map definition of scientific notation

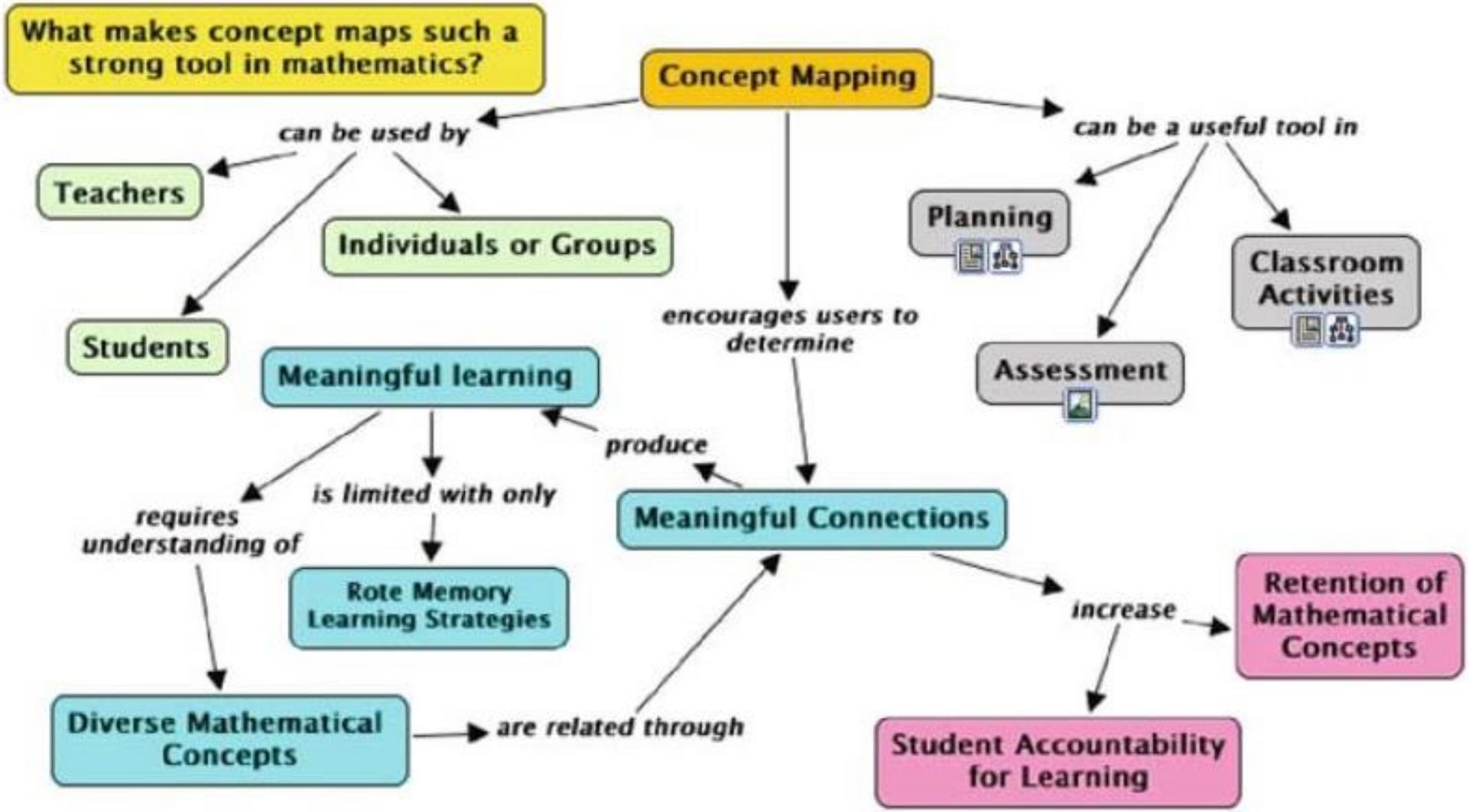
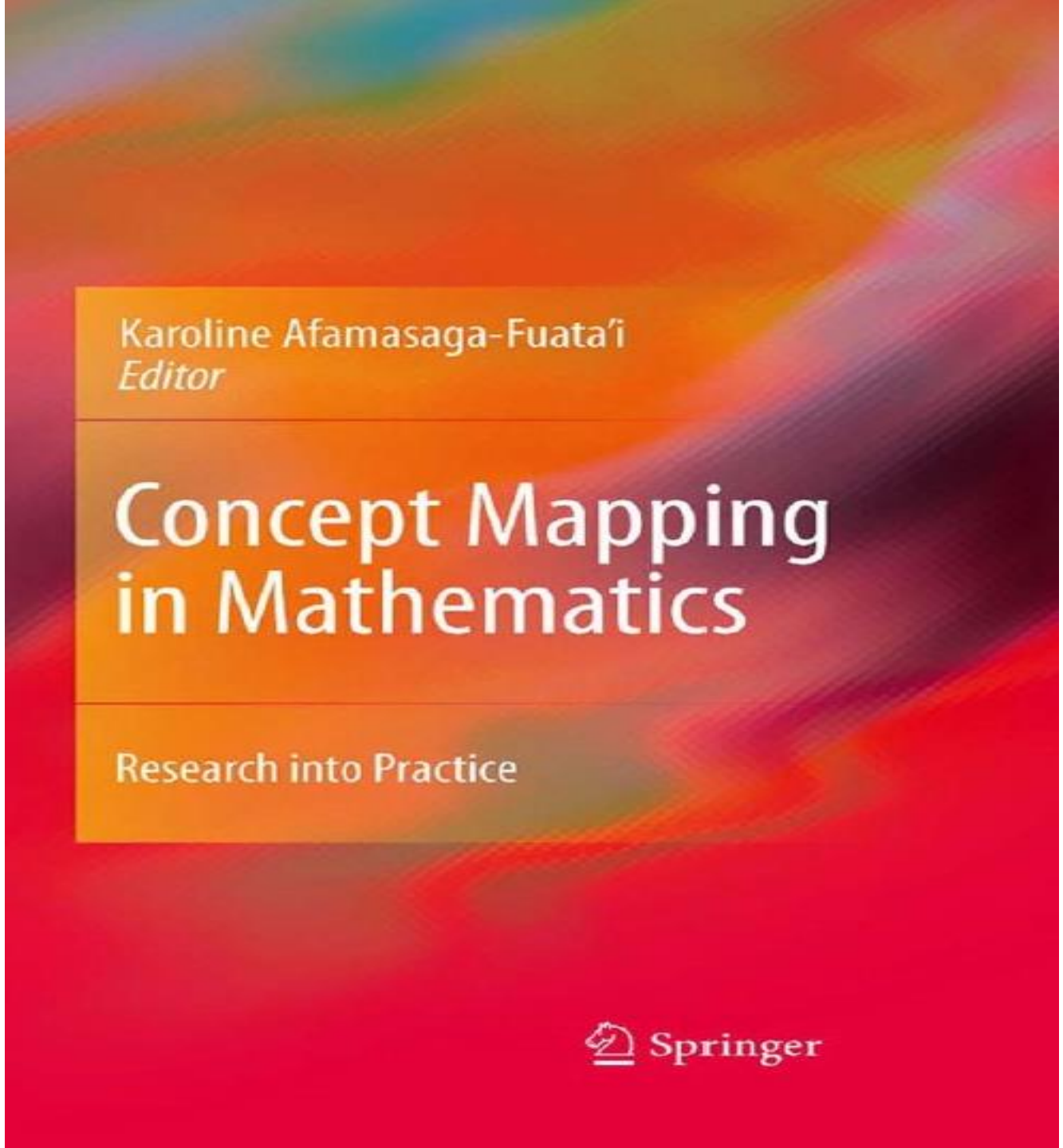



**Fig. 11.13** The value of using concept maps in mathematics courses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