



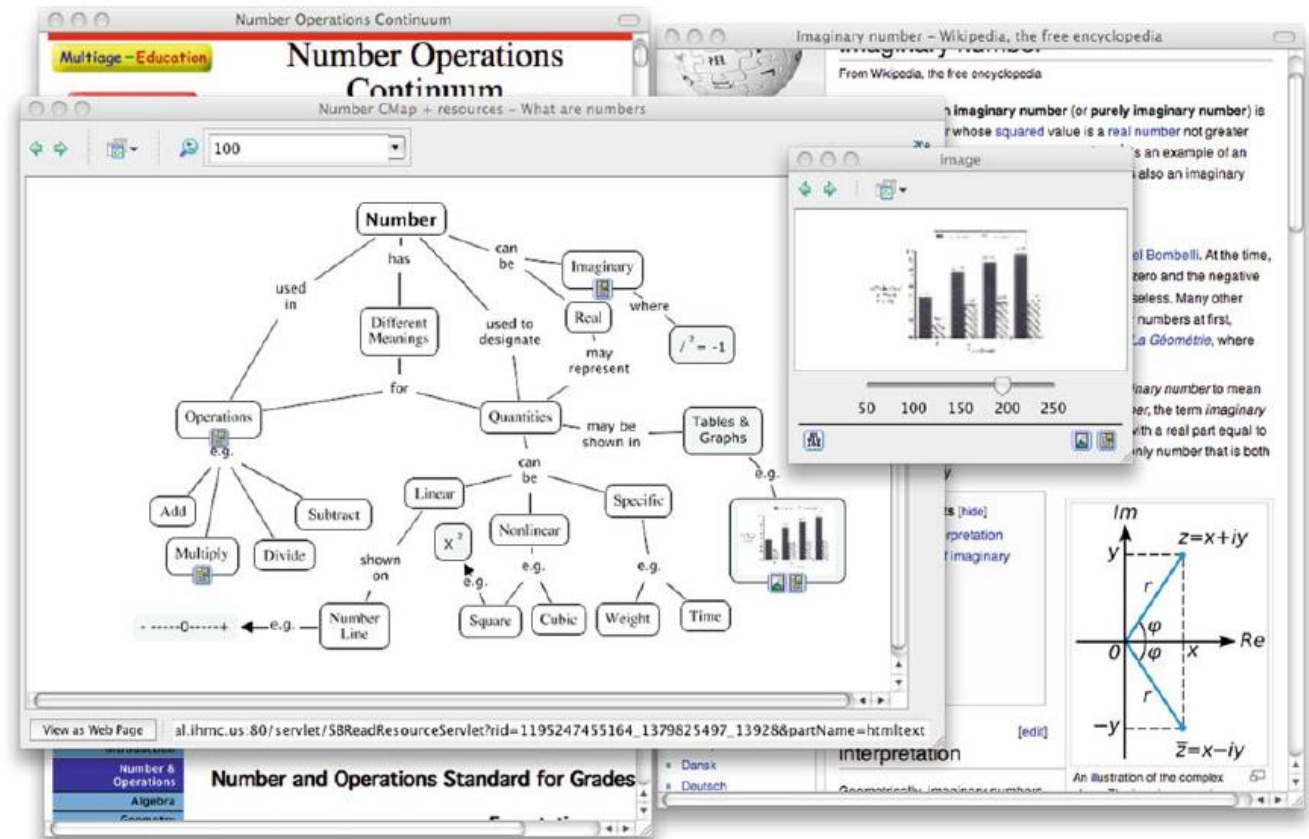
**Le mappe concettuali
nell'apprendimento della MATEMATICA
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GIS - Gruppo Scienze CESEDI – Parole della Scienza
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Editor

Concept Mapping in Mathematics

Research into Practice



The image displays a collage of educational resources. The central focus is a concept map titled "Number Operations Continuum" from the "Multiage - Education" website. The map is a hierarchical tree structure starting with "Number" at the top. "Number" is linked to "Operations" (via "used in") and "Different Meanings" (via "has"). "Operations" branches into "Add", "Multiply", "Divide", and "Subtract", with "e.g." below it. "Different Meanings" is linked to "Quantities" (via "used to designate") and "Imaginary" (via "can be"). "Imaginary" is further linked to "Real" (via "where") and "where" (via "where"), with the equation $i^2 = -1$ shown. "Quantities" is linked to "Linear" (via "can be") and "Specific" (via "can be"). "Linear" branches into "Square" and "Cubic", with "e.g." below it. "Specific" branches into "Weight" and "Time", with "e.g." below it. "Quantities" is also linked to "Tables & Graphs" (via "may be shown in"). "Tables & Graphs" is linked to "Number Line" (via "shown on"). "Number Line" is linked to "Number Line" (via "shown on").

Other resources include a Wikipedia page for "Imaginary number" with a bar chart showing the distribution of imaginary numbers. A complex plane diagram shows a complex number $z = x + iy$ and its conjugate $\bar{z} = x - iy$ in the first and fourth quadrants respectively, with the real axis labeled "Re" and the imaginary axis labeled "Im". The angle ϕ is shown between the positive real axis and the vector z . A table titled "Number and Operations Standard for Grades" is also visible, with columns for "Number & Operations", "Algebra", and "Geometry".

"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 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!**

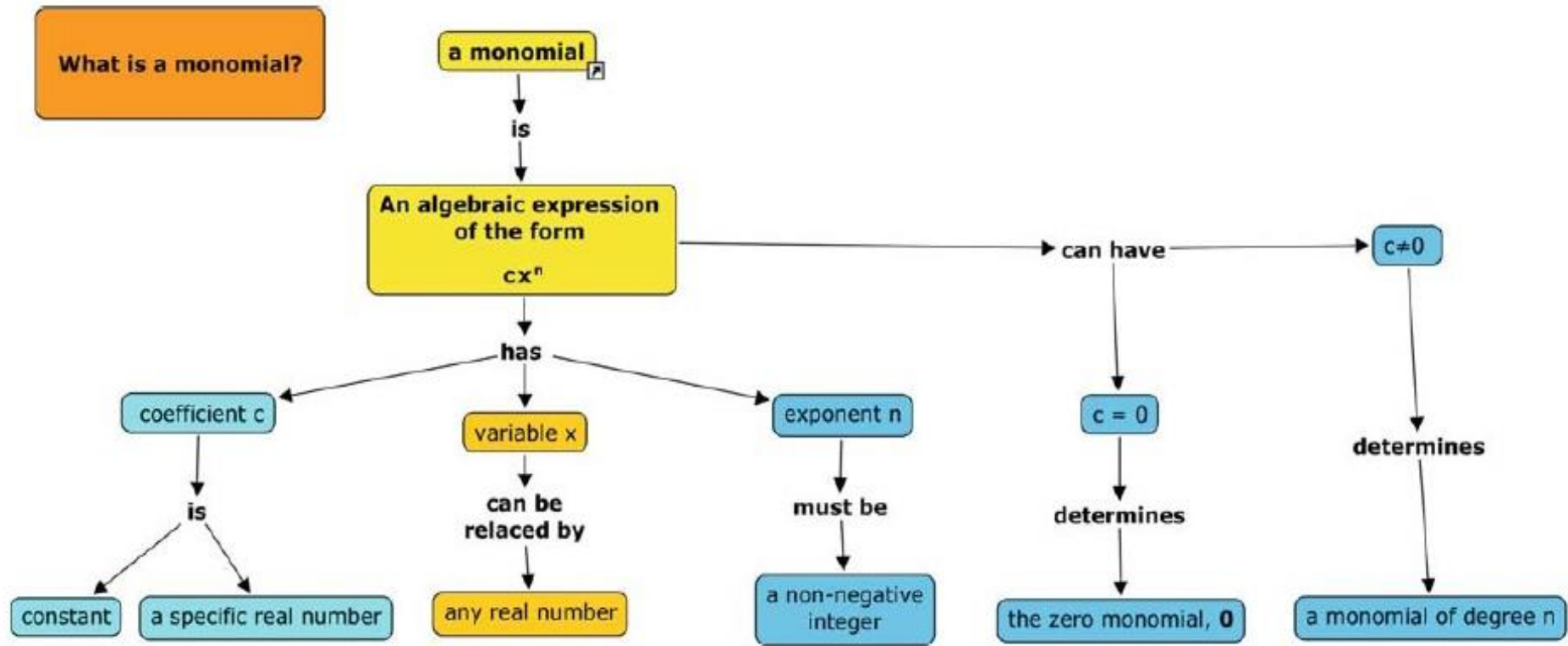


Fig. 11.1 Definition and characteristics of a monomial

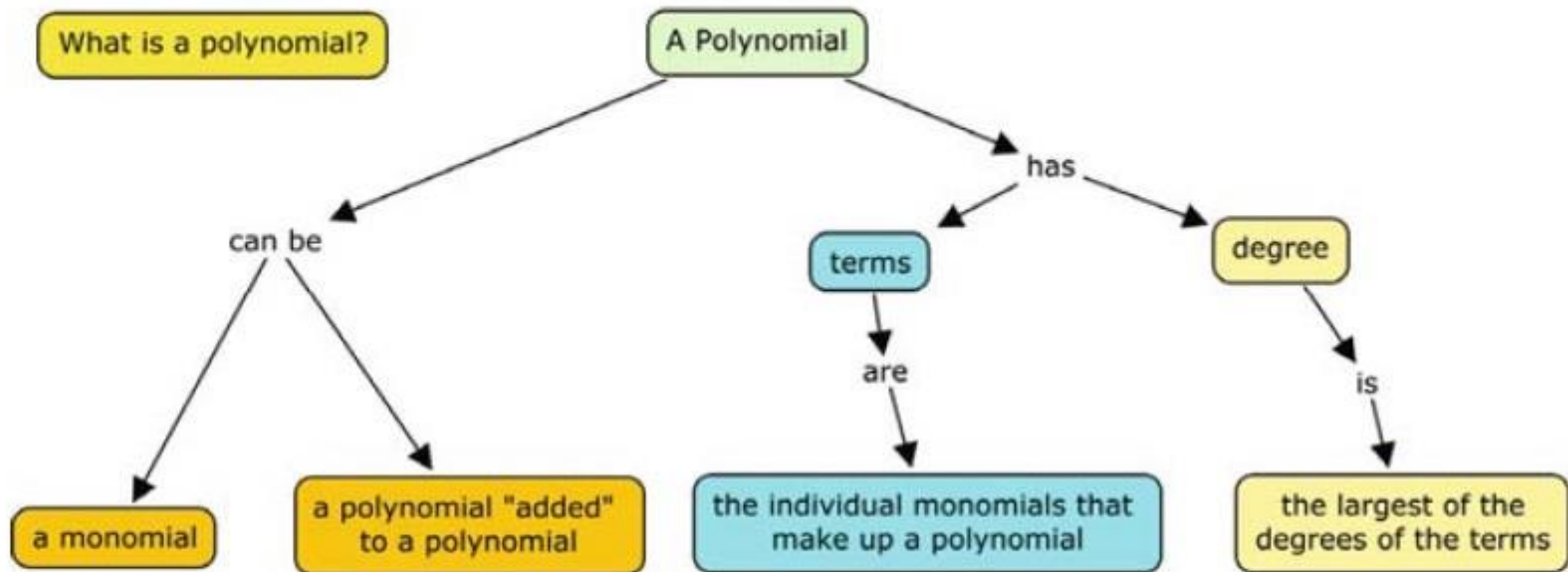


Fig. 11.3 Definition of a polynomial

Fig. 4.1 Early Stage 1
Fractions concept map

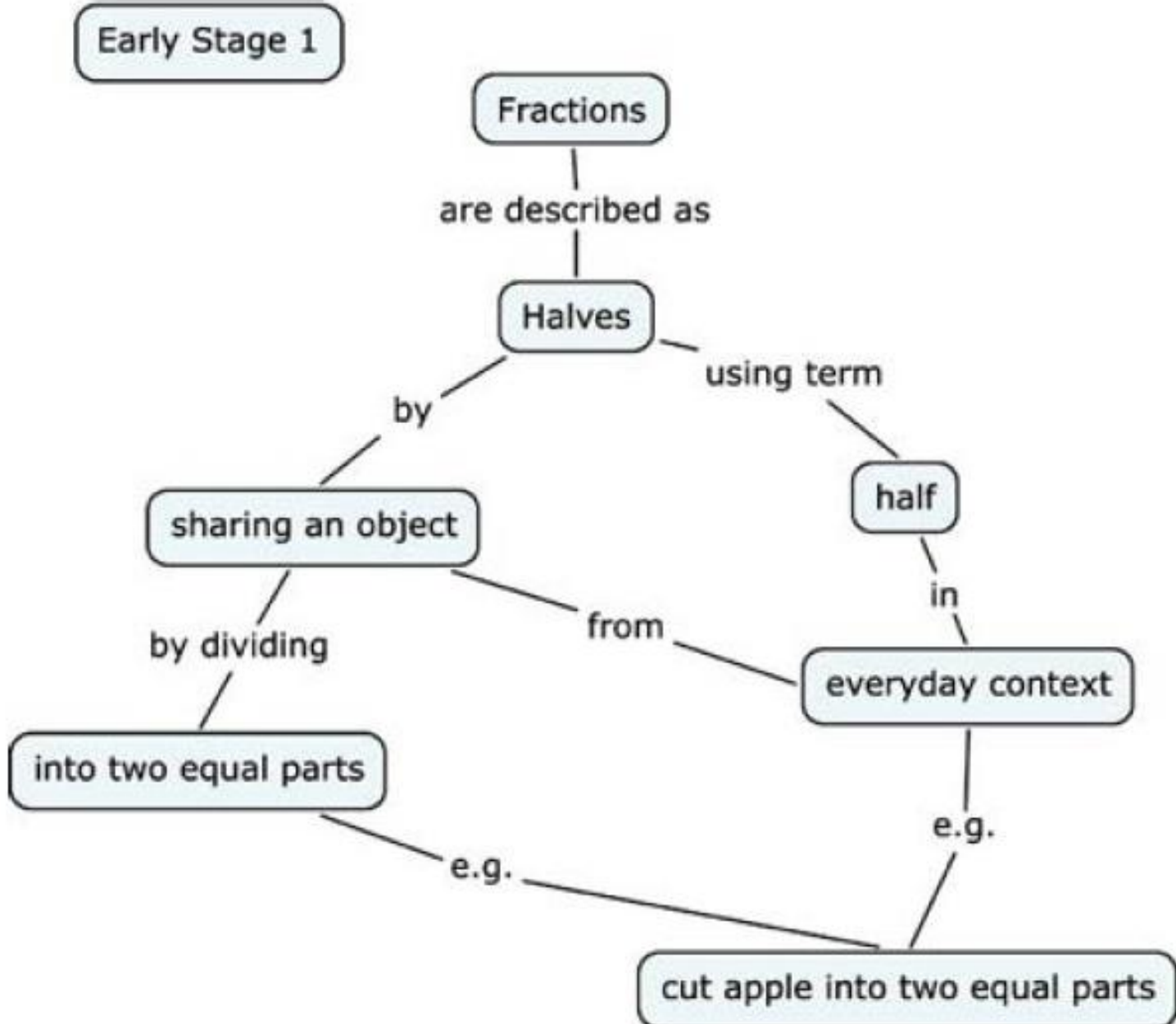
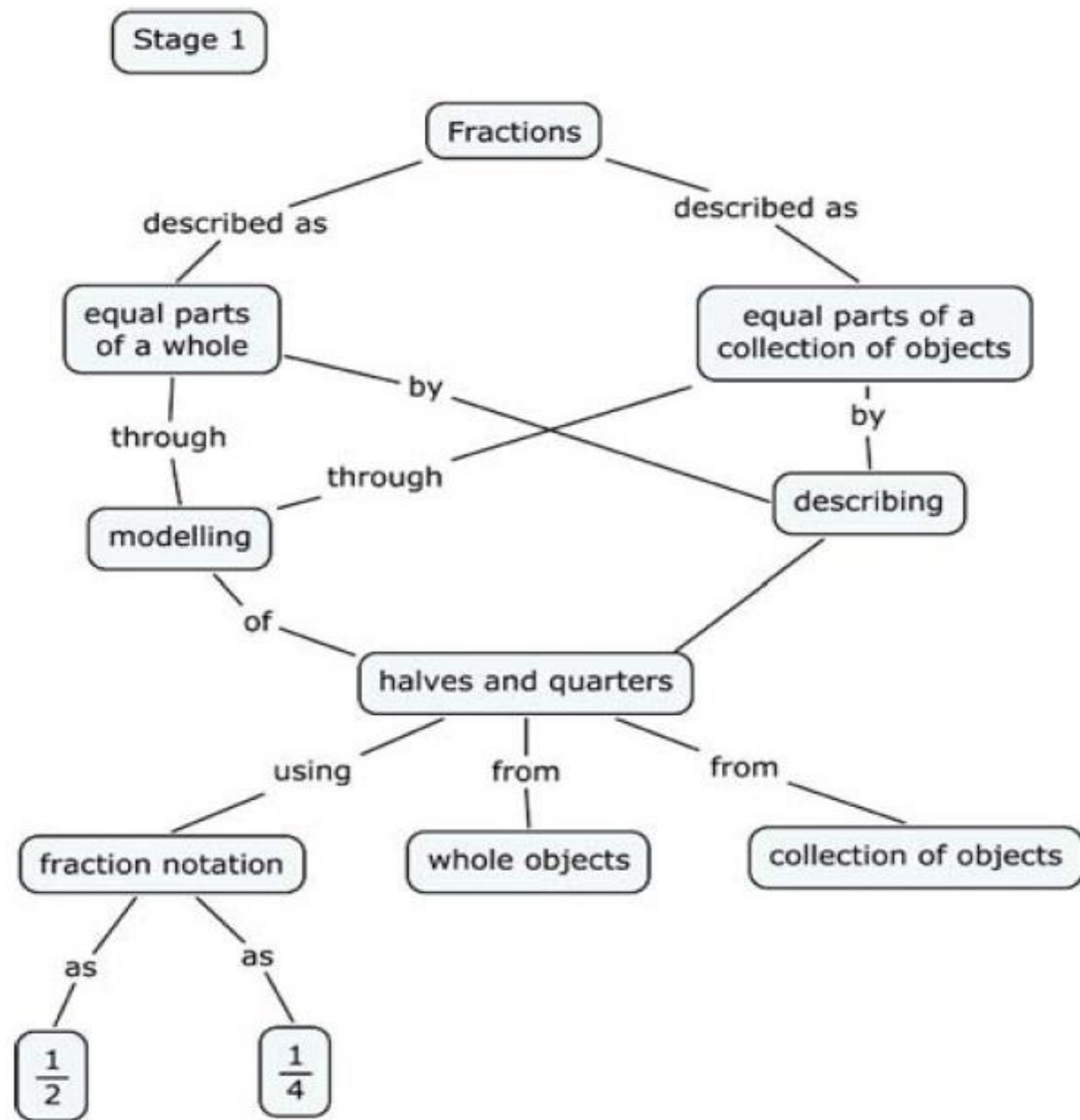
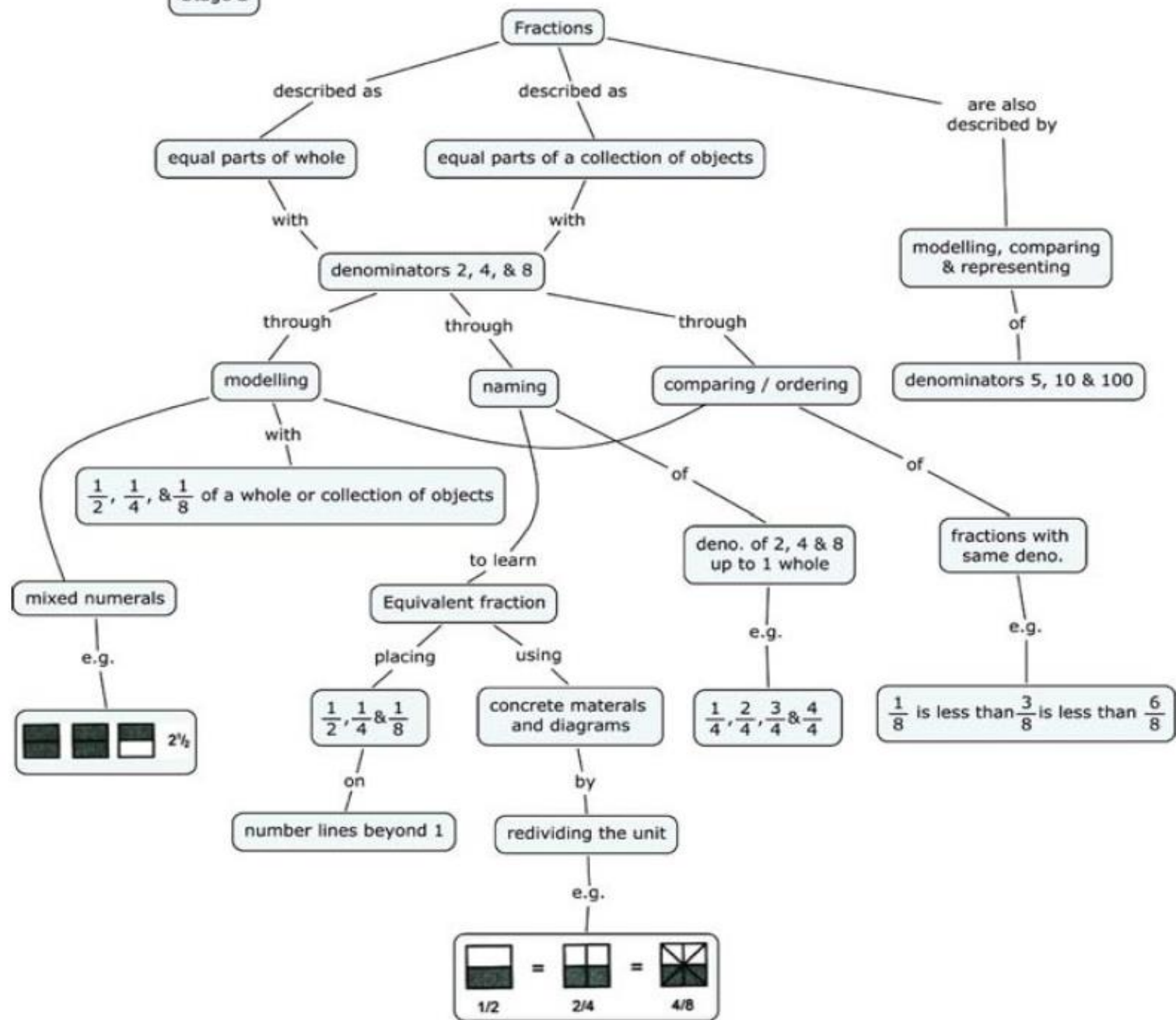


Fig. 4.2 Stage 1 *Fractions* concept map



Stage 2



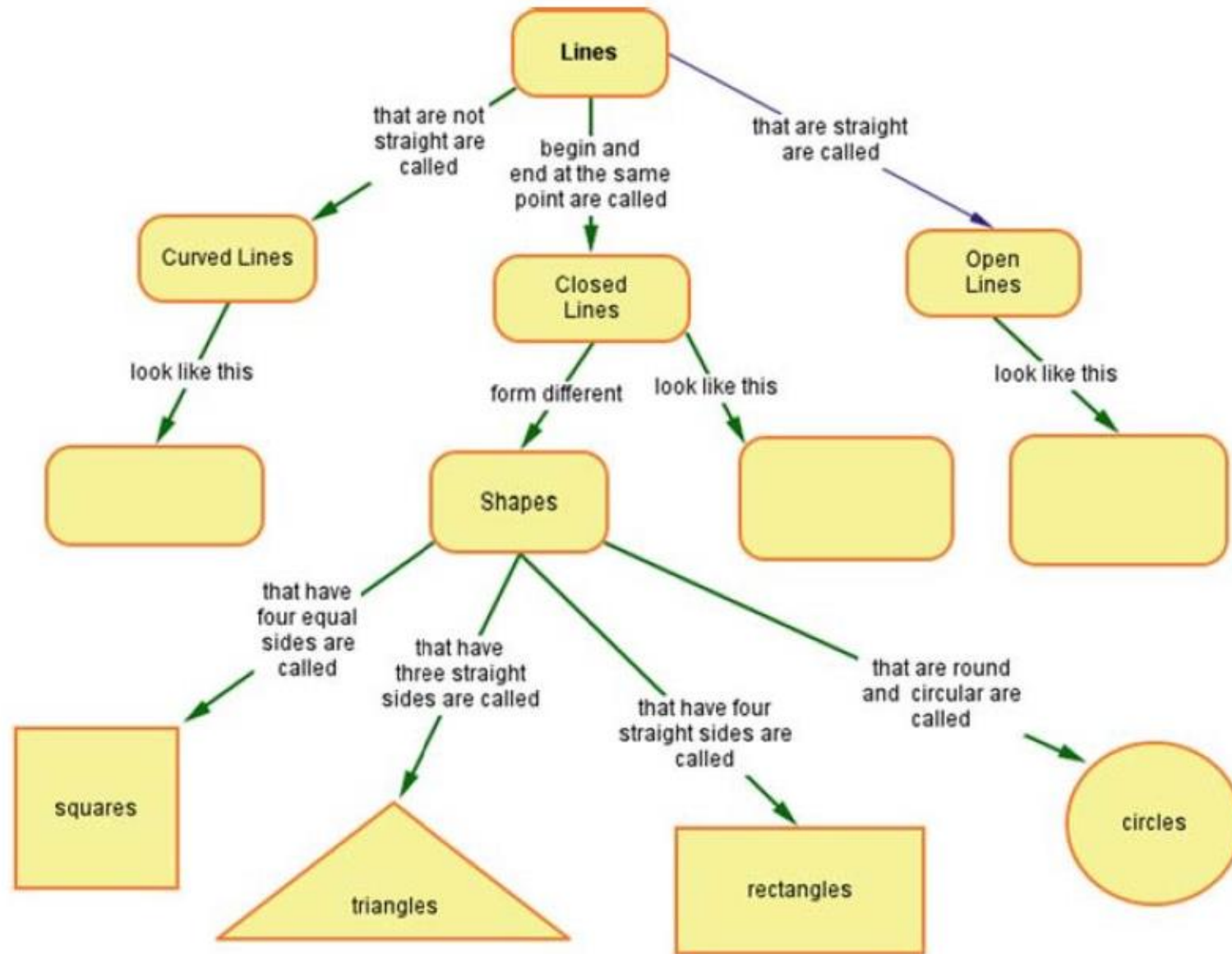


Fig. 5.3 A Fill-in-Nodes concept map – Lines

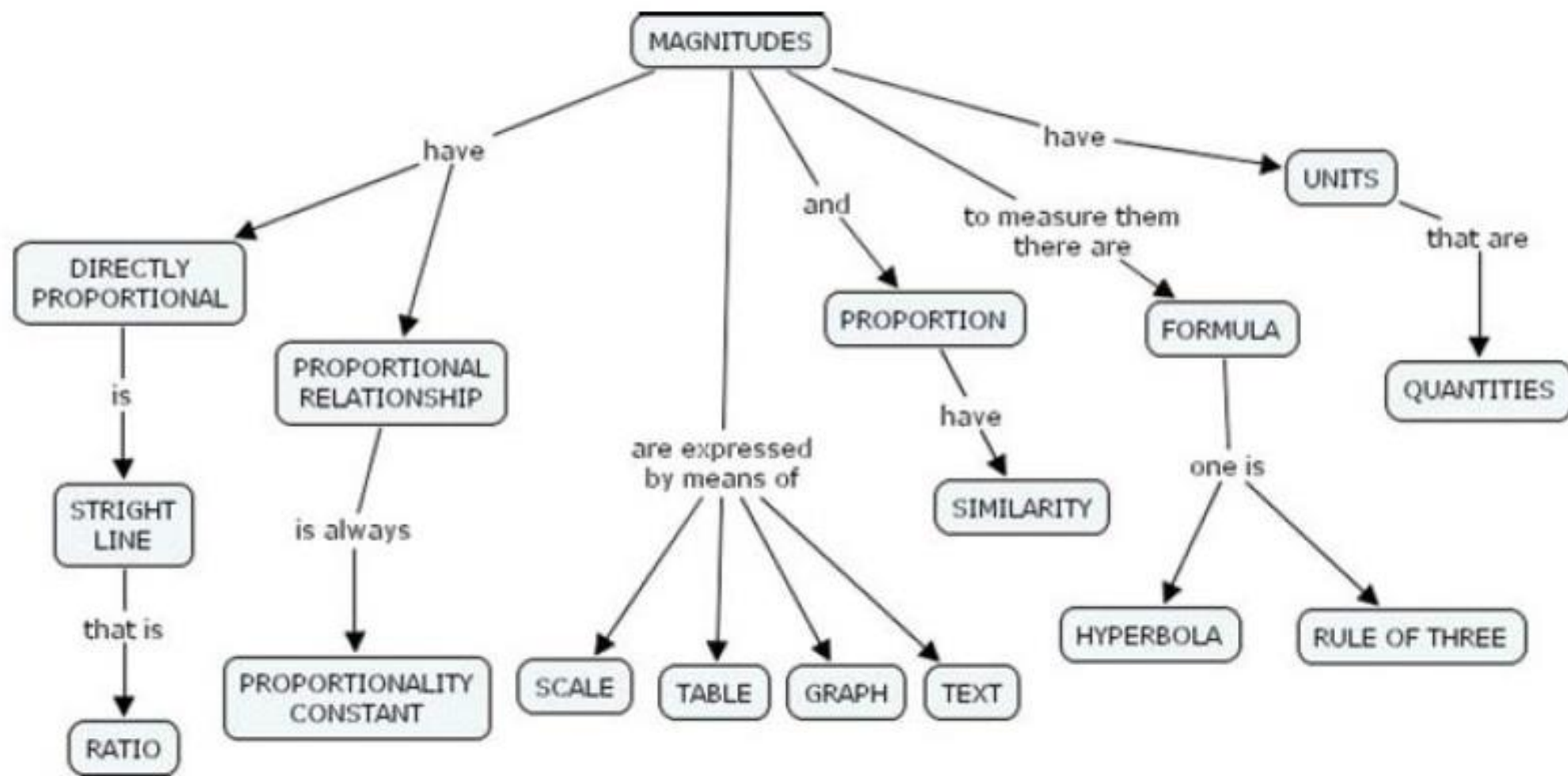


Fig. 6.4 I.M.'s first map

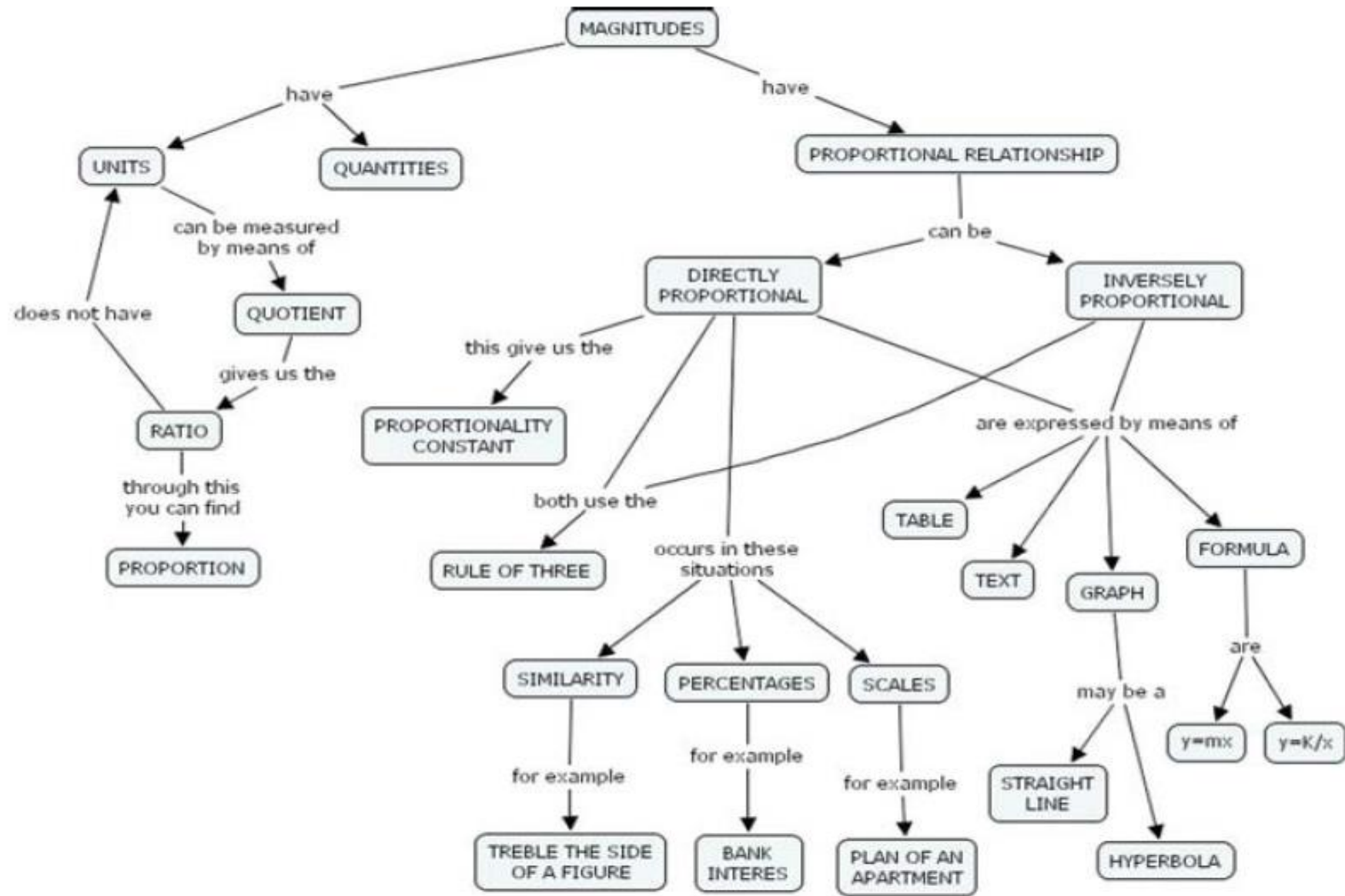


Fig. 6.5 I.M.'s final map

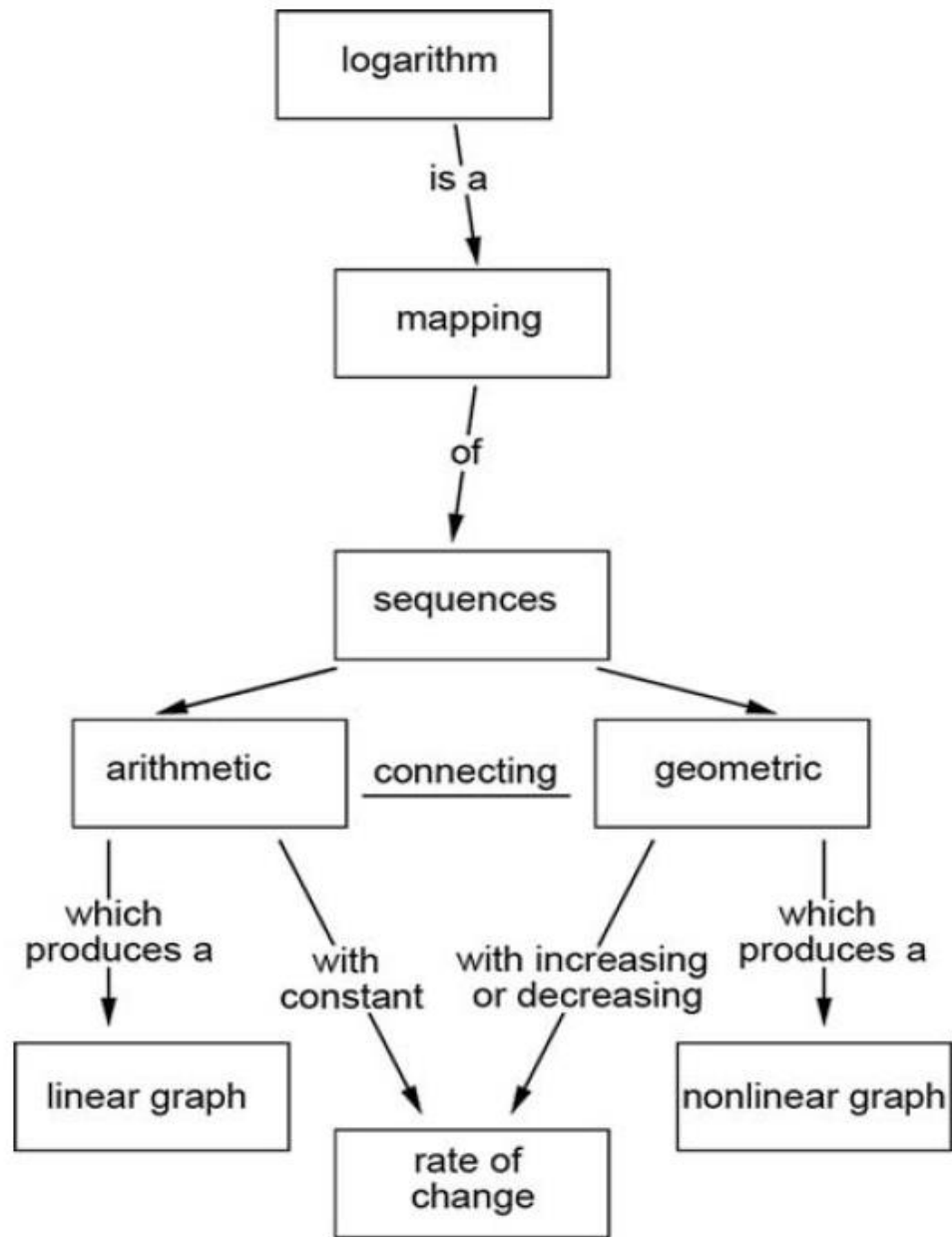


Fig. 9.3 Concept map of logarithm showing the historical conceptual crosslink, genesis of a new mathematical idea

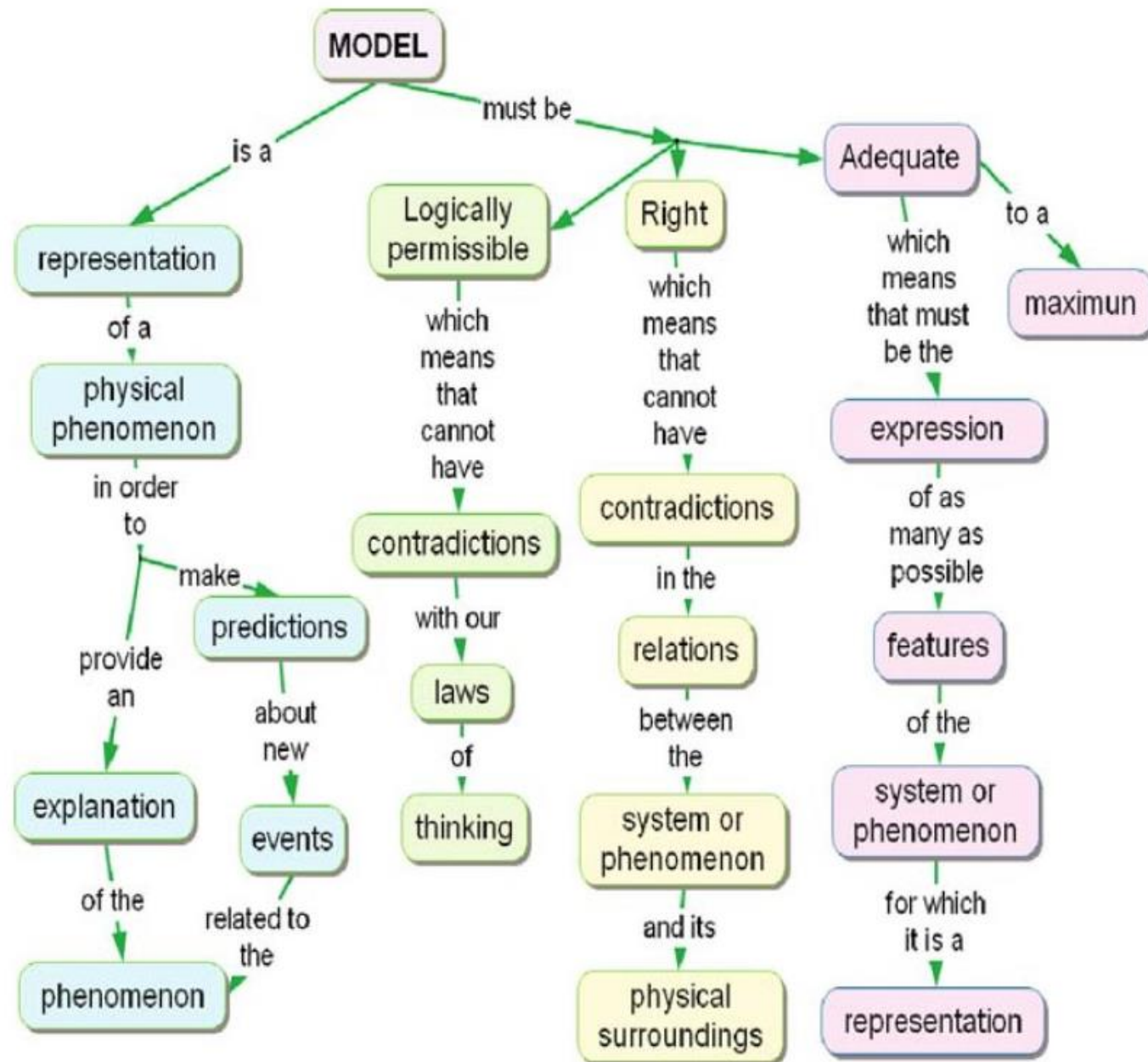


Fig. 10.13 Concept map about *model*

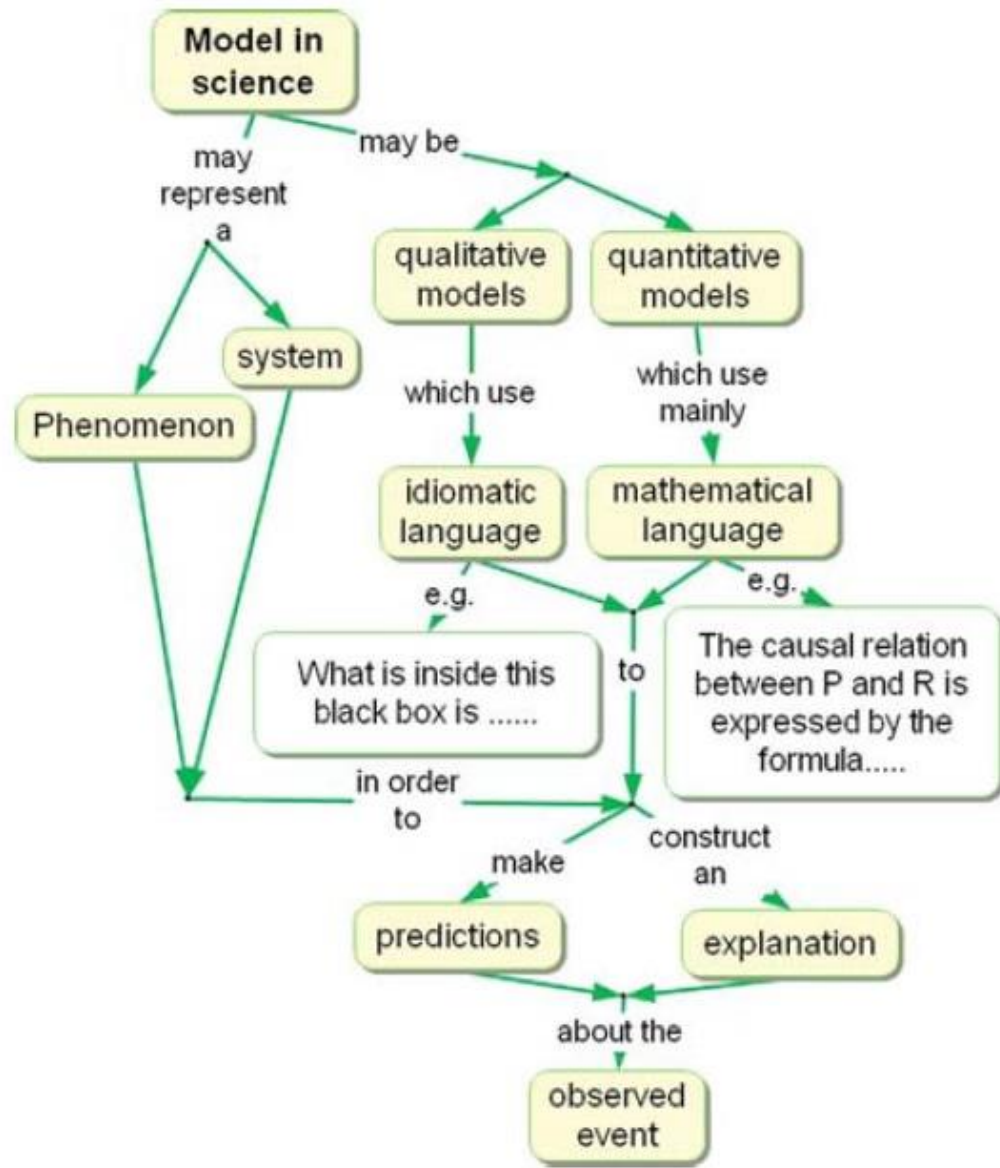


Fig. 10.14 Concept map about *model* in science

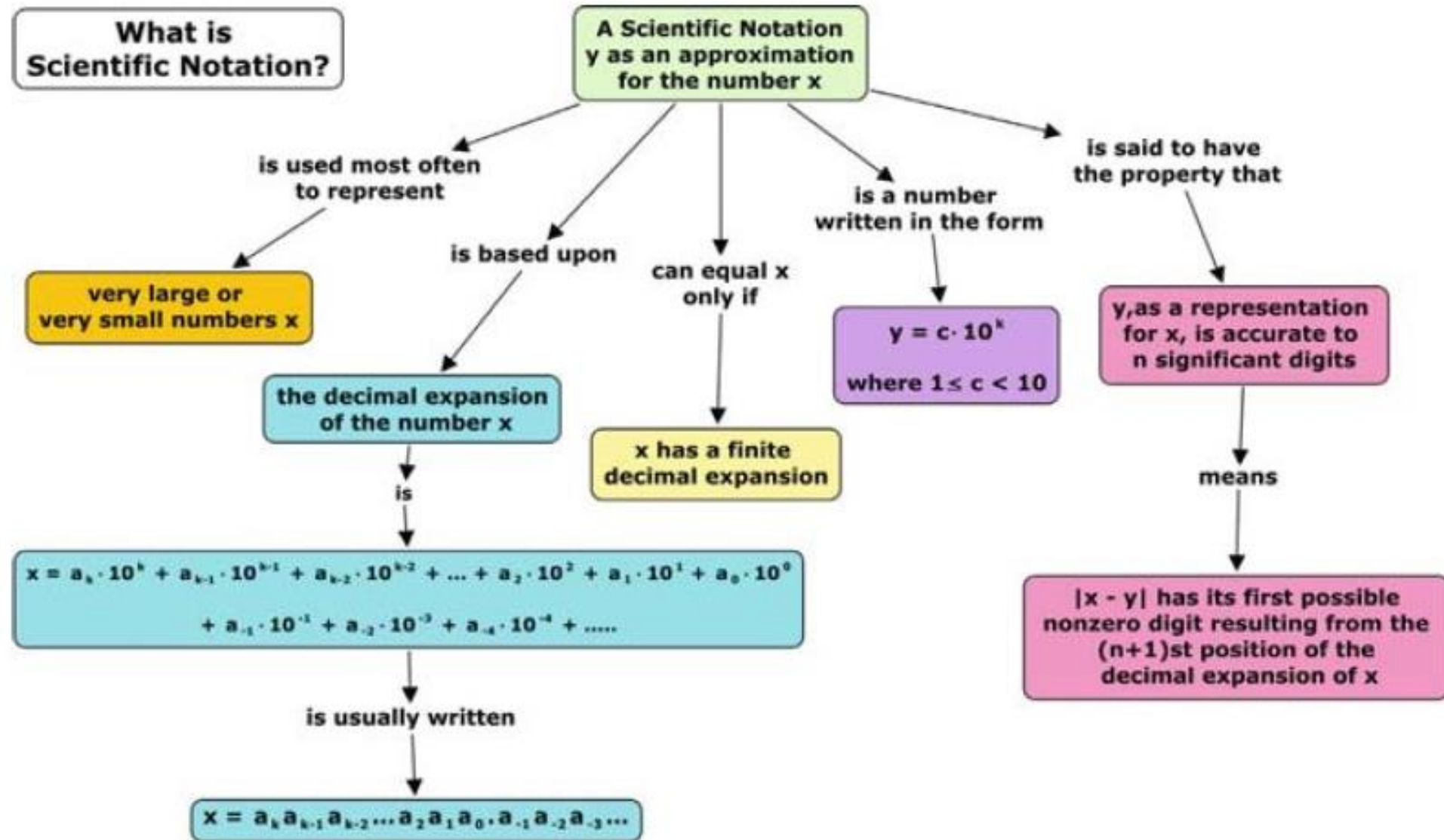


Fig. 11.11 A formal concept map definition of scientific notation

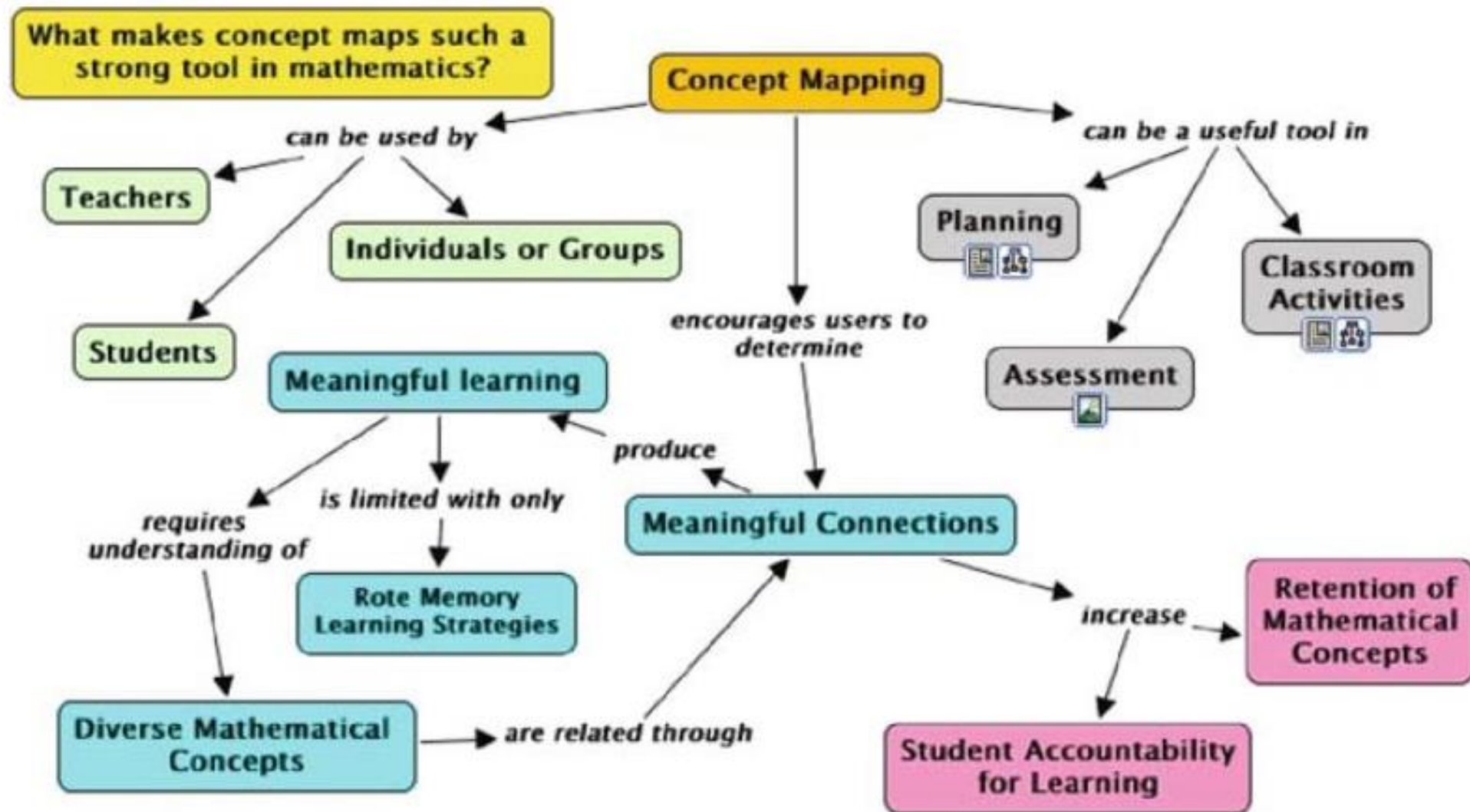


Fig. 11.13 The value of using concept maps in mathematics courses

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