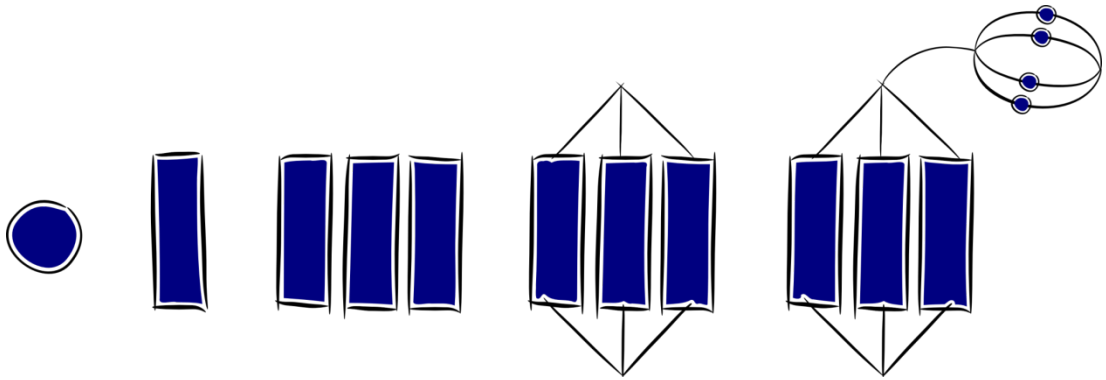
SOLO Taxonomy, Learning Intentions, Effective Strategies, Success Criteria, Self Assessment.



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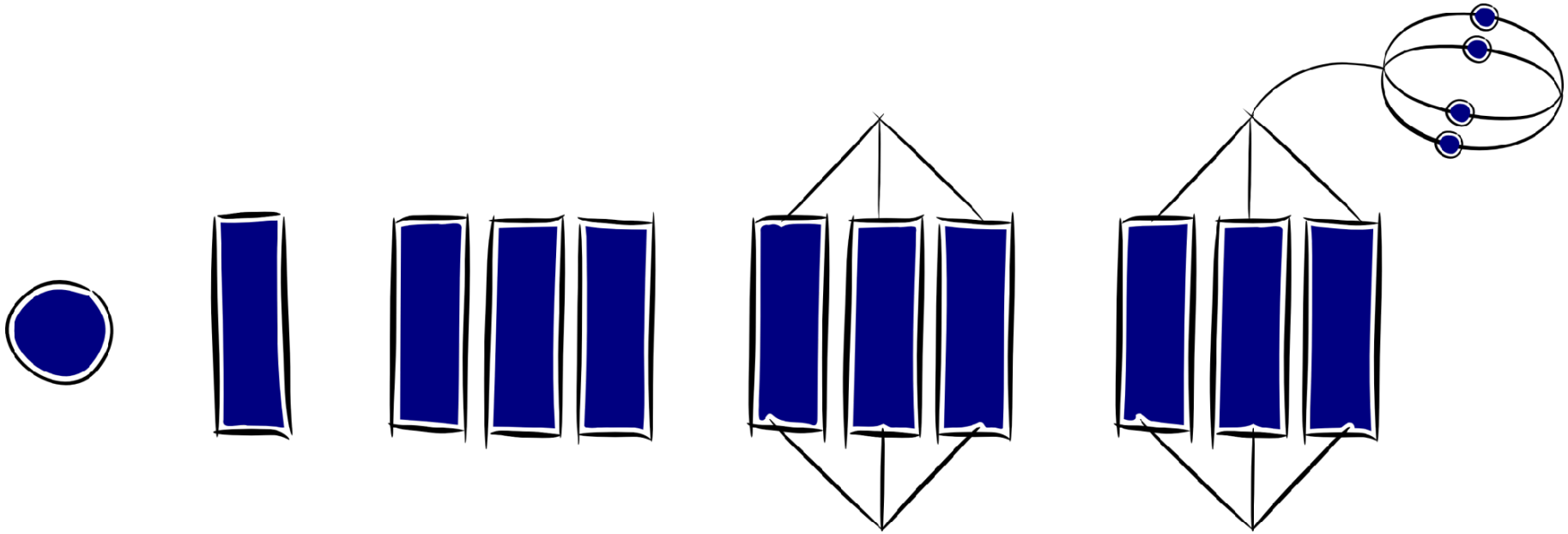
SOLO Taxonomy - Biggs and Collis 1982

Structure of the Observed Learning Outcome



Prestructural | Unistructural | Multistructural | Relational | Extended abstract

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Biggs, J.B., and Collis, K.F. (1982) Evaluating the Quality of Learning-the SOLO Taxonomy (1st ed) New York: Academic Press.

Identify the Learning Intention (LI).

[verb] [content] [context]

Use SOLO and constructive alignment to design learning intention/s that describe what students are to learn to understand an Achievement Objective or Achievement Standard.

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Identify the Learning Experiences (LE).

THINK ABOUT ...

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]

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Identify the Learning Experiences (LE).

Think [engagement relevance authenticity]

Check learning experiences against measures of engagement, relevance and authenticity.

How can I make this learning experience more engaging?
How can I make this learning experience more relevant?
How can I make this learning experience more authentic?

Identify the Learning Experiences (LE).

Think [prior knowledge]

Check learning experiences against students' prior knowledge.

How can I make the learning experience appropriately challenging?
How can I make the learning build upon what the student already understands?

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Identify the Learning Experiences (LE).

Think [effective strategies]

Identify effective strategies to match the learning experiences.

Identify Teaching and Learning Activities and Experiences (LE).

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]

Identify Teaching and Learning Activities and Experiences (LE).

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]

LI: [define] [content] [context]

LI: **Define** the geosphere on the Planet Earth.

LI: **Define** Pythagoras' Theorum in two and three dimensions.

LI: **Define** the rights of consumers in NZ society.

LI: **Define** artwork from a Maori cultural context.

LI: [describe] [content] [context]

LI: **Describe** the continental crust of the geosphere.
LI: **Describe** the gradient of a line making an angle of 40^0 with the x−axis.
LI: **Describe** consumption in early 20^{th} century New Zealand
LI: **Describe** the use of colour in an artwork by Robin Kahukiwa

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LI: [sequence] [content] [context]

LI: **Sequence** the distribution of heat energy around Planet Earth
LI: **Sequence** the steps needed to rearrange a line equation to the form y=mx + c
LI: **Sequence** the steps in setting up a limited liability company
LI: **Sequence** the preparation of Harakeke for Raranga (weaving, textile and fibre arts).

LI: [classify] [content] [context]

LI: **Classify** convergent plate boundaries by the plates involved.
LI: **Classify** straight line equations (ax + by + c = 0).
LI: **Classify** the way firms compete in the market
LI: **Classify** design features used when carving hei matua.

LI: [compare & contrast] [content] [context]

LI: **Compare & contrast** the geosphere and atmosphere on Planet Earth
LI: **Compare & contrast** a parallel line with a perpendicular line.
LI: **Compare & contrast** two strategies for profit maximisation.
LI: **Compare & contrast** examples of traditional and contemporary Tuhi Whakaniko (visual art practice).

We are learning to:

COMPARE & CONTRAST

[content] in [context]

Learning Intention:

[explain causes] [content] [context]

We are learning to:

EXPLAIN CAUSES [content] in [context]

LI: **Explain** how mountain ranges form when plates collide.
LI: **Explain** why two lines are parallel if $m_1 = m_2$
LI: **Explain** how quotas on NZ butter to overseas markets effect NZ butter production.
LI: **Explain** why the artwork “Makaro” by Gordon Walters was criticised.

Learning Intention:

[explain effects] [content] [context]

We are learning to:

EXPLAIN EFFECTS [content] in [context]

LI: **Explain** the effects of subduction on the Earth's surface.
LI: **Explain** the effect of increasing the change in y on the gradient of a line.
LI: **Explain** the impact of an economic event on economic activity.
LI: **Explain** the influence of whakapapa on Maori cultural design in an identified artwork.

Learning Intention:

[analayse] [content] [context]

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We are learning to:

ANALYSE [content] in [context]

LI: **Analyse** the evidence for continental drift theory.
LI: **Analyse** the point/gradient equation $y - y_1 = m(x - x_1)$
LI: **Analyse** the circular flow model in economics.
LI: **Analyse** the pictorial features of contemporary artworks from Maori cultural contexts.

Learning Intention:

[analogy] [content] [context]

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We are learning to:

ANALOGY [content] in [context]

LI: **Make an ANALOGY** for the Earth systems – geosphere, atmosphere, and hydrosphere.
LI: **Make an ANALOGY** for a line segment.
LI: **Make an ANALOGY** for venture finance.
LI: **Make an ANALOGY** for Alvin Pankhurst's work *Maybe Tomorrow.*

Learning Intention:

[predict] [content] [context]

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We are learning to:

PREDICT [content] in [context]

LI: **Predict** how a human activity will impact on the geosphere.
LI: **Predict** triangle classification by angle (right/obtuse/acute) using the Pythagoras' Theorum.
LI: **Predict** the likely effect of a proposed GST increase on markets.
LI: **Predict** a future art style for Maori facial tattoo (Moko).

Learning Intention:

[evaluate] [content] [context]

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We are learning to:

EVALUATE [content] in [context]

LI: **Evaluate** the impact of human activities on the hydrosphere.
LI: **Evaluate** the advantages of being a sole trader over working in a partnership.
LI: **Evaluate** the influence of European compositional practices on Maori 19th Century art.

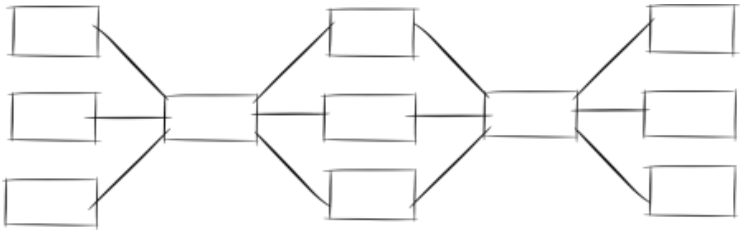
Learning Intention:

[generalise] [content] [context]

We are learning to:
GENERALISE [content] in [context]

LI: **Generalise** about the Earth's systems.
LI: **Generalise** about the design of motorway onramps and Pythagoras' Theorum.
LI: **Generalise** about economic concept of interdependence.
LI: **Generalise** about themes of kaitiakitanga in contemporary artworks with a Maori cultural context.

HOT SOLO Compare and Contrast Map and Self Assessment rubrics



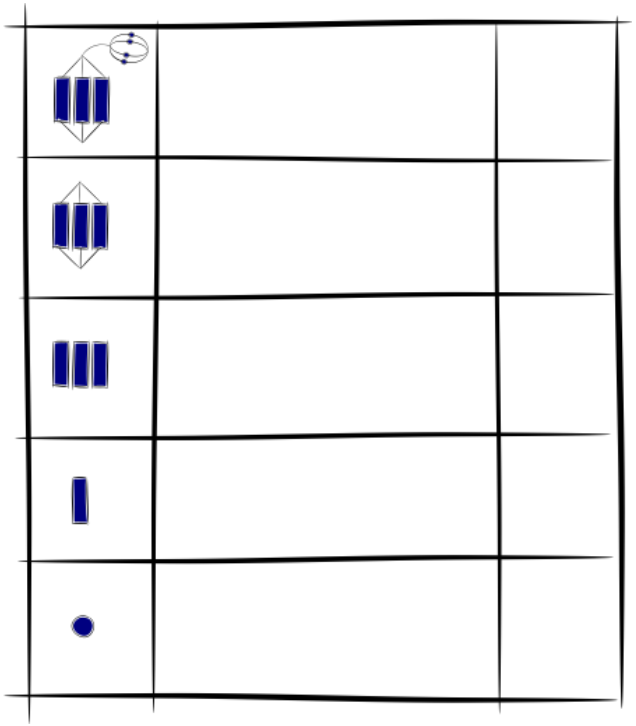
HOT Target Vocabulary:

Compare:

Also, as, as well as, both, In the same manner, in the same way, like, likewise, most important, same, similar, similarly, the same as, too, still, in comparison, at the same time

Contrast:

Although, but, differ, even though, however, in contrast, instead, nevertheless, on the contrary, on the other hand, unless, unlike, while, yet, conversely, nonetheless



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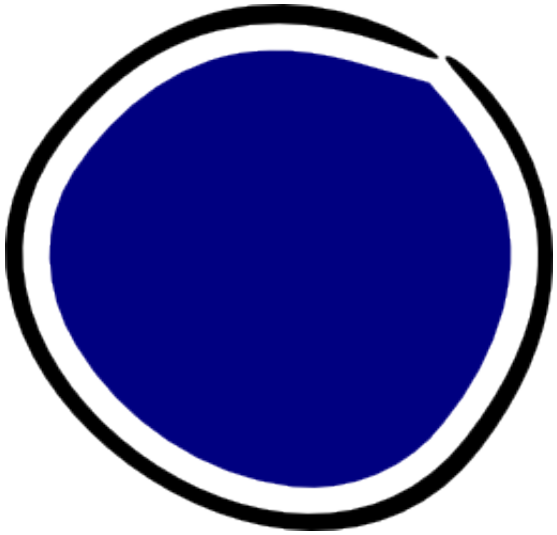
SOLO PRESTRUCTURAL:

Learning outcomes for comparison show unconnected information, no organisation.



“I need help to compare X and Y.”

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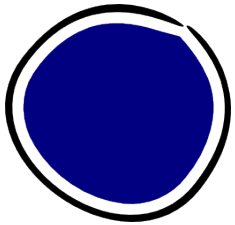
SOLO PRESTRUCTURAL:
Learning outcomes for comparison
show unconnected information, no organisation.

I need help to compare cats and dogs.



SOLO PRESTRUCTURAL:

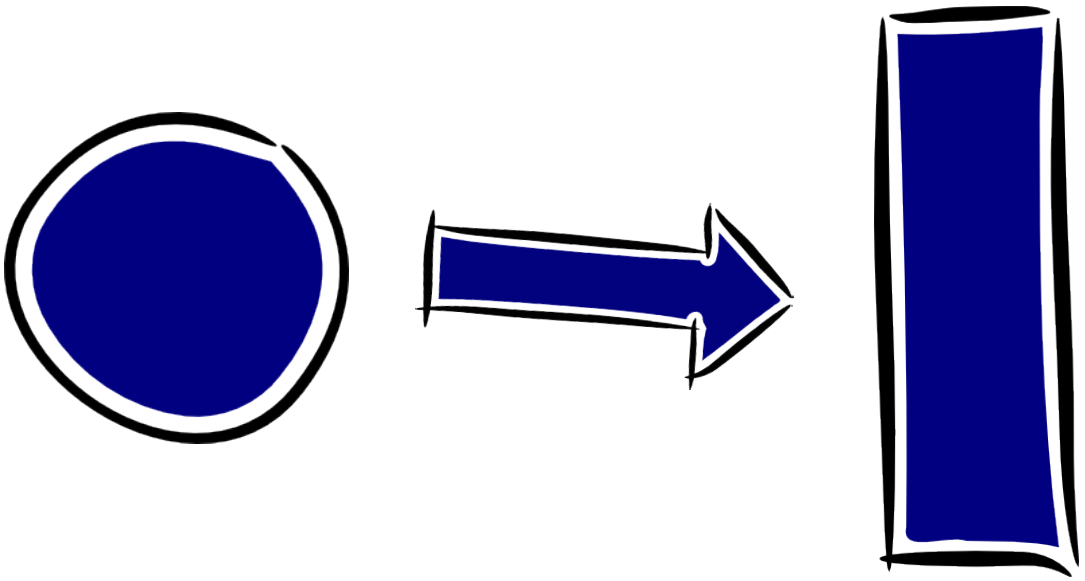
Learning outcomes for comparison

show unconnected information, no organisation.

Student Exemplar: *I saw a dog on the way to school.*

Where to next:

For student with **pre-structural learning outcomes**.



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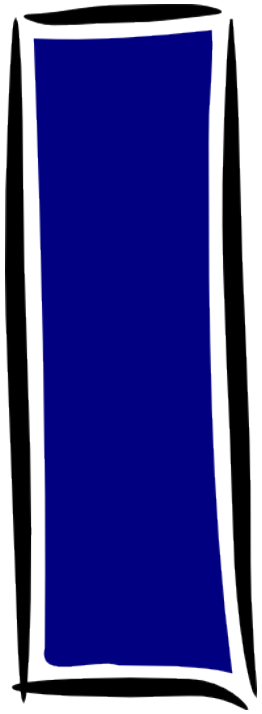
SOLO UNISTRUCTURAL:

Learning outcomes for comparison show simple connections but importance not noted.



“I can identify one relevant similarity or difference between [X and Y] ...”

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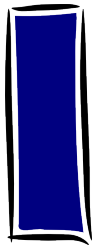
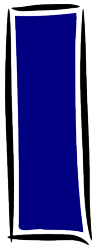


SOLO UNISTRUCTURAL:

Learning outcomes for comparison

show simple connections but importance not noted.

I can identify one relevant similarity or difference between [cats and dogs].



SOLO UNISTRUCTURAL:

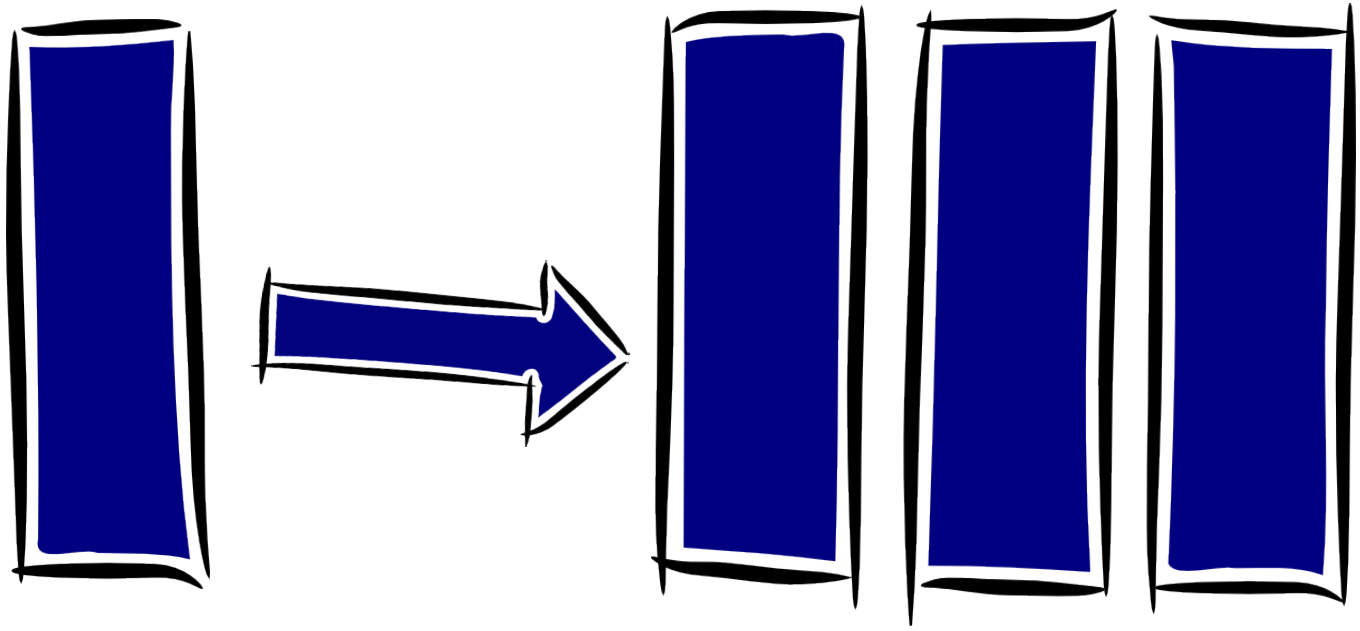
Learning outcomes for comparison

show simple connections but importance not noted.

Student exemplar: *Cats and dogs are different. A cat purrs and meows and a dog barks and growls.*

Where to next:

For students with **unistructural learning outcomes**.



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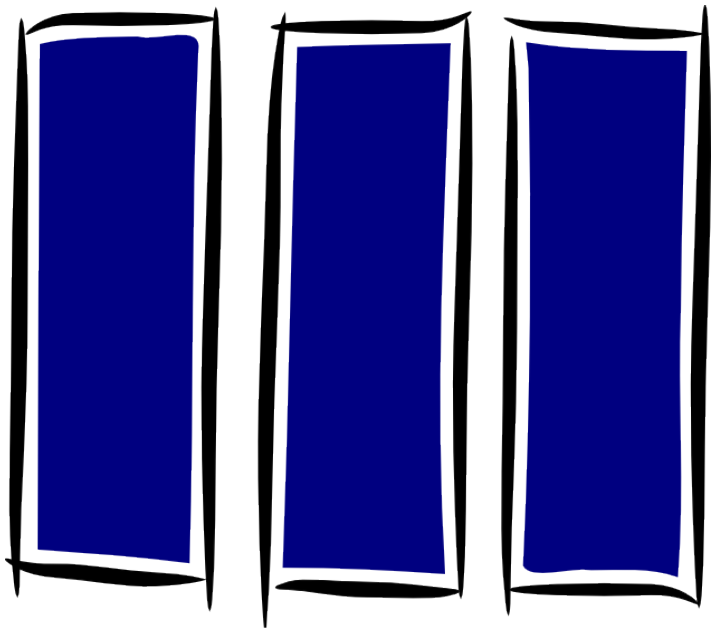
SOLO MULTISTRUCTURAL:

Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.



“I can identify several relevant similarities and differences between [X and Y].

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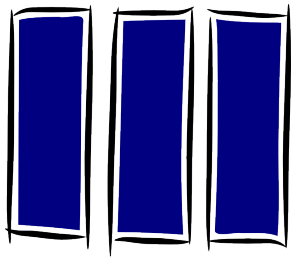
Listing similarities and differences



SOLO MULTISTRUCTURAL:

Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

"I can identify several relevant similarities and differences between [a cat and a dog].

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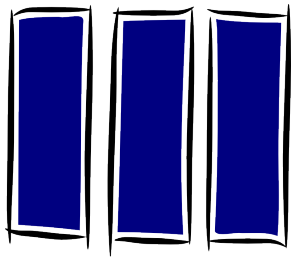
Listing similarities and differences



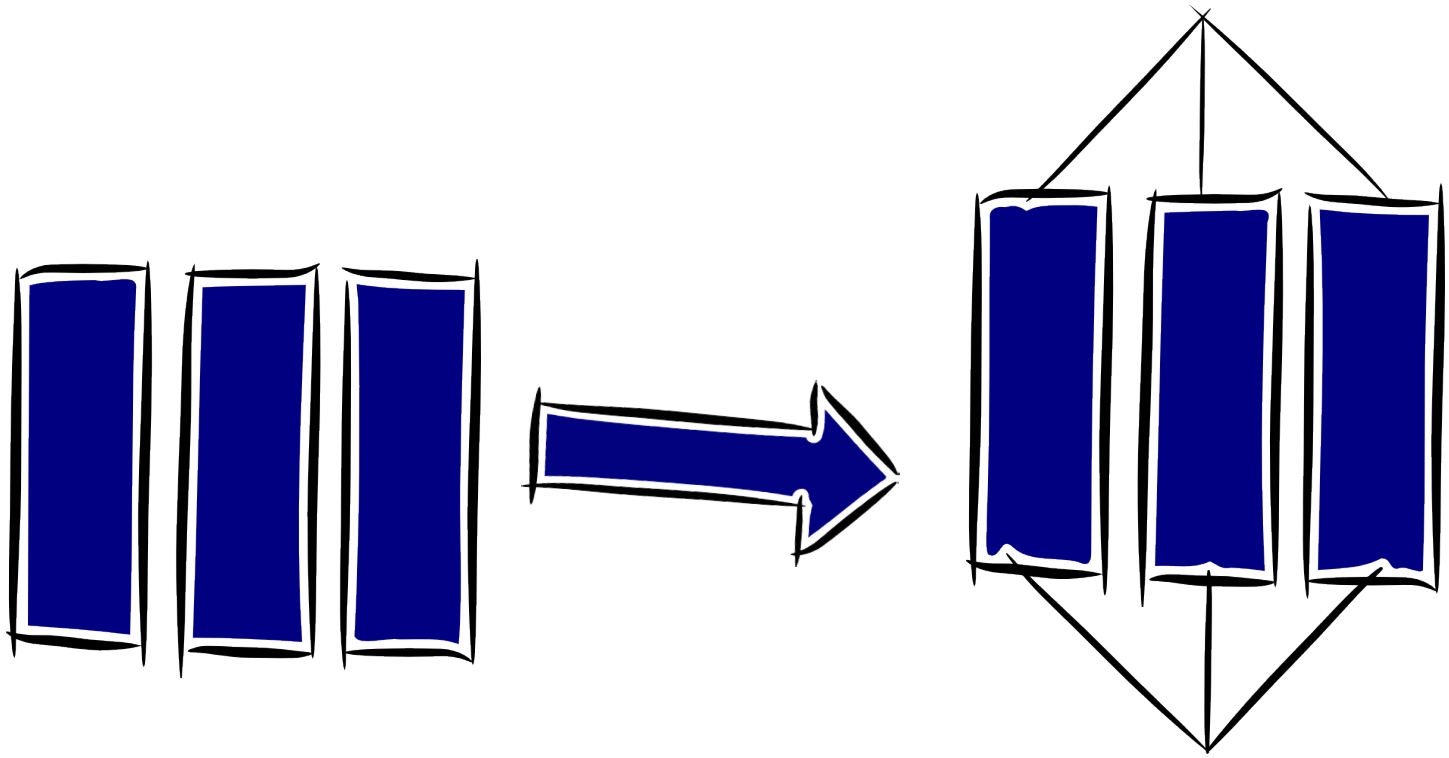
SOLO MULTISTRUCTURAL:

Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

Student Exemplar: *Cats and dogs are different. A cat purrs and meows and a dog barks and growls. You take dogs for a walk, but cats exercise themselves. However, both dogs and cats are kept as pets. Both have four legs and fur.*

Where to next:

For student with **multi-structural learning outcomes**.



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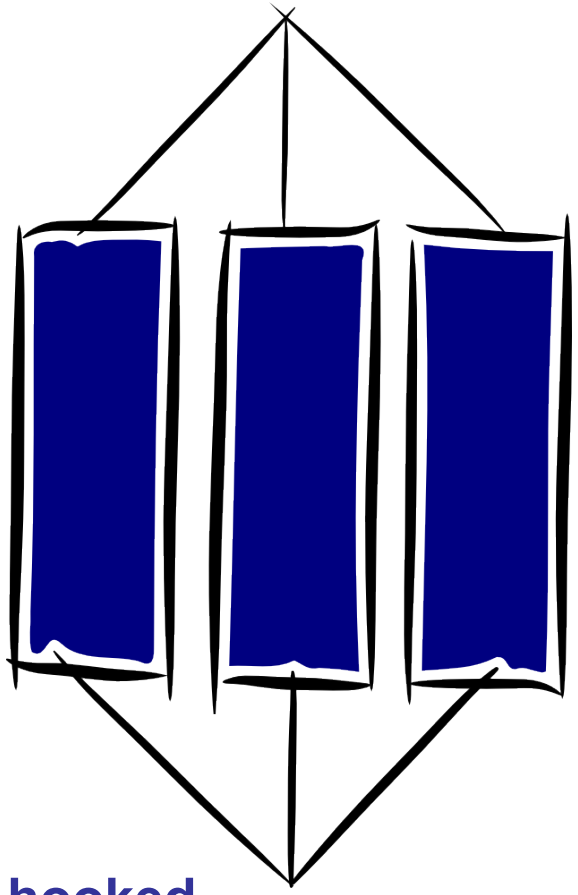
SOLO RELATIONAL:

Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning



"I can identify several relevant similarities and differences between [X and Y] and can explain why they are similar and different."

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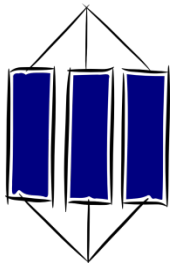
Explaining the significance of the similarities and differences – "these are similar because".



SOLO RELATIONAL:

Learning outcomes for comparison

show full connections made, and synthesis of parts to the overall meaning

"I can identify several relevant similarities and differences between [a cat and a dog] and can explain why they are similar and different."

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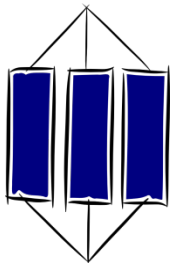
Explaining the significance of the similarities and differences – "these are similar because".



SOLO RELATIONAL:

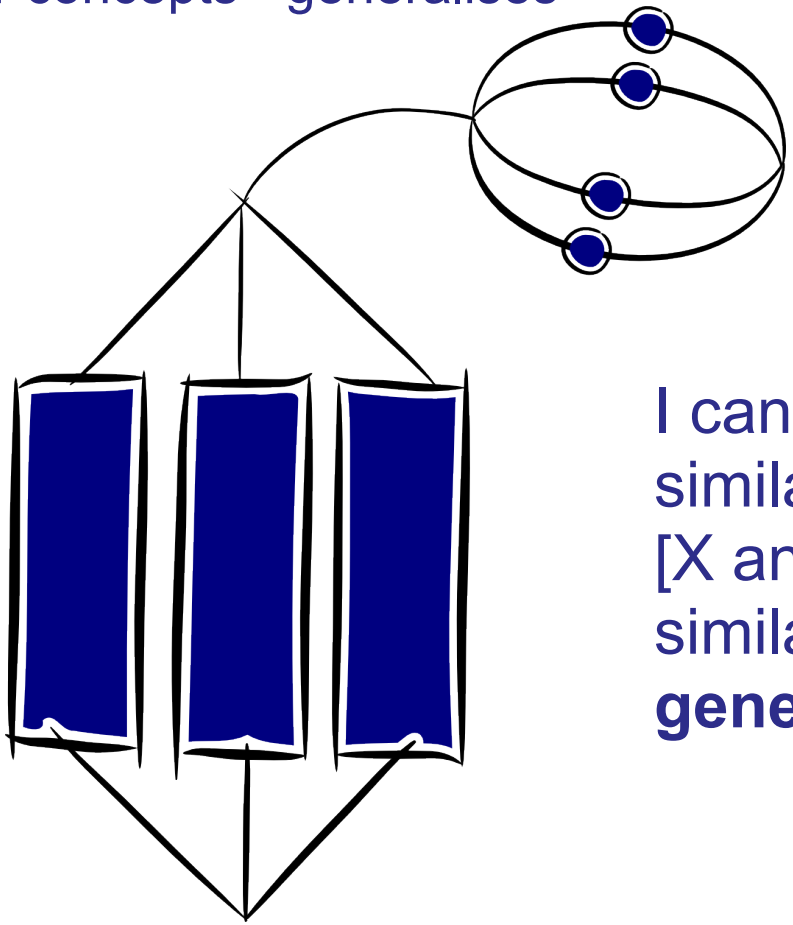
Learning outcomes for comparison

show full connections made, and synthesis of parts to the overall meaning

Student exemplar: *Cats and dogs are different. A cat purrs and meows and a dog barks and growls. They* ***are different because*** *they use different sounds to communicate. You take dogs for a walk, but cats exercise themselves* ***they are different because*** *dogs are not allowed to roam freely on the streets. However, both of them are kept as pets.* ***They are similar because*** *they are both tame animals. Both have four legs and fur.* ***They are similar because*** *they are both mammals.*

SOLO EXTENDED ABSTRACT:

Learning outcomes for comparison go beyond subject and makes links to other concepts - generalises



I can identify several relevant similarities and differences between [X and Y], explain why they are similar and different **AND make a generalisation**.

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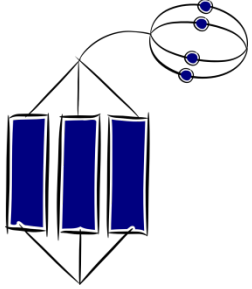
(overall … because)



SOLO EXTENDED ABSTRACT:

Learning outcomes for comparison go beyond subject and makes links to other concepts - generalises

I can identify several relevant similarities and differences between [cats and dogs], explain the similarities and differences **AND make a generalisation**.

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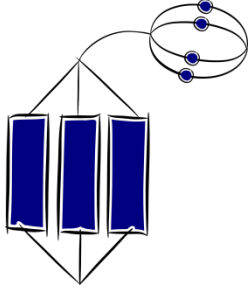
(overall … because)

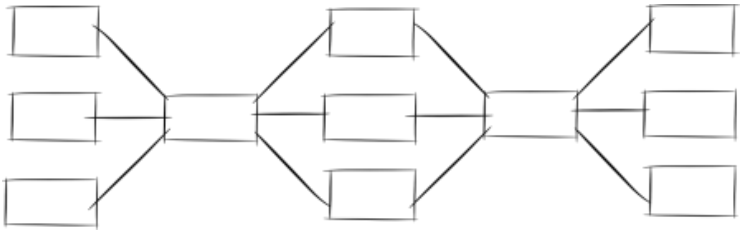


SOLO EXTENDED ABSTRACT:

Learning outcomes go beyond subject and makes links to other concepts - generalises

Student exemplar: *Cats and dogs are different. A cat purrs and meows and a dog barks and growls. They* ***are different because*** *they use different sounds to communicate. You take dogs for a walk, but cats exercise themselves* ***they are different because*** *dogs are not allowed to roam freely on the streets. However, both of them are kept as pets.* ***They are similar because*** *they are both tame animals. Both have four legs and fur.* ***They are similar because*** *they are both mammals.* **Overall I think** cats and dogs are more similar than different. This is probably because they are both domesticated and have lived alongside human beings for a long time.

Using SOLO Taxonomy Criterion Based Rubrics for Assessing Students Comparative Thinking



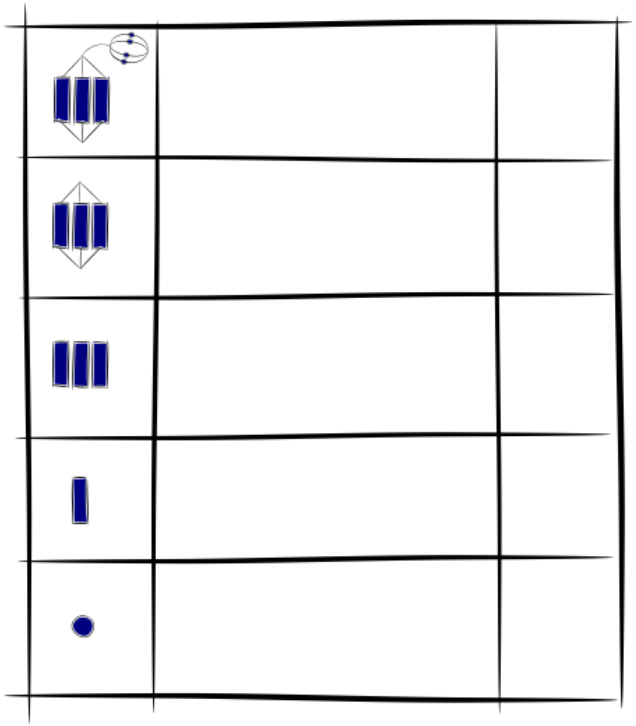
HOT Target Vocabulary:

Compare:

Also, as, as well as, both, In the same manner, in the same way, like, likewise, most important, same, similar, similarly, the same as, too, still, in comparison, at the same time

Contrast:

Although, but, differ, even though, however, in contrast, instead, nevertheless, on the contrary, on the other hand, unless, unlike, while, yet, conversely, nonetheless



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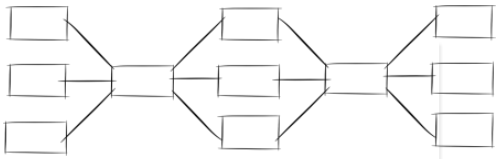

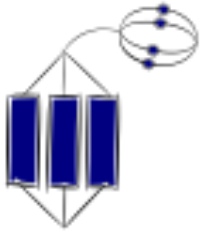	I can identify several relevant similarities and differences between [X and Y], explain why they are similar and different **AND make a generalisation**.
	*I can identify several relevant similarities and differences between [X and Y]* ***and can explain why*** *they are similar and different.*
	*I can identify several relevant similarities* ***and*** *differences between [X and Y].*
	I can identify one relevant similarity **or** difference between [X and Y] .
	*I need help to compare X and Y.*

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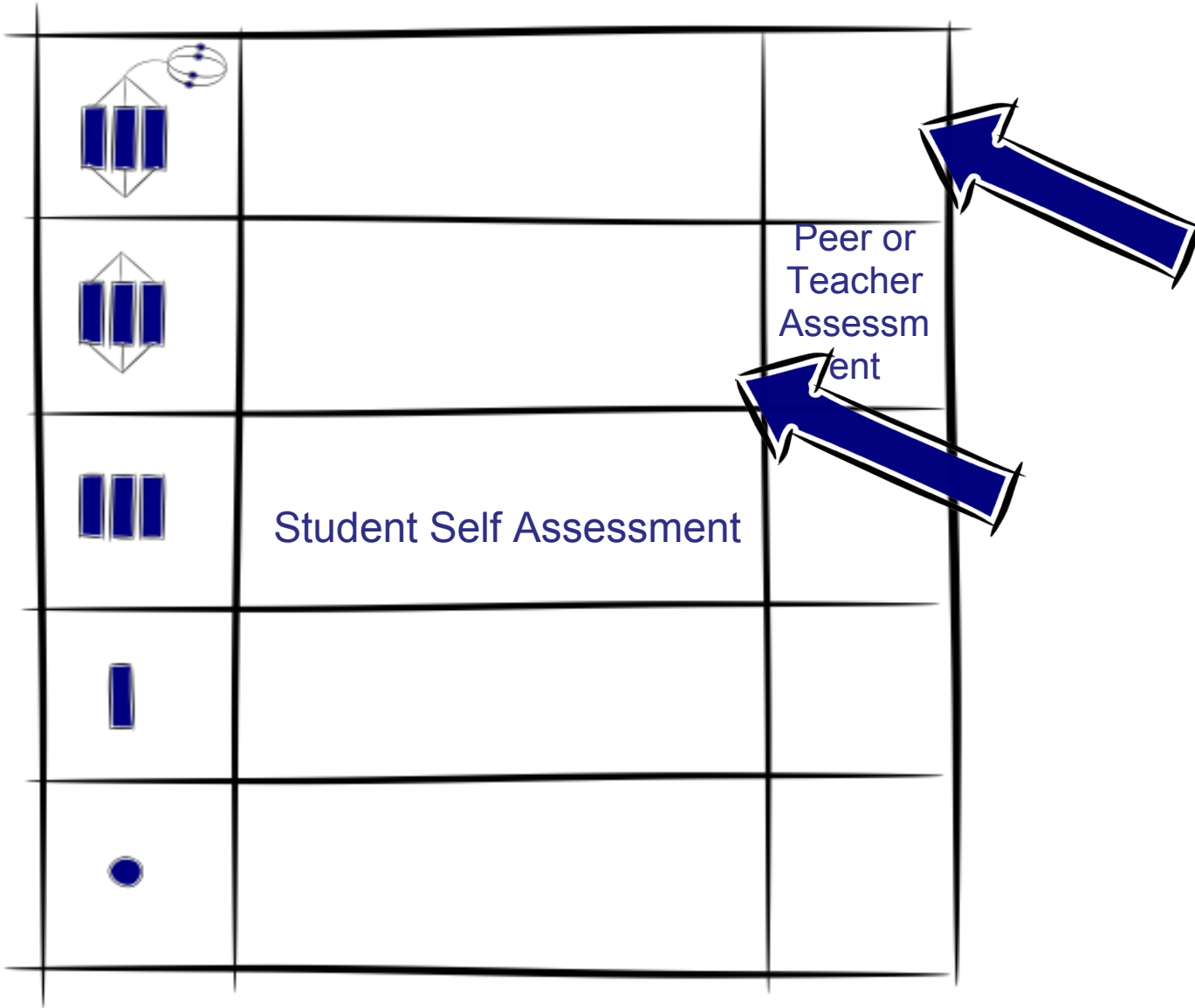
How reliable and/or valid is student self assessment of thinking?

Measuring the degree of correlation between student self assessment and peer/teacher assessment.



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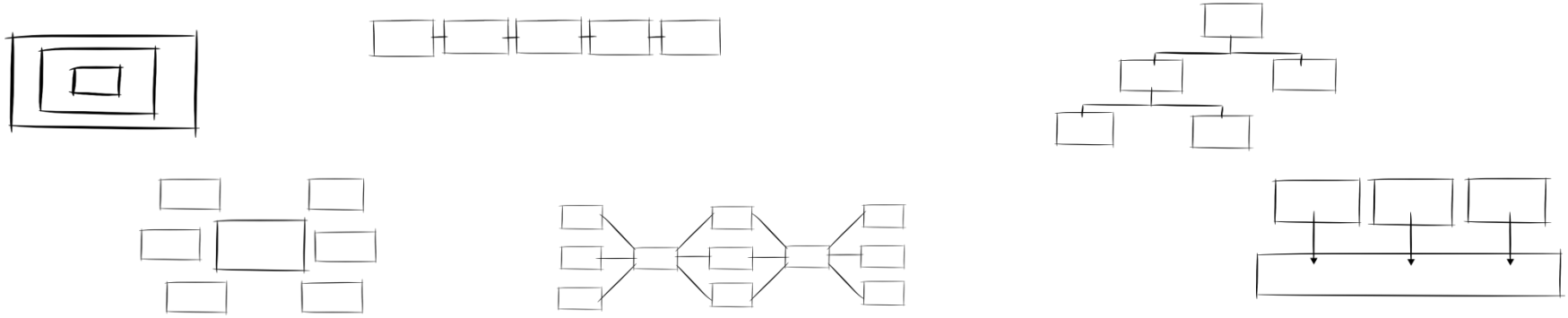
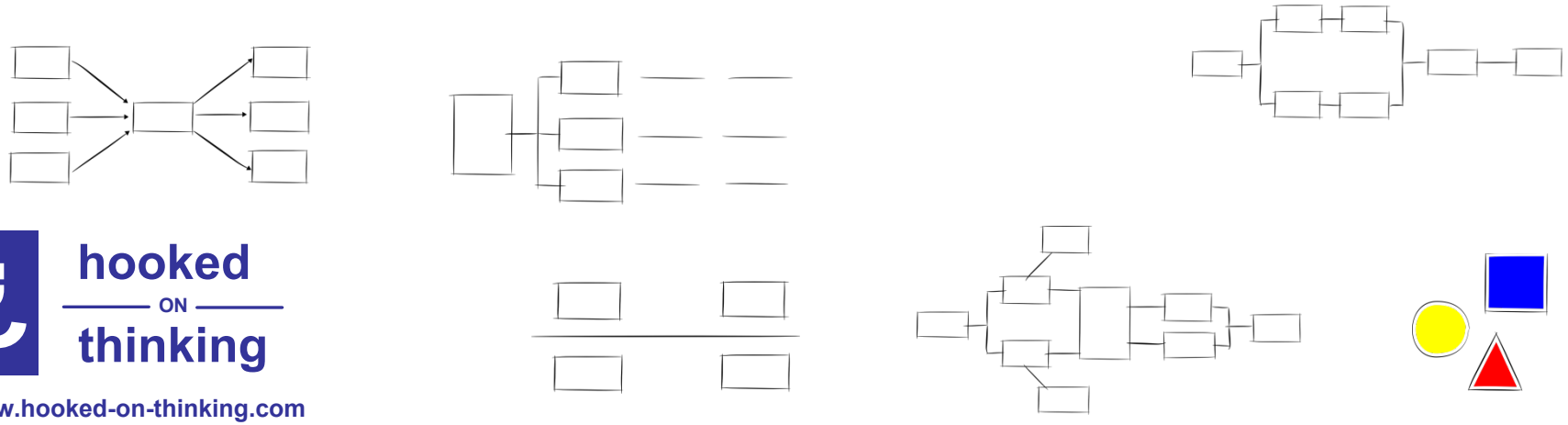


Where to next? – Using SOLO Taxonomy to build criterion based self assessment rubrics for student thinking for different thinking strategies.

E.g.. definition, description, sequencing, classification, causal explanation, analysis, prediction, generalisation and evaluation..



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