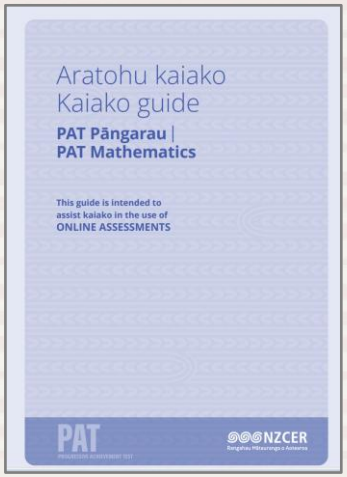
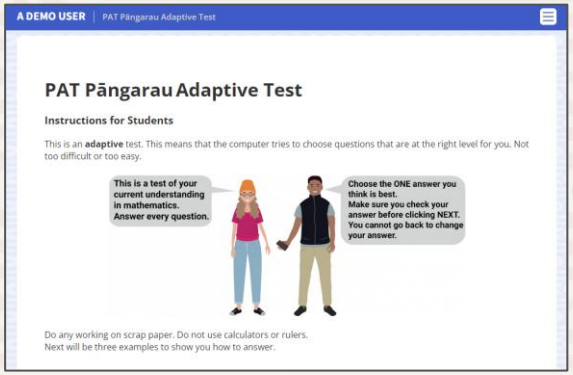
PATs

PROGRESSIVE ACHIEVEMENT TESTS

PAT Pāngarau | PAT Mathematics

Data analysis workshop





NZCER
Rangahau Mātauranga o Aotearoa

Kupu whakataki Introduction

PAT Pāngarau | PAT Mathematics

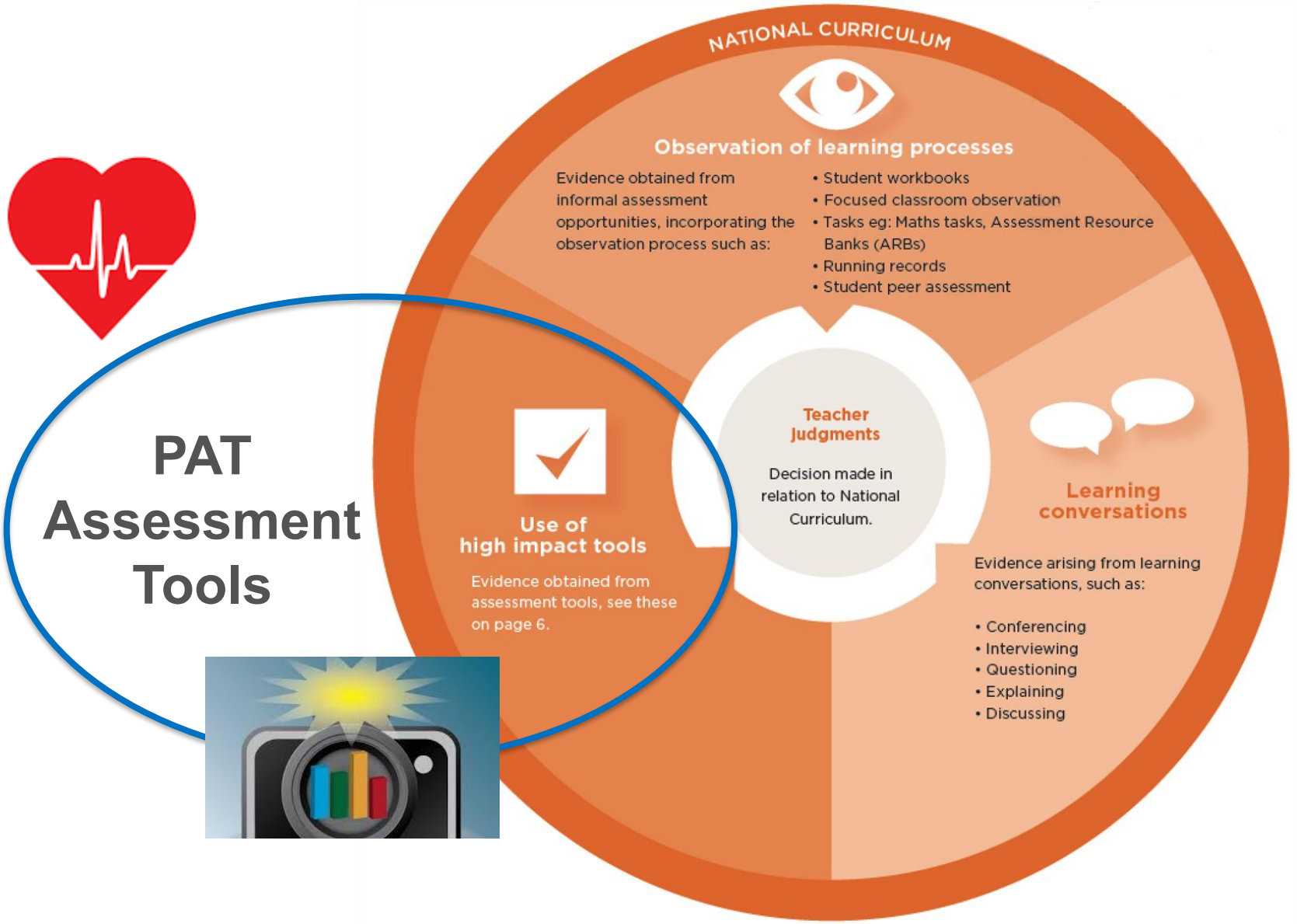
- background and content structure
- scale score
- question placement on the scale
- the filters on the item report

Exploring and analysing reports

Questions | Patai – ask as we go

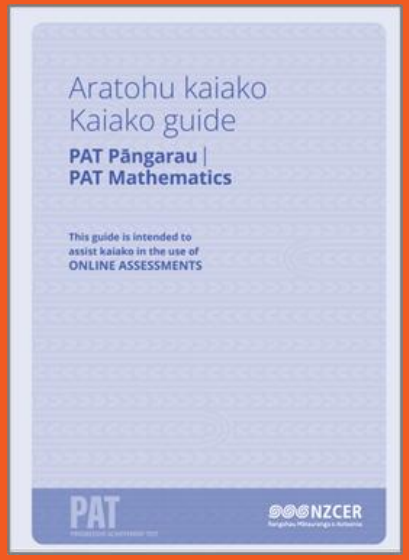
Mā whero mā pango
ka oti ai te mahi.

Each element has a role.


NATIONAL CURRICULUM
Observation of learning processes
Evidence obtained from informal assessment opportunities, incorporating the observation process such as:
• Student workbooks
• Focused classroom observation
• Tasks eg: Maths tasks, Assessment Resource Banks (ARBs)
• Running records
• Student peer assessment
PAT Assessment Tools
Use of high impact tools
Evidence obtained from assessment tools, see these on page 6.
Teacher Judgments
Decision made in relation to National Curriculum.
Learning conversations
Evidence arising from learning conversations, such as:
• Conferencing
• Interviewing
• Questioning
• Explaining
• Discussing

PAT Pāngarau | Mathematics

The value of the scale



What is your understanding about stanines and scale scores?

Stanine

Stanines are used to **compare an individual student's achievement** with the results obtained by a **national reference sample** chosen to represent a certain year level. Stanines divide the distribution of results from the trials for a year group, into nine categories. Most students, when compared with their own year level, achieve around stanines four, five, and six. Stanines seven, eight, and nine represent comparatively high achievement for a year group, while stanines one, two, and three indicate comparatively low achievement.

Stanine	1	2	3	4	5	6	7	8	9
Percentage**	0% (4%)	19% (19%)		68% (54%)			10% (19%)		3% (4%)
Number of students	0	1	5	11	5	5	2	1	1

Stanine Distribution (= 1 boy = 1 girl)

Scale score

- The scores for an assessment are based on the number of questions that ākonga have answered correctly. This number is sometimes referred to as the raw score.
- The raw score is converted to a scale score on the relevant measurement scale. There are separate PAT scales for each assessment. (e.g., PATm, PATc)
- Every question has been located on the same scale. This provides a sense of their relative difficulty. A scale score can be interpreted in terms of the kind of questions ākonga are likely to answer successfully.
- This scale allows achievement to be compared and tracked over time regardless of which assessments were administered.

Scale scores - Progress over time

Average mean scale score

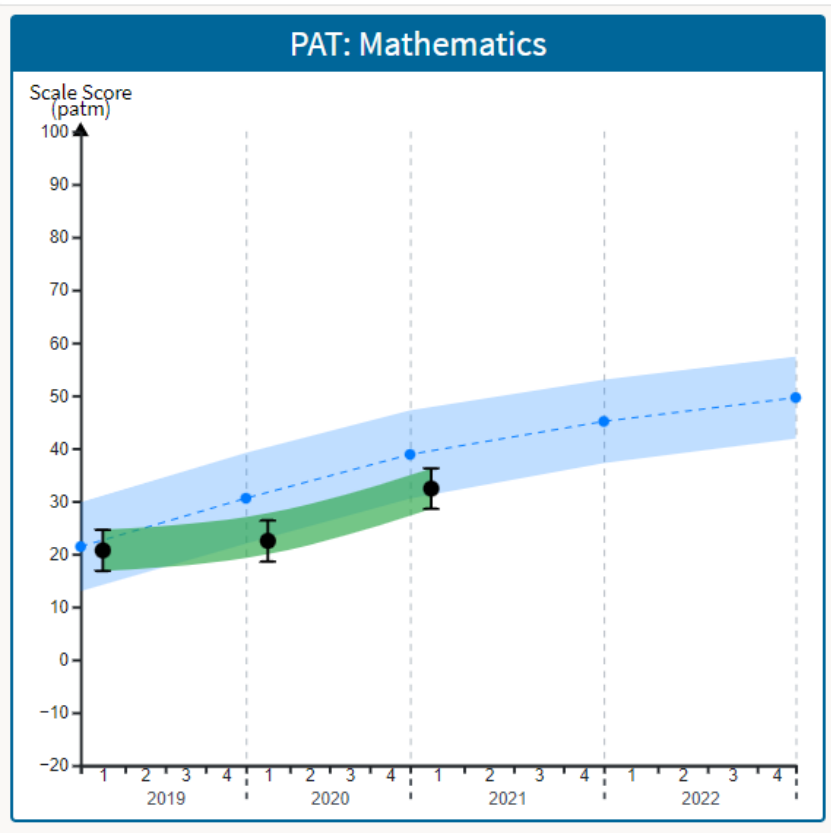
	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
NEW	32.5	39.7	45.8	49.1	53.6	57.8	62.4

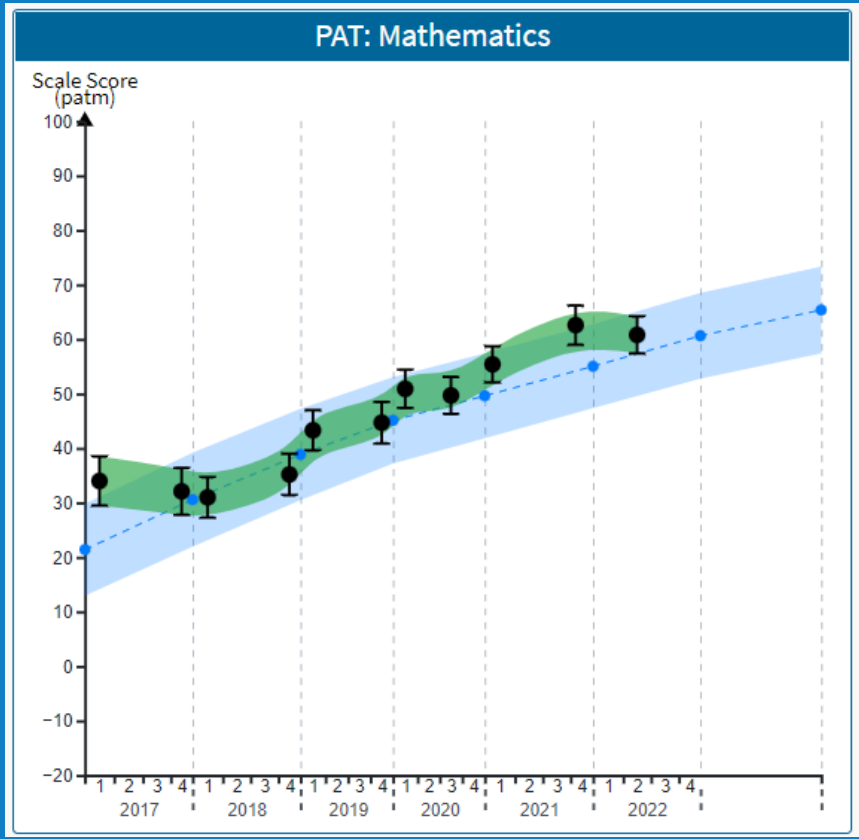
Average progress

	Year 3-4	Year 4-5	Year 5-6	Year 6-7	Year 7-8	Year 8-9	Year 9-10
NEW		7.2	6.1	3.3	4.5	4.2	4.6

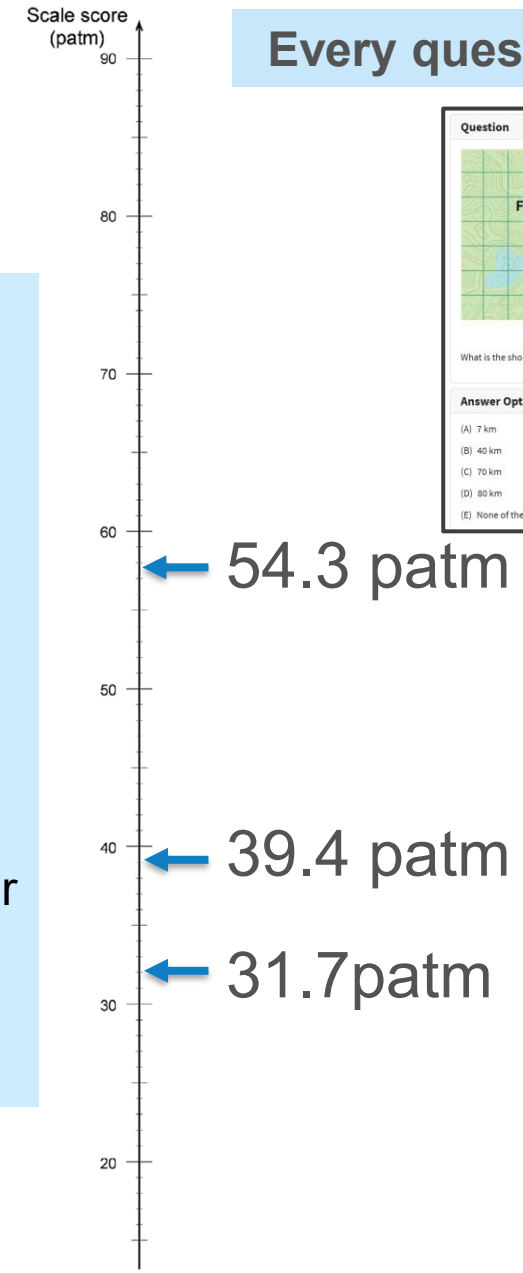
- average one year scale score progress
- a guide to compare progress for an individual student between multiple assessment time points
- snapshot of progress and achievement that is one piece of the puzzle that you know about your ākonga

Individual student progress report



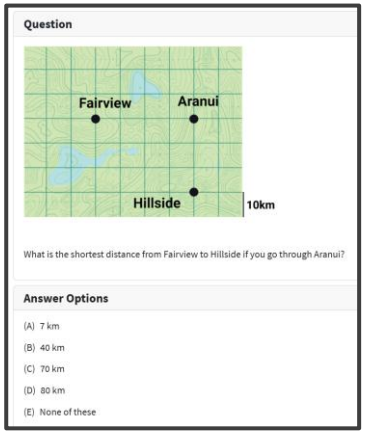


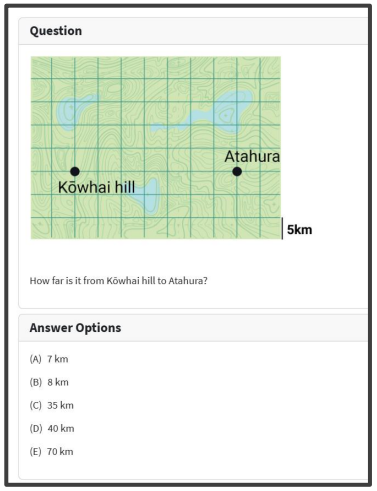
PAT:Mathematics scale

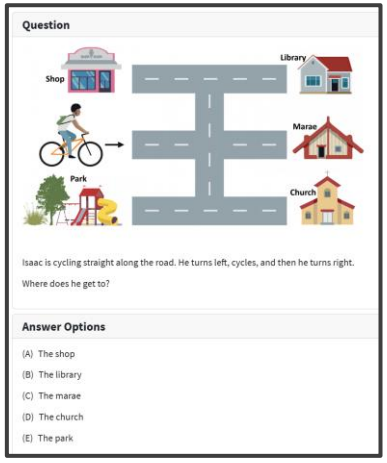


Every question is located on the scale.

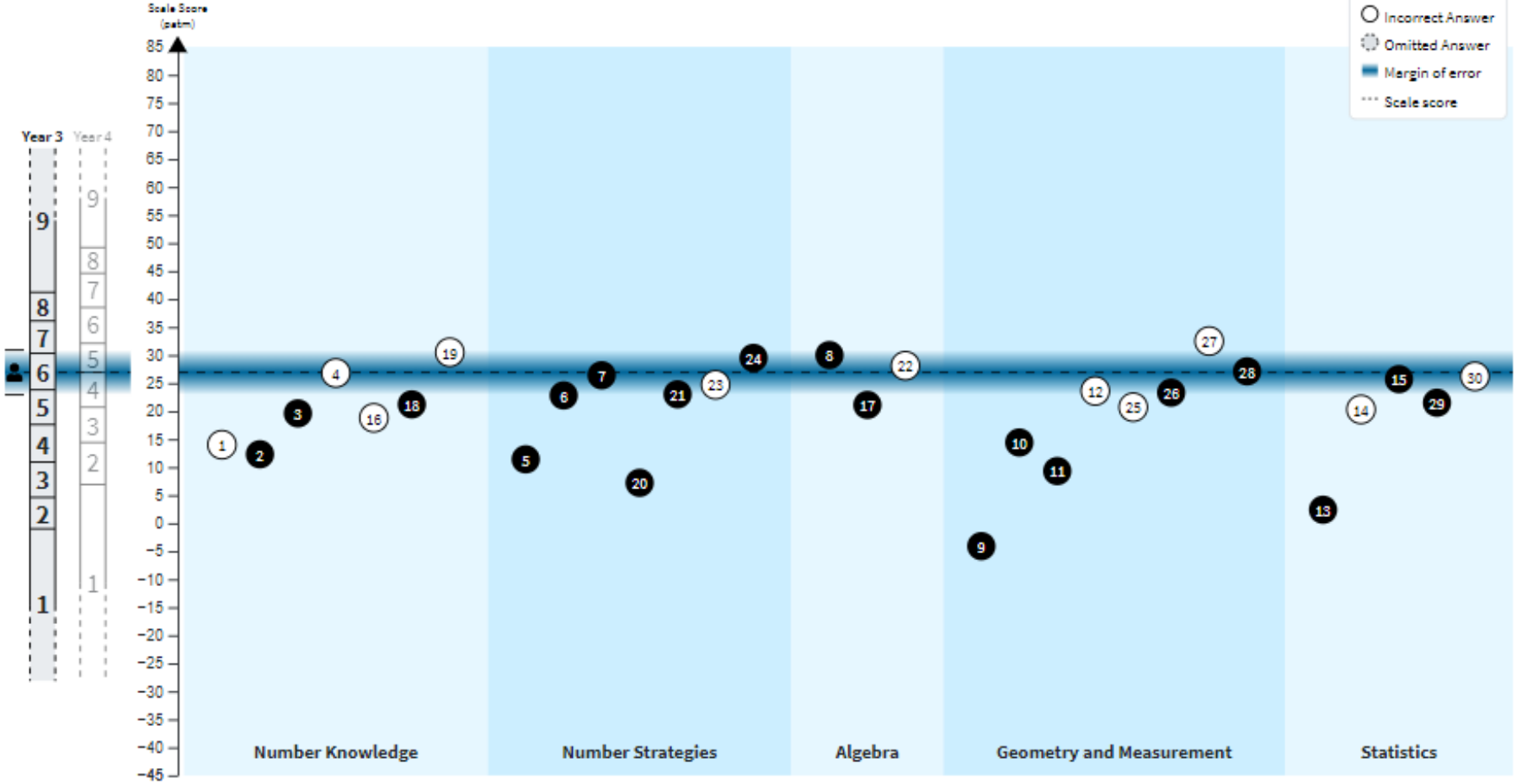
The relative difficulty of every question in each test is **described by its location on the scale**, based on the knowledge and skill associated with the question. A student's achievement can therefore be reported in terms of the knowledge and skill required to correctly answer questions that are located at or below the student's own scale score location.







Raw Score	Scale Score (Patm)	Stanine	Reference Year
19 / 30	26.9 ± 4	6	3



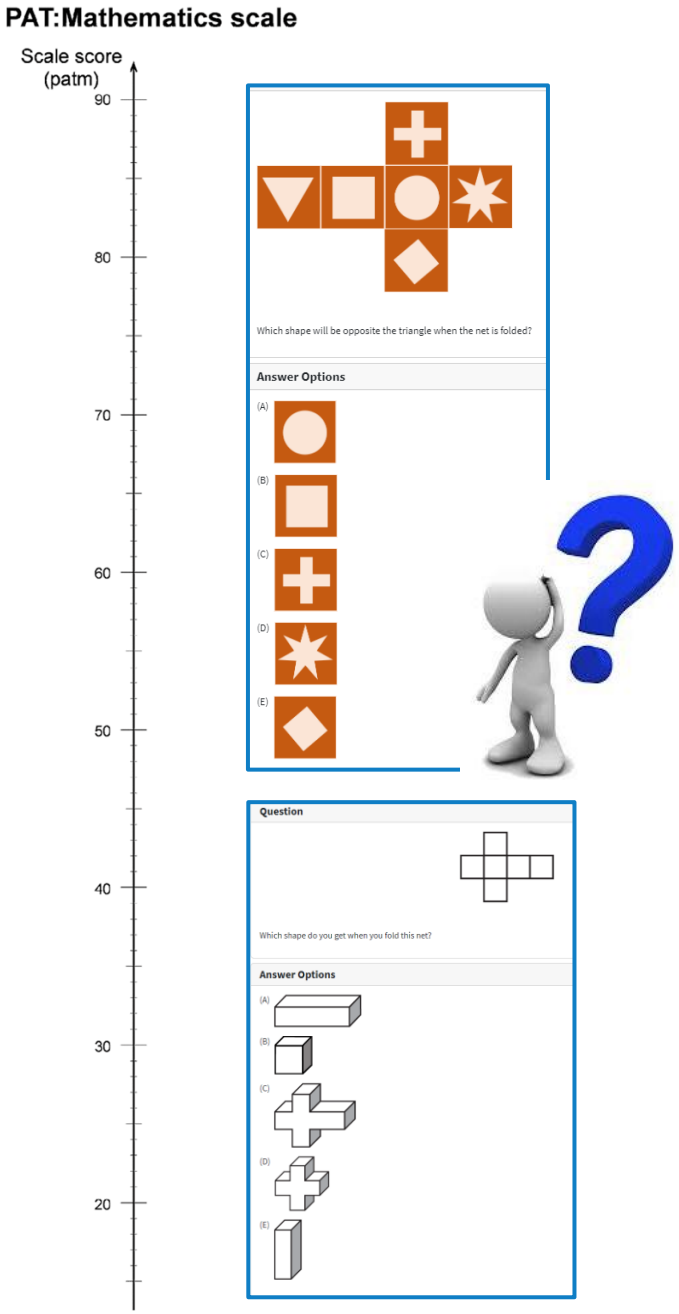
Term 2 2021

Conceptual Progression

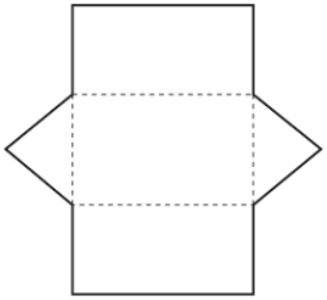
Place the items in order of level of difficulty for these spatial reasoning items in PAT Pāngarau tests 1 – 8.

What is the conceptual step-up between each item?

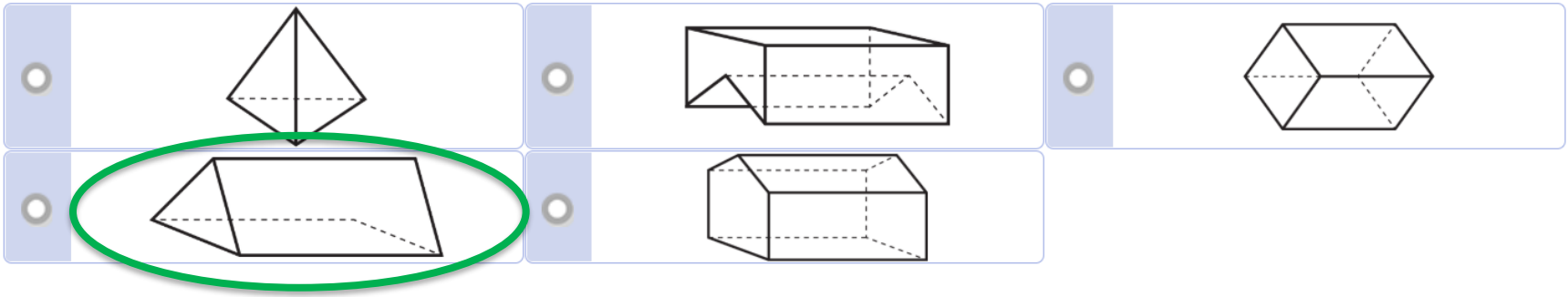
Where is the challenge point for your ākonga?



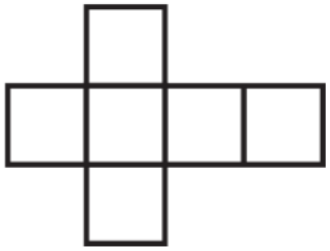
Test 1 – 27.7 scale score



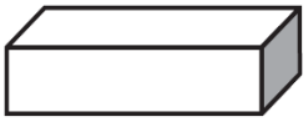
What shape will this net make when it is folded?

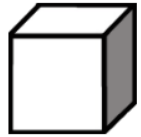


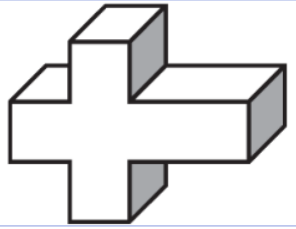
Test 2 – 35.9 scale score



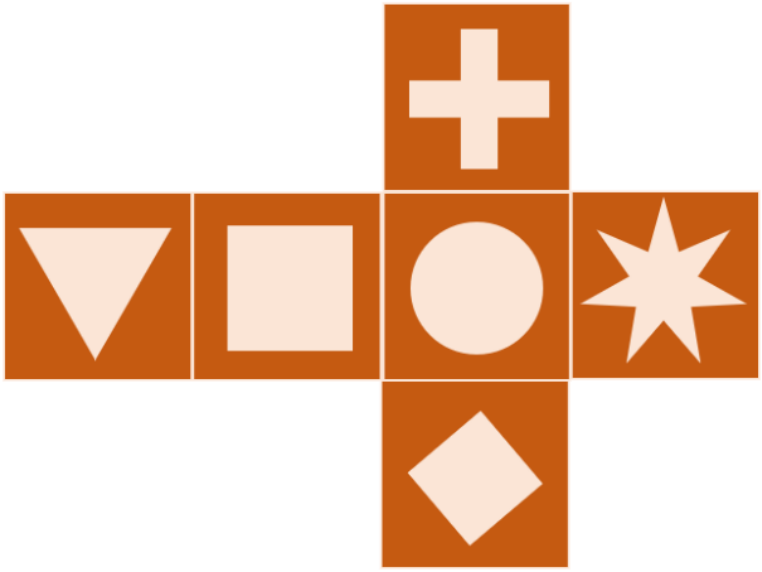
Which shape do you get when you fold this net?



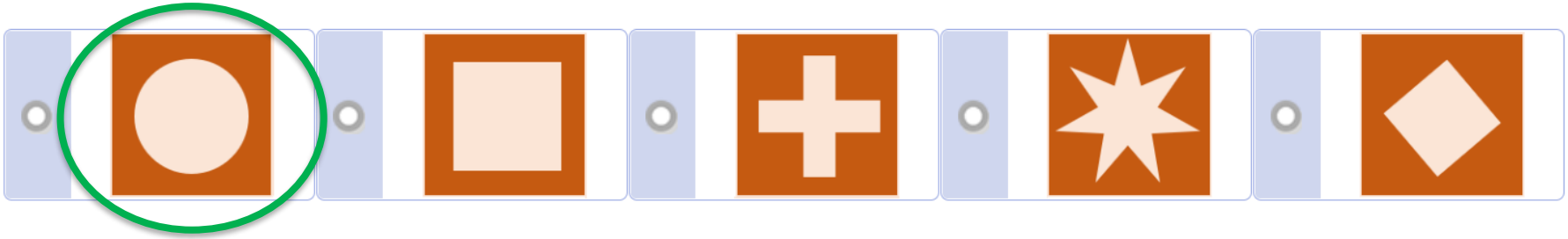




Test 3 – 47.4 scale score

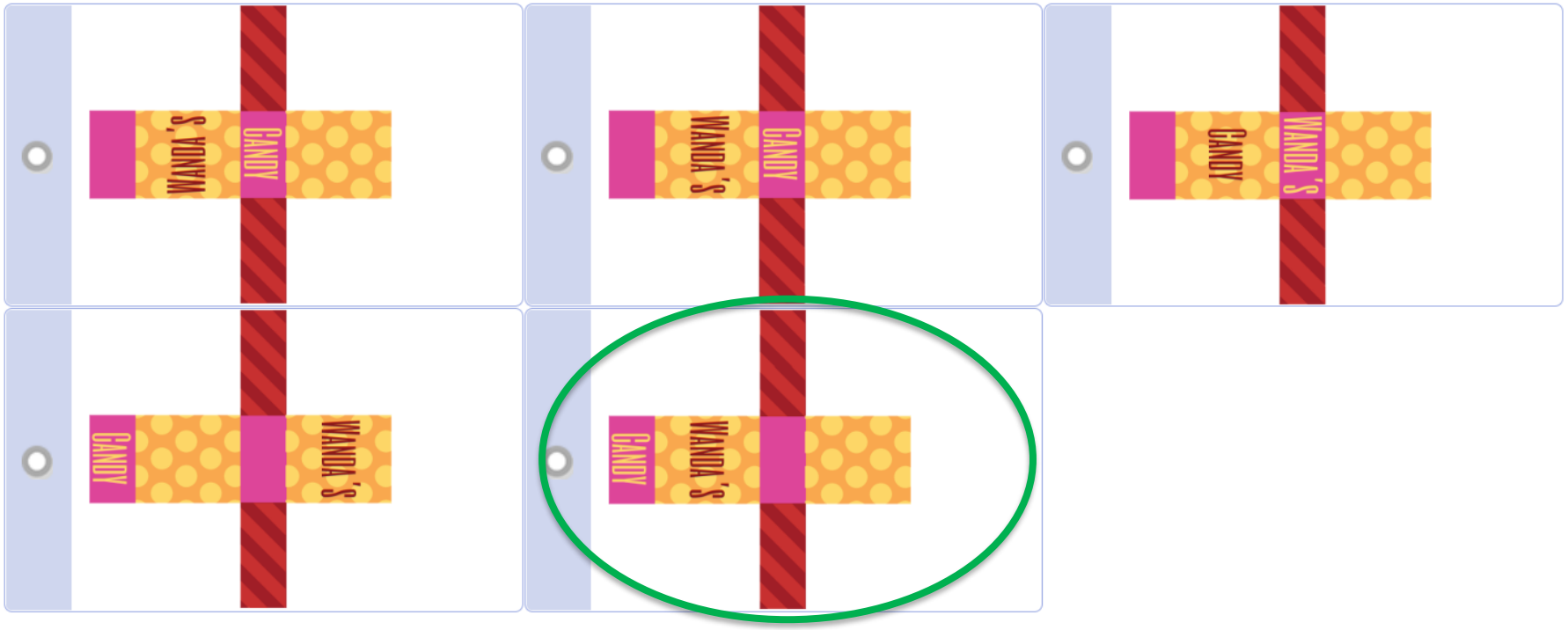


Which shape will be opposite the triangle when the net is folded?



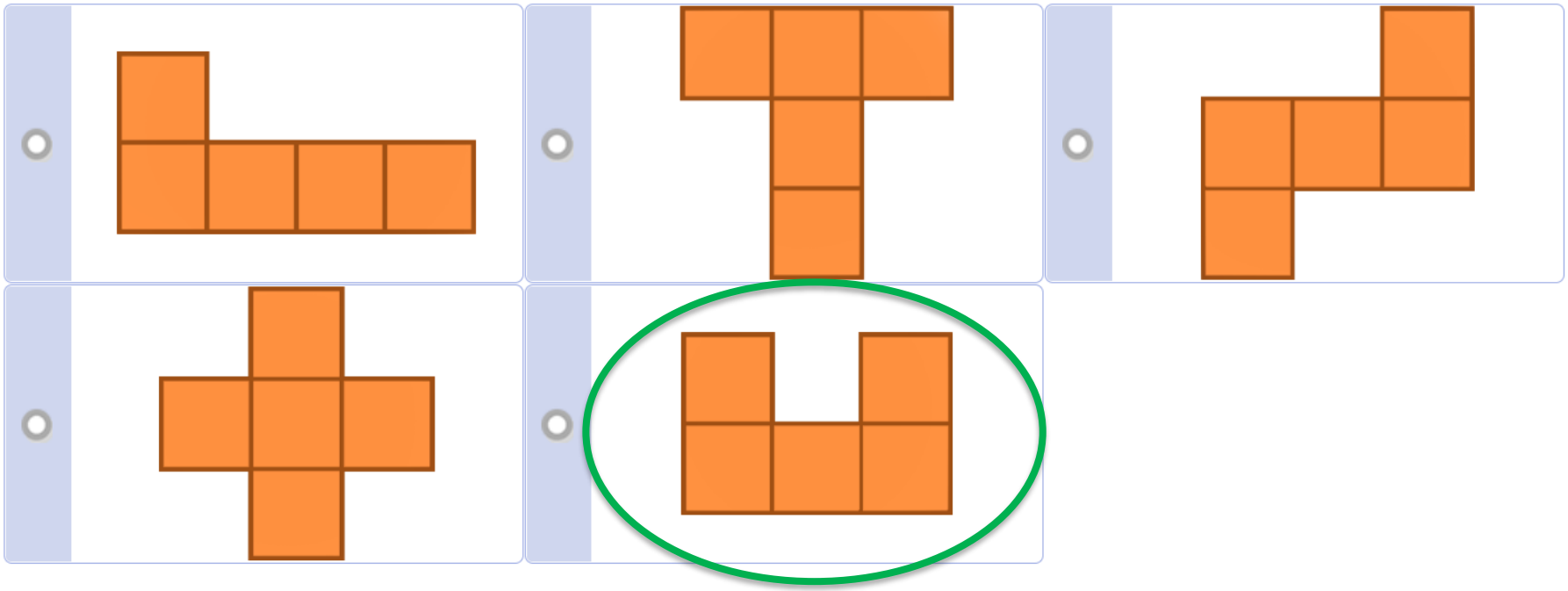
Test 4 – 53.3 scale score

Which of these nets can be folded to make this candy box?



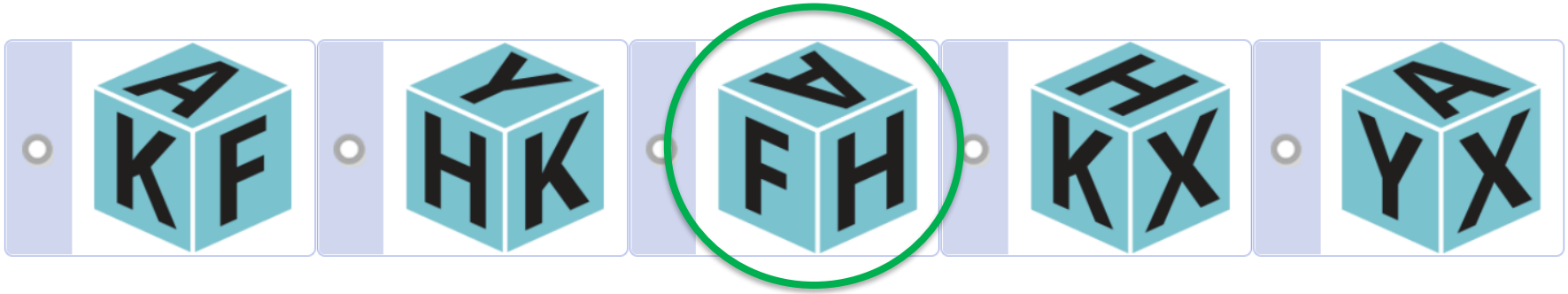
Test 5 – 57.3 scale score

Which net **cannot** be folded to make this open box?

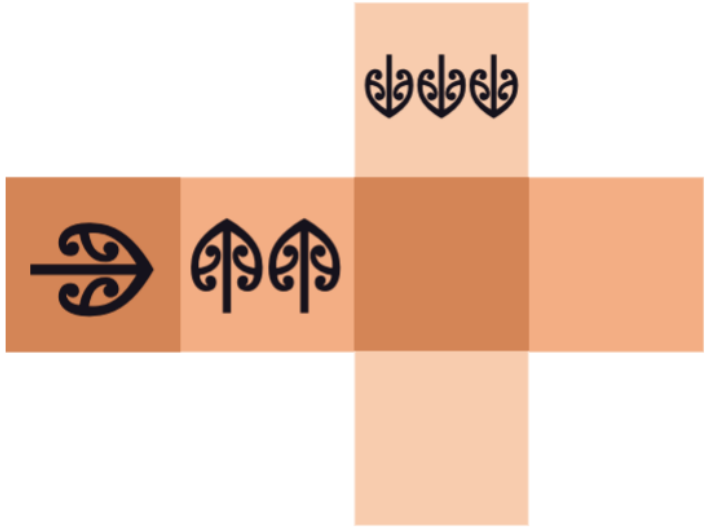


Test 6 – 70.1 scale score

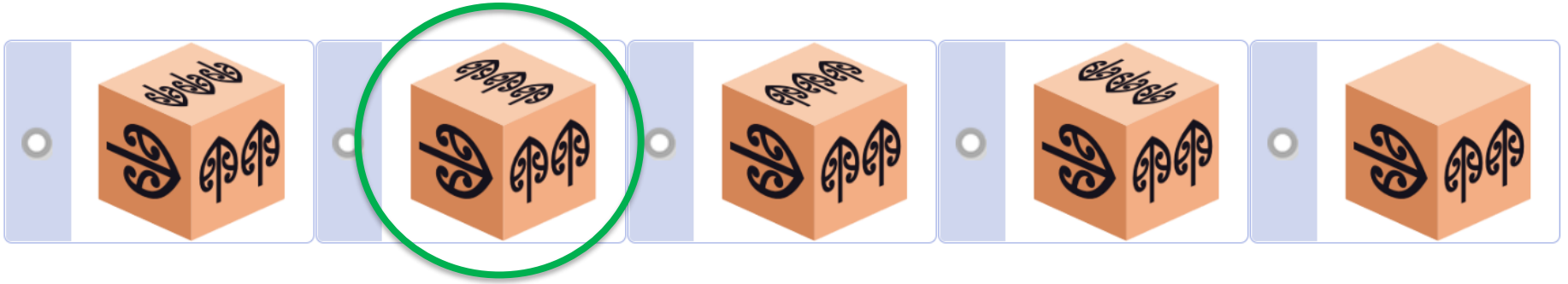
Which cube shows the net after it has been folded?



Test 7 – 79.9 scale score



Which of these cubes would be made by folding the net?

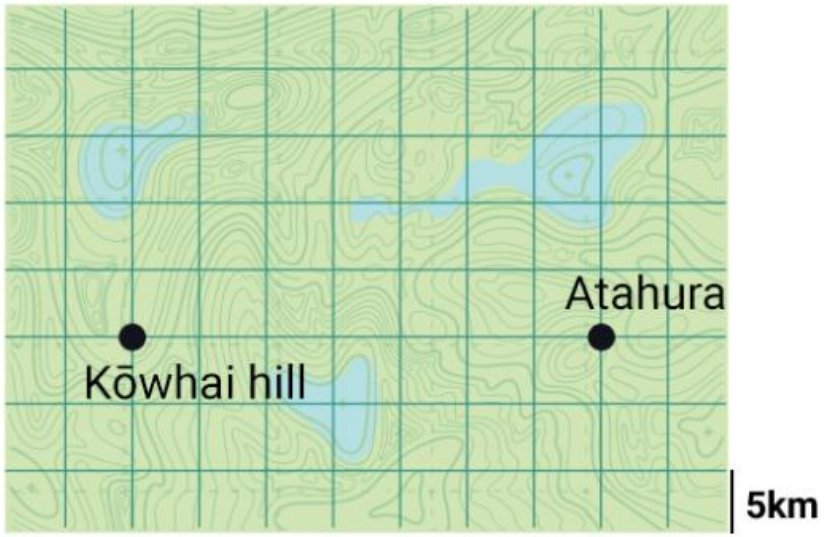


Conceptual Progression – Spatial reasoning

Test	Item no#	Scale score	Descriptor
1	35	27.7	**Rectangular prism** - Visualise which shape a net will fold to make
2	28	35.9	**Cube** - Visualise what a net will fold to make
3	35	47.4	**Shapes** - Visualise what a net will fold to make
4	32	53.3	**Candy box** - Visualise which of 5 nets will fold to make the shown box
5	13	57.3	Visualise which of 5 nets **cannot** be folded to make a cube
6	18	70.1	**Alphabet** - Visualise which cube a net will fold to make
7	18	79.9	**Koru** - Visualise what a net will fold to make

Why would students select each answer?

Question



How far is it from Kōwhai hill to Atahura?

Answer Options

(A) 7 km

(B) 8 km

(C) 35 km

(D) 40 km

(E) 70 km

Test 3

Level of difficulty

Misconceptions (Static)

Linked tasks (Static)

Ākonga responses

Strand

Geometry And Measurement

Question Scale Score

39.4

Question Description

Calculate distance on a scale map

Possible Misconceptions

Distractor	Misconception
A	forgets to apply the scale
B	miscounts and forgets to apply the scale
D	miscounts but uses scale correctly

Assessment Resource

ARB's keyword: scale

Option Information (Number of Students: 17)

A (52.9%)	B (17.6%)	C (23.5%) ✓	D (5.9%)
Min Min H	Ai'lani A	Charlie F	Arvana G
Ryder I	Ian P	Jasmine S	
Jacob K	Nadia V	Ethan W	
Jayde L		Armani H	
Olivia P			
Elias S			
Emma T			
Awatea T			
Maya W			
9 students	3 students	4 students	1 students

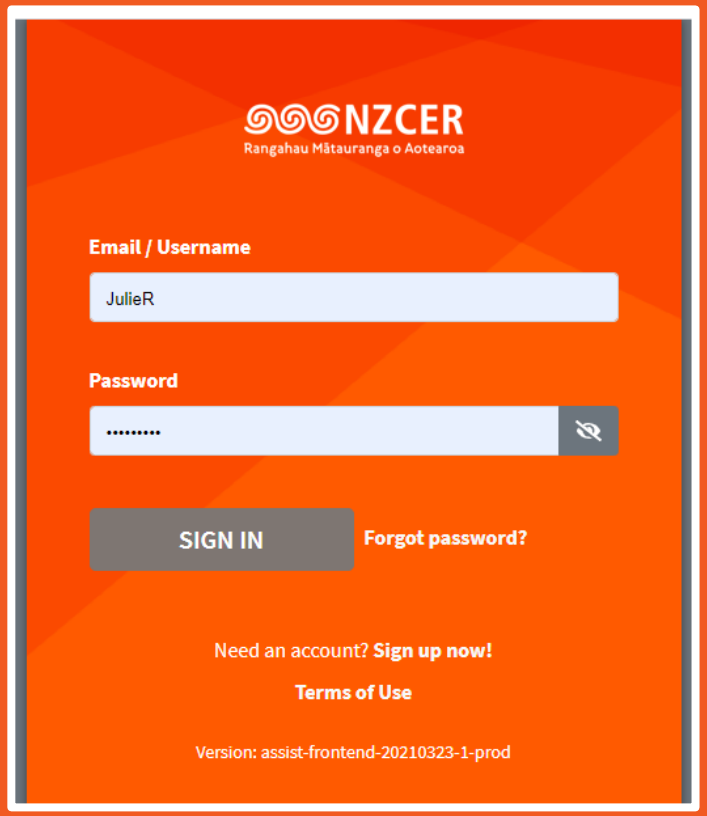
Consider the following:

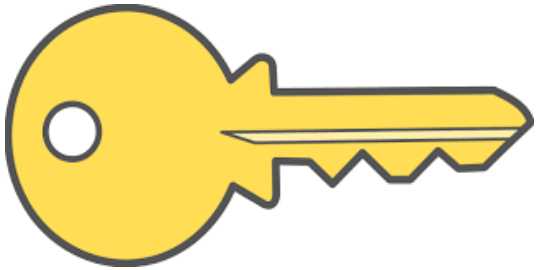
- What skills and knowledge did students draw on to answer this question?
- Does this reflect what you 'notice' in classroom learning?
- Do you need to check on student understanding another way? How will you do this?
- What do you need to consider in your teaching for Term 3?

PAT Pāngarau reports

Classroom level analysis

- List
- Year level
- Individual student
- Item
- Individual item





Akoranga hou

(new learning)

Kaupae i muri

(next steps)

Kei te mīharo au

(wondering, thinking about)