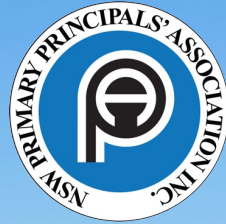# Measuring what we value: Session 2

Professor Jim Tognolini
Centre for Educational Measurement
and Assessment (CEMA)

THE UNIVERSITY OF
SYDNEY

# Acknowledgement of Country

Today's Agenda

- Welcome and housekeeping

- Acknowledgement of Country

- Q & A session

- Lecture

- Q & A session

- Breakout groups with task

- Return to whole group: any further questions?

- Task set for break between sessions & farewell

Aims of this presentation

1. reflect upon session 1

2. introduce a common approach to building a measurement scale (rubric);

3. introduce an approach to measuring performance against the measurement rubric;
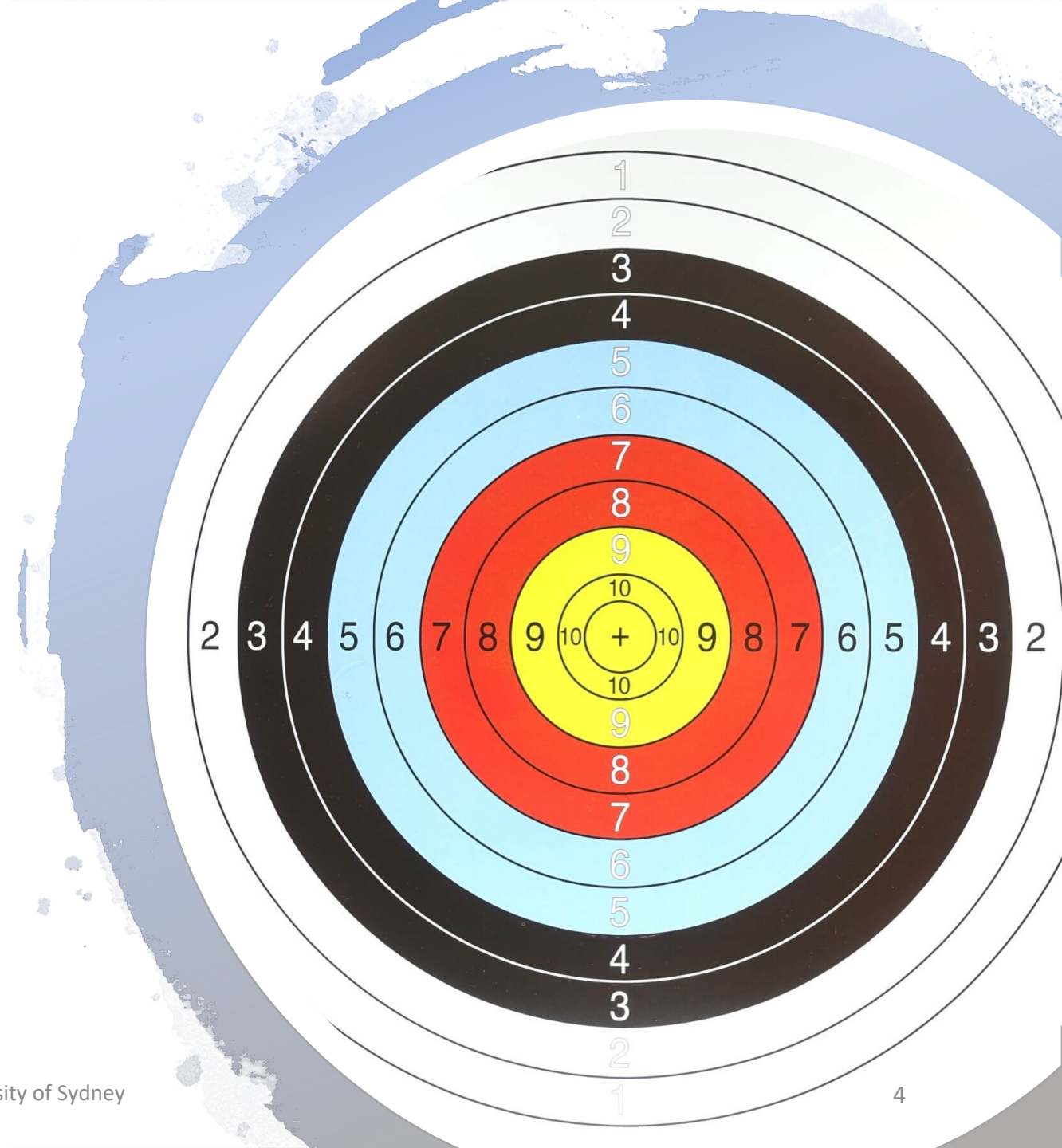
Aims of this presentation

4. consider some practical examples of how different measurement rubrics have been built by "teachers";

5. introduce the idea of building an evidential argument to support the validity (fairness) of the measurement rubric; and,
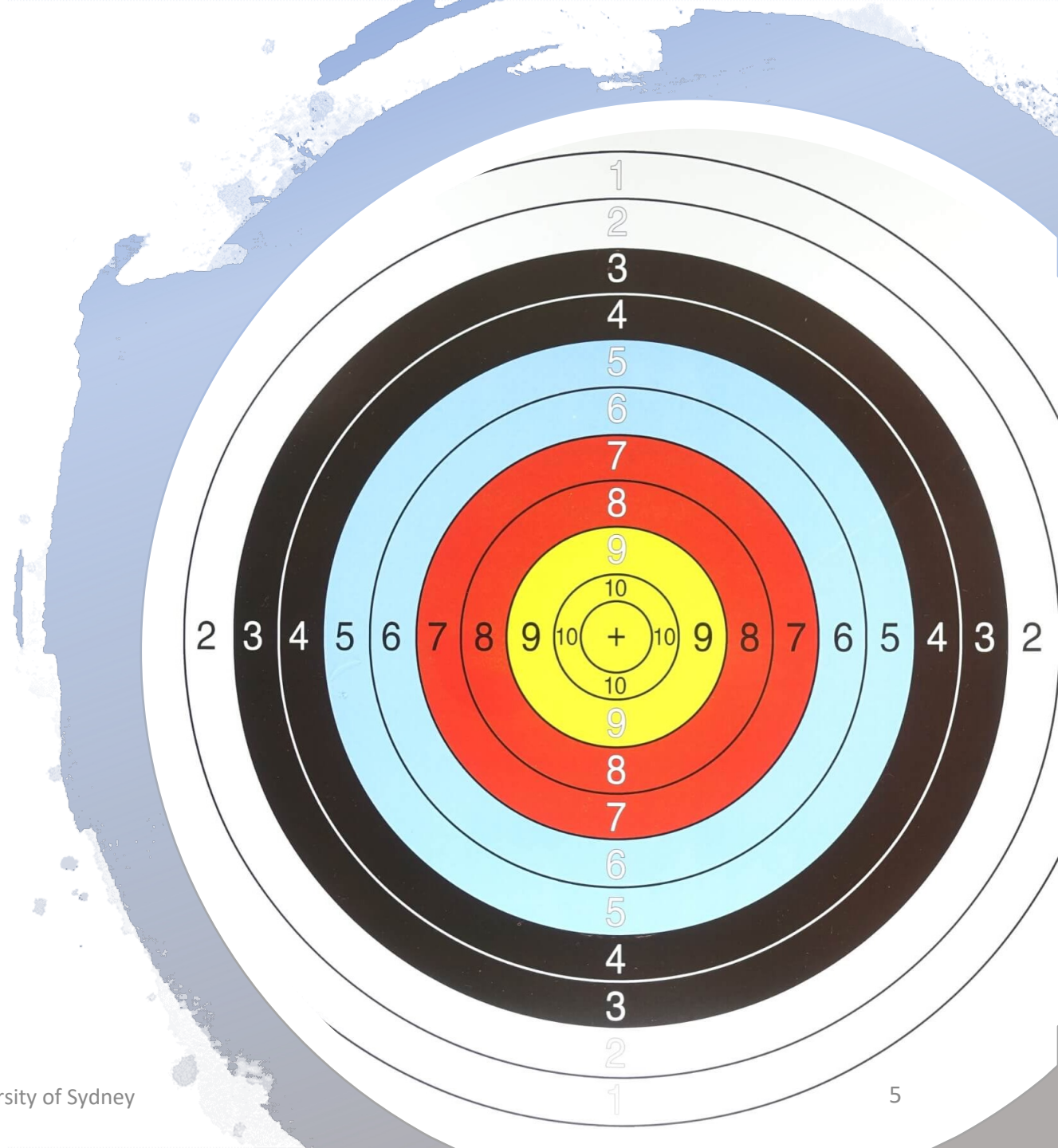
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6. consider some possible ways that teachers in schools might assess students to collect evidence that can be used to show what it is that students know, can do, and value, in relation to what is being measured.

7. present the next task for completion by session 3, on 5 May.

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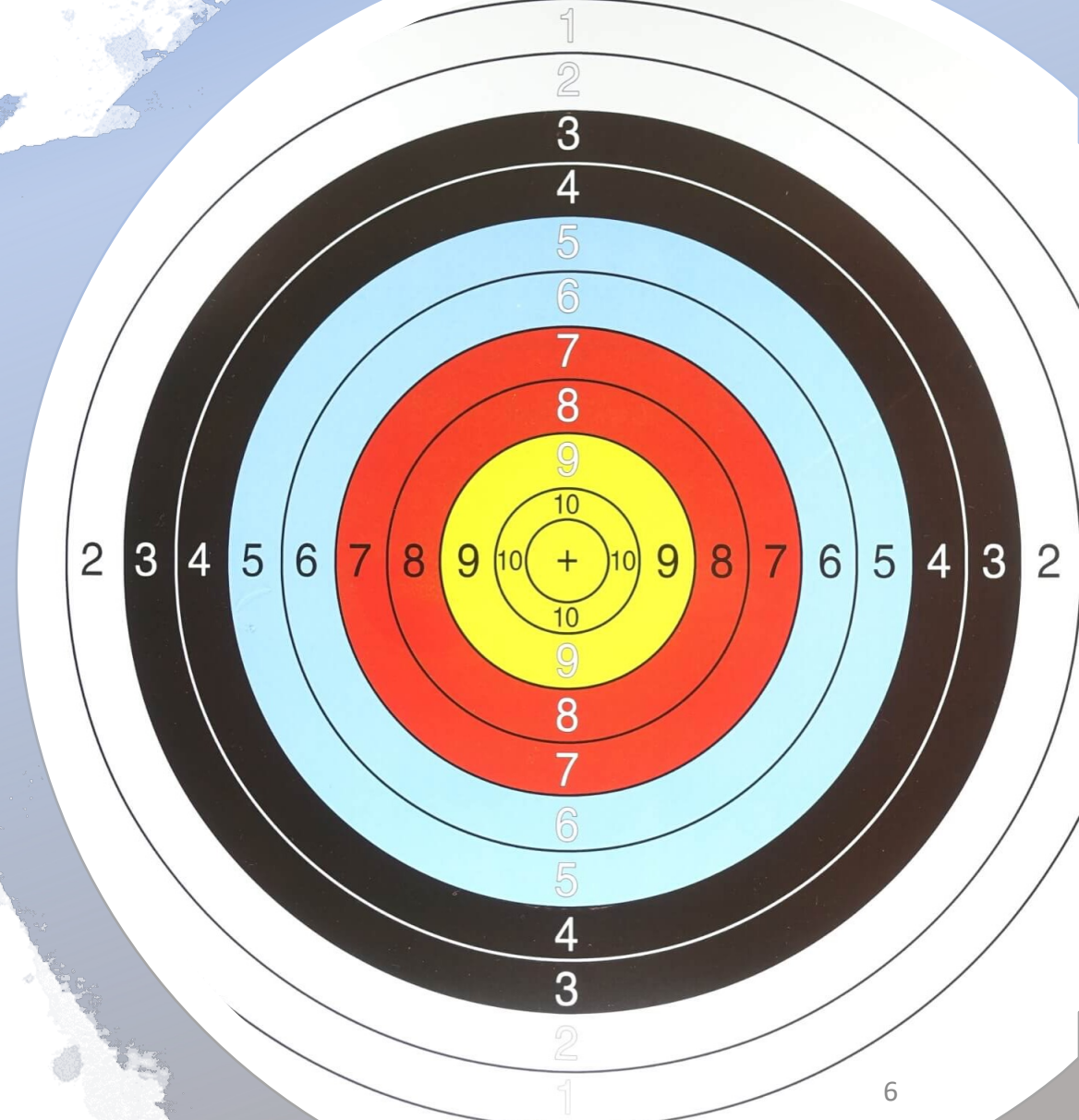
What (else) do we value?

"On assessment: measure what you value instead of valuing only what you can measure."

(Hargreaves, 2011)

What (else) do we value?

"If a thing exists, it exists in some amount. If it exists in some amount, it can be measured"

(Cronbach, 1990)

The key measurement challenge

How can we know that the students have *more* of whatever construct you "value" after they have participated in the teaching and learning program?

The key measurement challenge

How can we know that the students have *more* of whatever construct you "value" after they have participated in the teaching and learning program?

In other words, how do we know that we have had an *impact* on what it is we value?

Measurement

The starting point for talking about **impact** in the social sciences is to make a distinction between **counting and measurement**.

Thinking of **testing** slightly differently, the performance indicates **how much** of the "**property**" (e.g., numeracy, literacy, empathy, engagement) students have demonstrated rather than how many marks the student has accumulated.

Measurement

How much is a **measurement** question, not a **counting** question.

To answer the question of **how much**, we turn to the **physical sciences to help us answer the measurement question** because they are quite good at measuring.

Measurement

Measurement in the physical sciences is characterised by **3 properties**:
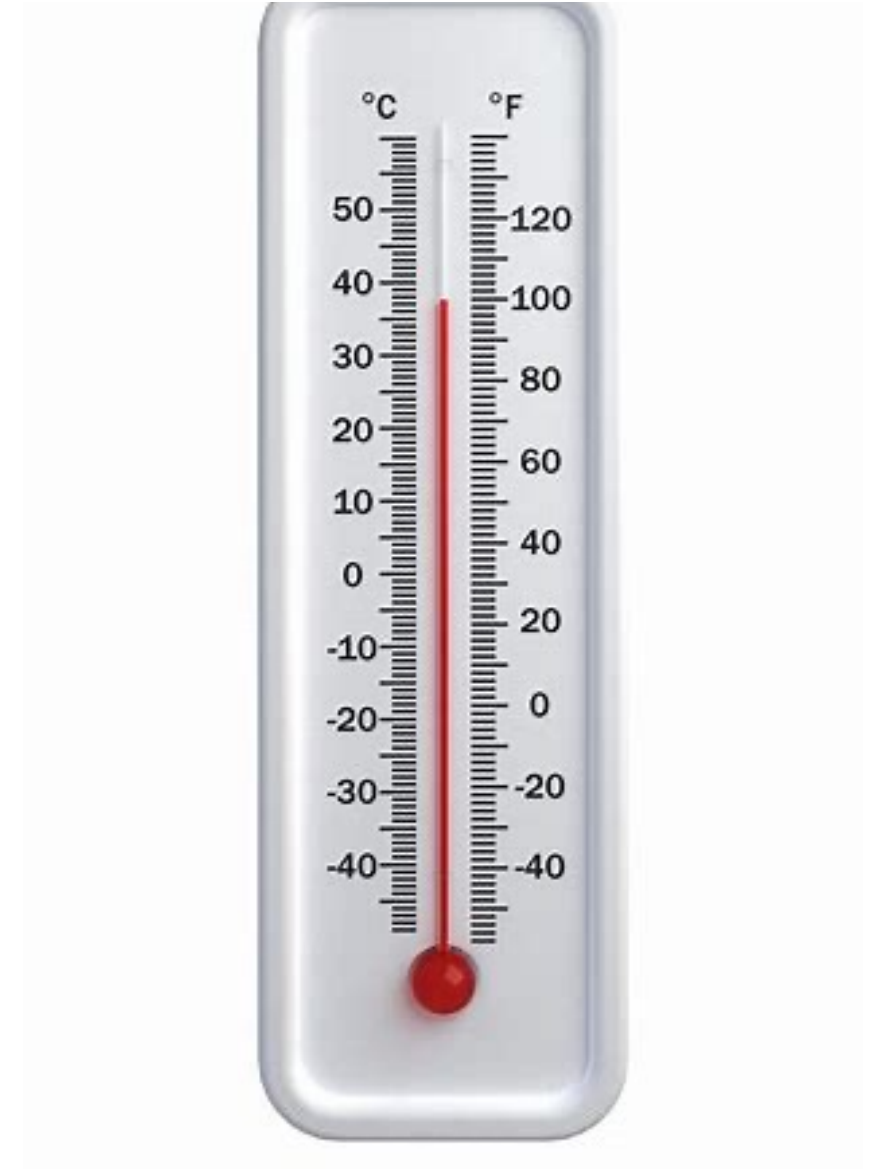
1. objectivity
2. linearity
3. calibrated scales

A common measurement approach to building the scale

Measurement is a 2-stage process:

Stage 1: Construct the measuring instrument

Stage 2: Measure what it is that you want to measure

A common measurement approach to building the scale

Stage 1: Constructing the measuring instrument is a **4 Step process**

Step 1: **Define** what it is you want to measure

Step 2: Identify the **components** that characterise what it is that must be measured

Step 3: **Develop descriptions of performance** for each level of each component

Step 4: Build the **evidential argument** for validating the rubric as a legitimate measure.

A common measurement approach to building the scale

Stage 2: Measure what it is that you want to measure **2 Step process**
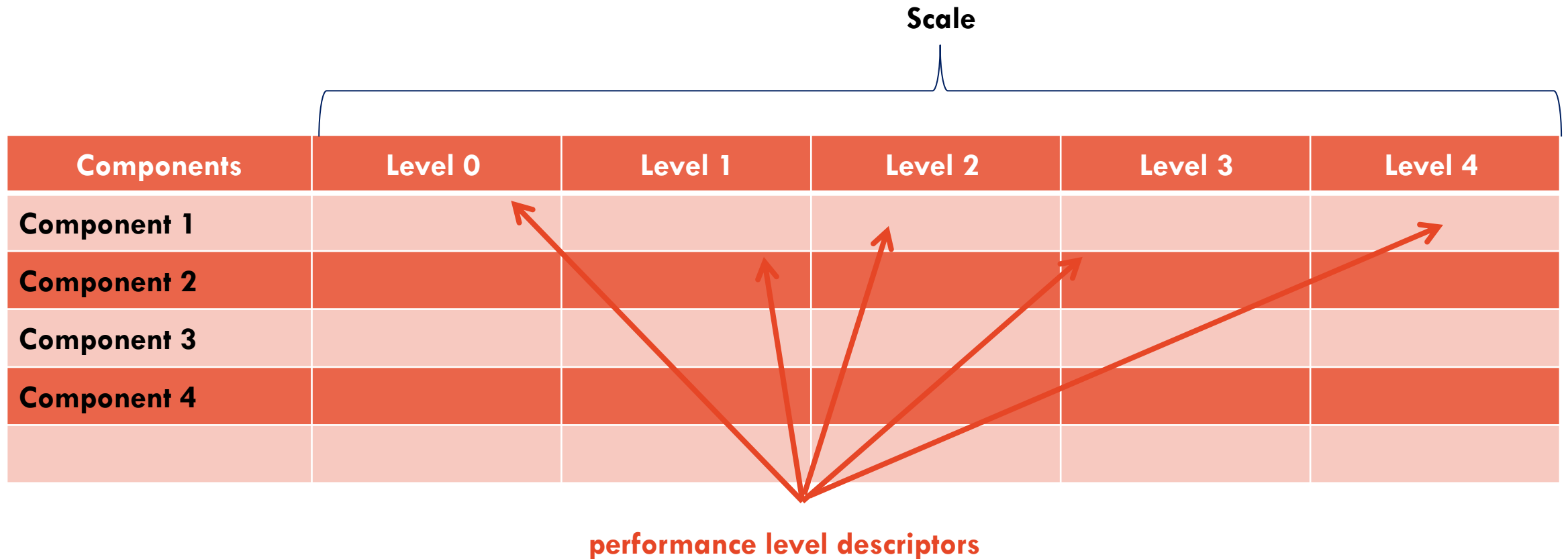
Step 1: Assess (collect the evidence)
Step 2: Use the evidence to locate the student performance on the scale

Steps in developing a measurement rubric

Definition of construct (what it is you want to measure)

Scale

Components	Level 0	Level 1	Level 2	Level 3	Level 4
Component 1					
Component 2					
Component 3					
Component 4					

performance level descriptors

Example 1:
Honesty in India

Not so honest

Very honest

Example 1: Honesty in India

Not so honest

Very honest
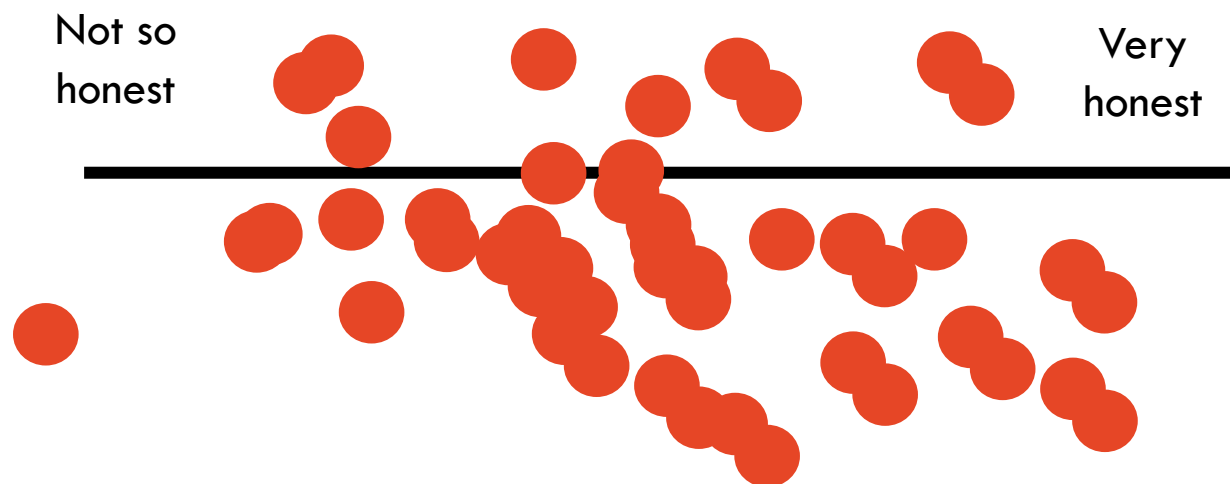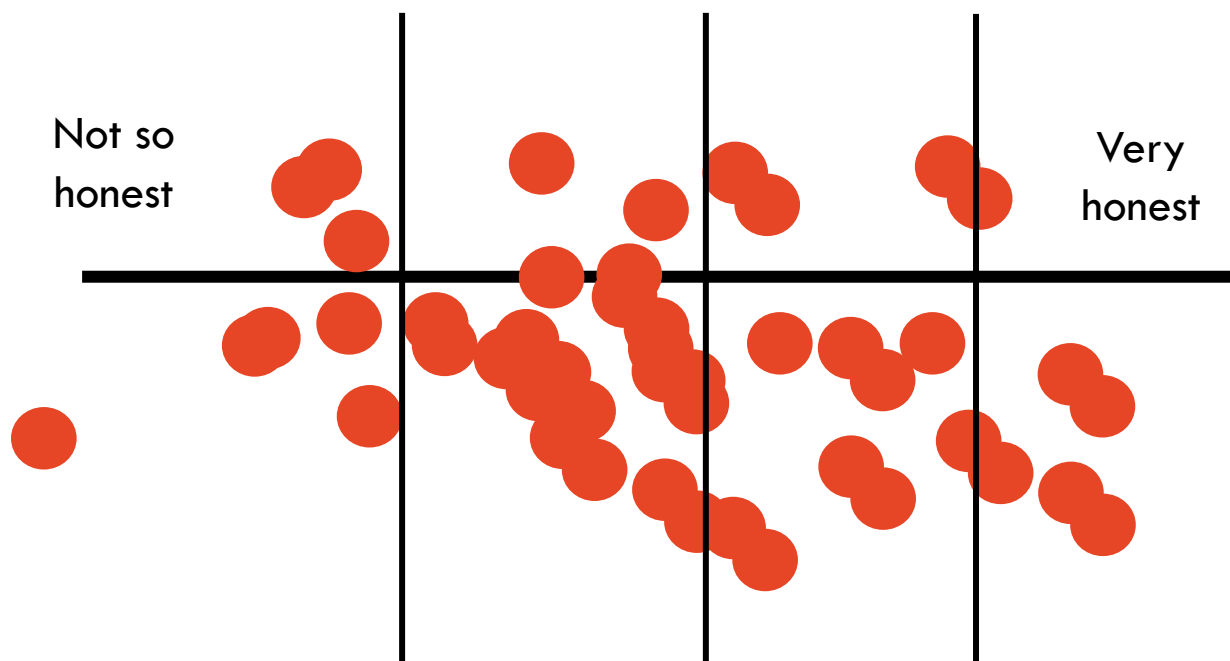
Example 1: Honesty in India

Not so honest

Very honest

Example 1: Honesty in India

What were some of reasons for putting a bubble here?

Not so honest

Very honest

Example 1: Honesty in India

What were some of reasons for putting a bubble here?

Not so honest

Very honest
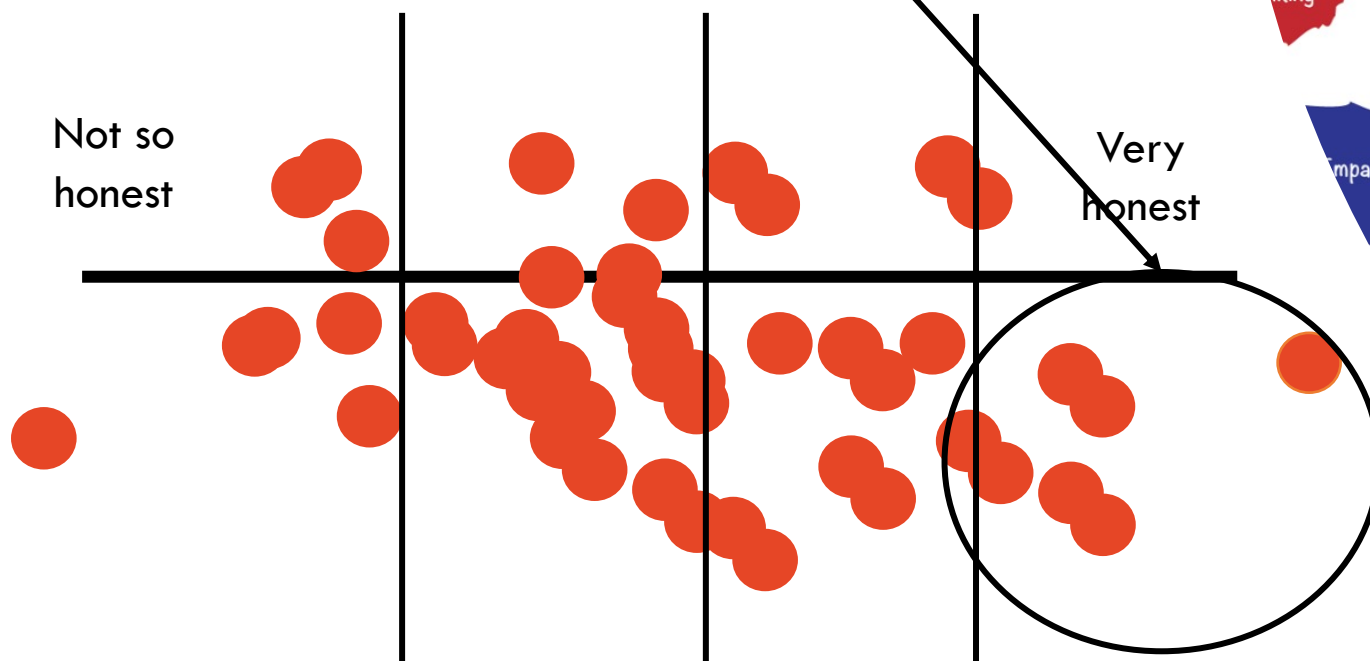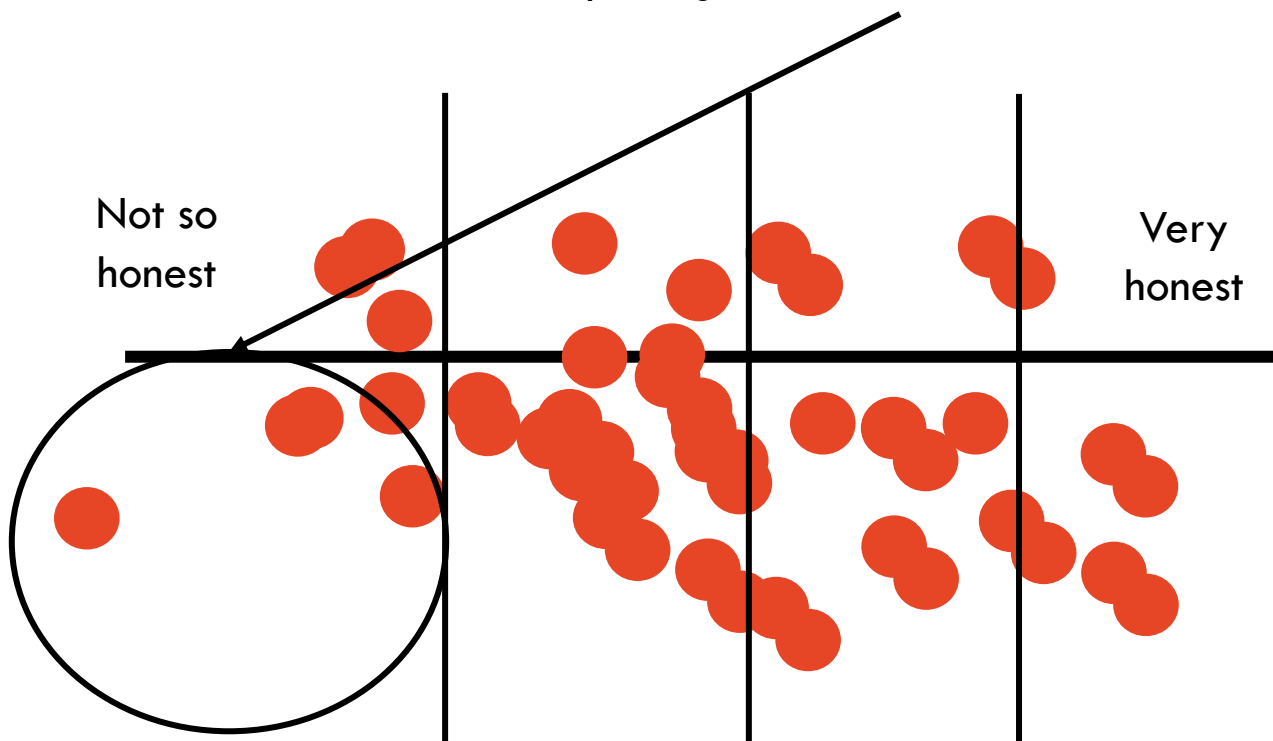
Example 2:
Cultural competence at CSU

Not so
Culturally
Competent

Very
culturally
competent

Problem Solving

Systems Thinking

Critical Thinking

Lateral Thinking

Cognitive

Entrepren-eurship

Excellence

Organizing

Leadership

Influence without authority

Negotiation

Collabor

Curiosity

Ideation

Innovation

Empathy

Emotional

Resilience

Creativity

Visualisation

Citizens

Social & Civic Engagement

Gender Harmony & Equity

Example 2: Cultural competence at CSU

Develop descriptions of performance for each level of each component.

Criteria	1	2	3	4
Cultural competence				

A common measurement approach to building the scale

Stage 1: Constructing the measuring instrument is a **4 Step process**

Step 1: **Define** what it is you want to measure

Step 2: Identify the **components** that characterise what it is that must be measured

Step 3: **Develop descriptions of performance** for each level of each component

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Steps in developing a measurement rubric

Definition of construct (what it is you want to measure)

Scale

Components	Level 0	Level 1	Level 2	Level 3	Level 4
Component 1					
Component 2					
Component 3					
Component 4					

performance level descriptors

Non-cognitive skills in China's quality comprehensive evaluation framework

Behaviour: Students performance in civilized manners, thrift, love of knowledge and the labour situation, care for the environment and other aspects.

Civic literacy: Students cherish life, law-abiding, honest and trustworthy, unity and friendly, willing to help others and other aspects.

Personality traits: Students performance in self-esteem, self-discipline, respect for others and so on.

Ideals and Beliefs: Patriotism, national identity, social responsibility, collective consciousness, and other aspects of life.

Subject thinking skills: Students understanding and mastery of the thinking approach and methodology to each school subject.

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Example 3:
Patriotism in Shenzhen China
(Step 1)

Definition: Patriotism is the emotional attachment to a country that the student feels is home

Example 3:
Patriotism in Shenzhen China
(Step 2)

Definition: Patriotism is the emotional attachment to a country that the student feels is home

Components:

1. Love of one's country
2. Identification with one's country
3. Willingness to sacrifice for one's country

Example 3: Patriotism in Shenzhen China (Step 3)

Develop descriptions of performance for each level of each component

Components	1	2	3	4
Love of one's country	Students never mention their country.	Students refer to their country when prompted but rarely make any positive statements to show their affection.	Whenever the opportunity arises students take the opportunity to show their affection for their country.	Students openly discuss their affection for their country and lead other students in organising activities to demonstrate this affection.
Identification with one's country	• Know the history and basic conditions of the country and the nation; • Know national identifications (national flag, national emblem, national anthem, RMB, etc.); • Know few current events and national development	• Be familiar with the history and basic conditions of the country and the nation; • Be familiar with national identifications (national flag, national emblem, national anthem, RMB, etc.); • Know current events and national development.	• Understand the history and basic conditions of the country and the nation; • Understand national identifications (national flag, national emblem, national anthem, RMB, etc.); • Pay attention to current events and national development.	• Identify the history and basic conditions of the country and the nation; • Respect national identifications (national flag, national emblem, national anthem, RMB, etc.); • Care for current events and pay attention to national development.

Example 3: Patriotism in Shenzhen China (Step 3)

Develop descriptions of performance for each level of each component

Components	1	2	3	4
Concern for one's country and the people in it	Contribution to the discussions about issues within their country.	Students acknowledge their country and mouth concern for the people in it. However, this is usually not followed up with any actions.	Students acknowledge issues that effect their country and show concern for the people in it. They celebrate its successes but they rarely, if ever, take a leadership role.	Students lead others in showing concern for their country and the people in it. For example, they are the ones who want to get their friends to help people in floods or fires.

University of Sydney Graduate Qualities

1. Depth of disciplinary expertise
2. Critical thinking and problem solving
3. Communication (oral and written)
4. Information and digital literacy
5. Inventiveness
6. Cultural competence
7. Interdisciplinary effectiveness
8. An integrated professional, ethical and personal identity
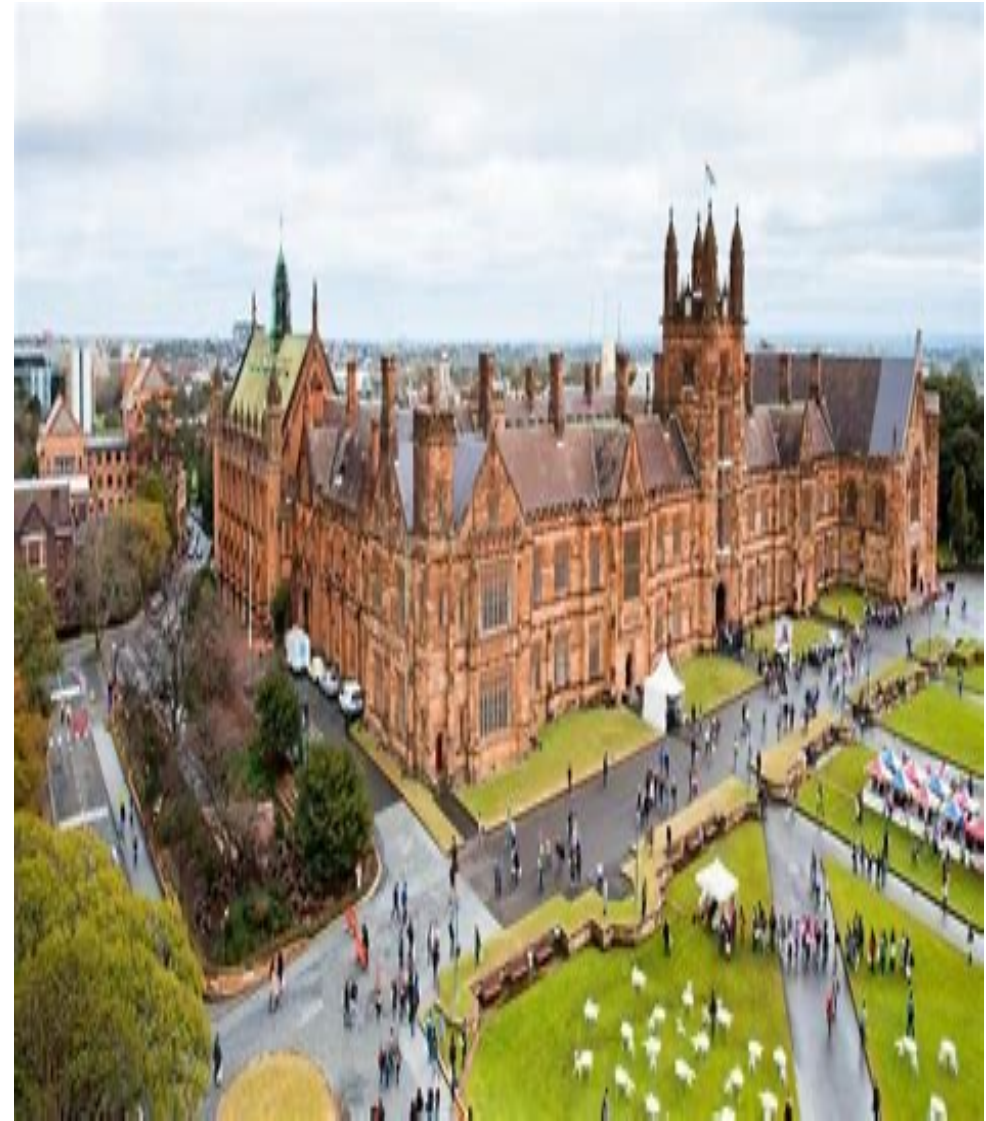9. Influence

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Example 4:
Critical thinking and problem solving at the University of Sydney
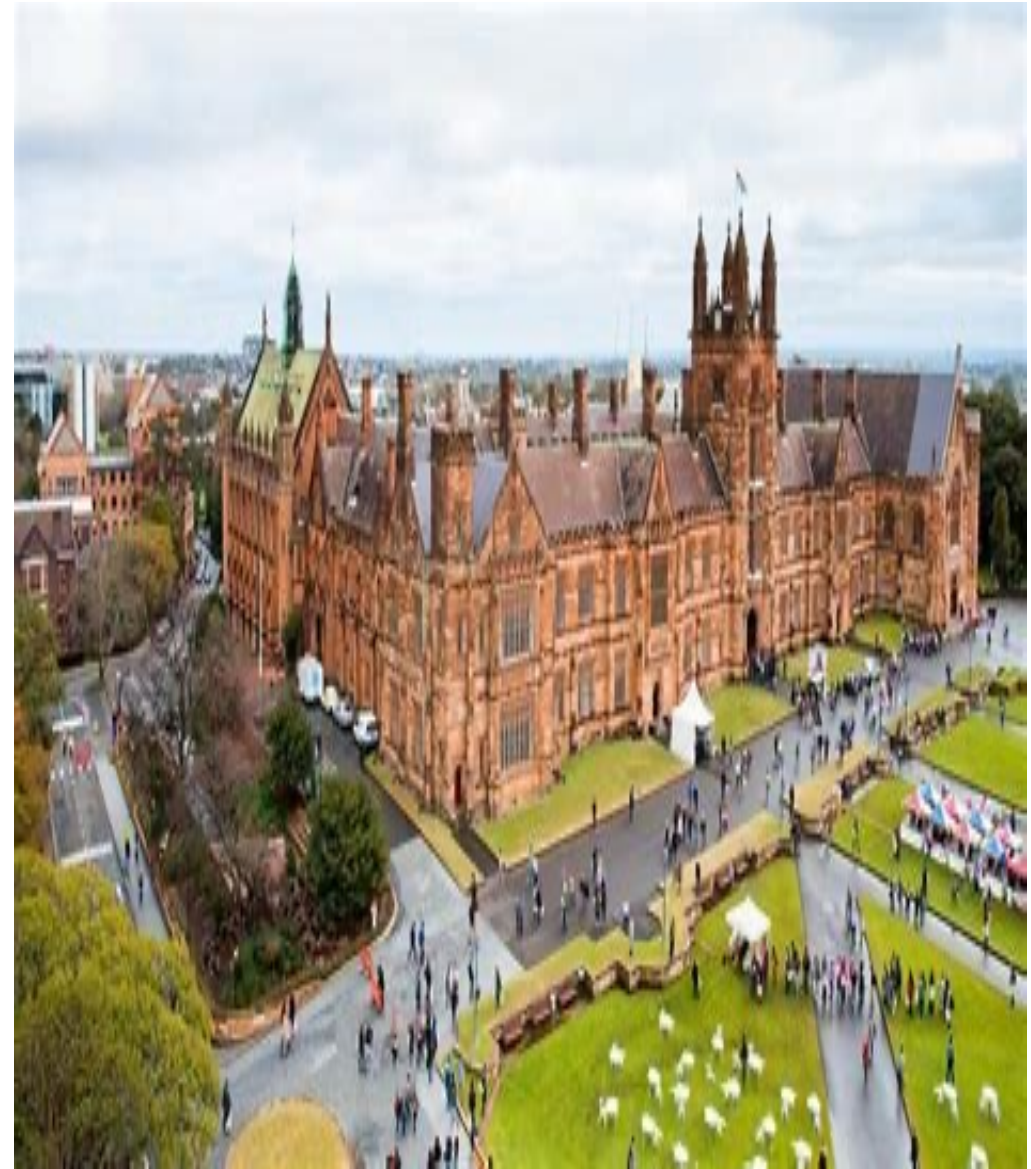

Definition

Critical thinking and problem solving <u>are the questioning of ideas, evidence and assumptions</u> in order to <u>propose and evaluate hypotheses or alternative arguments</u> before <u>formulating a conclusion or a solution to an identified problem</u>.

Example 4:
Cultural competence at the University of Sydney

Components

1. Definition of problem or issue in context
2. Critical questioning of ideas, evidence and assumptions
3. Creation and evaluation of hypotheses or alternative arguments
4. Formulation of defensible conclusions and best possible solutions

Example 4: Cultural competence University of Sydney

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Definition of problem or issue in context		Describes the problem or issue.	Provides a basic definition of the problem or issue and shows that the problem or issue is situated in a context.	Provides an informative definition of the problem or issue, shows that the problem or issue is situated in a context, shows understanding of the main features of that context and explains why these matter, defines key terms, identifies desirable features of possible solutions.	Insightful and articulate. Analyses a context by consulting a suitably broad range of informational sources, identifies and appropriately frames a problem or issue within that context, gives a detailed and clear definition of the problem or issue, explains why this problem or issue matters, sets out criteria against which to measure possible solutions.

Example 4: Critical thinking and problem solving

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Critical questioning of ideas, evidence and assumptions		Listens to and understands the ideas of others.	Recognises that ideas, evidence and assumptions need to be examined, shows awareness of differences in perspective, shows sensitivity to possible bias and error, seeks out those who have knowledge and expertise.	Questions received ideas, evidence and assumptions, engages with the work of genuine experts, critiques fallacious rhetoric, engages in rational argument, assesses currently available evidence, provides evidence to justify conclusions.	Open-minded and intellectually rigorous. Critically examines received ideas, evaluates the credibility and the methodology of experts, engages with competing views from various historical, intercultural and interdisciplinary perspectives, locates and assesses new evidence

Example 4: Critical thinking and problem solving

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Creation and evaluation of hypotheses or alternative arguments		Identifies and understand hypotheses put forward by others	Recognises that current hypotheses and arguments may be suboptimal, assesses the existing hypotheses and arguments.	Generates new hypotheses and arguments, shows awareness of how they could be compared and tested, carries out these tests.	Creative and judicious. Generates original hypotheses and arguments, tests relevant hypotheses and arguments via reasoning, observation, or experiment, evaluates the results.

Example 4: Critical thinking and problem solving

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Formulation of defensible conclusions and best possible solutions		Recognises conclusions and solutions offered by others.	Formulates basic solutions or conclusions	Offers a solution or conclusion based on engagement with the relevant evidence, defends this solution or conclusion in light of relevant evaluative criteria.	Wise and decisive. Decides on the balance of the evidence, formulates conclusion or solution clearly in their own words, identifies the proper scope and significance of the conclusion commensurate with methods used, explains why this conclusion or solution is best when measured against relevant evaluative criteria.

Checklist for writing the rubrics

1. Make sure that there is a *clear definition of the construct/quality.*

2. Make sure that there is an *alignment between the definition of the construct and the components being assessed.*

3. Where possible make sure that there are *no more than 7 components* to be assessed in an analytic rubric.

4. Make sure that the there are no more than *5 performance level descriptors (categories) in the rubric?* Typically a good rubric will have *three to five categories and it is not necessary to have equal numbers of categories for each component.*

5. Make sure that the *performance level descriptors show growth in terms of the components and subsequently the overall construct/quality.*

6. *Work to make the performance level descriptors coarse enough for lecturers and students to see a perceptible difference in performance.* Overly fine distinctions in performance might be illusory because of the multiplicity of factors which go into giving a fair rating (contributes to lower reliability).

7. *Acknowledge that rubrics generally are very imprecise measures* (low reliability) and as a consequence there will be a need *to identify exemplar scripts (work samples, etc.) that are representative of performance on the category cut scores. These exemplars (work samples) give substantive meaning to the performance level descriptors.*

University of Sydney Graduate Qualities

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Example 5:
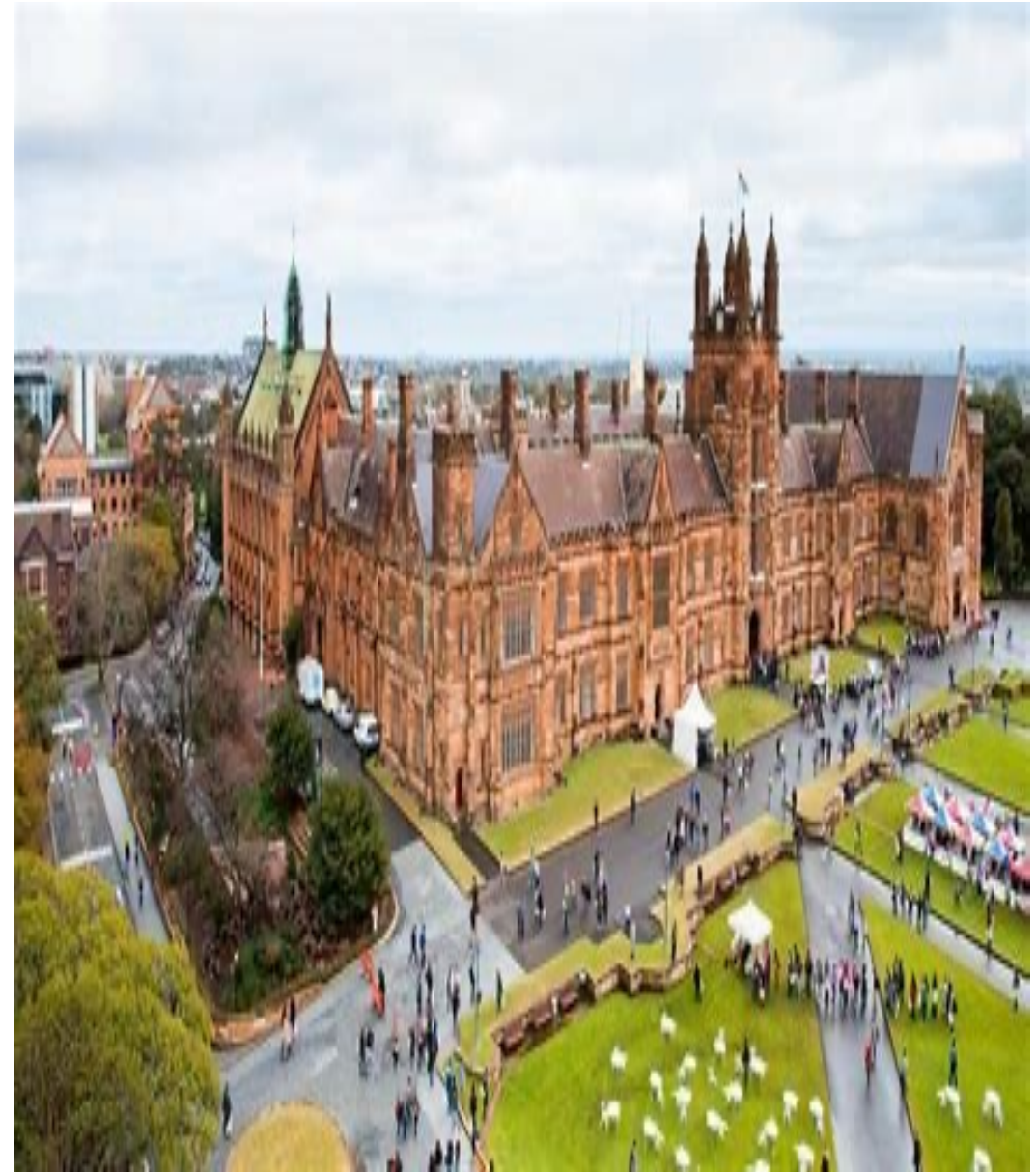# Cultural competence University of Sydney

Definition

Cultural Competence is the ability to actively, ethically, respectfully, and successfully engage across and between cultures. In the Australian context, this includes and celebrates Aboriginal and Torres Strait Islander cultures, knowledge systems, and a mature understanding of contemporary issues.

University of Sydney
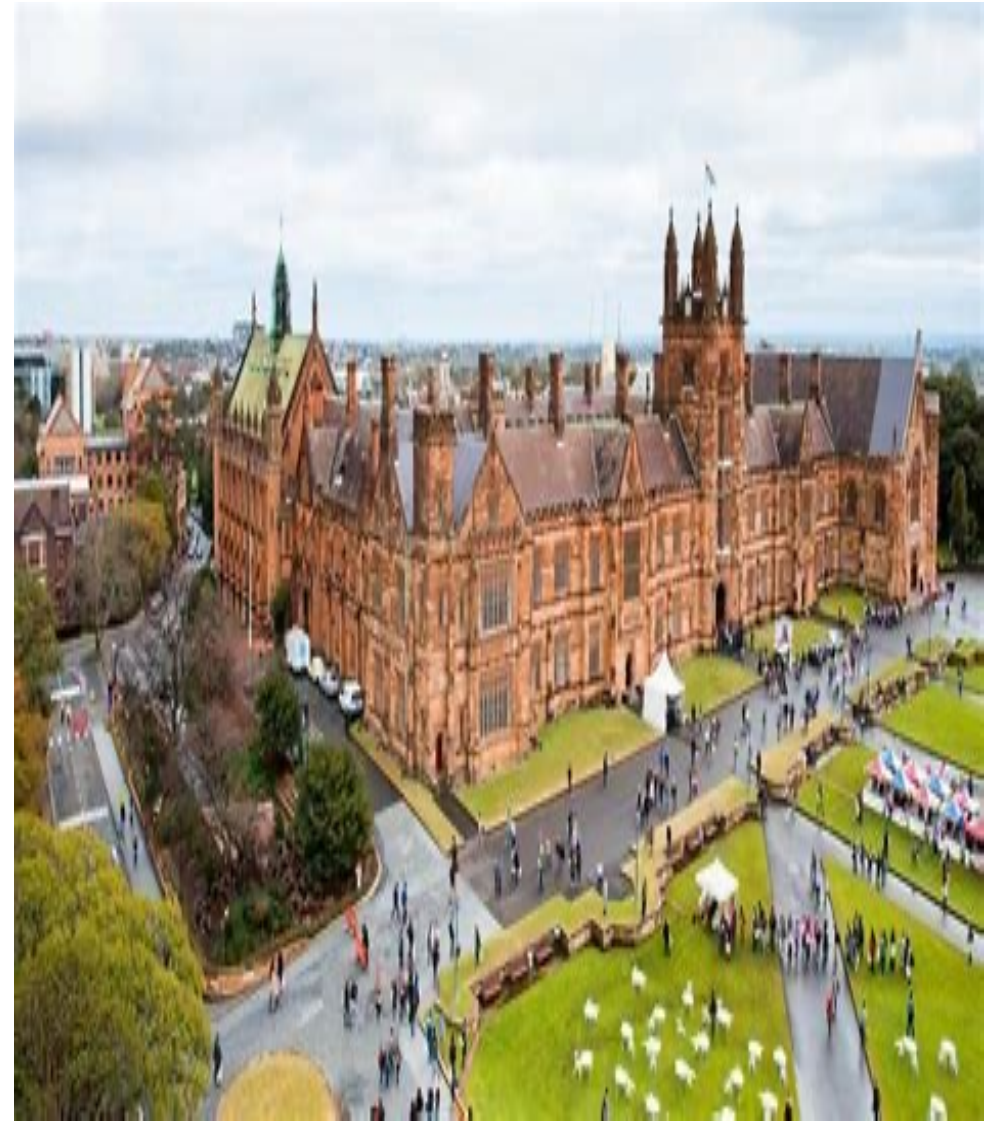
Example 5:
Cultural competence
University of Sydney

Components

1. Awareness of one's own cultural values and worldview
2. Actively seeking to understand norms and values of other cultures
3. Ability to communicate across and between cultures

Example 5: Cultural competence University of Sydney

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Awareness of one's own cultural values and worldview		Growing understanding of one's own cultural values, worldviews and practices: which may include emerging understanding of one's own culture through disciplinary or theoretical knowledge.	Recognises the importance of understanding one's own cultural norms and values.	Supports cultural difference on a personal, group/institutional and society level.	Possesses deep and broad understanding of one's own, group, institutional and societal cultures, and promotes that understanding among others.

Example 5: Cultural competence University of Sydney

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Understanding norms and values of other cultures: and ability to engage interculturally and cross culturally.		Growing understanding of one's own cultural values, worldviews and practices: which may include emerging understanding of one's own culture through disciplinary or theoretical knowledge.	Seeks knowledge and understanding of the norms and values of different cultures, which may be through engagement with disciplinary knowledge or theory.	Identifies the advantages gained and barriers overcome through inter- and cross-cultural understanding and collaboration.	Adopts a position of critical cultural reflection, and investigates cultural change with humility and sensitivity, whether independently or through active listening or active sharing, as appropriate.

Example 5: Cultural competence University of Sydney

Develop descriptions of performance for each level of each component

Components	0	1	2	3	4
Ability to communicate across and between cultures		Recognises the need to listen and communicate sensitively in culturally diverse settings (i.e., listening, speaking, writing, presenting).	Demonstrates sensitive listening and communication in culturally diverse settings.	Initiates thoughtful, accurate and respectful listening and communication with others in culturally diverse settings.	Implements high-level communication skills and complex understandings of cultural differences through a range of techniques to interact with a variety of stakeholders.

A common measurement approach to building the scale

Stage 1: Constructing the measuring instrument is a **4 Step process**

Step 1: **Define** what it is you want to measure

Step 2: Identify the **components** that characterise what it is that must be measured.

Step 3: **Develop descriptions of performance** for each level of each component.

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A common approach to measuring performance against a scale

Stage 2: Measure what it is that you want to measure **2 Step process**

Step 1: **Assess (collect the evidence)**
Step 2: Use the **evidence to locate the student performance on the scale**

Assessing performance

NOT necessary to have a standardised test e.g., no critical thinking test, or cultural competence assessment given to all students

Assessing performance

Teachers in the various subjects should be invited to build appropriate tasks (**could be a series of tasks**) that will provide evidence (**image**) that can be used to locate the students on the rubric.

The tasks can be different for different disciplines. The rubric is constant across subjects and across years.

The evidence is the work that the students have delivered in response to the task. Reporting can be via the difference in the work samples or a written description of what performance the student has displayed.
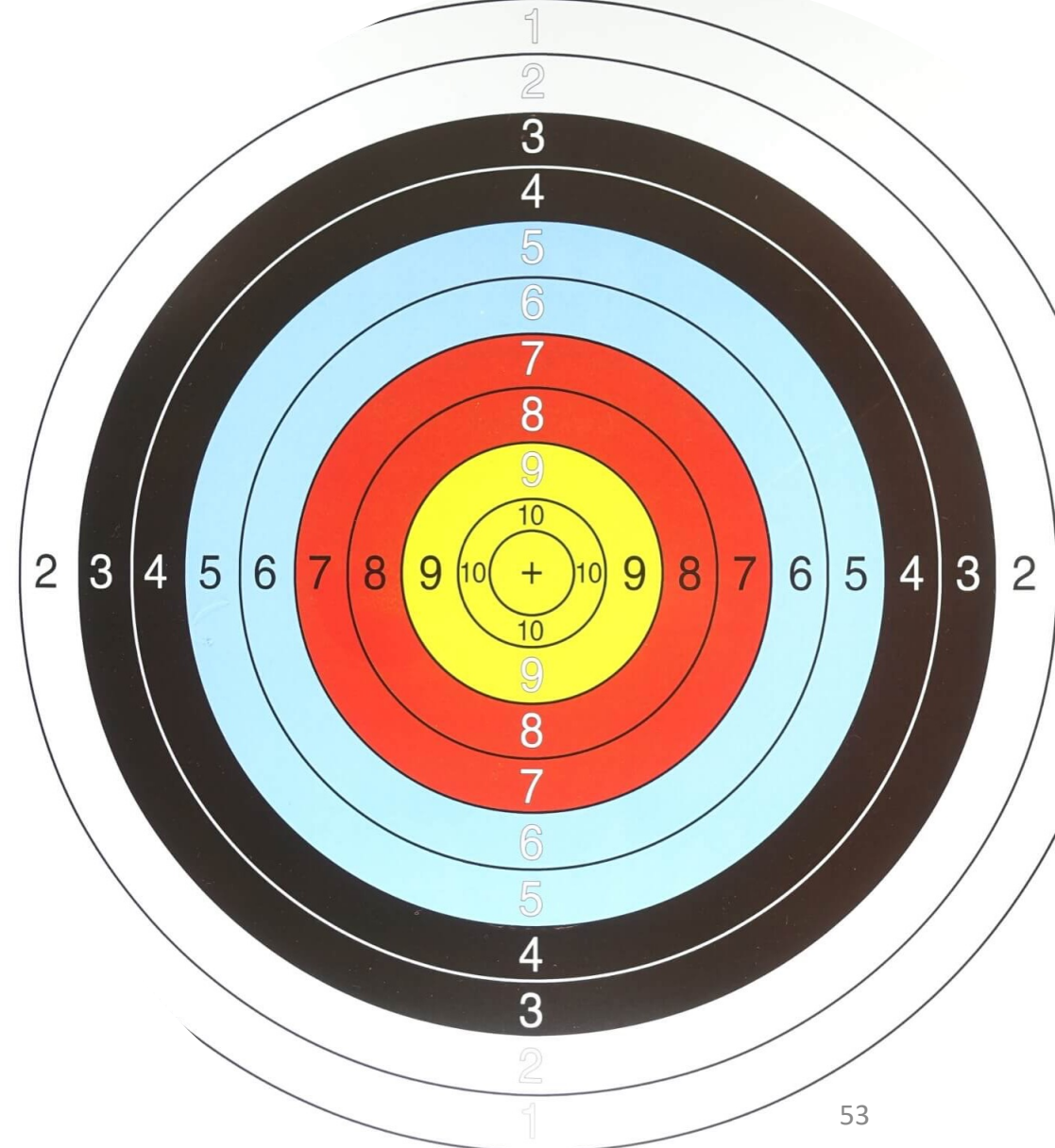
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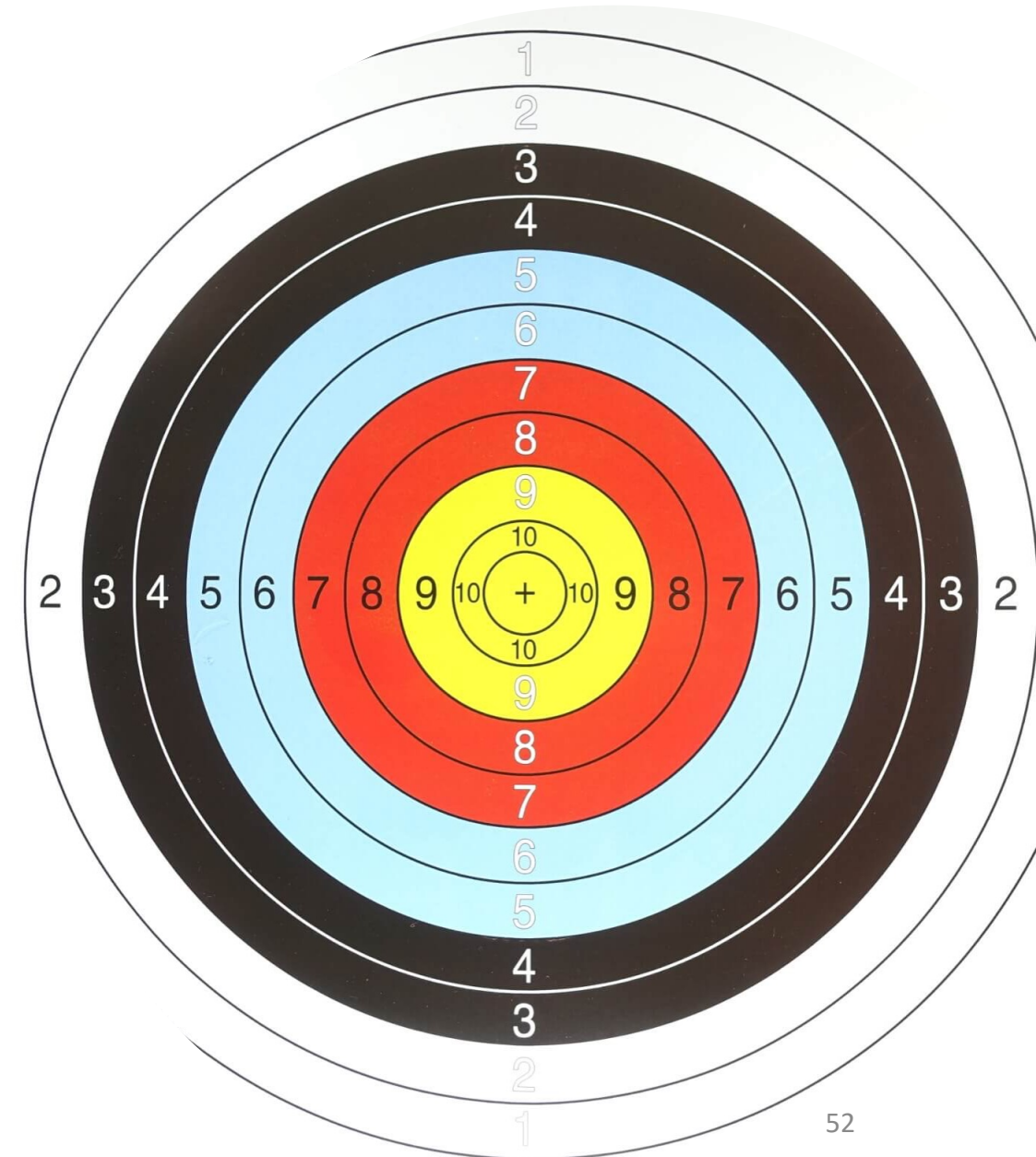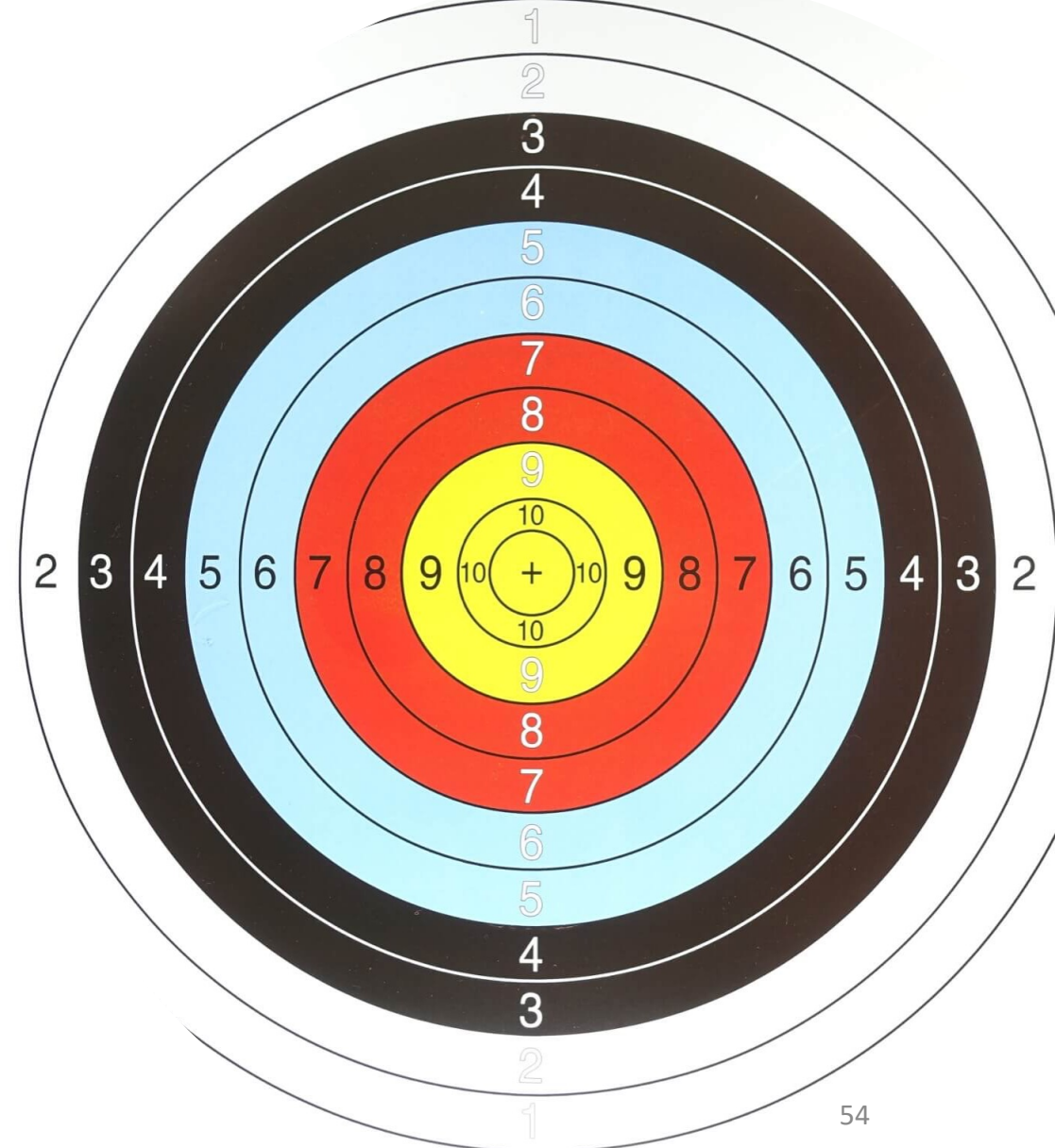
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References

Brookhart, S. M. (2013). *How to create and use rubrics*. ASCD: Alexandria. https://ebookcentral-proquest-com.ezproxy1.library.usyd.edu.au/lib/usyd/detail.action?docID=1123215

Chowdhury, F. (2019). Application of rubrics in a classroom: A vital tool for improvement in assessment, feedback and learning. *International Education Studies, Vol12(1)*. Microsoft Word - Layout-IES-p61 (ed.gov)

Davidson, M. and Tognolini, J. (2013). Assessment, *standards-referencing and standard setting*. Chapter in *Self-directed Learning Oriented Assessments in the Asia-Pacific*, Magdalena Mo Ching Mok (ed). Springer Science+Business Media, Dordrecht.

References

Jonsson, A. and Svingby, G. (2007). The use of scoring rubrics: Reliability, validity and educational consequences. *Educational Research Review, 2, 130–144.*
https://www.dropbox.com/s/0afuaplwz27pamx/The%20use%20of%20scoring%20rubrics.pdf?dl=0

Rhodes, T. (2010). Assessing outcomes and improving achievement: Tips and tools for using rubrics. Washington, DC: Association of American Colleges and Universities.
https://www.aacu.org/initiatives/value-initiative/value-rubrics

Rhodes, T. & Finley, A. (2013). *Using the VALUE rubrics for improvement of learning and authentic assessment.* AACU: Washington DC. Using AAC7U Value Rubrics for Advanced Assessment.pdf (fresnostate.edu)

References

Wolf, K. and Stevens, E. (2007). The role of rubrics in advancing and assessing student learning. The Journal of Effective Teaching, 17(1), 3-14. Wolf.doc (slu.edu)

Webb, N. L. (2007). Issues related to judging the alignment of curriculum standards and assessments. Applied Measurement in Education, 20, 7–25. https://www-tandfonline-com.ezproxy.library.sydney.edu.au/doi/full/10.1080/08957340709336728

Breakout Group Activity

<mark>The organisation of this depends on whether participants inform Rios beforehand of their school's chosen value</mark>

<mark>OPTION 1</mark>

- You are going to be allocated to the same groups across schools as last time.

- Jim and Margaret will circulate.

  1. In turn, briefly explain the value/construct you and your school's staff has chosen, and raise 1 or 2 points from the list of 4 that you considered as part of your task from last time

  2. As a group, discuss these points

  3. As a group, discuss aspects of Jim's lecture

  4. Identify how you might go about measuring the range of constructs chosen across the group

     - Define each – has your definition changed since last time?

     - Discuss the components that you want to measure (up to 5)

     - Discuss how many performance levels you might have in your rubrics (up to 5)

Breakout Group Activity

- You are going to be allocated to groups according to the value you and your school has chosen to focus on.

- Jim and Margaret will circulate.

  1. Briefly introduce yourself, your role, provide some information about your school (1 min each)

  2. In turn, raise 1 or 2 points from the list of 4 that you considered as part of your task from last time

  3. As a group, discuss these points

  4. As a group, discuss aspects of Jim's lecture

     - Identify how you might go about measuring the value/construct chosen by the schools in the group

     - Define it - has your definition changed since last time?

     - Discuss the components that you want to measure (up to 5)

     - Discuss how many performance levels you might have in your rubrics (up to 5)

Task to be completed before next session Thursday 5 May

What is the **construct** that you want to measure?

What is the **definition** of the construct that you want to measure?

What are the **components** of the construct you want to measure?

How many **performance levels** will you have in your rubric? Make sure that there are no more than 5.

Complete the **draft rubric** for your construct

Please complete and bring this with you to Session 3
(This will be emailed alongside a PDF of the presentation and a link to the video recording)

Thank you for listening

Any questions contact Jim

Jim.Tognolini@sydney.edu.au

CEMA website

https://www.sydney.edu.au/arts/ our-research/centres-institutes- and-groups/centre-for- educational-measurement-and- assessment.html