Primary Trait Analysis

Definition: Primary Trait Analysis (PTA) is the process of identifying major traits or characteristics that are expected in student work. After the primary traits are identified, specific criteria with performance standards, are defined for each trait.

Below is an example that incorporates a general education outcome (oral communication) within a science specific course-embedded assessment. The assignment is an oral report on a current controversial biological topic. Rather than intuitively grading the oral report specific traits or characteristics are identified.

Student Assignment

Prepare a 7 minute oral report on one of the controversial biological topics listed in the syllabus.

Identify Primary Traits

In this step the major traits or attributes representing best practices are identified.

Give an Oral Report on Genetic Engineering

1. Thesis
2. Content
3. Organization
4. Sources
5. Delivery

Identify Criteria for Performance

In this step the criteria which determine how well the student does each trait are innumerated.

Thesis

> ➢ Clarity
> ➢ Support

Content

> ➢ Subject knowledge
> ➢ Alternative opinions
> ➢ Currency of data
> ➢ Scientific sophistication

Organization

- ➢ Attention grabber
- ➢ Supporting arguments
- ➢ Conclusion

Sources

- ➢ Documented
- ➢ Reliable

Delivery

- ➢ Elocution
- ➢ Demeanor
- ➢ Attention to audience
- ➢ Use of visuals or Technology
- ➢ Timing

Example of Primary Trait Analysis for an Oral Report in a Science Course

In the next step (building a rubric) the criteria are weighted for value or points and sometimes defined more specifically.
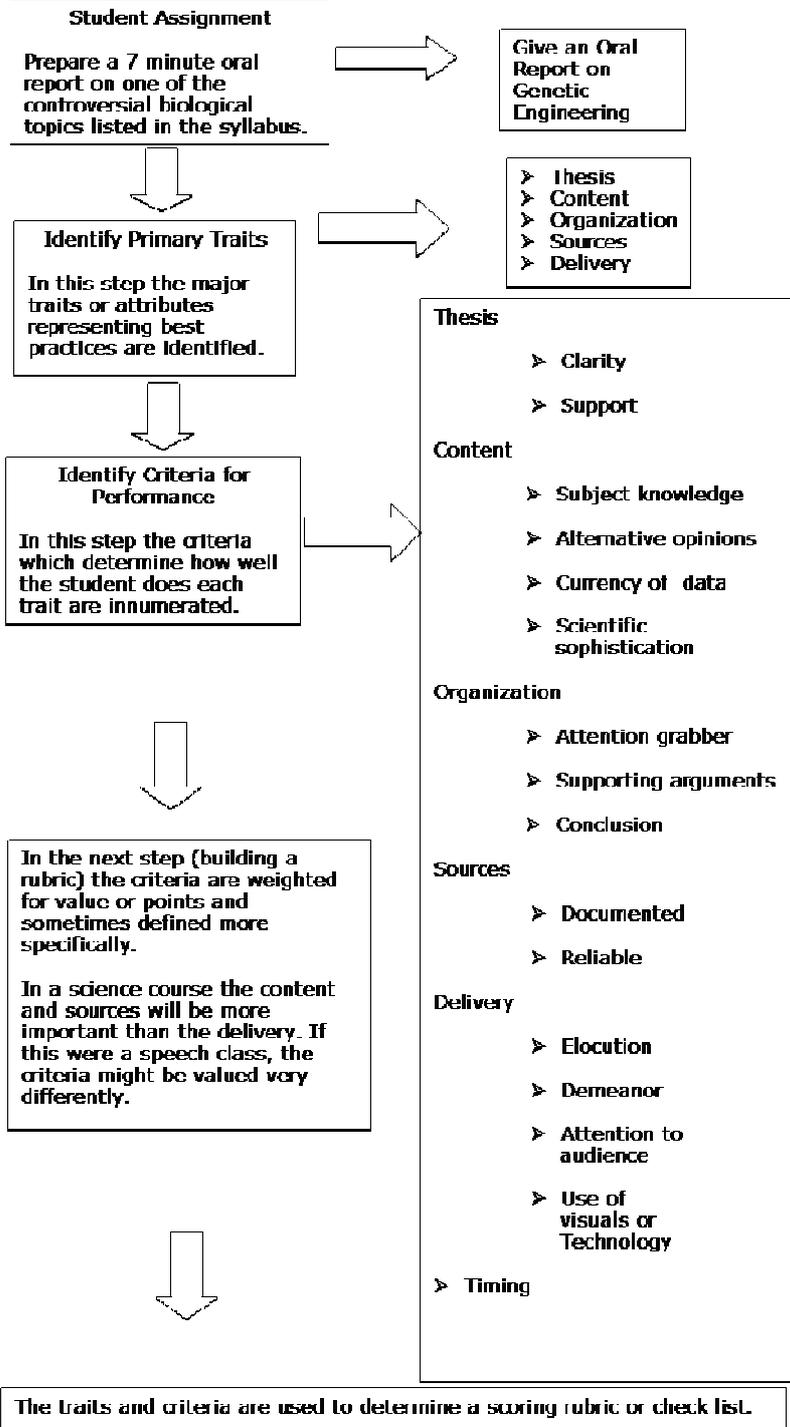
In a science course the content and sources will be more important than the delivery. If this were a speech class, the criteria might be valued very differently.

The traits and criteria are used to determine a scoring rubric or check list.

The primary traits and performance standards should be discussed with other faculty to obtain feedback. Faculty from other disciplines often provide excellent feedback. Healthy discussion validates and clarifies your thinking.

The next step is to develop a rubric used to score the student performance. A rubric is a grading tool used to assign points or values for meeting performance criteria. The rubric will be given to the student when the assignment is announced.

Example of Primary Trait Analysis for an Oral Report in a Science Course

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→ Give an Oral Report on Genetic Engineering

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The traits and criteria are used to determine a scoring rubric or check list.

Rubrics

A rubric is a set of criteria used to determine scoring for an assignment, performance, or product. Rubrics may be holistic providing general guidance or analytical assigning specific scoring point values.

Rubrics are useful because they help to:

1. Focus instruction on the most important outcomes.
2. Provide diagnostic formative feedback so students can improve.
3. Communicate explicit expectations which substantiate the grading process.
4. Convert the assignment to a valid assessment tool.
5. Articulate how scoring is determined, enable students to better meet expectations.
6. Produce more consistent and reliable grading that can be compared over time, between sections and even amongst diverse courses.

Using the primary traits and performance standards in the Primary Trait Analysis a rubric is constructed to evaluate the work. I have included a flow chart to complete the process for the oral report. The resource section also has links to a written step-by-step using student artifacts and a variety of rubrics other faculty have created. Notice that they are all different and specifically designed for each assignment with relation to that course and the desired outcomes.

Creating a Rubric for an Oral Report in a Science Course

Oral Science Report date_____ Title_____ Name		**Excellent** 5	**Good** 4	**Average** 3	**Poor** 2	Absent 1
Thesis	clarity					
	support					
Content	subject knowledge					
	alternative opinions	Two or more opposing opinions are described.	An opinion differing from the student's opinion is described.	The student admits that others have differing opinions	Only the student's opinion is described	No opinions are evident
	currency of data					
	scientific sophistication					
		3	**3**	**2**	**1**	1
Organization	attention grabber					
	supporting arguments					
	conclusion					
Sources	cited correctly					
	reliability					

Oral Science Report date_____ Title_____ Name		**Excellent** 5	**Good** 4	**Average** 3	**Poor** 2	Absent 1
Delivery	pronunciation					
	eye contact					
	use of visuals					
	demeanor					
	content appropriate to audience					
		5	5	5	3	0
	Timing					

Primary Traits

Values – some people describe these, others assign numbersPerformance Criteria – some people make comments or just give checks, others describe each level explicitly.You may want to vary the weight of some criteria.

In this report the scientific content is more important than delivery, but delivery is a performance criteria contributing to the overall assessment.

NOTE: In contrast to holistic rubrics, analytical rubrics have a value assigned to each criterion and the numbers an be added to get a score. There is a potential problem in this - notice in the rubric below. The student got average marks for every criterion but would receive a total score of only 60%. Adjusting the scale and point values will correct this.

Criterion	5	4	3	2	1	With average marks on all criteria
1			√			5 criteria X 3 pts each =15
2			√			
3			√			15/25 total points = only 60%
4			√			
5			√			

Creating a Rubric for an Oral Report in a Science Course

Primary Traits

Values – some people describe these, others assign numbers

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	currency of data				
	scientific sophistication				
		3	3	2	1
Organization	attention grabber				
	supporting arguments				
	conclusion				
Sources	cited correctly				
	reliability				
Delivery	pronunciation				
	eye contact				
	use of visuals				
	demeanor				
	content appropriate to audience				
		5	5	5	3
	Timing				

Choosing the Right Assessment Tools Part 1

This section has discussed the use of standardized assessments and local or homegrown assessments. There are advantages to using each depending on the circumstances and the way that they are constructed. Multiple choice questions are often seen as assessing only lower cognitive levels (recall and perhaps comprehension). However you can construct multiple choice questions that require analytical or synthetic thinking.

For example, if I want to see if my students can use the microscope, I can write some higher level thinking multiple choice questions that force the student to solve a problem. For instance,

Imagine that you are observing a malaria smear under the microscope at a total magnification of 1000X. The object appears dark and it is difficult to see the detail of the red blood cells. What is the first step you would take to solve the problem?

  ➢ Check the interface between oil on the slide and the lens.
  ➢ Look at each lens for dirt or smudging.
  ➢ Adjust the position of the diaphragm and light source or condenser.
  ➢ Select another slide with better staining quality.

However, if an outcome of the class is that the students will be able to use a microscope to focus on an object, this question does not authentically test that outcome. The best way to test the outcome is to give the students a slide, have them focus on the object as clearly as they can, write down an identification of an object indicated by the microscope pointer, and then call me over to evaluate their work.

This is also more efficient class management.

  ➢ I am able to give the students immediate feedback.

  ➢ Students can immediately identify and correct problems.

  ➢ I know what the students are capable of doing and how to proceed with the next material.

  ➢ Students either feel confident about their ability or know that they must come in for extra help.

  ➢ The assessment is graded and returned during the class time.

Choosing the Right Assessment Tools Part 2

Janet Fulks: Assessing Student Learning in Community Colleges (2004), Bakersfield College ; jfulks@bakersfieldcollege.edu; 07/11/2006
http://online.bakersfieldcollege.edu/courseassessment/Section_4_Assessment_Tools/Section4_8b.htm

Assessment Tool	Data Direct or Indirect	Domain Cognitive, Psychomotor, or Affective	Formative or Summative	Bloom's Knowledge, Comprehension, Application or Analysis/ Synthesis/Eval		
Abbreviation	D or I	C, P or A	F or S	K, C, A, ASE	**Pros**	**Cons**
Multiple Choice Exam	D	C	F & S	K, C if carefully constructed A, S, & E	easy to grade objective	reduces assessment to multiple choice answers
Licensing Exams	D	C	S	K, C, A	easy to score and compare	no authentic testing, may outdate
Standardized Cognitive Tests	D	C	S	K, C, A?	comparable between students	heavily dependent on exposure to topics on test
Checklists	D	C, A, P	F, S	variable	very useful for skills or performances students know exactly what is missing	can minimize large picture and interrelatedness Evaluation feedback is basically a yes/no - present/absent - without detail
Essay	D	C, A	F, S	K, C, A, ASE	-displays analytical and synthetic thinking well	time consuming to grade, can be subjective
Case Study	D	C, A	F, S	K, C, A, ASE	-displays analytical and synthetic thinking well	creating the case is time consuming, dependent on

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Abbreviation	D or I	C, P or A	F or S	K, C, A, ASE	**Pros**	**Cons**
					-connects other knowledge to topic	student knowledge form multiple areas
[Problem Solving]	D	C	F, S	K, C, A, ASE	displays analytical and synthetic thinking well authentic if real world situations are used	difficult to grade due to multiple methods and potential multiple solutions
Oral Speech	D	C	F, S	variable K, C, A, ASE	easily graded with rubric allows other students to see and learn what each student learned connects general education goals with discipline-specific courses	difficult for ESL students stressful for students takes course time must fairly grade course content beyond delivery
Debate	D	C, A	F, S	K, C, A, ASE	provides immediate feedback to the student reveals thinking and ability to respond based on background knowledge and critical thinking ability	requires good rubric more than one evaluator is helpful difficult for ESL students stressful for students takes course time
Product Creation & Special Reports	D	C, P, A	F, S	variable K, C, A, ASE	students can display skills. knowledge, and abilities in a way that is suited to them	must have clearly defined criteria and evaluative measures "the look" can not over-ride the content

Assessment Tool	Data Direct or Indirect	Domain Cognitive, Psychomotor, or Affective	Formative or Summative	Bloom's Knowledge, Comprehension, Application or Analysis/ Synthesis/Eval		
Abbreviation	D or I	C, P or A	F or S	K, C, A, ASE	Pros	Cons
Flowchart or Diagram	D	C	F, S	C, A, ASE	displays original synthetic thinking on the part of the student perhaps the best way to display overall high level thinking and articulation abilities	more difficult to grade, requiring a checklist or rubric for a variety of different answers difficult for some students to do on the spot
Portfolios	D	C, P	S	variable	provides the students with a clear record of their work and growth best evidence of growth and change over time students can display skills. knowledge, and abilities in a way that is suited to them promotes self-assessment	time consuming to grade different content in portfolio makes evaluating difficult and may require training bulky to manage depending on size
Exit Surveys	D, I	A	S	ASE	provides good summative data easy to manage data if Likert-scaled responses are used	Likert scales limit feedback, open-ended responses are bulky to manage,
Performance	D	C, P	F, S	variable K, C, A, ASE	provides best display of skills and abilities provides excellent	stressful for students may take course time some students may take

Assessment Tool	Data Direct or Indirect	Domain Cognitive, Psychomotor, or Affective	Formative or Summative	Bloom's Knowledge, Comprehension, Application or Analysis/ Synthesis/Eval		
Abbreviation	D or I	C, P or A	F or S	K, C, A, ASE	**Pros**	**Cons**
					opportunity for peer review students can display skills. knowledge, and abilities in a way that is suited to them	the evaluation very hard - evaluative statements must be carefully framed
Capstone project or course	D	C, P , A	F, S	ASE	best method to measure growth overtime with regards to a course or program - cumulative	focus and breadth of assessment are important understanding all the variables to produce assessment results is also important may result in additional course requirements requires coordination and agreement on standards
Team Project	D	C, A	F, S	variable K, C, A, ASE	connects general education goals with discipline-specific courses	must fairly grade individuals as well as team grading is slightly more complicated student interaction may be a challenge
Reflective self-assessment essay	D, I	C, A	S	ASE	provides invaluable ability to evaluate affective growth in students	must use evidence to support conclusions, not just self-opinionated assessment

Assessment Tool	Data Direct or Indirect	Domain Cognitive, Psychomotor, or Affective	Formative or Summative	Bloom's Knowledge, Comprehension, Application or Analysis/ Synthesis/Eval		
Abbreviation	D or I	C, P or A	F or S	K, C, A, ASE	Pros	Cons
Satisfaction and Perception Surveys	I	C, P, A	S	C, A, ASE	provides good indirect data data can be compared longitudinally can be used to determine outcomes over a long period of time	respondents may be influenced by factors other than those being considered validity and reliability most be closely watched

Create an Assessment Tool

Now it is your turn to select a tool from the previous table, convert something you already use, or create an assignment that could be used for an embedded assessment tool that aligns with one of the SLOs you have written.

1. Look at the SLOs for your favorite course (written in section 3). Do a mini-assessment audit. Are there any assignments, projects, or exams that provide good data on a specific student learning outcome? If not, you may need to create a new assignment. Determine which type of assessment tool best assessed that the student can DO the outcome. This should be authentic; closely resembling a real life experience. Will the student perform a task, create a product, analyze a case study, recite detailed information, or solve a problem?

2. Identify the purpose of the assessment. Will it be formative or summative? If it is formative, how will feedback be given? Will you use it to provide feedback from other students as well as yourself? If summative, has the student had ample practice and feedback to do what is expected?

3. Do Primary Trait Analysis (PTA). Identify the major traits that determine a successful outcome. (For important projects this can be created with the students thus becoming a powerful teaching tool engaging the students and fully informing them about the expectations. *Warning* - collaborating with students can be time consuming; use this for important or high stakes assignments/assessments.)

4. Describe the criteria relating to the traits and create a checklist, rubric or set of descriptive performance standards. Consider psychomotor, affective and cognitive outcomes. Set criteria at the appropriate level of thinking (Bloom's taxonomy).

5. Create a grading rubric by weighting the criteria appropriately. Do not include attendance or improvement as a criterion. The criteria should be standards-based, not norm-referenced. Look at samples of artifacts to determine the criteria. Try the rubric out on student work and make appropriate modifications.

6. Use the checklist below (and linked in the resource section as a downloadable document) to evaluate the assessment tool you have selected or created. Modify the tool appropriately.

7. Share the tool with other faculty and get feedback.

☑ Assessment Tool Checklist	√
1. Does the assessment adequately evaluate academic performance relevant to the desired outcome? (validity)	
2. Does this assessment tool enable students with different learning styles or abilities to show you what they have learned and what they can do?	
3. Does the content examined by the assessment align with the content from the course? (Content validity)	
4. Does this assessment method adequately address the knowledge, skills, abilities, behavior, and values associated with the intended outcome? (Domain validity)	
5. Will the assessment provide information at a level appropriate to the outcome? (Bloom's)	
6. Will the data accurately represent what the student can do in an authentic or real life situation? (Authentic assessment)	
7. Is the grading scheme consistent; would a student receive the *same* grade for the *same* work on multiple evaluations? (Reliability)	
8. Can multiple people use the scoring mechanism and come up with the same general score? (Reliability)	
9. Does the assessment provide data that is specific enough for the desired outcomes? (alignment with SLO)	
10. Is the assessment summative or formative - if formative does it generate diagnostic feedback to improve learning?	
11. Is the assessment summative or formative - if summative, is the final evaluation built upon multiple sources of data? (AAHE Good practice)	
12. If this is a summative assessment, have the students had ample opportunity for formative feedback and practice displaying what they know and can do?	
13. Is the assessment unbiased or value-neutral, minimizing an attempt to give desirable responses and reducing any cultural misinterpretations?	
14. Are the intended uses for the assessment clear? (Grading, program review, both)	
15. Have other faculty provided feedback?	
16. Has the assessment been pilot-tested?	
17. Has the evaluation instrument been normed?	
18. Will the information derived from the assessment help to improve teaching and learning? (AAHE Good Practice)	
19. Will you provide the students with a copy of the rubric or assignment grading criteria?	
20. Will you provide the students examples of model work?	