

Building Effective Rubrics to Assess Learning



by *Mike Matthews*

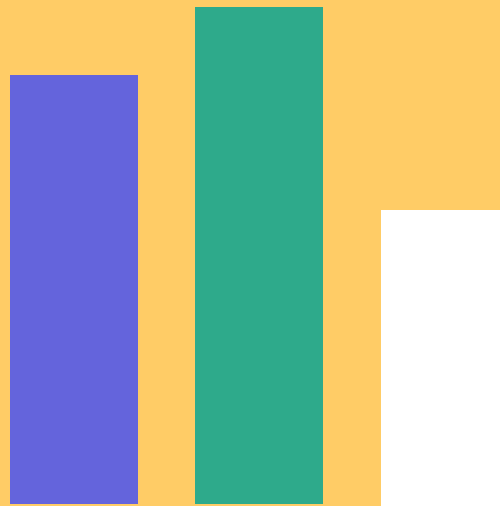


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About the author

Mike Matthews is a National Board Certified Teacher with over 20 years experience in education. He began as a Teach for America teacher in North Carolina. Mike spent nearly two decades at schools in the San Francisco Bay area, teaching science, math, and technology in public, charter, and independent schools. From a crocheted coral reef to student inventions designed to be cutting edge in 2040, Mike has received national attention for developing innovative project-based curriculum. He spent seven years as the Director of Curriculum and Innovation at Burke's school in San Francisco where his work included facilitating professional development on the Understanding by Design framework.

Mike earned his B.A. from Hobart and William Smith Colleges and his M.Ed. in Curriculum and Instruction from the University of Massachusetts. He recently moved to the Boston area with his husband and two year old twin daughters. He is currently working as a consultant with projects ranging from supporting

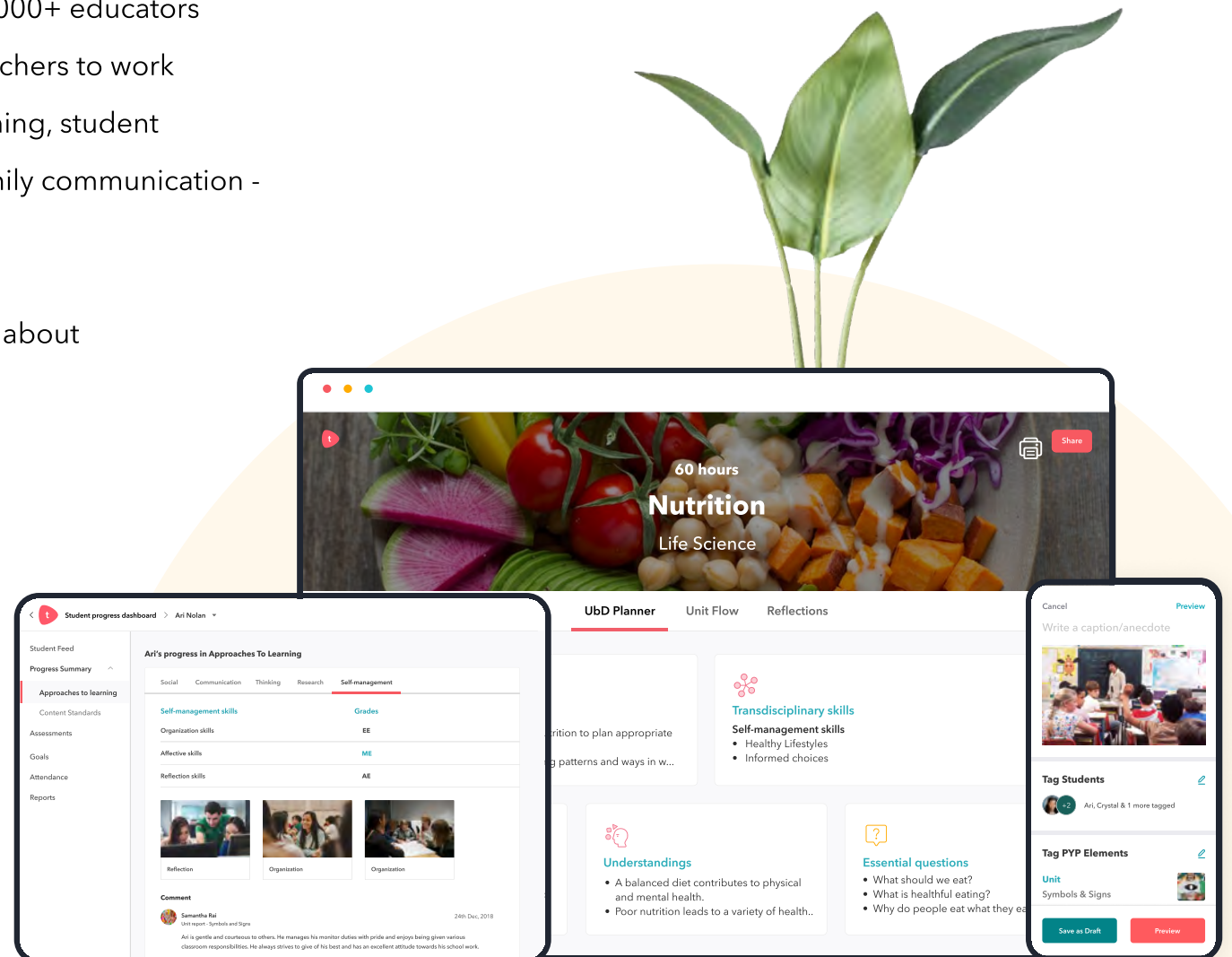
teachers designing innovative curriculum to a developing a toolkit for inclusive hiring in schools.

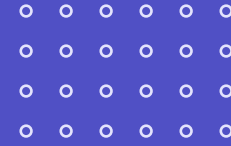


About Toddle

Toddle is an all-in-one teaching-learning platform for IB and other progressive schools. Loved by 30,000+ educators around the world, Toddle empowers teachers to work together and better for curriculum planning, student portfolios, assessments, reports, and family communication - all from one intuitive interface!

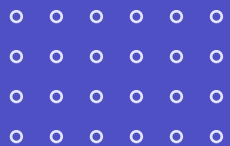
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1

The What and Why of Rubrics



What are rubrics?

Educators are always looking for tools and strategies for ongoing learning and assessment. Rubrics are an assessment tool used to evaluate student performance against a series of established criteria and standards. With a row-and-columns format, rubrics articulate student performance levels across a variety of learning outcomes.



Why rubrics matter?



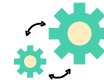
Rubrics give students clarity around what is expected of them

Rubrics give students a clear picture of what success looks like.



Rubrics promote self-reflection

Rubrics can help students self-evaluate their work, leveraging a growth mindset to improve their own work.



Rubrics make assessment more efficient

Rubrics can help make assessment quicker and easier for teachers by focusing evaluation on key learning outcomes.



Rubrics can ensure equity in assessment

Rubrics can help ensure that all students are evaluated against the same criteria by clearly articulating and consistently assessing student performance.



How can rubrics be used?

Rubrics can be used for both formative and summative assessment. Here are a few ways that you might consider using rubrics in your classroom:

- Having students use a rubric to guide, self-assess, and reflect upon their work throughout a project. A teacher then uses the same rubric to evaluate student performance.
- At the onset of a project, have students use a rubric to self-evaluate sample projects from a prior year.
- Evaluate student performance using a process-focused rubric, such as for group work, math problem solving, or scientific process skills. You can support ongoing mastery of these skills by re-using the rubric across multiple assignments or tasks.
- Assess student performance on a transfer task or performance-based assessment.

What are the different types of rubrics?

The three most common types of rubrics are:

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Analytic rubric

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—	—

Holistic rubric

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Single-point rubric

Analytic rubrics

Rows and columns offer explanations for all performance levels for each evaluation criterion.

Advantages:

- Offer clarity around different performance levels, which make student self evaluation easier (Students can say "this box describes my work.").

Challenges:

- Can be inaccessible to or overwhelming for younger students.
- Can be timely to create - teasing out a level 2 vs a level 3 can be tricky.

	Level 4	Level 3	Level 2	Level 1
Criterion A				
Criterion B				
Criterion C				
Criterion D				

Example: Analytic rubric for problem solving

	Reasoning	Computation	Representation	Communication
4	An efficient and effective strategy is used and progress towards a solution is evaluated. Adjustments in strategy, if needed, are made, and/or alternative strategies are considered. There is sound mathematical reasoning throughout.	All computations are performed accurately and completely. There is evidence that computations are checked. A correct answer is obtained.	Abstract or symbolic mathematical representations are constructed and refined to analyze relationships, clarify or interpret the problem elements and guide solutions.	Communication is clear, complete and appropriate to the audience and purpose. Precise mathematical terminology and symbolic notation are used to communicate ideas and mathematical reasoning.
3	An effective strategy is used and mathematical reasoning is sound.	Computations are generally accurate. Minor errors do not detract from the overall approach. A correct answer is obtained once minor errors are corrected.	Appropriate and accurate mathematical representations are used to interpret and solve problems.	Communication is generally clear. A sense of audience and purpose is evident. Some mathematical terminology is used to communicate ideas and mathematical reasoning.
2	A partially correct strategy is used, or a correct strategy for only solving part of the task is applied. There is some attempt at mathematical reasoning, but flaws in reasoning are evident.	Some errors in computation prevent a correct answer from being obtained.	An attempt is made to construct mathematical representations, but some are incomplete or inappropriate.	Communication is uneven. There is only a vague sense of audience or purpose. Everyday language is used or mathematical terminology is not always used correctly.
1	No strategy is used, or a flawed strategy is tried that will not lead to a correct solution. There is little or no evidence of sound mathematical reasoning.	Some errors in computation prevent a correct answer from being obtained.	No attempt is made to construct mathematical representations or the representations are seriously flawed.	Communication is unclear and incomplete. There is no awareness of audience or purpose. The language is imprecise and does not make use of mathematical terminology.

Holistic rubrics

Rows offer summaries for work at each performance level.



Advantages:

- Can give a clearer picture of how the skills and standards come together. Each level's explanation gives a description of what student work or performance looks like.

Challenges:

- Can create ambiguity when a piece of work or performance doesn't fit into a single level. (For example, if parts of the work are described by level 4, but others are best described by level 2, it's unclear what level it should be - especially when the level 3 description may not describe the work at all!).

	Description of performance at this level
Level 4	
Level 3	
Level 2	
Level 1	

Example: Holistic rubric for graphic display of data

3	All data is accurately represented on the graph. All parts of the graph (units of measurement, rows, etc.) are correctly labelled. The graph contains a title that clearly tells what the data shows. The graph is very neat and easy to read.
2	All data is accurately represented on the graph or the graph contains minor errors. All parts of the graph are correctly labelled or the graph contains minor inaccuracies. The graph contains a title that suggests what the data shows. The graph is generally neat and readable.
1	The data is inaccurately represented, contains major errors, or is missing. Only some parts of the graph are correctly labelled or labels is missing. The title does not reflect what the data shows or the title is missing. The graph is sloppy and difficult to read.

Single point rubrics



Rows share mastery-level performance for each performance standard.

Columns are used to note areas needing attention or evidence of exceeding standard.

Advantages:

- Can be a valuable tool to support student self-reflection.
- Quicker to build than analytic and holistic rubrics.

Challenges:

- Only articulate a single performance level, which can make it harder for some students to accurately self-assess their work.
- Can be hard to use in younger grades.

Areas needing attention	Standards	Evidence of exceeding standard
	Criterion A	
	Criterion B	
	Criterion C	
	Criterion D	

Example: Single-point rubric for scientific investigation

Areas needing attention	Scientific investigation standards	Evidence of exceeding standard
	In trying to understand an unknown, I asked an open-ended question that can be tested or explored through science.	
	I designed a controlled scientific experiment that explored my question.	
	I made a prediction about the outcome of my experiment, which I backed up with my prior experience and knowledge.	
	My procedure had enough detail so that another scientist could use it to recreate my experiment	
	When conducting my experiment, I followed all lab safety procedures and used lab equipment properly.	
	I followed the steps in my procedure carefully, recording qualitative and quantitative data.	
	I took accurate measurements using the proper measurement tools.	

What makes an effective rubric?

Effective rubrics designers:

- **Focus on the 'transferrable' real-world skills that are central to a unit or project's goals**

Rubrics should assess what matters in a unit and omit things that don't. For example, in a science project on cell organelles & processes, a rubric should assess cell knowledge and understanding of structure/function relationships because they reflect goals that are central to a unit. Resist the temptation to include evaluation items that are not related to the unit's goals, such as the appearance or design of the student's project.

- **Articulate student performance**

Effective rubrics communicate observable evidence will be seen in the students' work.

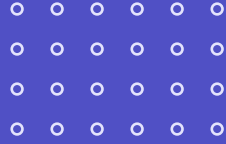
- **Are clearly written and specific**

Evaluation criteria clearly delineate student performance at each level, leaving little or no ambiguity as to which level a student's performance aligns with.

- **Are fair and consistent**

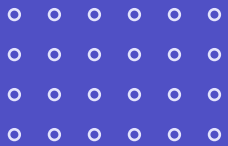
Different assessors using the same rubric should classify a work sample at the same performance level. Similarly, effective rubrics should evaluate students fairly against one another.





2

Step by Step Guide to Building a Rubric



Step 1

Identify your purpose

Step 2

Focus on application

Step 3

Articulate success

Step 4

Build your rubric

Step 5

Check for alignment

Before getting started, download the rubric planning template. You'll fill in the template in steps 1-3, and then use your completed template to build and evaluate your rubric in steps 4 and 5.



[Download now](#)

Step 1

Identify your purpose

In this step, you will articulate your assessment needs, including when and how your rubric will be used.



Step 1: Identify your purpose

Why?

While often associated with a culminating project or other summative assessment, rubrics can be used at various points throughout a unit. Identifying your intended purposes for the rubric is an important first step. Doing so can help you match the format, scope, and language of your rubric to how you plan on using it. Having clarity around purpose will also make the work designing your rubric more efficient and focused.



How?

Begin by considering the following:

When and how	Student engagement	Type
When and how do you plan on using the rubric? Will it be used throughout your unit, for a specific project or performance, across multiple units, or something else?	How will your students engage with the rubric? ● Will they use it while they're working on a project? ● Will they use it to self-evaluate their work? If so, when? ● You may need to also consider the developmental level of your students as well as their experience using rubric. Don't let challenges in this area deter you. Instead, acknowledge them and let them inform your rubric design.	What type of rubric will you build & why? ☐ Analytic Rubric ☐ Single Point Rubric ☐ Holistic Rubric

Example

7th grade science - Process skills rubric

When and how	Student engagement	Type
I will design a rubric to assess scientific process skills. It will be used throughout the year, across multiple units.	My students will use the rubric to self-evaluate their work at the end of each lab throughout the year.	I will build a single-point rubric as this format is well-suited to student reflection.



Step 2

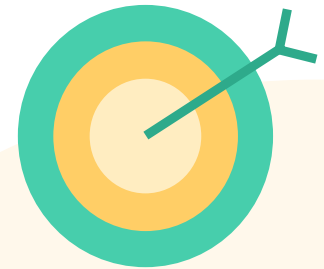
Focus on future application

In this step, you will revise the learning outcomes for your unit, project, or class, and will codify student action as a result of their learning.

This step has 2 parts:

Part 1: Identify your transfer goals

Part 2: Re-write your goals as headlines



Step 2: Focus on future application

Why?

Part 1: Identifying your transfer goals

'Transfer' is the central idea in the Understanding by Design (UbD) framework. It refers to the things that students will be able to do as a result of their learning. The actions articulated in the transfer goals section of a UbD planner should be relevant for both short-term and long-term. Assessing for transfer today is an important indicator that our students will be able to apply their understanding beyond the unit, project, or grade. An effective rubric should be designed with transfer in mind.

For an introduction to or refresher on transfer goals, check out Jay McTighe's ebook entitled '[Demystifying Transfer Goals](#).'

Part 2: Re-write your goals as headlines

Creating 'headlines' is a particularly helpful step when you're planning on having your students use your rubric to guide or self-assess their work. The headlines will give them a quick at-a-glance picture of the things they need to be focusing on. Also, by phrasing your transfer headlines with verbs, you're giving them a clearer picture of the actions you expect them to be taking. For example, 'asking questions' is a better headline than simply 'questions', because it subtly cues students into what they should be doing.





Tips on planning for transfer:

- The number of transfer goals and headlines that you come up with will vary based on how you'll be using the rubric.
For example, if you will be using your rubric with younger students or as part of a short project, aim for 2 or 3 transfer goals at most. If you're using your rubric for a long-term project or with older students, you might have 4 or 5 transfer goals.
- Stuck on transfer goals? Keep in mind that rubric design can be non-linear.
If you get stuck on this step, move to step 3. As you identify what success looks like, it's common for new themes and groups of related skills to emerge. Come back to continue refining and honing your transfer goals and headlines as needed.



Part 1: Rephrase your transfer goal



How?

First, articulate your transfer goals (how students will be able to apply their learning)

What will your students be able to do as a result of their learning? Articulate possible actions of someone who understands:

Someone who truly understands will be able to _____

- If you have already designed your unit using the UbD framework, start by revising your stage-1 transfer goals.
- If you have not designed your unit using the Understanding by Design framework, focus on the real-world, long-term applications of learning. For example, if designing a unit on coding, how might the knowledge, skills, and understandings of the unit be relevant to a student who ultimately ends up pursuing a career in an unrelated field.

Transfer goal example:

Students will independently use their learning to ask informed questions to gather information about the world around them

In this example, asking questions is a key science concept in the unit. With the reframing above, the skill's relevance is articulated in a way that gives it broader purpose.

Continue generating transfer goals for your unit. Aim for two to four clear and concise transfer goals, though again, the number of transfer goals may vary based on your instructional context (grade level, length of unit, etc.).

- Example: The full set of transfer goals for the scientific process standards unit might look like this:

Students will independently use their learning to...

1. Ask informed questions to gather information about the world around them
2. Approach problems with a plan
3. Make purposeful observations and measurements to understand a new phenomenon more deeply
4. Evaluate new situations and discoveries with curiosity and skepticism



Part 2: Rewrite as headlines

How?

Next, rewrite each action or transfer goal as a short headline or statement.

You'll be using these headlines in step 3 to generate observable evidence, and again in step 4 to create headings and/or groupings within your rubric.

Example

7th grade science - Process skills rubric

Transfer goal

Students will independently use their learning to ask informed questions to gather information about the world around them.

Transfer headline

Asking questions





Step 3

Articulate success

In this step, you will generate a list of observable student actions that will evidence their proficiency.



Step 3: Articulate success

Why?

While our hope is that students will apply their understanding in new situations long beyond their time in our classrooms, it's not enough to just hope that this will happen. Instead, we need to give students opportunities to practice applying their learning today, and identify the things we'll see in their present work that we believe are good predictors of how they'll use their learning in the future.

How?

Revisit each of the transfer goals you articulated in step 2. With how you'll be using your rubric in mind, brainstorm a list of things of things you'd expect to see your students do or things you'd see evidenced in their work if they have achieved mastery of each transfer goal.

Tip: Be as specific as possible when articulating the evidence you might see. It will give you a clearer and more comprehensive picture of what success looks like and will save you time when you build your rubric in step 4. Don't worry too much about editing or refining the observable evidence at this point - you'll hone your list as part of step 4. Also, if you're working to build a rubric from your UbD unit, make sure to leverage all of the work you've already done articulating knowledge, skills, and understandings.

Example

Transfer headline: Asking questions

Transfer goal: Students will independently use their learning to ask informed questions to gather information about the world around them.

Observable evidence

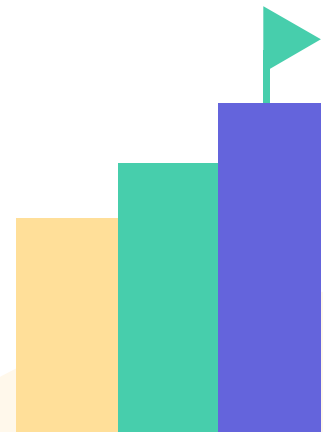
- When faced with an unknown, a student generates questions that will help them collect the info they need to explore or answer the question.
- Student asks questions that are informed by their prior knowledge.
- Student asks questions that are open ended and evidence a curiosity to understand the phenomenon more deeply.
- Student reframes 'curious questions' into questions that can be tested, observed, or studied through science (for example, reframing "I wonder if plant sever stop growing?" into 'What factors affect plant growth?' or 'How does the concentration of soil nutrients affect plant growth?').



Step 4

Build your rubric

In this step, you'll use your transfer headlines from step 2 and your observable evidence from step 3 to build your rubric.



Step 4: Build your rubric

Why?

Having articulated your transfer goals and evidence of student mastery, you're ready to build your rubric. By organizing and grouping your learning outcomes, you will build a rubric that is easier and more efficient to use for both you and your students. Your work in the previous steps will help you design a rubric that tells a clear and compelling story of what success looks like.

This section outlines a process for each of the three rubric types that were previously introduced.



Analytic rubrics

How?

Follow these 5 steps if you're designing an analytic rubric:

- 1. Start by reviewing your transfer goals, headlines, and observable evidence.
- 2. Create a row in your rubric using your first transfer headline.

	Level 4	Level 3	Level 2	Level 1
Asking Questions				

3. Use the observable evidence you generated in step 3 to build your 'proficient' or 'Level 4' explanation. You do not need to use all of the evidence you brainstormed. Instead, focus on the most compelling and /or most easily observed evidence.

Observable evidence

- When faced with an unknown, a student generates questions that will help them collect the information they need to explore or answer the question.
- Student asks questions that are informed by their prior knowledge.
- Student asks questions that are open ended and evidence a curiosity to understand the phenomenon more deeply.
- Student reframes 'curious questions' into questions that can be tested, observed, or studied through science. (for example, reframing "I wonder if plants ever stop growing?" into "What factors affect plant growth?" or "How does the concentration of soil nutrients affect plant growth?".

Level 4 (Proficient)

In trying to understand an unknown, the student asks an open-ended question that can be tested or explored through science.





4. Continue building out the remaining performance levels.

 **Tip:** Try building out the Level 1 explanation next, and then working the remaining levels.

	Level 4	Level 3	Level 2	Level 1
Asking questions In trying to understand an unknown..	The student asks an open-ended question that can be tested or explored through science.			The student asks a question that is not related to the topic being explored, and cannot be tested through scientific processes.

5. Continued building additional evaluation lines. For some of your transfer headlines, you may wish to create more than one row in your rubric.

	Level 4	Level 3	Level 2	Level 1
Asking questions In trying to understand an unknown..	The student asks an open-ended question that can be tested or explored through science.	The student asks an open-ended question, though the question is not sufficient to guide a scientific investigation.	The student asks a yes/no question. It is related to the scientific topic being explored but is not sufficient to guide a scientific explanation.	The student asks a question that is not related to the topic being explored, and cannot be tested through scientific processes.



Holistic rubric

How?

Follow these 3 steps if you're designing a holistic rubric:

1. Start by reviewing your transfer goals, headlines, and observable evidence. Imagine that you're taking a step back to look at the student performance as a whole - what does a student performance that is fully-proficient look like?
2. Using your transfer goals, headlines, and observable evidence, write a description that tells the story of 'level 4' work.
3. Continue adding additional explanations for each performance level.



Performance level	Description of work
Level 4	In trying to understand an unknown, the student asks an open-ended question that can be tested or explored through science. They then set up a controlled scientific experiment that explores their question, which includes a well-reasoned prediction and a detailed procedure that another scientist could use to recreate their experiment. When conducting the experiment, the student follows lab safety procedures. They follow their procedure carefully, recording qualitative and quantitative data. The student uses lab equipment properly, including taking accurate measurements using the proper measurement tools.
Level 3	
Level 2	
Level 1	

Single point rubric

How?

Follow these 2 steps if you're designing a single point rubric:

1. Start with one of your transfer headlines. Use the observable evidence you generated in step 3 to build your explanation of what proficiency looks like for this transfer goal. You do not need to use all of the evidence you brainstormed. Instead, focus on the most compelling and/or most easily observed evidence.

Observable evidence

- When faced with an unknown, a student generates questions that will help them collect the info they need to explore or answer the question.
- Student asks questions that are informed by their prior knowledge.
- Student asks questions that are open ended and evidence a curiosity to understand the phenomenon more deeply.
- Student reframes "curious questions" into questions that can be tested, observed, or studied through science. (for example, reframing "I wonder if plants ever stop growing?" into "What factors affect plant growth?" or "How does the concentration of soil nutrients affect plant growth?").

Level 4 (Proficient)

In trying to understand an unknown, the student asks an open-ended question that can be tested or explored through science.



2. Continue building additional evaluation lines. For some of your transfer headlines, you may wish to create more than one row in your rubric.

Areas needing attention	Performance standards	Evidence of exceeding standard
	Asking questions: In trying to understand an unknown, the student asks an open-ended question that can be tested or explored through science.	



Step 5

Check for alignment

In this step, you'll check to make sure that your rubric authentically and accurately assesses for key learning outcomes.



Step 5: Check for alignment

Why?

It's important to check that your rubric (and the student work or task that you'll be evaluating) is actually assessing your learning objectives. When your rubric, performance task, and learning objectives are aligned, you are more likely to get a detailed glimpse into your student's understanding and their ability to apply their learning both now and in the future. When they're not aligned, however, you may have students who don't understand and can't apply their learning do well on the assessment, or have students who do understand and can apply their learning perform poorly on the assessment. An alignment check can help ensure you're assessment and rubric will yield useful and relevant data.

How?

Gather and review the following:

- *Your transfer goals and learning objectives for the assessment*
- *The assessment, including any instructions, materials, or guides that are provided to students*
- *The rubric you built to assess student learning*



Questions and learning outcomes



The [Understanding by Design](#) framework recommends that teachers ask two questions to evaluate the validity assessment. The questions are intended to help check that the assessment is aligned with learning outcomes and both short- and long-term transfer.

Question 1:

Could students do a great job on the task, but not meet the learning goals?

Question 2:

Could students do a poor job on the task but still provide lots of evidence that they can otherwise meet the learning goal?



If you answered **No** to both questions, you're good to go! Your assessment, learning objectives, and transfer goals are well-aligned.



If you answered **Yes** or **Maybe** to either or both of the questions, consider making one or more of the following changes to your assessment and/or rubric.

From 'Granted, and... ~ thoughts on education by Grant Wiggins'

- **Revise the task instructions.**

Remove or de-emphasize any parts of the assessment that are not directly relevant to your instructional goals. Help your students prioritize their time on what matters.

- **Refine your rubric**

Make sure your rubric is evaluating student understanding related to the learning goals. Add any important evaluation criteria that are missing, hone those that aren't focused on your learning goals, and remove those that are not related to your learning outcome.

- **Differentiate your assessment.**

If the format of the assessment might cloud your ability to evaluate student performance, consider giving your students more flexibility in how they can show their understanding.

Example

2nd grade social studies unit on changemakers

During the unit, students studied a variety of leaders who have made a difference in their community. The unit is guided by the idea that students will understand a variety of ways that community leaders advocate for change so they can be changemakers themselves both now and throughout their lives. In the culminating project, students contribute two pages to a class e-book in which they celebrate the work of a changemaker, and then share how they might follow in their changemaker's footsteps to bring change in their community.

For example, "Jane Goodall was a scientist who studied chimpanzees. She helped people be advocates for animals by teaching that humans are similar to chimpanzees in many ways. San Francisco has many native wild animals, like coyotes and mountain lions. I want to teach people to see these animals are part of our city and not our enemies."



2nd grade social studies unit on changemakers

Areas Needing Attention	Performance standards	Evidence of exceeding standard
	Stories of changemakers: What they did: I shared at least one action my changemaker took to make a difference in their community.	
	Stories of changemakers: Why it matters: I shared how my changemaker changed their community and why this change matters.	
	My change: I shared one change that I hope to make in my community. I explained why my change will make my community better.	
	E-book pages: My book creator pages have pretty images and are fun to look at.	



Step 5: Check for alignment

Question 1:

Could the students do a great job on the task, but not meet the learning goals?

Question 2:

Could the students do a poor job on the task but still provide lots of evidence that they can otherwise meet the learning goal?

Answer: Maybe. The assessment is well-aligned with the unit's learning goals. However, the final assessment line in the rubric isn't related to the unit's instructional goals. A student could design a beautiful page that in no way evidences their understanding of the work of changemakers. Consider cutting the final assessment line or revising it to be more closely aligned with the instructional goals (see example on next page).

From 'Granted, and... ~ thoughts on education by Grant Wiggins'

Original

E-book pages

My Book Creator pages have pretty images and are fun to look at

Revisions

Split the original evaluation item into two criteria that are more closely aligned with the unit's learning goals.

E-book changemaker page

The pictures or drawings I put on my e-book page helped tell the story of my changemaker.

E-book 'My change' page

The pictures or drawings I put on my e-book page helped show the change I hope to bring to my community



Rubrics Made Easy with Toddle

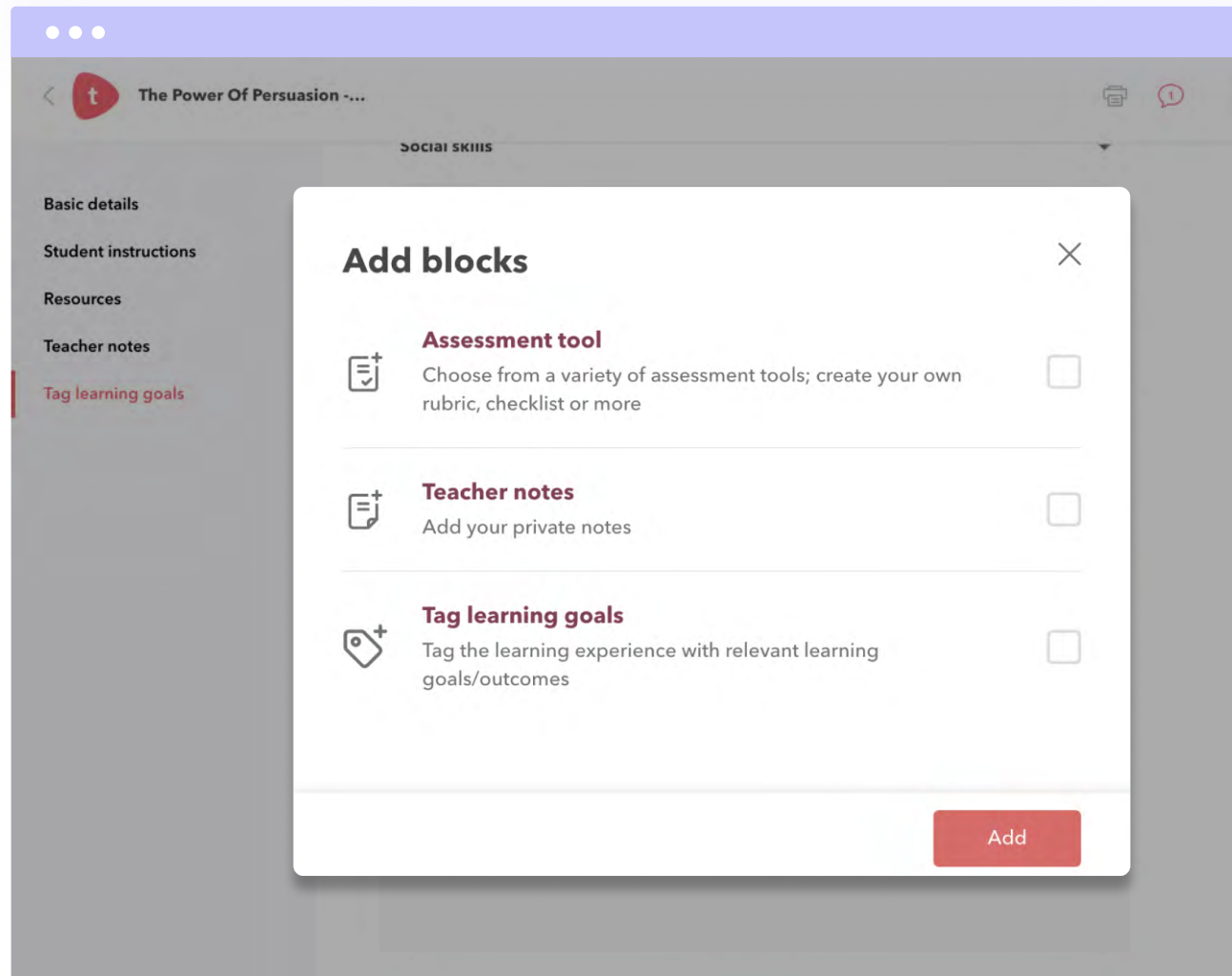
You can use **analytic or single point rubrics** directly on **Toddle**!

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Create templates for quick use and design

Choose whether assignments will be teacher or self-assessed

Tag your learning goals to make assessment and reporting a breeze





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