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Recommended Assessment and Grading Practices

The nature of this content is hands-on learning, with opportunities for inquiry, collaboration, and problem-solving. When considering grading for your course, we ask you to contemplate how you will know that learning is happening. How will you be able to assess what Depth of Knowledge (DOK) level skills and understandings your students are demonstrating? Some best practices that we recommend are incorporating reflection as an opportunity for the students to demonstrate their understanding while integrating English Language Arts (ELA), Mathematics, Science, and/or Career Technical Education standards. We also recommend incorporating revision, the use of rubrics, and allows opportunities and space for creative and innovative designs while allowing the students to have voice and choice in what they are creating and learning and how they demonstrate that learning in authentic and public ways. These Problem-Based and Project-Based Learning (PBL) approaches are proven successful strategies for building 21st Century Success skills and increasing student engagement.

It is common for a student to struggle for a while and then have a “light bulb moment.” Often, student learning looks less like slow, steady growth and more like a series of light bulb moments. Every district and school has different grading practices, so it is difficult for us to recommend a grading system that matches your requirements specifically.

Dewey, Montessori, and Piaget would agree that students learn by doing. It is in these hands-on experiences that students construct their knowledge, understanding, and skills. Hands-on does not necessarily mean learning is happening however, and if learning is happening, does not necessarily mean the teacher knows how to assess this learning.

We recommend, in addition to hands-on activities, that teachers make sure they formatively assess student learning while it is happening. Becoming a facilitator, rather than a lecturer, will allow you to use best practices such as student reflection and revision, collaboration, asking probing questions, providing timely individualized, and scaffolded direct instruction will allow you to guide students through their learning in inquiry-based, problem-based, and project-based contexts. Best practices pedagogies are continually being created and adapted. We recommend keeping current through high-quality professional development and visiting the National School Reform Faculty for a list of protocols and activities at <http://www.nsrffharmony.org/free-resources/protocols/a-z>

We also recommend following Parallax, Inc on social media for regular updates on how others are integrating robotics, electronics, UAV's, and other equipment in authentic, real-world, problem and project-based ways, often integrated with CTE, STE(A)M, NGSS, CCSS, and other key content standards.

Parallax Inc.

phone: 888-512-1024

e-mail: education@parallax.com

store: <https://parallax.com>

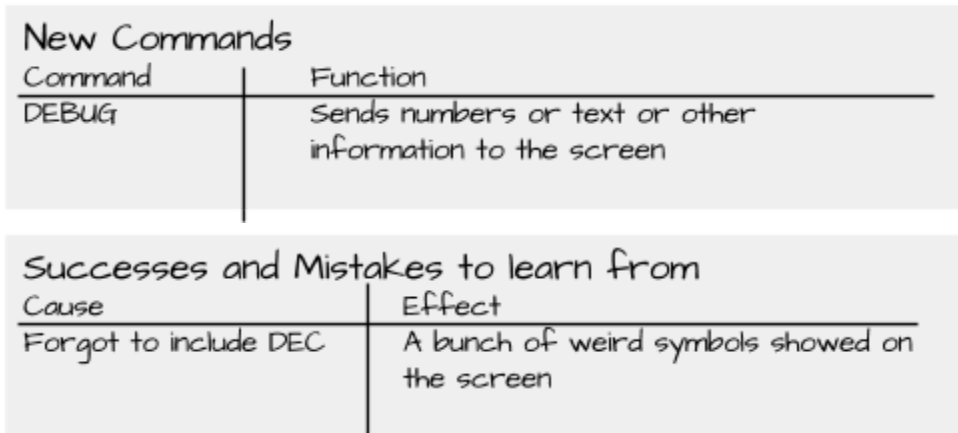
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Below is one example of using a rubric for assessing learning. This example uses “circuits” as a general example, however feel free to change the terminology to be more specific to the task you are assessing.

Rubric	1	2	3	4
Descriptor	Below Standard: Student needed considerable assistance in building circuit or is unable to do so to completion.	Approaching Standard: Student demonstrated ability to build circuits with assistance or is unable to articulate how they work or solve problems as they arose.	At Standard: Student demonstrated ability to build circuits with little to no assistance and can articulate how it works or problem solve problems as they arose.	Above Standard: Student demonstrated ability to build circuits with little to no assistance, can articulate how it works, and has demonstrated ability to problem solve as necessary.

Student Writing

Students are better able to retain what they learn when they write about the activities they are completing. Writing two-column formats such as Cornell notes, T-charts, word-definition, or cause-effect in journals are proven traditional-education methods for students to articulate the concepts they are learning, which in turn helps cement their knowledge.



New Commands	
Command	Function
DEBUG	Sends numbers or text or other information to the screen

Successes and Mistakes to learn from	
Cause	Effect
Forgot to include DEC	A bunch of weird symbols showed on the screen

Additionally, student reflection provides formative assessment opportunities to check for understanding. It also provides opportunities for you to challenge students to think-critically, problem-solve, and be innovative through Socratic or probative questioning. It also provides you opportunities to individualize education by identifying where scaffolding and direct instruction needs to happen for each student.



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Reflection

A real life example of a phototransistor would be a street light - they turn on when it gets dark and they turn back off when it's light enough outside.

Many teachers utilize technology for student reflection and/or teacher feedback. Some also have their students use technology to create student digital portfolios of their learning. Others use technology to make student work public. As many teachers or programs do so, they are often demonstrating how they are meeting Career Technical Education (CTE) or STE(A)M grant/charter requirements, or how they are integrating in order to meet Common Core ELA & Math and Next Generation Science Standards (NGSS), while preparing student for College, Career, and Life!

Our question for you, is how will you? We would like to celebrate your successes with you by inviting you to share them on Twitter @ParallaxInc, on LinkedIn at Parallax, Inc, or on facebook at ParallaxInc.

Formative Assessment

We recommend using best practices such as Socratic Seminar or the Probing Questions Protocol. During times when students are working through the activities, asking questions such as: "Can you tell me what you're working on?", "What did you change to make it do that?", or "How is this the same or different than the last activity?". Asking probing questions such as these for a minute or two from each student will allow you to assess their level of understanding quickly, which will help you identify which students need more help or instruction. As your students become more comfortable with this process, you can even ask them to develop and ask each other probing questions. Not only will this cement their understanding even better, it will also allow you to roam as observer/facilitator more efficiently. Be sure to avoid asking clarifying questions or giving a recommendation in the form of a question. One example of the Probing Question Protocol can be found at http://www.nsrffharmony.org/system/files/protocols/probing_questions_guide.pdf

Summative Assessment

We do provide a variety of traditional questions for you to generate quizzes and tests. The answer key is only in this document and available from Parallax to educators only. We have provided questions corresponding to the various levels of Webb's Depth of Knowledge which are: (1) Recalling/Reproducing, (2) Applying Skills (3) Problem Solving, and (4) Independent Projects.

However, we would also like to encourage you to consider what other forms of summative assessment you might use. How can your students demonstrate their learning in real and relevant ways that are public and authentic? How can your students demonstrate their learning of the essential skills and content while applying their own creativity and innovation in their approach? Have you considered looking into successful problem-based or project-based learning strategies? We have resources for professional development on using these best teaching practices. Contact us for more information.

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