Assessment

There are many ways in which you can monitor and assess your students' progress through a lesson. This section includes an observation rubrics grid that you can use to provide feedback to your students about the development of their computational thinking skills.

STUDENT-Led Assessment

Encourage your students to tell their learning story. Provide them with the opportunity to share their thinking, ideas, and reflections using the documentation tool(s) they have available. Students can document their thoughts using text, videos, images, sketchnotes, or another creative medium. Allow each student to select the tool(s) they find most appropriate for capturing and sharing their unique thinking, creations, and learning process.

Teacher-Led Assessment

Developing students' science, engineering, and computational thinking skills requires time and feedback. Just as in the design cycle, in which students should understand that failure is part of the process, assessment should provide feedback in terms of what students did well and where they can improve. Problem-oriented learning is not about succeeding or failing. It is about being an active learner and continually building upon and testing ideas.

Giving feedback to students in order to help them develop their skills can be done in various ways. Along with the EV3 Coding Activities, we have provided examples of rubrics that can be completed by:
• Observing students' behavior, reactions, and strategies
• Asking the students questions about their thought processes

As students often work in groups, you can give feedback both on a team level and on an individual level.

Observation Rubrics

Examples of computational thinking rubrics have been provided on the next pages. For every student, or every team, you can use the observation rubrics grid to:
• Evaluate student performance at each step of the process
• Provide constructive feedback to help each student progress

The rubrics are based on these progressive stages:

1. Bronze (Emerging)

The student is at the beginning stages of development in terms of content knowledge, ability to understand and apply content, and/or ability to demonstrate coherent thoughts about a given topic.

2. Silver (Developing)

The student is able to present basic knowledge only (e.g., vocabulary), and cannot yet apply content knowledge, or demonstrate comprehension of the concepts being presented.

3. Gold (Proficient)

The student has concrete levels of comprehension of the content and concepts, and can adequately demonstrate the topics, content, or concepts being taught. The ability to discuss and apply this knowledge outside the required assignment is lacking.

4. Platinum (Accomplished)

The student can take concepts and ideas to the next level, apply concepts to other situations, and synthesize, apply, and extend their knowledge to discussions that include extensions of ideas.

Decomposition Rubrics

	Bronze	Silver	Gold	Platinum	Notes
Describe the problem in your own words.	The student is unable to describe the problem in their own words.	With prompting, the student is able to describe the problem in their own words.	The student is able to describe the problem in their own words.	The student is able to describe the problem in their own words and starts to decompose the problem into smaller parts.	
Describe how you will know whether or not you have found a successful solution to the problem.	The student is unable to describe success criteria.	With prompting, the student is able to describe success criteria.	The student is able to describe success criteria.	The student is able to describe success criteria in detail.	
Describe how you can break the problem down into smaller parts.	The student is unable to break down the problem.	With prompting, the student is able to break down the problem into smaller parts.	The student is able to break down the problem into smaller parts.	The student is able to break down the problem into smaller parts and can describe the links between each of the parts.	

Generalization Rubrics

	Bronze	Silver	Gold	Platinum	Notes
Describe which program you have used from the Program Library (or elsewhere) and why.	The student is unable to describe which program has been used and why.	With prompting, the student is able to identify which program has been used.	The student is able to describe which program has been used and why.	The student is able to describe, in detail, which program has been used and what modifications have been made to it.	
Observe how your students recognize patterns, or reuse concepts they have seen before.	The student is unable to recognize patterns, or reuse concepts seen before.	With prompting, the student is able to recognize patterns, or reuse concepts seen before.	The student is able to recognize patterns, or reuse concepts seen before.	The student is able to recognize patterns, or reuse concepts of their own.	

Algorithmic Thinking Rubrics

	Bronze	Silver	Gold	Platinum	Notes
Describe the list of actions to program.	The student is unable to describe a list of actions.	With prompting, the student is able to describe a list of actions.	The student is able to describe a list of actions.	The student is able to create a detailed list of actions to help them develop their program.	
Describe how you have programmed your solution.	The student is unable to describe the program.	With prompting, the student is able to describe the program.	The student is able to describe the program.	The student is able to describe the program, providing extensive details about each component.	
Describe the programming principles used in your solution (e.g., output, inputs, events, loops, etc.).	The student is unable to describe the programming principles used in their solution.	With prompting, the student is able to describe the programming principles used in their solution.	The student is able to describe the programming principles used in their solution.	The student is able to describe, with extensive comprehension, the programming principles used in their solution.	

Evaluation Rubrics

	Bronze	Silver	Gold	Platinum	Notes
Describe what happened when you executed your program, and whether or not it was what you expected.	The student cannot describe what happened.	With prompting, the student is able to describe what happened, and compare it to what was expected.	The student is able to describe what happened, and compare it to what was expected.	The student is able to describe what happened, compare it to what was expected, and is already finding solutions.	
Describe how you have fixed the problems in your program.	The student cannot describe how they have fixed the problems.	With prompting, the student can describe how they have fixed the problems.	The student can describe how they have fixed the problems.	The student can describe, in extensive detail, how they have fixed the problems.	
Describe how your solution is linked to the problem.	The student is unable to describe how their solution is linked to the problem.	With prompting, the student is able to describe how their solution is linked to the problem.	The student is able to describe how their solution is linked to the problem.	The student is able to describe, in extensive detail, how their solution is linked to the problem.	
Describe some of the different ways in which you have tried to solve the problem.	The student is unable to describe the different ways in which they have tried to solve the problem.	With prompting, the student is able to describe the different ways in which they have tried to solve the problem.	The student is able to describe the different ways in which they have tried to solve the problem.	The student is able to describe the different ways in which they have tried to solve the problem and can explain why each of the options wasn't viable.	

Abstraction Rubrics

	Bronze	Silver	Gold	Platinum	Notes
Describe the most important part of your solution.	The student is not able to describe any parts of their solution.	With prompting, the student is able to describe their solution.	The student is able to describe their solution.	The student is able to describe their solution, focusing on the most important part of the solution.	
Describe the most important details of your solution.	The student is not able to provide any details about their solution.	With prompting, the student is able to provide details about their solution.	The student is able to discuss details of their solution, but some of the details are not essential.	The student is able to discuss the most important details of their solution.	
Describe how your solution met the initial design criteria.	Their student is unable to describe how their solution met the initial design criteria.	With prompting, the student is able to describe how their solution met the initial design criteria.	The student is able to describe how their solution met the initial design criteria.	The student is able to describe, with extraordinary clarity, how their solution met the initial design criteria.	