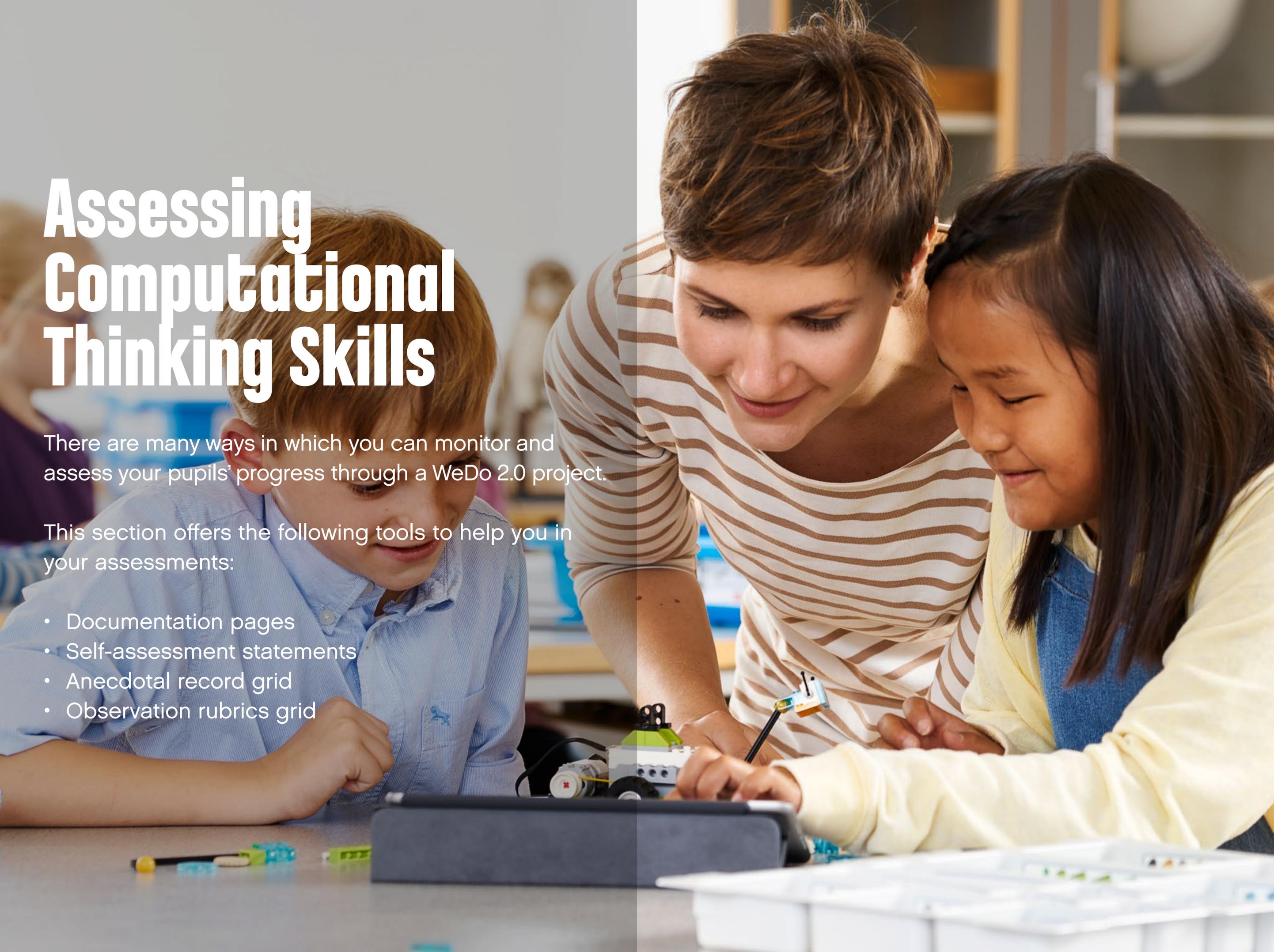


# Assessing Computational Thinking Skills

There are many ways in which you can monitor and assess your pupils' progress through a WeDo 2.0 project.

This section offers the following tools to help you in your assessments:

- Documentation pages
- Self-assessment statements
- Anecdotal record grid
- Observation rubrics grid





# Pupil-Led Assessment

## Documentation Pages

Each project will ask your pupils to create documents to summarise their work.

To have a complete science report, it is essential that your pupils:

- Document their work using various types of media
- Document every step of the process
- Take the time to organise and complete their document

It is most likely that the first document that your pupils will complete will not be as comprehensive as the next one. You can support them by:

- Giving feedback and allowing them time to see where and how they can improve some parts of their document.
- Allowing them to share their documents with each other. By communicating their scientific findings, your pupils will be engaged in the work of scientists.

## Self-Assessment Statements

After each project, your pupils should reflect on the work that they have done. Use the following page to encourage reflection and to set goals for the next project.





# Pupil Self-Assessment Rubric

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Project: \_\_\_\_\_

Directions: Circle the brick that shows how well you did. The bigger brick, the better you did.

I defined the question or problem.				
I built a LEGO® model and programmed a solution.				
I tested my solution and made improvements.				
I documented and shared my ideas.				

### Project Reflection

One thing I did really well was: \_\_\_\_\_

One thing I want to improve on for next time is: \_\_\_\_\_



## Teacher-Led Assessment

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

Giving feedback to your pupils in order to help them to develop their skills can be done in various ways. At each phase of the WeDo 2.0 projects, we have provided examples of rubrics that can be used by:

- Observing your pupils' behaviour reactions and strategies
- Asking questions about their thought processes

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

### Anecdotal Record Grid

The anecdotal record grid allows you to record any type of observation that you believe is important for each pupil's development. Use the template on the next page to provide feedback to your pupils as needed.





# Anecdotal Record Grid

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Project: \_\_\_\_\_

1. Emerging	2. Developing	3. Proficient	4. Accomplished
			

Notes:



# Teacher-Led Assessment

## Observation Rubrics

Examples of rubrics have been provided for every Guided Project. For every pupil or every team, you can use the observation rubrics grid to:

- Evaluate your pupils' performance at each step of the process
- Provide constructive feedback to help the your pupils progress

The observation rubrics that are provided in the Guided Projects can be adapted to fit your needs. The rubrics are based on these progressive stages:

### 1. Emerging

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

### 2. Developing

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

### 3. Proficient

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

### 4. Accomplished

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

## ▶ Suggestion

Use the observation rubrics grid on the next page to keep track of your pupils' progress.





# Observation Rubrics Grid

Class:		Project:			
Pupils' Names					
		Explore	Create	Test	Share
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					



To be used with the rubrics that are described on the following page: (1) emerging, (2) developing, (3) proficient, (4) accomplished.



# Assessing Project Phases - General Rubrics

You can use these assessment rubrics to give general feedback to your pupils on a scale of 1 to 4 at the end of each phase of a project.

## Explore Phase

In the Explore phase, feedback should relate to whether or not the pupil is actively involved in the discussion by asking and answering questions, and their level of understanding of the problem.

1. The pupil is unable to provide answers to questions or adequately participate in discussions.
2. The pupil is able, with prompting, to provide answers to questions or adequately participate in discussions.
3. The pupil is able to provide adequate answers to questions and participate in class discussions.
4. The pupil is able to extend explanations in class discussions.

## Test Phase

During the Test phase, make sure that the pupil works well as part of a team, justifies their best solution and uses the information that they collected in the Explore phase.

1. The pupil is unable to work well as part of a team, justify solutions and use the information that they collected for further development.
2. The pupil is able to work as part of a team, collect and use information with guidance or with help, to justify solutions.
3. The pupil is able to work as part of a team and contribute to the team discussions, justify solutions, and collect and use information about the content.
4. The pupil can justify and discuss solutions that allow for the collection and use of information.

## Share Phase

During the Share phase, make sure that the pupil is able to describe their solution using the right vocabulary and the right level of detail.

1. The pupil does not use evidence from their findings in connection with the ideas that they share during the presentation and the pupil does not follow established guidelines.
2. The pupil uses some evidence from their findings, but the justification is limited. Established guidelines are generally followed but may be lacking in one or more areas.
3. The pupil provides adequate evidence to justify their findings and the pupil follows established guidelines for presenting.
4. The pupil fully discusses their findings and thoroughly utilises appropriate evidence to justify their reasoning while following all established guidelines.



# Assessing Computational Thinking Skills

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Decomposition	1. Emerging	2. Developing	3. Proficient	4. Accomplished	Notes
Describe the problem in your own words.	The pupil is unable to describe the problem in their own words.  <input type="checkbox"/>	The pupil is able, with prompting, to describe the problem in their own words.  <input type="checkbox"/>	The pupil is able to describe the problem in their own words.  <input type="checkbox"/>	The pupil is able to describe the problem in their own words and starts to decompose the problem into smaller parts.  <input type="checkbox"/>	
Describe how you will know whether or not you have found a successful solution to the problem.	The pupil is unable to describe success criteria.  <input type="checkbox"/>	The pupil is able, with prompting, to describe success criteria.  <input type="checkbox"/>	The pupil is able to describe success criteria.  <input type="checkbox"/>	The pupil is able to describe success criteria with a high level of detail.  <input type="checkbox"/>	
Describe how you can break the problem down into smaller parts.	The pupil is unable to break down the problem.  <input type="checkbox"/>	With prompting, the pupil is able to break down the problem into smaller parts.  <input type="checkbox"/>	The pupil is able to break down the problem into smaller parts.  <input type="checkbox"/>	The pupil is able to break down the problem into smaller parts and can describe the links between each of the parts.  <input type="checkbox"/>	



# Assessing Computational Thinking Skills

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Generalization	1. Emerging	2. Developing	3. Proficient	4. Accomplished	Notes
Describe which program you have used from the Program Library (or elsewhere) and why.	The pupil is unable to describe which program has been used and why.  <input type="checkbox"/>	The pupil is able to identify which program has been used.  <input type="checkbox"/>	The pupil is able to describe which program has been used and why.  <input type="checkbox"/>	The pupil is able to describe, in detail, which program has been used and what modifications have been made to it.  <input type="checkbox"/>	
Observe how your pupils recognise patterns or reuse concepts that they have seen before.	The pupil is unable to recognise patterns or reuse concepts seen before.  <input type="checkbox"/>	With prompting, the pupil is able to recognise patterns or reuse concepts seen before.  <input type="checkbox"/>	The pupil is able to recognise patterns or reuse concepts seen before.  <input type="checkbox"/>	The pupil is able to recognise patterns or reuse concepts of their own.  <input type="checkbox"/>	



# Assessing Computational Thinking Skills

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Algorithmic Thinking	1. Emerging	2. Developing	3. Proficient	4. Accomplished	Notes
					
Describe the list of actions to program.	The pupil is unable to make a list of actions.  <input type="checkbox"/>	With prompting, the pupil is able to make a list of actions.  <input type="checkbox"/>	The pupil is able to make a list of actions.  <input type="checkbox"/>	The pupil is able to make a detailed list of actions to help them develop their program.  <input type="checkbox"/>	
Describe how you have programmed your solution.	The pupil is unable to describe the program.  <input type="checkbox"/>	With prompting, the pupil is able to describe the program.  <input type="checkbox"/>	The pupil is able to describe the program.  <input type="checkbox"/>	The pupil is able to describe the program, providing extensive details about each component.  <input type="checkbox"/>	
Describe the programming principles used in your solution ( e.g., output, inputs, events, loops, etc.).	The pupil is unable to describe the programming principles used in their solution.  <input type="checkbox"/>	With prompting, the pupil is able to describe the programming principles used in their solution.  <input type="checkbox"/>	The pupil is able to describe the programming principles used in their solution.  <input type="checkbox"/>	The pupil is able to describe, with extensive comprehension, the programming principles used in their solution.  <input type="checkbox"/>	



# Assessing Computational Thinking Skills

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Evaluation	1. Emerging	2. Developing	3. Proficient	4. Accomplished	Notes
					
Describe what happened when you executed your program and whether or not it was what you expected.	The pupil cannot describe what happened.  <input type="checkbox"/>	With prompting, the pupil is able to describe what happened and compare it to what was expected.  <input type="checkbox"/>	The pupil is able to describe what happened and compare it to what was expected.  <input type="checkbox"/>	The pupil is able to describe what happened, compare it to what was expected and is already finding solutions.  <input type="checkbox"/>	
Describe how you have fixed the problems in your program.	The pupil cannot describe how they have fixed the problems.  <input type="checkbox"/>	With prompting, the pupil can describe how they have fixed the problems.  <input type="checkbox"/>	The pupil can describe how they have fixed the problems.  <input type="checkbox"/>	The pupil can describe, in extensive detail, how they have fixed the problems.  <input type="checkbox"/>	
Describe how your solution is linked to the problem.	The pupil is unable to describe how their solution is linked to the problem.  <input type="checkbox"/>	With prompting, the pupil is able to describe how their solution is linked to the problem.  <input type="checkbox"/>	The pupil is able to describe how their solution is linked to the problem.  <input type="checkbox"/>	The pupil is able to describe, in extensive detail, how their solution is linked to the problem.  <input type="checkbox"/>	
Describe some of the different ways in which you have tried to solve the problem.	The pupil is unable to describe different ways in which they have tried to solve the problem.  <input type="checkbox"/>	With prompting, the pupil is able to describe the different ways in which they have tried to solve the problem.  <input type="checkbox"/>	The pupil is able to describe the different ways in which they have tried to solve the problem.  <input type="checkbox"/>	The pupil 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.  <input type="checkbox"/>	



# Assessing Computational Thinking Skills

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Abstraction	1. Emerging	2. Developing	3. Proficient	4. Accomplished	Notes
Describe the most important part of your solution.	The pupil is not able to describe their solution.  <input type="checkbox"/>	With prompting, the pupil is able to describe their solution.  <input type="checkbox"/>	The pupil is able to describe their solution.  <input type="checkbox"/>	The pupil is able to describe their solution, focusing on the most important part of the solution.  <input type="checkbox"/>	
Describe the most important details of your solution.	The pupil is not able to provide any details about their solution.  <input type="checkbox"/>	With prompting, the pupil is able to provide details about their solution.  <input type="checkbox"/>	The pupil is able to discuss details of their solution, but some of the details are not essential.  <input type="checkbox"/>	The pupil is able to discuss the most important details of their solution.  <input type="checkbox"/>	
Describe how your solution met the initial criteria.	The pupil is unable to describe how their solution met the initial criteria.  <input type="checkbox"/>	With prompting, the pupil is able to describe how their solution met the initial criteria.  <input type="checkbox"/>	The pupil is able to describe how their solution met the initial criteria.  <input type="checkbox"/>	The pupil is able to describe, with extraordinary clarity, how their solution met the initial criteria.  <input type="checkbox"/>	