

VUK ALL TOPICS

S7
T1-5
D1-9
L3-4 P1



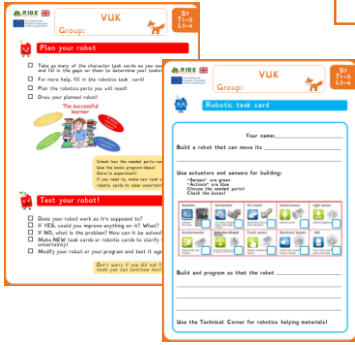
Goals of the lesson:

- self-regulated learning
- problem solving
- creativity
- fine motor skills

<p>Activity Start: plan how to create the output, and the order in which to create its parts. Then, decide how to build them, dividing the work among the group. All students fill in their Robotic task card Planning the robots</p>	<p>Method/Interaction The working groups should be helped to coordinate and distribute tasks (with attention to developmental aims) Individual and group work, with the teacher's orientation to fulfill the developmental aims</p>	<p>Output Roles in the group – what part of the scene will be built by whom Concrete plans of robots and environment of all scenes</p>	<p>1. Planning the robots Time needed: 20 minutes</p> <p>• Needed materials:</p> <ul style="list-style-type: none"> • the text segment • Group task sheet • Character cards, Storyline • Robotic task card • Template for planning the robot • Paper, pencils for taking notes, drawings
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<p>Activity Building and programming characters (animated figures: Stefan, Ioan, the Traveler, the Judge and visualisation of the decision) – actions, interactions according the text Building environment (static objects): Landscape, a road, the court room, etc.</p>	<p>Method/Interaction Group work using the text, Character task cards, Robotic cards and Technical Corner Show sample robots from the Idea Bazaar if needed (the aim is NOT to copy the samples!) Help in problem solving and self-regulated learning</p> <div data-bbox="335 1440 621 1595" data-label="Diagram"> </div> <p>Communication among the groups</p>	<p>Output Built and programmed robots Photos and videos taken about the making</p>	<p>2. Building and programming the robots Time needed: 55 minutes</p> <p>Needed materials</p> <ul style="list-style-type: none"> • Group task sheet, • Character task cards, • Robotic task cards, • Storyline sheet • Technical Corner • Pencils • Idea sheets if needed <p>• ArTeC robots • ArTeC Blocks • computer</p> <div data-bbox="1178 1315 1385 1636" data-label="Image"> </div>
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<p>Activity Presentation Evaluation</p>	<p>Method/Interaction Each group presents their robots and environment Discussion, teacher's feedback</p>	<p>Evaluation Evaluate the process (the flow, being autonomous, cooperation among group members), the originality (variety of ideas) inclusion,</p>	<p>3. Evaluation Time needed: 15 minutes</p> <p>Output Ideas for the project-closing presentation</p>
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Flexible usage of the learning materials

The teacher can customize the learning process and the development of each student by combining the variations of learning materials and the appropriate level of programming skills.

Problem solution, self-regulated learning

The most important task of the teacher is helping the problem solving and the self regulation learning, more like a mentor than an instructor. The development of these skills is essential for the improvement of learning success and life skills.

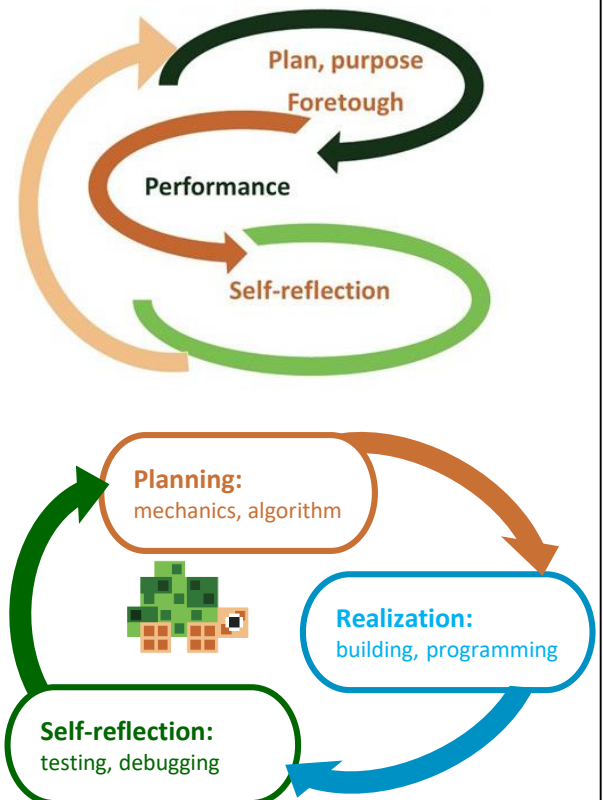
How can you help your students in self-regulation learning?

- Don't give them concrete instructions in the matter of the structure and the program of the robot!
- Teach them to build their program step by step and continue writing the program only if the current part works correctly.
- Encourage them to test their robot after each step of programming!
- In case of any error in the program, help them to identify the logical problem, but don't tell them or show them the concrete bug! Make them verbalize the difference between the planned and the real performance of the robot.
- Let them look for the bug in the program, help them with questions, not with instructions!
- Don't tell them if the correction was good or not, but make them test their robot again and self-reflect!
- Ensure them that having errors in the structure of the robot or in the logic of the program is not a failure, but natural part of learning and of product development!

Supporting creativity

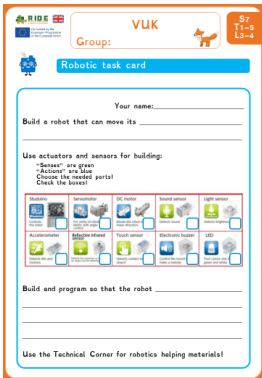
- Support individual creative initiatives but ensure that the right balance is maintained between them and didactic goals
- Allow access to the helping materials, task cards and the text as resources
- Make the students fill in additional Character cards or Robotic task cards to concretise new, additional ideas
- Use the robot samples only in „emergency cases“, when students don't have their own idea or if development needs a specific solution!

The model of self-regulated learning and it's application in teaching robotics



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Programming levels

These levels can be combined in one scene and one group.

This is also the tool for differentiating and for individual treatment. Choosing the appropriate programming level helps to focus and strengthen the developmental aim.

The teacher can combine all programming levels with all developmental fields according to the students' skills and needs.

Don't hesitate to differentiate within the group! Don't aim to make all the students work on the same complexity level when programming! It's not necessary to use robots of the same programming level within one scene!

If they complete the task too quickly they can be given another task card. If the task is too difficult the other students should be asked to help or they can be given more helping materials!

1. Level (**PROG1**): building, especially mechanical solutions, motorized structures, basic automatic algorithms
2. Level (**PROG2**): programming, simple robots, a few lines of basic/combined programming codes
3. Level (**PROG3**): complex problem solution, interactive algorithms, sensors
4. Level (**PROG4**): talent development: complex robots, structured coding and solution optimisation

Development according students' needs

The 8 developmental fields can be integrated in any level of robotics according to the developmental aim. At the same time these are tools for differentiating and for individual treatment.

Teacher can help development by choosing the appropriate tasks, by questions, choosing helping materials, samples, etc.

Suggested procedure for every group:

Hints:

- First do a plan, a project about what to do, and who have to be responsible for each part.
- Start by planning the body (which should contain the Studuino base), then the other parts of the body, according to the robot's size.
- Integrate features when needed, in order to improve interaction among characters.
- More robots can be integrated to the same Studuino board – make their program separately and when everything works correctly, copy them into a unified program.
- Consult with other groups and harmonize the work, the size of the robots.
- If students are worried about the lack of time, take care of them: they have got 2 lessons for completing their work.

Remind students to collect pictures/videos of the robot's creation for the final documentation!

Suggested output:

Robots

- Built robot characters (animated figures) visualising the essence of the text portions
- Built environment (static objects): according to the text
- Unifying the scenes, we get the whole story

A set of pictures, videos, task cards documenting the creation process