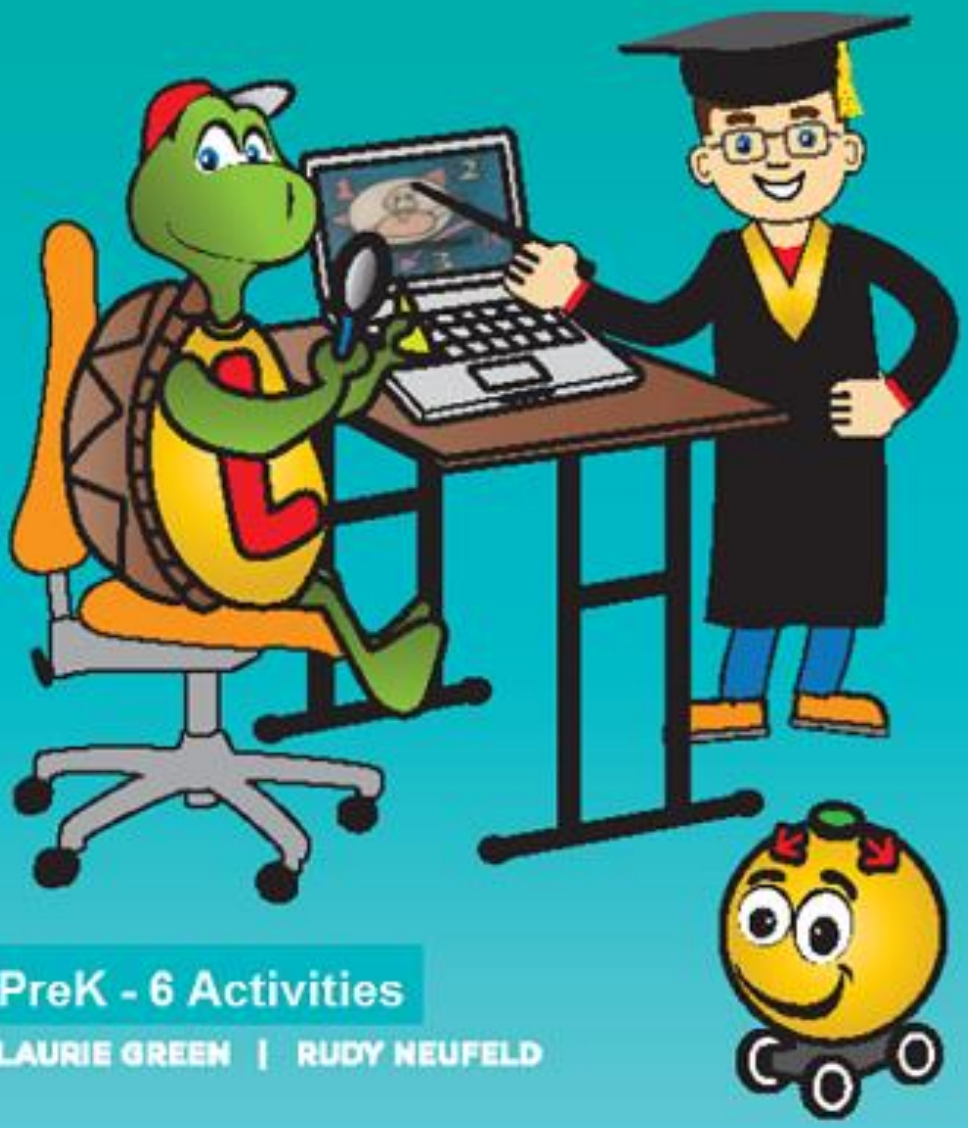
LEARNING MATH
Through Robotics and Coding



PreK - 6 Activities

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Learning Math Through Robotics and Coding

PREFACE

The Role of Manipulatives

Manipulatives help to move the learner along the pathway from concrete to abstract. Their use assists the learner to visualize mathematical symbols, operations and ultimately concepts. They are critical in the understanding and the learning of mathematics.

The Role of Robots

Robots engage the minds of students in rich, exploratory, open-ended enquiries, thereby creating, “Communities of Innovation”, as students work together and share their explorations and findings.

The robot facilitates a learning environment in which:

- There is a clear correspondence between the concrete (action) and the symbolic (code).
- The student develops problem solving and critical thinking skills.
- Learning is student-centered and personal. Students learn by teaching robots.
- Process takes precedence over product.
- A mistake is a step to new learning. A mistake is an opportunity to learn.
- Students are encouraged to investigate and to discover.
- Students engage in oral and written communications.

The robot promotes the development of number sense defined as the intuition of and understanding of numbers and their relationships. The robot also promotes the recognition of patterns, extension of patterns, and creation of patterns. These patterning skills are a requisite life skill.

The Role of The Teacher

Teachers make learning possible for all students. They are not lecturers and tellers nor are they the “Font of all Knowledge”. They are far more skilled and important. They establish an environment of trust for risk-taking by students; they create rich pathways for students to follow and explore in their individual search for understanding, thus knowledge. They are guides and essential support for students as the individual students construct knowledge and make it useable. Using coding, robots and robotics, they can develop one of the most effective learning paths - the path to self correction.
Coding and the use of robots and robotics can be a vital pathway teachers can employ for students to explore and develop invaluable skills for full exploration of Mathematics throughout their schooling.

This Resource is designed as an integrated curriculum unit of activities for students in grades JK to 6. We will begin with activities for the “person robot”. This will be followed by activities to be used with a mechanical robot, a Blue-Bot. Finally we will present activities for the robot in the shape of a turtle on the computer screen.

Most of the activities suggested in this resource, “Learning Math Through Robotics and Coding” make use of the “person robot” and a robot in the shape of a turtle on the computer screen and could be done without the

use of a mechanical robot, however we strongly suggest the purchase of at least one mechanical robot, a Blue-Bot* for each class or family. Quality time spent on the floor and paper turn exercises will make later work on the computer screen easier to understand.

Order the Blue-Bot Robot at: **Blue-Bot Robot @ **$119.95 US$**
Use coupon code **(NLSRobot).**
Everyone will receive a 10% discount and free shipping.

In Chapter 3, you will be introduced to a **free version of Terrapin LOGO, a set of codes that will direct a robot on the computer screen. This version is fully functional with the exception of saving data, printing, or controlling robots which are not on the computer screen.
One may purchase a full license of Terrapin Logo at: **Logo License**

DRAFT 1

Learning Math Through Robotics and Coding

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