



The SPIRIT Project

Educational Robotics

Lesson Building Block Template

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Grade Level: ___ **Date:** Aug 1, 2006 ___

Directions: Directions: Definition of a Lesson Building Block: This is a “Lesson Building Block” from the SPIRIT educational robotics institute. A ‘lesson building block’ is in essence an educational activity that might be later turned into a more formal classroom lesson by a creative teacher. The SPIRIT Institute is striving to put a variety of “lesson building blocks” up on the web for the potential use of teachers as they try to prepare more formal educational lessons using the TekBot robotics platform.



I. Concepts (*Give a list of one or more concepts that might be taught using this activity*)
-Students will be using Inquiry, Algebra, and teamwork to navigate a simple maze with the TekBot.

II. Standards: (*Standards for Technological Literacy*)

III. Learning Activity Context (Describe the overall context for the learning activity)

-Overview: Students will learn the formula $D=rt$ (Distance-rate x time) as a basis for completing a task set by the teacher. It will begin with one lesson posing the task to them and using a series of questions that will hopefully allow the students to see the need for developing some kind of system or formula.

They will then learn the formula $D=rt$. Using a TekBot driver and a person doing the timing, they will test this formula and their math calculations on a very simple maze (one turn in the maze at this point.) After they develop proficiency in this supervised format, they will continue on to a more difficult maze. They will measure it...develop calculations...practice it...all with their backs turned to the maze. The driver may only turn when given the command by the timer. The word they may use is "time." At this point the driver will have to utilize the practice from prior experience to turn at the proper angle, etc. to navigate the maze successfully.

IV. Teacher and Student Suggestions/Tips

-Pitfalls:

-The maze will have to be wide enough to allow a margin of error for the operator.
-These calculations may get extensive in that they are not "book answers" that come out even. Both partners will need to check and re-check calculations against each others...the teacher should also do some 'behind the scenes' checking to at least have a quick sense of why things went wrong if nothing has already been said to the students.

V. Teacher Questions

(Give a list of questions that teachers might ask students during the activity)

Questions:

-How could you navigate through this maze without sight? If the maze were more complex?
-What are the constraints that are before you?
-Is it possible to use Math to conquer this problem? How?
-What are the variables in this problem? (distance, speed of TekBot, time, and operator error)

VI. Assessment Ideas

(Give an idea or two about how the lesson activity might be assessed)

VII. Other Information

I hope you enjoy this lesson. Again, it is conceptual at this point so I don't use my standard level of practice to hammer out the chinks in the armor. My goal is to give as much forethought to my questions and to allow students to do almost all the thinking necessary to complete the task. Good luck.

VIII. -Materials: TekBot, stopwatch, Engineering Notebook (w/calculations), calculator, and a simple tape maze in the hallway or other available space.