



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*)
Unit Analysis / Conversion Factors

II. Standards: (*Standards for Technological Literacy*)
a. Problem Solving Skill
b. Ratios and Similarity

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

Context –

- a. Moving TekBot
- b. Possibly Engineering/Notebook as well

Abstract –

The class will begin with a brief discussion of appropriate units of measure. Students will be divided into four groups, each with a TekBot. Using a stopwatch and measuring tape, students will measure the time it takes for the TekBot to travel whatever distance they have deemed appropriate. They will then calculate the velocity in the units they have chosen. The students will come back together as a large group and we will work on converting from the units they have chosen (I would guess it will be inches or feet per second) to other units, both within standard and metric systems. Information would be recorded in engineering notebooks.



IV. Teacher and Student Suggestions/Tips

- a. In my PreAlgebra textbook this skill is taught in the chapter on ratios and similarity. Students would need to have some prior experience with ratios as well as with measurement. The physical act of measurement can be difficult for them. It would be ideal to be able to use a tile floor with one foot square tiles, but most of our classrooms are carpeted.
- b. It would be helpful to talk about some speeds they are familiar with (driving 55 miles per hour on the highway, 25 miles per hour in the neighborhood) to give them a point of reference.
- c. They may be surprised if we converted times for sprint events from Track and Field competitions to miles per hour. Can people really run that fast for a sustained period of time?

V. Teacher Questions

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

- a. Do the units you are using change the actual speed the TekBot is going? (The units are like nicknames – they don't change how fast it is going, it just changes what we call it.)
- b. Would miles per hour be an appropriate unit of measure? Why or why not?
- c. Does the surface the TekBot is driving on make a difference in its speed?
- d. What are some advantages/disadvantages to using the metric system vs. the standard units of measure?

VI. Assessment Ideas

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

- c. Student comprehension could be assessed initially by checking for understanding as students practice some sample problems – formative assessment. If there are gaps, further practice could be done before moving on.
- d. There would be additional problems assigned for homework and it would be tested on both quizzes and tests – summative assessment. This is a concept that is routinely tested on our standardized tests – Essential Learner Outcomes, Terra Nova, and 8th grade benchmarks.

VII. Other Information

(Give any other information that might be useful or a visual or two)

No visual available – I think it's fairly self-explanatory.

VIII. A materials list