ASSOCIATION of TEACHERS OF MATHEMATICS IN MAINE

ATOMIM Grant Incentives for Teachers (*GIFT)* Program Application

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Project Title: Understanding Geometry through Robotics.

Grade Level/Courses Affected: Grades 6 and 7

Project Abstract:

With the use of a classroom Lego Robotics kit, students will submit written programming commands in an attempt to have the robot negotiate challenge courses around the classroom. The students will have only the circumference of the wheel, the turn radius, and math knowledge as tools. They will be challenged to calculate distances and turns based on the rotation of the wheel(s). Courses and challenges will get progressively complex. Advanced math work will include creating tables and graphs for different wheel sizes and turn radii relative to the construction of the robot. The project will be an ongoing component of the daily math class, regularly testing submitted programs at the start of class.

Project Description:

Purpose of the project:

To engage students in real-life complex problem solving situations that require mathematical reasoning.

Target audience:

All 6th/7th grade students in my teaching team (75 students)

Materials needed:

LEGO MINDSTORMS Education NXT Base Set,

LEGO MINDSTORMS Education Resource Set

LEGO MINDSTORMS Education NXT Software 2.1

Evaluation:

Ongoing interest/excitement in math classes.

Completion of progressively complex of problems and courses.

Successful completion of curriculum components around tables, graphs and circle geometry. (rubrics will be designed for the curriculum components)

Project Budget:

LEGO MINDSTORMS Education NXT Base Set		$294.95
LEGO MINDSTORMS Education Resource Set		$99.95
LEGO MINDSTORMS Education NXT Software 2.1 from		$79.95
	Total:	$478.85

Project Dissemination:

Along with an article for ATOMIM, I would be glad to present next year at the conference. I will also take video of some of the classroom session and “attempts" by the programed robot to complete the specific challenges. I will be posting the challenges and the videos along with successful program solutions on my Classroom Website.

Project State/National Standards:

6RP-3. Use ratio and rate reasoning to solve real-world and mathematical problems.

6EE-9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.

7RP. Analyze proportional relationships and use them to solve real-world and mathematical problems.

7EE. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

7G. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.