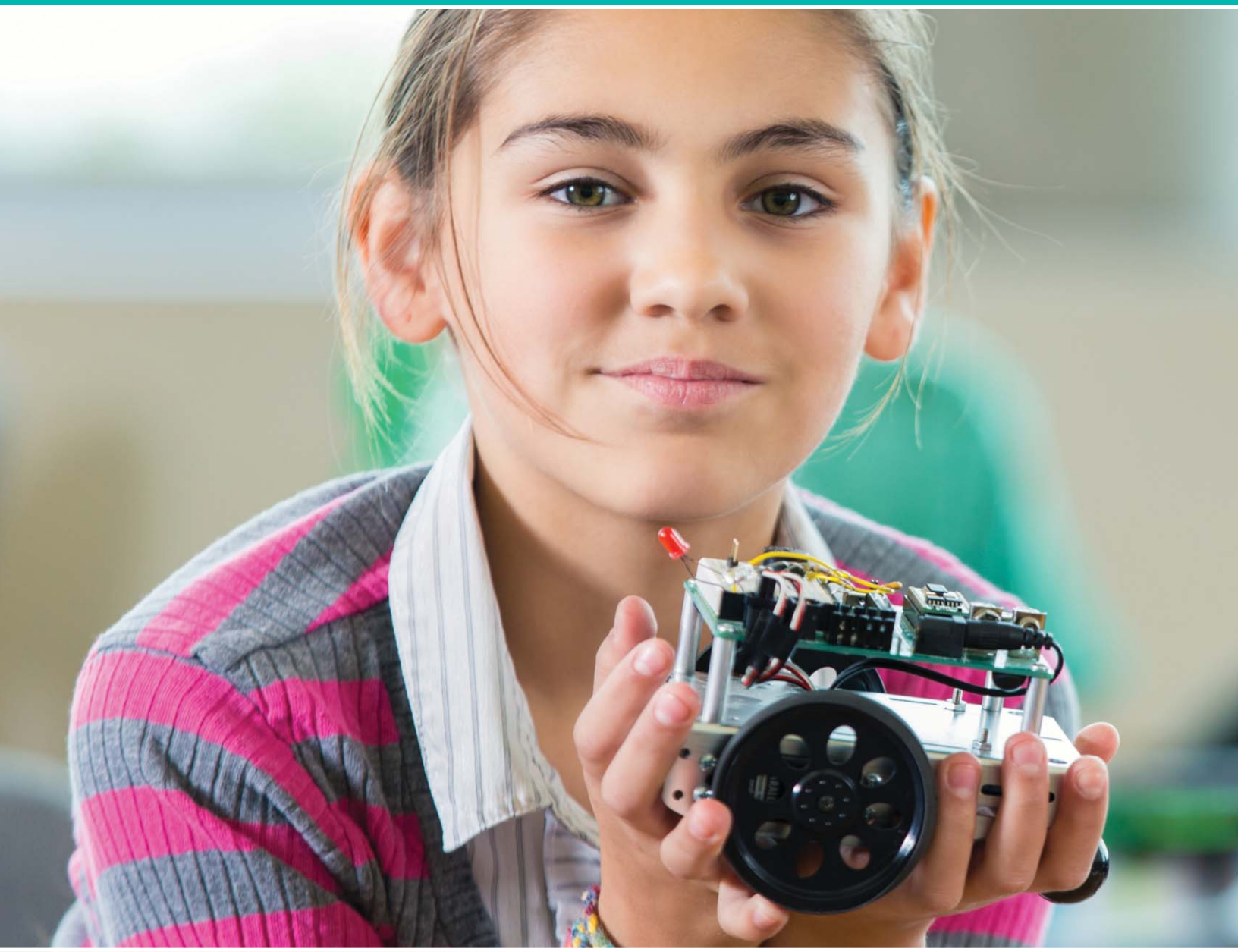
THE EDUCATION FUND
CELEBRATING 30 YEARS
2016-2017

ideas with IMPACT



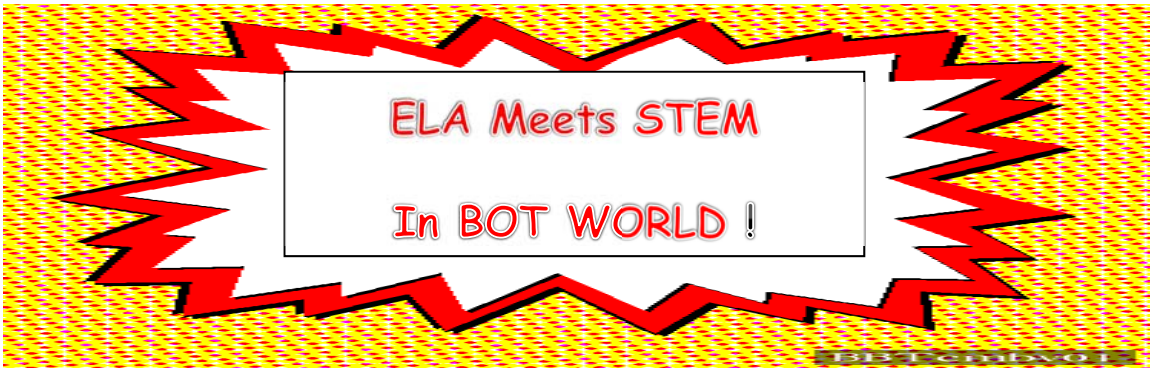
idea packet

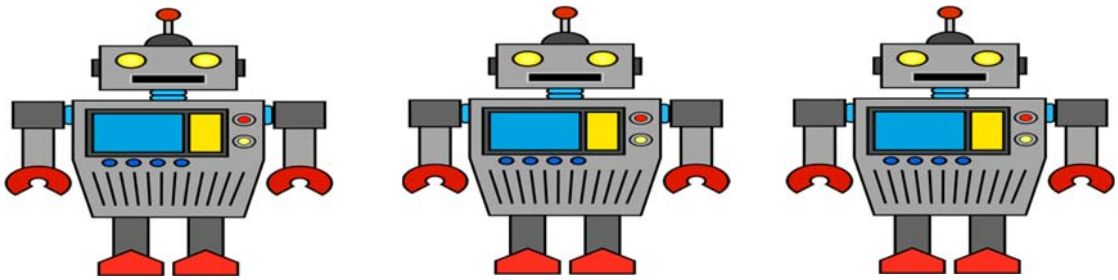
Sponsored by:

FPL

Ford Motor Company Fund

ELA and STEM Unite in Bot World





Ms. Jennifer Dibble

jdibble@dadeshools.net

David Lawrence K-8 Academy 3rd Grade

15000 Bay Vista Boulevard

North Miami, FL

33181

Phone: (305) 354-2600

Table of Contents

I. Goal and Objectives
II. Florida Standards
III. Overview
IV. Step by Step Lesson Plan Guide
V. Resource List
VI. Supplies List
VII. Adapter Application

I. Goals and Objectives

A. <u>Loving Learning:</u>

The most important and easiest goal to achieve with this project is to instill in students a love of learning. Because this project takes into account students' different interest and skill levels, using the current concept of robotics, students are really excited to dive right in.

B. <u>Enhancing Critical Thinking:</u>

Students need to think about the problems that are currently pervasive in our society. They must be creative; solutions oriented and able to clearly state their reasoning, verbally and in written form.

C. <u>Team Work:</u>

At certain points in the project students collaborate by sharing ideas and getting feedback from peers. Also, this important skill is really tested when they assemble the robots. Success only comes from following directions and working together.

D. <u>Independence:</u>

Because each child is responsible for creating his or her own problem solving robot, it fosters an environment conducive to self-expression and creativity.

E. Enhanced Academic Skills:

As noted below, this project will touch many academic standards. For example, in English Language Arts (ELA), students focus on characterization, problem solving, compare and contrast, writing, research, and illustration. With Science, Technology, Engineering and Mathematics (STEM), students learn about simple tools, problem solving, using math in real world applications, and the scientific method.

F. Encourage Multifaceted Learning:

With this project educators can show how different interests like writing, art, environmentalism, and math can be combined in an educational manner. Students who are stronger in one area, like art, can use that medium to explore scientific concepts.

G. Solidify Writing Skills

The five steps of writing (1. Brainstorming 2. Organizing 3. Drafting 4. Editing 5. Publishing) are followed. Students are motivated to express themselves in writing because the essence of the topic is self-generated.

H. A Happy, Fun, Learning Environment:

This project is a delightful way to get your class thinking, writing, creating, and moving. This generation will be using robotics in ways most of us could never dream possible, it is a topic they are very interested in.

II. State Standards

Science Standards

Big Idea 1: The Practice of Science

SC.3.N.1.1 Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.

SC.3.N.1.2 Compare the observations made by different groups using the same tools and seek reasons to explain the differences across groups.

SC.3.N.1.3 Keep records as appropriate, such as pictorial, written, or simple charts and graphs

SC.5.P.13.1 Identify familiar forces that cause objects to move, such as pushes or pulls, including gravity acting on falling objects

ELA Standards

Reading: These correlate to the books and videos about robotics, the text of the instructional manuals and the children's writing

LAFS.3.RL.3.7 Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).

LAFS.3.RL.3.9 Compare and contrast the themes, settings, and plots of stories written by the same author about the same or similar

characters (e.g., in books from a series) contribute to the sequence of events.

LAFS.3.RI.1.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

LAFS.3.RI.2.5 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

Writing:

LAFS.3.W.1.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. a. Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons. b. Provide reasons that support the opinion. c. Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion and reasons. d. Provide a concluding statement or section.

LAFS.3.W.1.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
a. Introduce a topic and group related information together; include illustrations
when useful to aiding comprehension.
b. Develop the topic with facts, definitions, and details.
c. Use linking words and phrases (e.g., also, another, and, more, but) to connect
ideas within categories of information.
d. Provide a concluding statement or section.

LAFS.3.W.2.4 With guidance and support from adults, produce writing in which the development andorganization are appropriate to task and purpose.

LAFS.3.W.2.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.

III. Lesson Plan

(The Pacing is Teacher Determined)

An Encouraging Overview

Today's students are technology obsessed and we teachers must get on board the high tech, fast moving train they are conducting. I remember a decade ago when I would have to do lengthy lessons on computer use, now the students are so advanced, they teach me. We must harness the enthusiasm these kids have for their fast paced, connected worlds. I am not technologically savvy. I still read paper books from the library! If I can do it, you can too!

A Two part Project

Part one: using literature and writing, students create their own robotic prototypes that solve real world problems. They are only limited to how far the imagination can take them.

Part two: students work together to assemble robots from kits. They can do science projects based on the functionality of the robots.

Understanding the Topic

- Get familiar with the world of robotics. For teachers and/or students to view depending on the level you teach:

  - A quick video about why robots are great to teach to kids: https://youtu.be/uvlgcjJzbLE.

  - FL competition: https://youtu.be/RM_3-zpTjLA https://youtu.be/v27cAVRdQdg

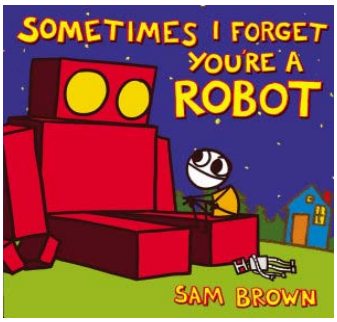
  - A complete 8 part video clip intro about robotics: https://youtu.be/d3MBTT10pxk <iframe width="560" height="315" src="https://www.youtube.com/embed/d3MBTT10pxk" frameborder="0" allowfullscreen></iframe>

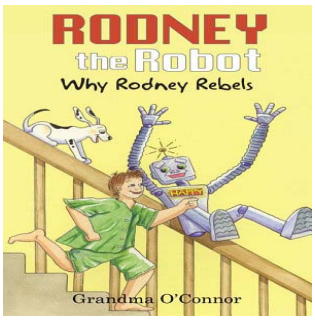
  - 60 minutes: robots 2005 video http://www.cbsnews.com/videos/robots-robots-everywhere/

  - Ted talk about the humanities side of robotics: https://www.ted.com/talks/ken_goldberg_4_lessons_from_robots_about_being_human#t-147222

Build background

- Read a sweet book about robots, focus on problem and solution, compare and contrast (use of a graphic organizer to lead a discussion about the literary aspects of the books)





Connect Students to the Topic

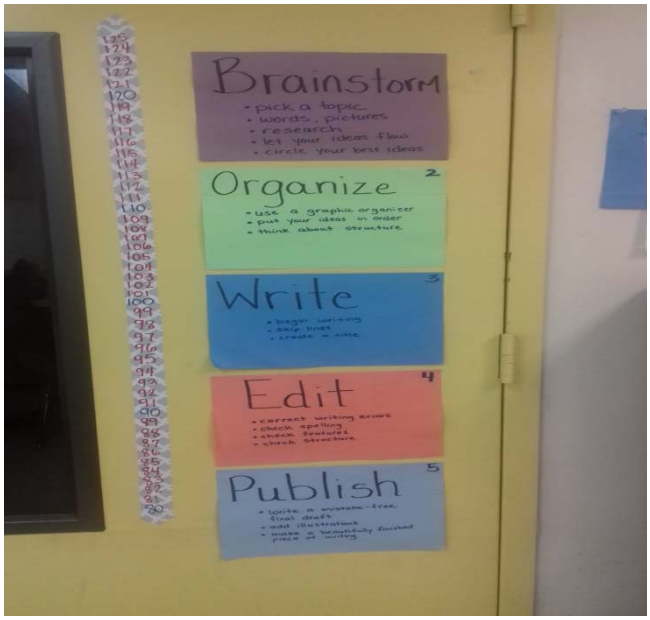
For the most part kids today know much more than we do about Robotics. An open discussion about what they do know is quite telling. Allow collaborative conversations to set the course for discussions and idea exchanges.

- Guiding questions: Where do robots appear in your lives, like in movies, shows, songs, dances, medicine?
- Write ideas on the board and create a KWL chart that can give you an idea about interest and knowledge level.
- Show videos about how children are exceedingly involved in the world of robotics through competitions. They will be inspired.

Implement the 5 Steps of writing with the following Prompts

(make a folder for each students' work for easy revisits)

1. Brainstorming (use words pictures color sound to get ideas flowing)
2. Organize (use a graphic organizer to help create structure)
3. Write (free writing, first draft skip lines!)
4. Editing (conference with the teacher or a peer to improve)
5. Publishing (this is the presentation piece, final draft)



Writing Prompts

Use these prompts to guide instruction. Creating a robot and writing is the first part of the project.

- What is a problem you would like your robot to solve?
- What character traits does your robot need to solve the problem?
- How does your robot work? Turn on? Move? Know how to function?
- What your robot looks like?
- Create a portrait of your robot (either digitally or by hand)

Building the Robots

The second part of this project requires Robot Kits that can be purchased on line. The building of the robot is a satisfying way to show students what is already our there. The robots they created are no related to the robots in the kids. However, teachers should use students' writing to determine groups and what type of robot model might interest a particular child.

- Purchase robot kits on line so that kids can have the experience of following directions and assembly. I did this with funds from the Ed Fund's Teach-A-Thon grant money. Each kit is about $12 plus screw drivers and batteries. I bought 10 kits which gave me a lot

of flexibility when it came to grouping for assembly. I thought my students would have a really difficult time following directions but because the final product was a robot they persevered and did it without much help from me. Lessons are to be learned from skipping steps and not working collaboratively.

- Implement Differentiated Instruction based on students' interest and capabilities by using robot kits that vary in assembly difficulty and interest. See the supplies list below to understand that robots kits can create art, move like crabs, reuse bottles and cans

- When robots are completed students can use the scientific method to test speed, distance and strength of their robots.

Supplies List

The best place I have found to order the Robot Kits is Amazon.com. Here is a look at the ones I used in my class:

1. 

3 of 4M Soda Can Robug $11.41 This kit is good for students who are very good at following directions and keeping track of small parts. A can is also needed to complete this robot. Could frustrate lower level learners. It spins around in a fun way when completed. Popular!

2. 

3 of 4M Table Top Robot $13.26 This kit has a lot of parts and requires some patience to put together, it is good for mid to high achievers. This is the robot that can be used for further predicting, measuring, and obstacle court activities. It moves like a crab until it touches an edge then turns. The kids love it.

3. 
3 of 4M Doodling Robot $12.68 This kit is good for medium level learners and artists because when it is done it draws. Students can create courses to try to get it to draw something, Left alone it make circles. The kids love this one.

4. 

[3 of 4M Trash Robot Kit] $9.49 This basic kit is good for low level learners. The parts snap together and the kids can decorate it. Students can create courses and track distance looking at how the amount of water affects the speed and distance. Great for inquiries using math.

Supplemental Materials

Lined Writing Paper

Colored Pencils

Construction Paper

Graphic Organizers

Student interest survey

Small screw drivers

Batteries may also be needed

Empty Shoe Boxes to store robot kits during assembly

THE EDUCATION FUND
CELEBRATING 30 YEARS

APPLY FOR AN IMPACT II ADAPTER GRANT!

M-DCPS teachers, media specialists, counselors or assistant principals may request funds to implement an IMPACT II idea, teaching strategy or project from the Idea EXPO workshops and/or curriculum ideas profiled annually in the ***Ideas with IMPACT*** catalogs from 1990 to the current year, 2016-17. Most catalogs can be viewed at The Education Fund website at www.educationfund.org.

- Open to all K-12 M-DCPS teachers, counselors, media specialists
- Quick and easy reporting requirements
- Grants range from $150 - $400
- Grant recipients recognized at an Awards Reception

To apply, you must contact the teacher who developed the idea before submitting your application. Contact can be made by attending a workshop given by the disseminator, communicating via email or telephone, by visiting the disseminator in their classroom, or by having the disseminator visit your classroom.

Project funds are to be spent within the current school year or an extension may be requested. An expense report with receipts is required by Friday, May 5, 2017.

APPLICATION DEADLINE:
Monday, December 12, 2016

Apply online at www.educationfund.org

For more information, contact:
Edwina Lau, Program Director
305.558.4544, ext. 113
elau@educationfund.org

FORD MOTOR COMPANY FUND

Driving a **Brighter Future**

For more than 65 years, Ford Motor Company Fund has worked to improve people's lives, investing $1.5 billion to support innovative programs in Community Life, Education, Safe Driving and the Ford Volunteer Corps.

For opening minds, creating opportunities, and helping to create a brighter future, Ford Salutes The Education Fund.

www.community.ford.com · @fordfund_ · @ford

THE EDUCATION FUND
CELEBRATING 30 YEARS

Contributors with IMPACT

Platinum Star

School District Education Foundation Matching Grant Program

Gold Star

TD Bank
America's Most Convenient Bank®

Ford Motor Company Fund

Humana Foundation

ASSURANT®

P L Dodge Foundation

FPL

FLORIDA 123 ABH SUPPORT EDUCATION

Silver Star

Learning A-Z

PEREZ TRADING COMPANY

Rod and Lucy Petrey

Raj Rawal and Anne Marie Miller

Robert Russell Memorial Foundation

Bronze Star

The Jack Chester Foundation

PNB

Miami Sportfishing Tournament/ Gary M. Pappas

NSU NOVA SOUTHEASTERN UNIVERSITY
Abraham S. Fischler College of Education