Hexbug Nano Insect lesson

This unit plan is cross curricular covering several lesson periods.

The story Bugs are Insects by Steve jenkins will be the focus of the unit.
http://youtu.be/pCqkIqJLOSQ

Grade/Level: 1 English, Math, Science
Subject(s): VA Standards of Learning: English Reading,1.9 Non-fiction- main idea, Math 1.9 Measurement, non-standard units; Science 1.1 investigation, 1.2 Force and Motion, 1.5 Life processes

Instructional Setting: Classroom whole group and collaborative groups of 4

Lesson Objective(s):
Students will compare and contrast living and nonliving insects.
Students will construct a trail for a robotic insect to travel.
Students will measure using non-standard units how far the robotic insect travels.
Students will create a video with sound of the insect traveling the constructed trail.
Students will identify living insects in a confined outdoor space.

MATERIALS AND RESOURCES

Instructional Materials:
The book **Bugs are Insects**

Teacher computer, IWB,
Mobile device with a camera or digital camera
Magnifying lens (1 per student)
5 Hula hoops (borrow from the gym)
Investigation worksheet
Hex bug Nano 1-8
Construction materials: toilet paper tubes, popsicle sticks, straws, paper, Lego bricks, carpet surface,
Maze Assessment rubric

Resources:
The book can be checked out from the library.
Hex bug Nano are available from this website or at RadioShack cost: between $4-5 each
http://www.hexbug.com/nano
Use the questions on this form to help guide the students
work.http://www.opalexplorenature.org/survey/index.php/129392/lang-en

INSTRUCTIONAL PLAN

Sequence of Instructional Procedures/Activities/Events (provide description and indicate approximate time for each):

1. Identification of Student Prerequisite Skills Needed for Lesson:
The classroom teacher will read the book instructing the students to try Discuss and report on the insect descriptions in the book. Identify parts of the story. Using questions compare and contrast the insects in the book. Show the hexbug, discuss living or nonliving, compare to living insects. Using the pictures, the students should be able to identify important parts of insects. http://www.aitc.sk.ca/saskschools/animals/insects.html
Whole group activity, Use plickers for formative assessment 10min

Students in groups of 4 will take the hula hoops outside with the magnifiers and a clipboard with paper to draw pictures of insects. Each group will randomly put their hula hoop down outside on the ground, the hula hoop will define the observation area.

Students will make observations of the insects in the hula hoop area paying attention to the main ideas discussed in the book. Draw any insects the see. Remind student not to touch or pick up the insects. Students should make some observation on the motion of the insect.

Take pictures of the insects with a mobile device. Discuss as a whole group the pictures and draw over the pictures the legs and body parts. 30min

2. Presentation of New Information or Modeling:
Use the hexbug, describe to the students the challenge- the hexbug must be directed to follow a maze within six floor tile squares. The Hexbug must travel under one object and over another.

Outline experiment and group work. Discuss expectations of groups: everyone does their job, everyone records the information on their sheet, follow directions.

4. Guided Practice: With students in groups of four (all are builders, one reporter, one designer, and one video recorder) allow for students to discuss and build the maze.
Use appropriate safety rules (keep everything away from the mouth and face), do not step on or loose the nano hex bug. Every team will get to try the maze with the bug one time and make adjustments to their maze.

5. Culminating or Closing Procedure/Activity/Event:
Each team will allow the hex bug to run their maze with one person taking video. After review

of the videos, the class will decide which team had the best results with their maze. Discuss with the class why the maze worked better than others.

Extend: Discuss what is characteristics of the Hex bug are similar to living insects and what are not. Create a diagram of characteristics with the whole class from the IWB

Pedagogical Strategy (or Strategies):
Direct instruction: story reading, guiding questions, demonstration of Hex-bug.
Collaborative work: insect maze, living insect observations
Independent work: drawing of insects

Differentiated Instruction:
Classroom teacher and Assistant will work directly with lower performing students during activities. Allow more advanced students to follow the form in the resources section.

Student Assessment/Rubrics:
Informal assessment: Answers to questions/ teacher observation
Formal assessment: Rubric for insect maze
*Add pictures and video to website