**ASHFORD PARK ELEMENTARY SCHOOL**

STEM Challenge Unit

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Grade Level:**  Kindergarten | **Challenge Title: Racecar Ramp** | | | **Duration:**  **90 Minutes** |
| **Primary Subject Area:**  **Science** | | **Primary Content Area:**  **Force and Motion** | | |
| **Standards Addressed in this Unit** | | | | |
| **Science** | SKP2. b Students will investigate the different types of motion. Push, pull, roll objects, and describe motion. | | | |
| **Mathematics** | MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight.  MGSEK.MD.2 Compare Two Objects | | | |
| **ELA** | ELAGSEKRL1: With prompting and support, ask and answer questions about key details in a text.  ELAGSEKW1: Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are “writing” about and state an opinion or preference about the topic or book (e.g., My favorite book is…) | | | |
| **Social Studies** | SSKCG1 Following rules to engineer ramps | | | |
| **Technology** | Brain Pop Jr.  Youtube | | | |
| **Materials**  Informational books about pushes and pulls, cardstock, unifix or linking cubes, scotch tape, toy racecars | | | **Resources**  Books  Videos | |
| **Primary Content Area STEM Activity** | | | | |
| **Content Area Knowledge to be delivered before activity begins:**  Prime students’ background knowledge about force and motion by reading aloud books. Show Google images of ramps in the real world.  Hold a class discussion, allowing students to share what they already know about pushes and pulls and what they might like to learn. Record their ideas on chart paper.  Introduce permitted materials and share the challenge. Allow students to share ideas for how the materials work and might fit together in different ways to make a ramp. Ask them how pushes and pulls might be useful. Model how to use unifix cubes as nonstandard units of measurement to measure how far their racecar travels.  Allow students at least 45 minutes with partners or small groups to create and test a variety of designs, as well as record in their STEM journals. Encourage them to improve their designs after each test to try to make their racecar go farther.  **Vocabulary Relevant for Unit:**  Force  Motion  Push  Pull  Friction  **Understandings Relevant for the Unit:**  Understand Force and Motion  **Prerequisites**  Students will understand what it means to push and pull, students will understand is motion  **Activity:**  The challenge is to create a race car ramp that will make a race car go the farthest distance.  Completed in the STEM Interactive Notebooks  Students will predict the pace of the cars motion, by determining the height of the ramp  **Overview:**  Students will create a simple ramp out of cardstock, unifix/linking cubes, and scotch tape. They may use one or both materials to create the height and “track,” experimenting with different heights and lengths. They will test their ramps with toy racecars, measuring the distance that the racecar travels with unifix/linking cubes.  **Real Word Connection:**  Discussion about roads, bridges, interstates  **Engineering Design Process:**  **Ask Steps**   * **Student will describe the problem in his or her own words.** * **Students will receive materials to analyze in relation to the problem presented.** * **Students will determine constraints.**   **Imagine Steps**   * **Students will brainstorm ideas and explore the materials.** * **Students may work individually before collaborating as a group to share original ideas.**   **Plan Steps**   * **Students will draw their plans and include information specific to the problem.** * **The group will collaborate to come up with one idea to be included in the individual STEM Interactive Notebooks.**   **Create Steps (according to the STEM problem)**   * **Task: You are in charge of building a birds nest to hold 3 eggs and the mommy/daddy bird. It must lay on the branch for 30 seconds without falling or eggs falling out.** * **Improve Step** * **Students will analyze the group design for strengths and weakness and begin the EDP to rework the design.** | | | | |
| **Secondary Content Area Activity** | | | | |
| **Aligned to the general curriculum standards** | | | | |
| **Additional Comments or Considerations** | | | | |