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**Findley Oaks STEM Connect**

**3rd Grade Design Brief**

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| **Month**  **March** | **Challenge**  Invisible  Forces | **Unit**  Magnets |

**Standard:**

Students should follow the **Engineering Design Process.**

**Background/Problem:** To change a spacecraft's speed and direction, NASA engineers use a planet's or moon's gravity, a process called a "gravity assist." In this video from *Design Squad Nation*, kids design and build systems that use magnets to control the speed and direction of a rolling ball. As they build their systems, the kids use the engineering design process, apply a variety of science concepts (e.g., force, magnetic fields, inverse square law), and learn how NASA spacecraft use gravity to help them explore the solar system.

[Click Here For Design Squad Activity](http://www-tc.pbskids.org/designsquad/pdf/parentseducators/DSN_NASA_MissionSolarSystem_InvisibleForce.pdf)

**Design Challenge:**

**Criteria:**

Constraints:

You must work with a partner (or in a group of 3) teacher discretion.

Make sure you have a design plan before you start

Materials: (per team or group) 2,3 (teacher discretion)

Paper cup (6- to 8-ounce)

• Strip of index card (2.5 x 12.5 centimeters) [1 X 5 inches])

• 30-centimeter (12-inch) length of flexible rope (e.g., clothesline)

• 1 steel ball (e.g., 60-millimeter [quarter inch] ball bearing)

• 1 strong magnet

• 1 target (e.g., “X” of tape on the table or an object to hit)

• Tape (any kind)

Tools:

Scissors

Crazy scissors

Staplers

Hole punch

Rulers

Paper/pencil for design planning

Options: Brainstorm ideas…. make sure the students have time to plan.

Use design brief below.