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**Findley Oaks STEM Challenge**

**4th Grade Design Brief**

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| **Challenge**  Blowing in the Wind | **Unit**  Weather |

**Standard:** Prioritized Standard: S4E4.b Obtain, evaluate, and communicate information using weather charts/maps and collect weather data to predict weather events and infer weather patterns. Interpret data from weather maps to identify fronts (warm, cold, and stationary), temperature, and precipitation to make an informed prediction about tomorrow’s weather. E

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

**Background/Problem:**

In the science unit on weather, you have been studying wind and how it affects weather changes across our country. You have or will be learning how wind creates fronts, high- and low-pressure systems, hurricanes and tornadoes. You will also be learning about the different types of instruments used to measure wind speed and direction, like anemometers, wind vanes, and windsocks.

**Fun Facts About Windsocks**

* Windsocks are designed to show wind direction and relative wind speed.
* ﻿A windsock is tube-shaped and looks like a giant sock.
* They are often used at airports, as they serve as an indicator of the direction of wind and its velocity. This helps pilots make smart decisions when taking off or landing an airplane.
* Windsocks are also used at chemical plants to in case toxins are released into the air.

We’re going to put our knowledge to use by creating a weather windsock.

**Design Challenge:**

Your challenge is to design a windsock that can detect wind direction and speed when placed in our weather station.

**Criteria:**

Your windsock should:

* be weatherproof
* move freely around a pole
* stand up to strong winds
* correctly identify wind direction when tested over five days
* maintain an attractive colorful appearance when placed outdoors for more than one week

**Constraints:**

* Make sure you have a design plan before you start.
* You may use **some or all of the materials listed.**

Brainstorm ideas…. make sure you have taken the time to plan.

Materials:

* Construction paper
* Fabric strips
* Trash bags
* Dry cleaner bags
* Tissue paper
* Crepe paper
* String
* Yarn
* Paper clips
* Pipe cleaners
* Wire bag ties
* Thread
* Glue
* Washers
* 12 inches’ tape

Tools:

* Scissors
* Staplers
* Hole punch
* Rulers
* Paper/pencil for design planning

How about a bit of ***Scientific Testing?***

* + - What’s the best way to attach the ribbons? Glue, Sticky Tape, Masking Tape, or Staples? Perhaps they’d prefer to make holes and tie the ribbon on?
    - Which method will last the longest and why?
    - Which method will be best in the rain?
    - Is there an optimum number of ribbons?
    - Where is it best to attach the ribbons?
    - Could the tails be made out of different materials? How about, paper or strips of plastic bag?

Post your finished creation on [Flipgrid here.](https://flipgrid.com/7c7508c4)