**STEM Club**

**New Springs Schools**

**1. Smart Greenhouse Project**

* Build a small greenhouse with sensors to monitor temperature, humidity, and soil moisture.
* Integrate coding with microcontrollers (Arduino/Raspberry Pi) for automated watering and climate control.

**2. Renewable Energy Challenge**

* Have students design and test their own wind turbines or solar-powered devices.
* They can compete to see who generates the most energy with their design.

**3. Eco-Friendly Water Filter**

* Students design and build a simple water filtration system using natural materials.
* Test different materials to see which cleans water most effectively.

**4. DIY Hydraulic Arm**

* Create a robotic arm using syringes and tubing to demonstrate hydraulic systems.
* Relate it to real-world engineering applications like construction and robotics.

**5. Balloon-Powered Car Race**

* Design and build small cars powered by balloons.
* Experiment with different materials and structures to optimize speed and distance.

**6. Egg Drop Challenge – Engineering Edition**

* Students design protective containers for eggs and test them by dropping them from different heights.
* Use principles of physics and engineering to absorb impact.

**7. Coding a Simple Video Game**

* Use Scratch, Python, or another beginner-friendly programming language to create a game.
* Encourage students to add elements related to STEM topics like space exploration or environmental conservation.

**8. Biodegradable Plastics Experiment**

* Make plastic-like materials using cornstarch and other biodegradable ingredients.
* Test their strength and decomposition over time.

**9. DIY Hovercraft**

* Build a simple hovercraft using balloons, CDs, and small motors.
* Teach students about air pressure and friction.

**10. Bridge-Building Competition**

* Students design and build bridges using popsicle sticks, straws, or other materials.
* Test for strength and efficiency under different weights.

**Engineering & Physics Projects**

1. **Marble Roller Coaster**
	* Build a track using foam tubing or cardboard and test how gravity and momentum affect speed.
2. **Pasta Tower Challenge**
	* Use spaghetti and marshmallows (or hot glue) to build the tallest, strongest tower.
3. **Propeller-Powered Boat**
	* Construct small boats with rubber band-powered propellers and test them in water.
4. **Cardboard Hydraulic Lift**
	* Create a mini scissor lift using syringes and water to explore hydraulics.
5. **Spinning Paper Helicopters**
	* Cut paper into helicopter shapes and drop them to test how wing shapes affect descent.

**Chemistry & Material Science Projects**

1. **Oobleck and Non-Newtonian Fluids**
	* Explore the strange properties of cornstarch and water mixtures.
2. **DIY Bouncy Ball**
	* Make rubber-like balls from glue, cornstarch, and borax.
3. **Exploding Soap (Microwave Ivory Soap Experiment)**
	* Heat Ivory soap in a microwave to see how gases expand.
4. **Chromatography Art**
	* Separate colors in markers using coffee filters and water.
5. **Glow-in-the-Dark Chemistry**
	* Create glowing liquids using tonic water and UV lights.

**Biology & Environmental Science Projects**

1. **Mini Ecosystem in a Bottle**
	* Build a closed terrarium or aquatic ecosystem to observe cycles of life.
2. **Solar-Powered Desalination**
	* Purify saltwater using a simple solar still.
3. **Leaf Chromatography**
	* Extract pigments from leaves to explore plant photosynthesis.
4. **DIY Biodegradable Seed Paper**
	* Create paper embedded with seeds that can be planted in the ground.
5. **Testing Acid Rain Effects**
	* Simulate acid rain with vinegar and test its effects on plants or materials.

**Technology & Coding Projects**

1. **Simple Flashlight Circuit**
	* Build a working flashlight using LED lights, batteries, and conductive materials.
2. **Paper Circuit Art**
	* Use copper tape and LEDs to create light-up greeting cards.
3. **Build a Simple Robot (Brushbot)**
	* Attach a vibrating motor to a toothbrush head to create a tiny robot.
4. **Stop-Motion Animation with Science Concepts**
	* Use a tablet to create short stop-motion films demonstrating physics concepts.
5. **Virtual Reality with Google Cardboard**
	* Have students create their own virtual worlds using Google Cardboard.