EXPERIMENT QUICKIES!

Newton's First Law of Motion

EGGS-PERIMENT

Our Equipment/Supplies: Egg(s), aluminum pie plate, cardboard tube (such as toilet paper roll), drinking glass or other cylindrical container.
Our Question: What will happen to the egg when the plate is knocked out from under it?
Setup: Place Drinking Glass on level surface. Place Pie Plate on top of glass. Place toilet paper tube in center of pie plate. Place egg on top of paper tube.
Prediction: (Answer the "Question," above before continuing experiment)
Execution: Swiftly pull pie plate out from it's place on the glass.
Result: (What happened and why?)

Now, Repeat the same experiment with different methods...

Equipment/Supplies: Drinking Glass, Playing Card, Coin
Our Question: What will happen to the coin when the playing card is swiftly removed from under it?
Setup: Place drinking glass on flat surface. Place playing card over drinking glass. Place coin on playing card.
Prediction: What will happen?
Execution: Swiftly pull the playing card from between the coin and the glass.
Result: (What happened and why?)

Equipment/Supplies: Toilet paper roll cut into a half-inch segment, drinking glass, coin, pencil
Our Question: What happens to the coin when the hoop (toilet roll segment) is removed from under it?
Setup: Place drinking glass on flat surface. Place paper tube segment on glass. Place coin on paper tube segment.
Prediction: What will happen?
Execution: Use the pencil to quickly roll the tube from between the glass and coin.
Results: (what happened and why?)

If you're brave and convinced of your skills... you can set something on top of a paper towel and quickly yank the paper towel out from under it. Or, go full magician mode and put a full place setting under a thin cloth, like a handkerchief or tablecloth, and swiftly yank the cloth out and hope you do it quick enough to leave the dishes standing where they were!

Why don't the dishes remain upstanding when the handkerchief is yanked slowly?

Now, we've tackled objects at rest... how about objects in motion!

Equipment/Supplies: Vehicle. Use something to which you can add weights. I used pinewood derby cars and taped batteries to them as weights.
Our question: What happens when we add weight to a moving vehicle?
Setup: Make a ramp. Place a flat surface, such as a board, with one side lifted up on some books to form a ramp. Place a masking tape line where you want your finish line to be (this is to record time). Ready your vehicle. Roll the vehicle once and record time with a stop watch from release to finish line. Measure length of travel from start line to where the vehicle stopped.
Prediction: What will happen when we add weight to vehicle?
Execution: Add a weight to the vehicle and repeat Time Record & Length of Travel Measurement. Record Results. Add another weight and repeat, until you have added all your weights, one by one.
Results: What happened when you added weights?

Now, place an object before the finish line. It can be a brick, or a book, anything to obstruct your vehicle. Use a vehicle that can hold a stuffed animal or other small object as a test dummy. Release the vehicle and allow it to “crash” into the obstruction. What happens to the “test dummy,” during the crash incident? (You should ensure your vehicle and crash test dummy will collide with the object and let the test dummy fly from the vehicle. Why does the test dummy fly from the moving vehicle? How does this knowledge help us in our vehicles?

You could use a skateboard and allow it to “crash” into an object while a stuffed animal is riding on it. Second, tape the animal to the vehicle to represent the seat belt. What happens, now?

Try different Law of Inertia & Law of Motion Experiments using water, marbles, ramps, obstructions, etc.