Scenario
You shipwreck on a coral reef next to an uninhabited island. Being the brilliant leader of the surviving group, you assert that a good way to flag down a passing ship is to run a large, brief current through some conducting filamentary wire to create a momentary but bright flash of light. So you set out to construct some capacitors with the materials that washed ashore with you.

Challenge
1. Construct three capacitors with paper dielectrics. Measure their capacitances and infer the paper’s dielectric constant in each case. Compare the estimated paper’s dielectric constant to accepted value(s).
2. Place the capacitors in series and quantify how well the measured equivalent capacitance matches the expected value based on the results from Part 1.

Available materials:
aluminum foil
paper
scissors
ruler
wooden dowel
multimeter & probes
tape
caliper

Technical details
Beware measured capacitances of 1nF, as this is the lower limit of the multimeters’ abilities. Multiple trials should be pursued.

Lab report considerations
Use the dataset to report both an average error on the estimated dielectric constant and its uncertainty. A photo of the lab setup must be included.

Teacher signatures
Please get your TA to sign off on your experimental plan, the pre-lab equipment practice, and the completion of the lab. These signatures will be worth 4% of the lab grade and will help to promote a successful experience.

https://www.youtube.com/watch?v=WC2sZ5iJ7gQ

A duck goes into Radio shack to buy a capacitor.
“Charge it?” asks the clerk?
“Nah, put it on my bill.” says the duck.