

Feb 5, 2026.

Located the Informed Consent form 2C, which is required to be signed by all participants.

Experimental requirements video:

- Know the variables, controller, manipulated, and responding.
- Need a materials list
- Procedure - Conduct experiment 3 times, keep detailed list of procedure
- Results - Detailed charts or graphs
- Conclusion - Proven by data, refer back to hypothesis
- Applications and Extensions - Why people should be interested in this project, how results can be used, and how it can benefit people.
- How you would perform experiment in the future.

Feb 16, 2026

Materials list:

- Heart rate sensor: [Link](#)
- GSR sensor: Homemade
- Arduino: Preowned

I have researched how many people should be used in a lie detector test, and a size of around 10-15 will be appropriate. With a higher sample size, the results can be more towards a certain group of people, so variety of age, gender, and other characteristics, such as higher/lower natural heart rate, or increased/decreased sweat production.

Other people have done a similar project, performing it by having participants be asked 5 questions truthfully, to be a low or truth band, and then 5 questions which are told false, and this is the high band or lie band, and then 10 questions that are randomly asked, and whichever band they are in is the result. My idea of how my experiment will be performed is that they will be asked 20 questions, and the person will choose whichever ones they would like to lie on, and then from a observation in the polygraph the lies can be found. A baseline is needed, and will be done by simply having the person have small talk, with simple questions such as which school, or previous schooling, topics such as how old they are, or when their birthday is.

Credits: [A project performed at a California science fair.](#)
CYSF judging recommendations.

Feb 17, 2026

The most popular method of lie detection is a polygraph, which comprises of multiple sensors that are recorded on a chart throughout the test. These sensors can include a heart rate sensor, a breathing meter and a skin conductance sensor. Of these, I have chosen a heart rate sensor and a skin conductance measurement. Heart rate sensors measure the number of beats per minute, or BPM. A skin conductance sensor uses electrodes to measure the conductance of the skin, which is changed by the amount of sweat produced, even if not visible.

Today, I also tested a homemade GSR sensor. I tested the system by playing high frequency noise in my ears, and this caused the nervous system to reach and make the number decrease. After it stopped, it returned. After, I wanted to try stabilizing my stress, before I then played high frequency. I played chill music, and this brought the number up, with some moving

due to the fact that the galvanic response is better with averages, then direct values. Then, I switched to the high frequency noise. It caused a large dip in the chart, and then it went back to a medium, and when it was stopped, it went up to normal again.

I performed a experiment with lies, by doing two truths and a lie. My participant gave me 3 statements, and on the first one, it dropped very quickly, indicating stress, the second one was stable, and third was stable. I guessed the first one was a lie, and I was correct! This proved my GSR sensor is working.

Hypothesis: My hypothesis is that when the people lie, this will cause a natural stress response, causing the reading to go down.

The participants will either choose to lie or tell the truth on the questions. They are told that they do not want me to find out which ones are lies and which are true. Similar to two truths and a lie, they try to deceive me into thinking a certain question is the lie.

My questions I will ask people are:

Baseline:

What is your name?

What school do you/did you go to?

What is your favourite colour?

I am going to assemble the device onto a prototype board.

Feb 27, 2026

Today, I have brought my lie detector to school to allow teachers to participate. I was able to get 9 people to participate, which is lots of data. One participant said a statement that they found embarrassing, and it showed up as stress, even though it was not a lie.