



### **Transcript: How To Do a Science Fair Project: Step 3**

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Ota Lutz: Now it's time to design your procedure. Remember, you're only changing one variable and you need to conduct your experiment multiple times for each trial. Each trial needs to be repeated in exactly the same manner.

Arby Argueta: Let's look at the airplane for procedures. Instead of an airplane, let's look at a balsa glider. You try to keep everything constant except for one variable. In this case, let's look at the angle of launch.

Launch it at different angles and measure the distance it covers. You have the same glider for every experiment. You try to keep the launch force constant throughout the experiments. And for each angle you throw it multiple times so you get several data points at each angle. Once you do that, you repeat the steps for a different angle and so forth until you have enough data that you can assess which angle gives you the longest distance traveled. By doing this, you've maintained everything constant throughout your experiment and the only thing you're looking at is the angle of launch.

Ota: Very good. It sounds like that sort of data would fit nicely in a table and would also be graphable later.

Arby: Yes.

Ota: Obviously there are a lot of other variables you could test on that airplane, but you're not going to, you're just going to test one thing at a time.

Arby: Correct. Just keep focused and you'll get enough data and you'll be able to make your conclusion on one variable.

Ota: If I didn't want to do the launch angle, what else might I change instead?

Arby: Another experiment you can do is keep the angle constant and then change the wing design of your glider. The variable under test is the shape of the wings. So you would do the same procedure for one wing design you would launch it several times, take your distance measurement, then you would change your wing design, return to that same angle and do several launches. You'd do this for as many wing designs as you have, then you'd compare your distances and find out which one's the best wing design for distance.

Ota: Alright, very good. So, 'Which is the best wing design for distance or which is the best launch angle for distance?' both measurable things, we could collect the data in a table, graph it, and make a very nice science fair project.

Arby: Correct.

Ota: Alright. Serina, do you have another idea from the drawing that you could investigate?

Serina Diniega: Looking at the picture, one science question you could attempt to answer is,



'What type of window covering best keeps a room cool?' So you could look at curtains, you could look at blinds, maybe aluminum foil or even a tree in the yard that's shading that window. So you would look at those different types of window coverings and measure the temperature within the room at different times during the day, and look at the difference between that temperature and the temperature that's outside.

Ota: Okay, so you would be comparing the different coverings. You would investigate the data in the morning and perhaps after school when you got home and then just before sundown?

Serina: Yes. Make sure you have data from different times of the day. Make sure that everything else is kept the same and the only thing you're changing is the window covering.

Ota: And as many days as you possibly can.

Serina: One day maybe the thermometer isn't working and you want to make sure that you notice that difference and that you can take that set of data out when you look at the overall trend.

Ota: And possibly cloud day versus sunny day if that might affect your data. So make note of all those things as you're collecting your data so that you can note in your log, well this day the data was off because this or this occurred.

Serina: This is going to help when you have to explain your data.

Ota: Okay, so we have several ideas here, pretty simple materials, things you could come up with on your own for not a very expensive amount. And you can conduct a really good science experiment.

Remember to measure your data carefully. Make sure that you record the units that you use. In most cases, this will be the metric system, but in some cases it may not be. Check with your teacher for clarification on that. And also make sure that your log book is neat and organized so that you're ready for your next step in the process.