Transcript: How To Do a Science Fair Project: Step 2

Ota Lutz: Now it's time to develop your idea into a testable question. Serina, you had several really good ideas from our image. Can you pick one of those and lead us through how you might develop that into a testable question?

Serina Diniega: Looking at the picture, I'd seen the plant growing out of the storm drain, and that might lead to questions of how do plants grow and under what conditions do they grow best? And so you want to pick just one idea, one thing to test, so I might restrict my question to: How much dirt does a plant need to grow? Or you could decide instead to test different fertilizers. But you want to pick one, bite-size science question and use that to set up your science investigation.

Ota: OK, so you might be able to vary the amount of dirt - we would want to keep track of the amount of dirt - or the different types of fertilizers. How many types of fertilizers might you try?

Serina: Generally, you want to experiment with probably at least three different options for each one. It will of course depend on your science question, but if you just have one data point, of course, that doesn't really tell you anything. You need two to compare and then three to really start seeing a trend and then obviously more if possible is usually better.

Ota: OK, so you'll want to be sure to measure your results somehow. Measuring the results on a plant might involve?

Serina: It just depends on what you're measuring. If you're looking for the health of the plant, you could look at planet height. If it's a blooming plant, how many flowers perhaps come out. You could look at its root system perhaps. It just depends on what you're measuring.

Ota: OK, so the question would be something along the lines of, 'How does this affect this?' And your 'this' and 'this' would have to be specified very clearly so that you would be measuring either how does fertilizer affect planet growth/height? Or how does fertilizer affect number of flowers? So you would need to make sure that you specify your input variable and your output expectation. OK, so Arby, tell me about one of the things you saw in this image that you could ask a question about and what your development of that question would entail.

Arby Argueta: Well like I said, being an engineer, the first thing I think of is how to make things better. So I saw the car. And for you kids, I don't recommend borrowing your parents' car for this. My idea is get a mouse trap and you can actually build a mouse trap car from this. There's two kinds of cars. You can have one for distance and you can have one for speed. So pick first whether you want to build a hot rod or a Prius. How do make a car go long distance with the same equipment: four wheels, a mouse trap and some sort of pulley and lever system to transfer the energy from the mouse trap to the wheels. You can change the wheel size, you can change the wheel diameter. You can change the kind of traction, the width of the wheels. You can change the length of the mousetrap arm. And playing with those variables, you can arrive at a long-distance car or a hot rod.

Ota: There are instructions all over the internet on how to build a basic mouse trap car so you

can find that and then introduce your variable. Remember, you want to ask your question: How does this affect this? And so, perhaps as Arby suggested, you would want to vary the wheel diameter and say, 'How does wheel diameter affect distance traveled?' Or, 'How does wheel diameter affect speed?' Or, even with the traction change, 'How does traction affect distance?' Remember, both of your variables need to be measurable, so you need to be able to quantify your traction or your diameter and then measure your distance or your speed.

Be sure to use a regular mouse trap and be careful not to catch your fingers.

Join us next to see how we might conduct an experiment and develop our data collection mechanisms.