

OUSDK-12 ScienceFair

Choosing the Science Fair Question Elementary Science in OUSD

Choosing the right science fair question is, without a doubt, one of the most challenging aspects of participating in science fairs. To make this process more manageable and student-centered, we offer the following considerations and recommendations:

What will the scope of your project be?

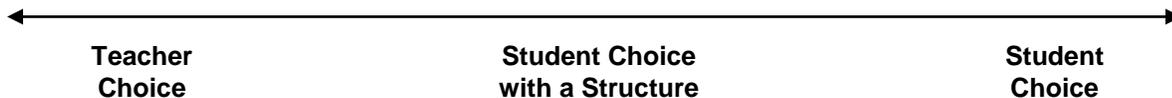
Grades	OUSD Recommended Project Scope
K & 1 st	Whole Class
3 rd - 5 th	Small group or Partners*
Discouraged**	Individual

*It is critical to consider your comfort and ability level in managing multiple simultaneous projects **for quality**.

** Science is a collaborative endeavor.

Who will choose the question?

In deciding who will choose the question, teachers must consider their own science background, their skill in managing small group work, their comfort level with 'not knowing the answers,' the materials they have access to and the time available.



- **Teacher Choice:** OUSD discourages teachers from choosing questions without student input. Less experienced teachers, however, may select several investigable questions and put them up for a *class vote*, even if time is limited.
- **Student Choice:** Though one of our goals is to foster independent student thinking in science, allowing younger or less-experienced students to choose a question without appropriate supports may not ultimately serve them. Students need significant experience in investigative science as well as specific supports in working with questions before they can successfully choose their own investigable question.

Many teachers in OUSD successfully honor student choice by engaging them in a semi-structured question-identifying process that, at the same time, also helps teachers manage the knowledge and materials needs of potential investigations.

Student Choices within a Structure: A Step-by-Step Guide

1. Engage students in exploring hands-on materials (via stations)
2. As students explore, they generate questions on separate sticky notes
3. Either the teacher (or older students in concert with the teacher) sort questions into investigable or non-investigable piles
4. Teacher "turns" non-investigable questions into investigable ones, using the "Variables Scan"
5. Teacher write each investigable question on sentence strip and posts strips around classroom
6. Students do a Gallery Walk to view question options and identify their preferred questions
7. Teacher crafts student groups based on question preference

Sorting Questions: *Investigable & Non-investigable*

Investigable Questions	Non-investigable Questions
<ul style="list-style-type: none">• Access to appropriate tools• Enough time• Discrete enough to be answered in single investigation• Safe• “Measuring questions”• “Comparison questions”• “What happens if...”	<ul style="list-style-type: none">• Unanswerable• Not “scientific in nature”• Too big (often “Why” or “How” questions)• Answer already available - “Ask an Expert” question• Not enough time - “Million Year” question• Not enough money - “Million Dollar” question• Too dangerous

“Turning Questions” (aka The Variables Scan) How to Turn *Non-investigable* Questions into *Investigable* Ones

The Situation

Second grade students are exploring how paper towels absorb water. They noticed that paper towels seem to “suck up” water. Someone asks, “Why does the water go into the paper towel?”

Un-investigable Question:

“Why does the water go into the paper towel?” is not yet an investigable question.

The Scan

To make this question investigable, we can use the Variables Scan to “turn” the question. When you scan the question, what variables can you find? The explanation must have something to do with how the water and the paper towel interact, so those are the variables we can change to help us learn more about the phenomenon.

The variables we can identify are:

1. Paper Towel
2. Water

Variable 1: *Paper Towel*

What could be changed about the paper towel?

- The thickness/ply
- The color (kind of material, bleach/no-bleach)
- The brand

Possible Turned question: How does the **thickness** of the paper towel affect its absorbency?

Variable 2: *Water*

What could be changed about the water?

- Chemistry (Freshwater v Salt)
- Temperature
- Volume

Possible Turned question: How does the **temperature** of the water affect its absorbency?