High School Chemistry

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OAKLAND UNIFIED SCHOOL DISTRICT

Community Schools, Thriving Students

Our Vision

All OUSD students will find joy in their academic experience while graduating with the skills to ensure they are caring, competent, fully-informed, critical thinkers who are prepared for college, career, and community success.

Our Mission

Oakland Unified School District (OUSD) will build a Full Service Community District focused on high academic achievement while serving the whole child, eliminating inequity, and providing each child with excellent teachers, every day.

Ask of the Board

- Natural Approach to Chemistry *(LabAids)*.

Outline

- Background
- Selection Process
- Fiscal Impact
- Strengths & Supports

State of Curriculum (2024-25)

	Elementary	Middle School	High School
English Language Arts	*EL Education* *Foundational Skills: SIPPS* (*Benchmark* for Dual Language)	*EL Education 2.0*	**ELA: FishTank**
Mathematics	Eureka2	Illustrative Mathematics	Illustrative Mathematics
Science	FOSS Next Generation	FOSS Next Generation	Biology Chemistry and Physics Pilot 24-25
History / Social Studies	3rd Gr. Oakland History 4-5 Gr. OUSD on Newsela	Pearson MyWorld Interactive	US/World/Econ/Gov

High Quality Materials

Pilot/Selection in Process

Lack of High Quality Materials

Background:

The adoption is an opportunity to:

- **Update and modernize** the learning and teaching experience for students & teachers. The current Physics curriculum was adopted in 2007.
- Provide all teachers with opportunity to **connect** and **collaborate** around common lessons and pedagogy.
- Offer teachers materials that align with **Next Generation Science Standards** and stakeholder feedback
- Offer multiple opportunities for **hands-on activities and investigations** to support development of **Science and Engineering Practices**
- Support science **literacy** and **discourse** skills
- Offer new teachers a **strong set of materials** to start their careers in OUSD.

Selection Process

- **2019 and 2022 groundwork:** Science teachers surveyed around curriculum and instructional; participation in field testing of unpublished curriculum

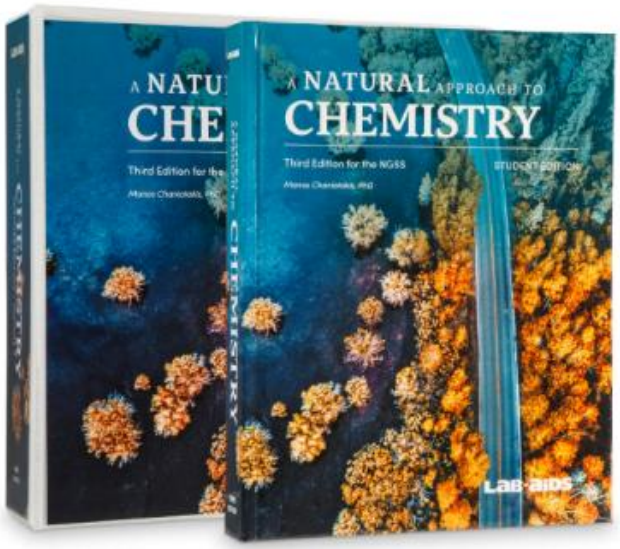
- **24 - 25 SY Steering Committee:** Coordinator and teacher leads Identified Natural Approach to Chemistry and OpenSci Ed: Chemistry as pilot options

- **Adoption Committee:** Gen Ed Teachers, Teachers supporting EL and Newcomers, and content experts

- **Additional stakeholder input:** SpED, students, Science Leads, Coordinators, Curriculum Field-testers

- **Deliberation:** The final deliberation brought together piloting teachers and other community members connected to Science education to weigh all feedback collected, and come to majority vote on recommendation.

Natural Approach to Chemistry (LabAids)



“*A Natural Approach to Chemistry* is a student-centered approach that emphasizes how chemistry applies to everyday life and simplifies complex ideas into relevant, manageable steps. With over 65 labs and investigations, *A Natural Approach to Chemistry* is designed to be exciting and meaningful for all students.”

-LabAids

Supporting Data - High School Physics

- **100% of pilot teachers, and 90% of teacher surveyed, recommend adoption of Natural Approach to Chemistry**

- **Students said:**
  - We do projects [and labs] most of the time. It's better than just doing bookwork.
  - We have to show our design before we're allowed to do the lab. We have to figure out the procedure…
  - We work on projects for a few days and we do a lot of labs (like every week). We have an even amount of worksheets and labs because they don't take a lot of time. I prefer doing the labs because I could actually see what's happening.

I have been in science classes where we mostly do bookwork and worksheets. I prefer labs because it's way more interesting, like when you're actually doing something rather than just copying or writing stuff down in your notebook.

Student, Skyline HS

- **Teachers said:**
  - This curriculum has different strengths--the content feels more organized, and there seems to be more opportunities to understand and apply science concepts.
  - The language is clear and concrete, not technical and complicated. For students who may be intimidated by math, this textbook is a good choice. The textbook layout with the left margin of key terms, the solved problems, the vocabulary in colored boxes at the bottom of the page are valuable in helping the student identify what is most important. There is a nice selection of section questions at the end of each chapter. The questions are relevant, great and reveal whether or not students understand what was presented in the corresponding section. The careful student will find the questions doable, because the textbook explains everything very well.

Natural Approach to Chemistry Strengths

- **Hands-on materials organized into kits for each lab and activity**

- **Units organized around:**
  - investigable phenomena
  - labs
  - focal questions

- **Clear and useable teacher resources to support:**
  - investigations
  - diverse learners
  - assessments

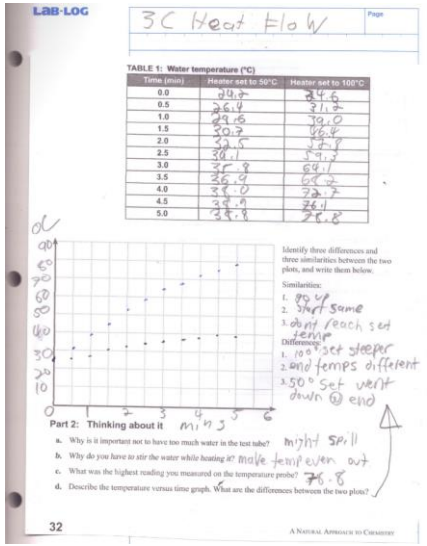
Student and Teacher Experiences

- Manual and guidelines to support hands-on activities

- *LabHub* equipment package to promote safety and support data collection/ analysis

Student and Teacher Experiences

- Frequent opportunities to analyze and interpret data and evaluate models
- Teacher and student editions organized with prompts to guide reading, analysis, and discussion


LAB-LOG

3C Heat Flow

TABLE 1: Water temperature (°C)

Time (min)	Heater set to 50°C	Heater set to 100°C
0.0	24.2	24.6
0.5	26.4	31.2
1.0	29.6	39.0
1.5	30.7	46.4
2.0	32.5	54.4
2.5	34.1	59.1
3.0	35.8	64.1
3.5	36.9	68.7
4.0	38.0	72.7
4.5	38.9	76.1
5.0	39.8	78.8

Identify three differences and three similarities between the two plots, and write them below.

Similarities:
1. they same
2. start same
3. don't reach set temp

Differences:
1. 100° set steeper
2. end temps different
3. 50° set vert down to end

Part 2: Thinking about it

a. Why is it important not to have too much water in the test tube? might spill
b. Why do you have to stir the water while heating it? make temp even out
c. What was the highest reading you measured on the temperature probe? 78.8
d. Describe the temperature versus time graph. What are the differences between the two plots?

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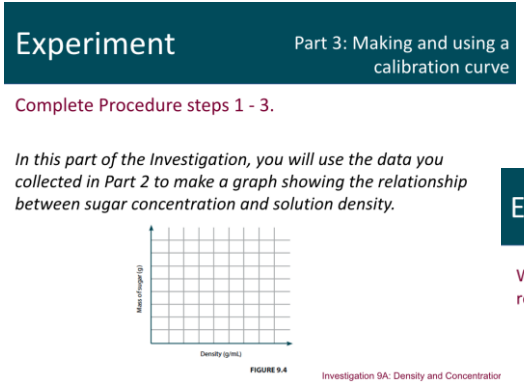
A Natural Approach to Chemistry

Investigation 19A: The Water Cycle


Experiment — Part 3: Making and using a calibration curve

Complete Procedure steps 1 - 3.

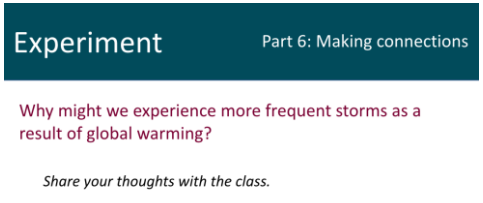
In this part of the Investigation, you will use the data you collected in Part 2 to make a graph showing the relationship between sugar concentration and solution density.

Mass of sugar (g)

Density (g/mL)

FIGURE 9.4

Investigation 9A: Density and Concentration

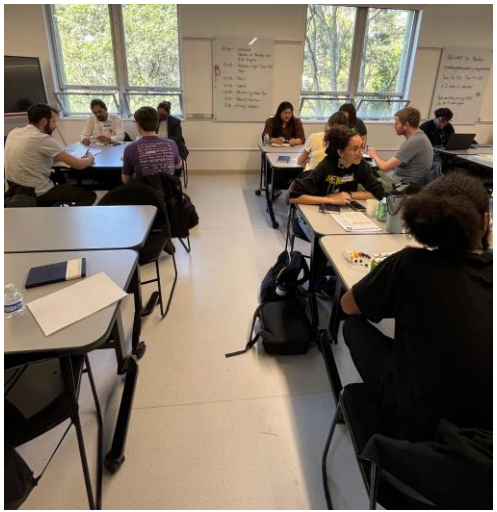

Experiment — Part 6: Making connections

Why might we experience more frequent storms as a result of global warming?

Share your thoughts with the class.

“The Lab Aids system is attractive because of the many digital, electronic and lab resources. The variety and number of resources allow the teacher to have many options and enable the teacher to present an interesting, engaging, clear series of lessons from day to day…the questions are relevant, great and reveal whether or not students understand what was presented in the corresponding section. The careful student will find the questions doable, because the textbook explains everything very well.” (Oakland Tech Teacher)

Next Steps to Support Teachers



- Ensure ongoing PD to unpack curriculum resources
- Identify additional phenomena, local examples, and connections to our student populations to address teacher concerns raised during pilot and deliberation process
- Provide technical support around the use of the online portal

Ask of the Board

- Approve adoption and purchase of Natural Approach to Chemistry (*LabAids*)

Thank you

For more information, please reach out:

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Additional Slides

Not part of presentation

For additional information and/or in response to Board member questions

Community Schools, Thriving Students

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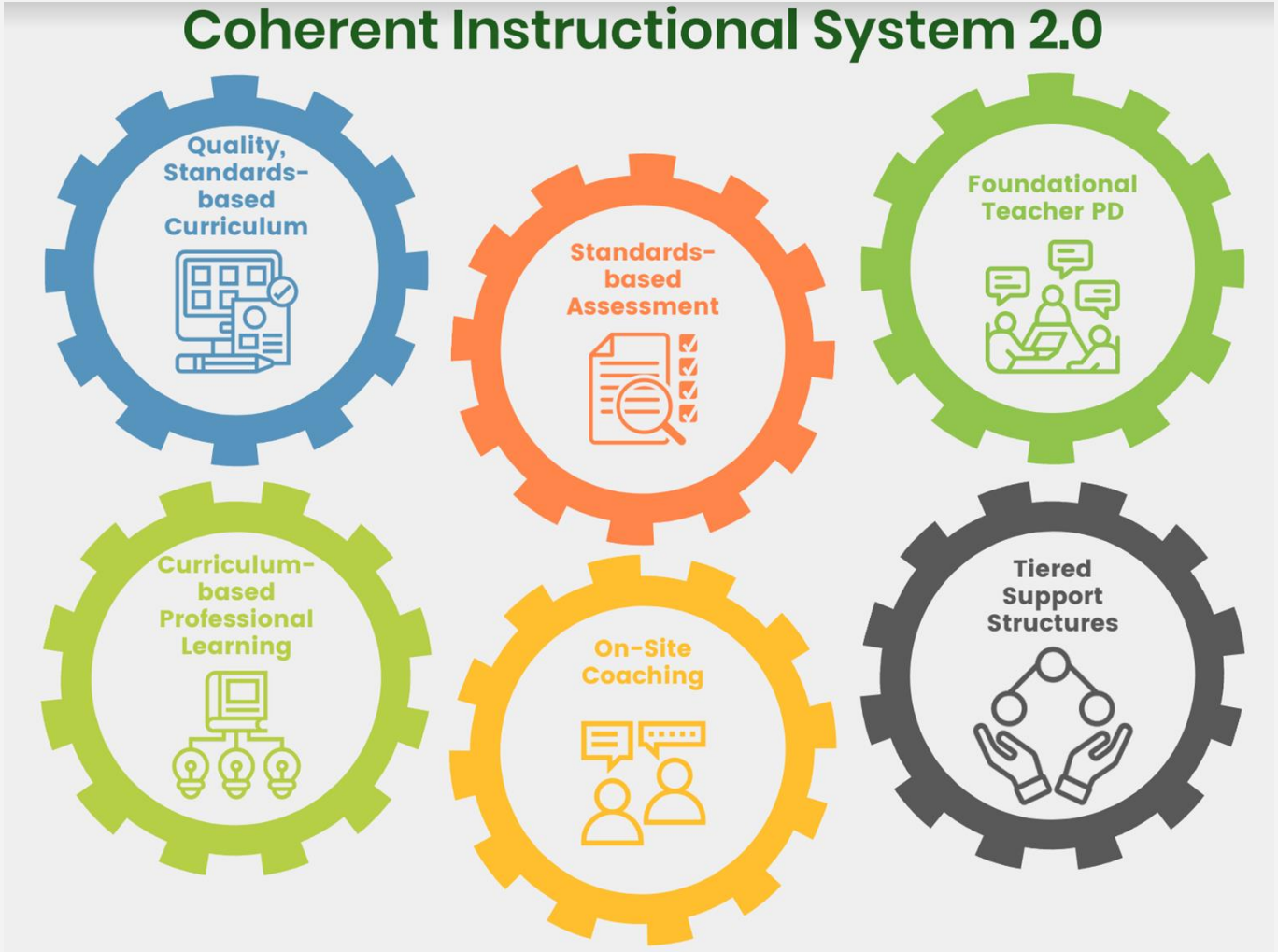
Coherent Instructional System 2.0



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High School Physics Fiscal Impact:

Years 1-3, 2025-2028 Instructional Materials

Year	Summary of Materials to be Purchased	Costs
2025-26	Student Editions Teacher Editions Digital Resources Materials kits and equipment packages	**$743, 263.13**
2026-27	Kit and consumables refurbishment	**$78, 233.76**
2027-28	Kit and consumables refurbishment	**$78, 233.76**
	TOTAL =	**$899, 730.65**

High School Physics Fiscal Impact:

Years 1-3, 2025-2028 - Professional Learning

Year	Summary of Professional Learning Offerings	Costs
2025-26	Vendor provided professional Learning Standards & Equity Institute Foundational Curriculum Training Monthly 2nd Wednesday Series September & January PD Days	**$24,800** **(includes $8000 cost for vendor provided training)**
2026-27	Vendor provided professional Learning Standards & Equity Institute Foundational Curriculum Training Monthly 2nd Wednesday Series September & January PD Days	**$16,400** **(includes $8000 cost for vendor provided training)**
2027-28	Vendor provided professional Learning Standards & Equity Institute Foundational Curriculum Training Monthly 2nd Wednesday Series September & January PD Days	**$12,200** **(includes $8000 cost for vendor provided training)**
	Cost for direct vendor provided training	**$24,000**
	OUSD costs for teacher stipends	**$29,400**
	TOTAL =	**$53,400**

Science Course Enrollment
(start of AY 24/25)

Class	Sections	Enrollment
Biology:	157	2646
Chemistry:	95	2072
Physics:	72	1389
Total:	**324**	**6107**

includes Gen Ed and SpED self contained classrooms

Science courses grades (MP 4, AY 24/25)