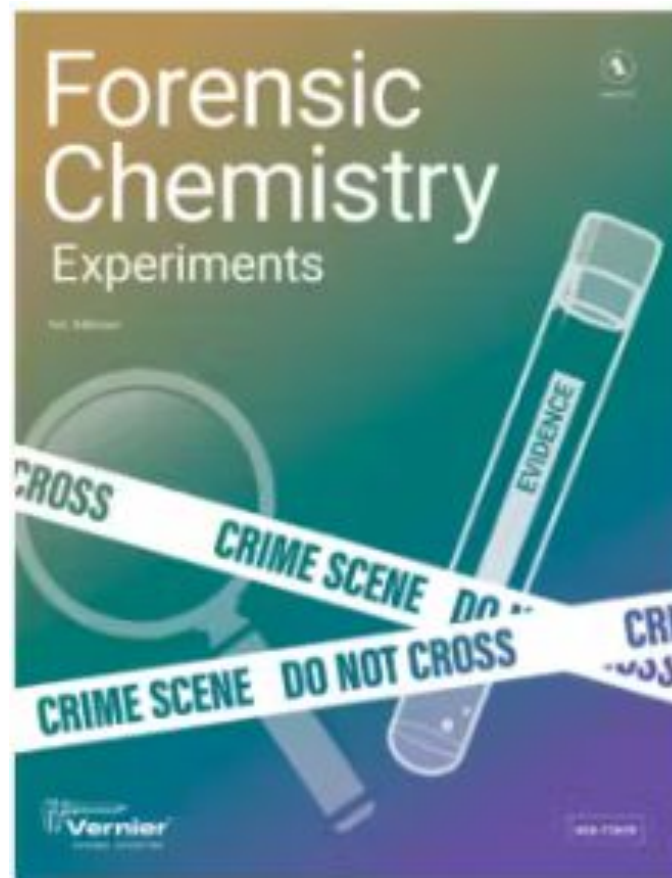
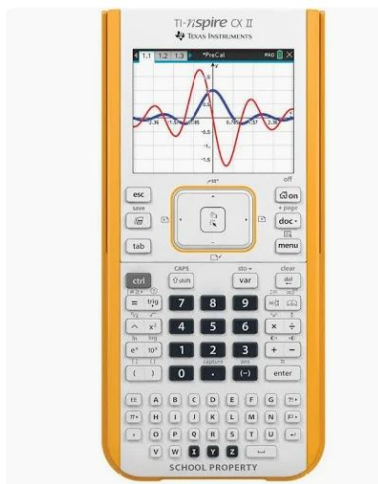
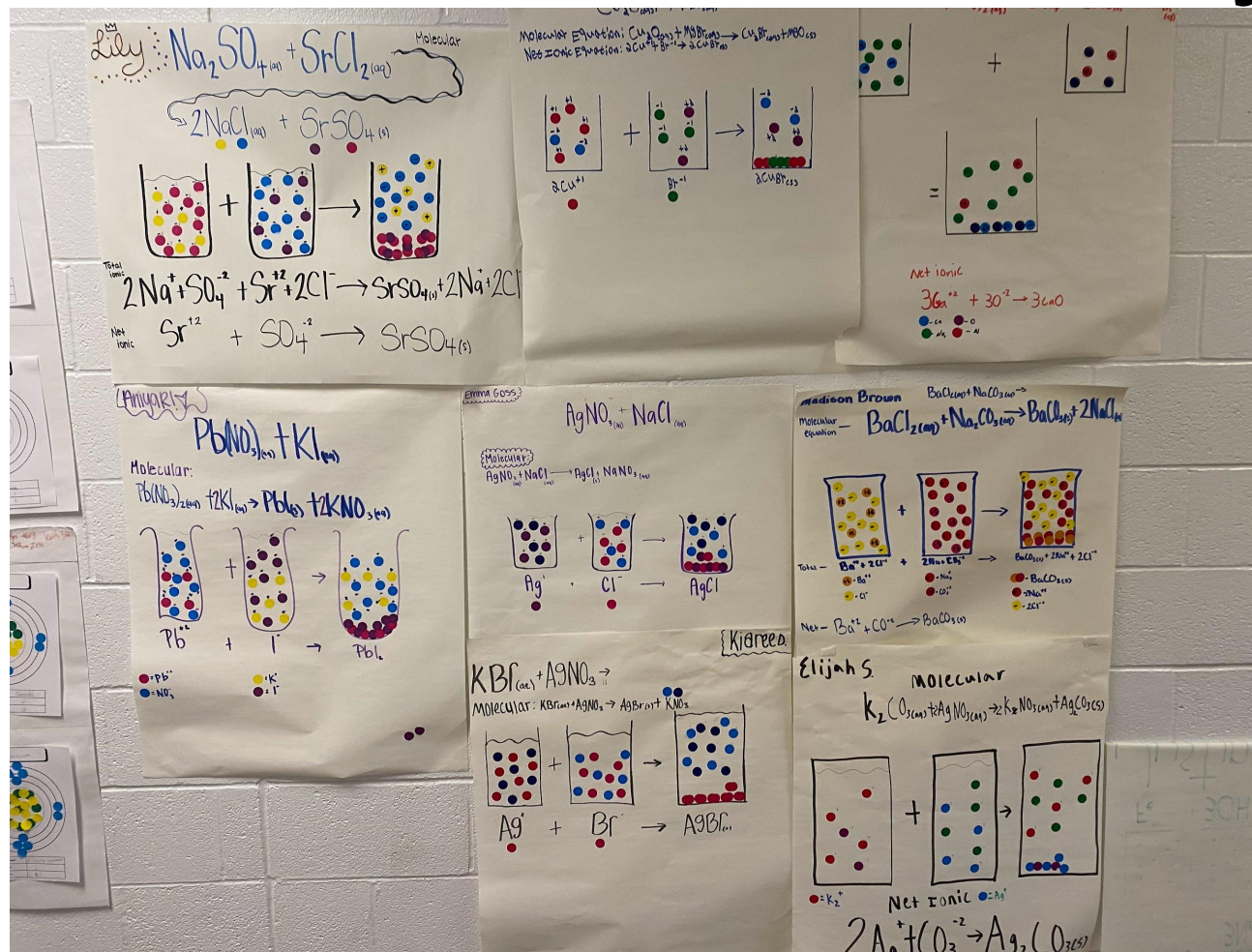


Forensics in Chemistry



Forensics in Chemistry





Scenario

At 7:15 am on Sunday, attorney Apchem Annie, 38, was found unconscious on the water on the Ouachita River from what appeared to be a near drowning. After being transported to the hospital, Apchem Annie was treated by emergency room personnel. the liquid found in her lungs was inconsistent in appearance and smell with the river water from the Ouachita River. Annie is expedited to make a full recovery. It is very likely that someone tried to drown Apchem Annie and stage it to look like she drowned in the river. We have three suspects under investigation for attempted murder.





Suspect #1: Kyle Koi

Suspect has a small koi pond in his backyard. A sample has been collected for testing. He and Apchem Annie have an ongoing dispute over and inheritance.



Suspect #2: Myrtle Mermaid

A water sample was taken from the swimming pool of this suspect. During the summer the police responded to several altercations between this female suspect and Apchem Annie.





Suspect #3: Wayward Will

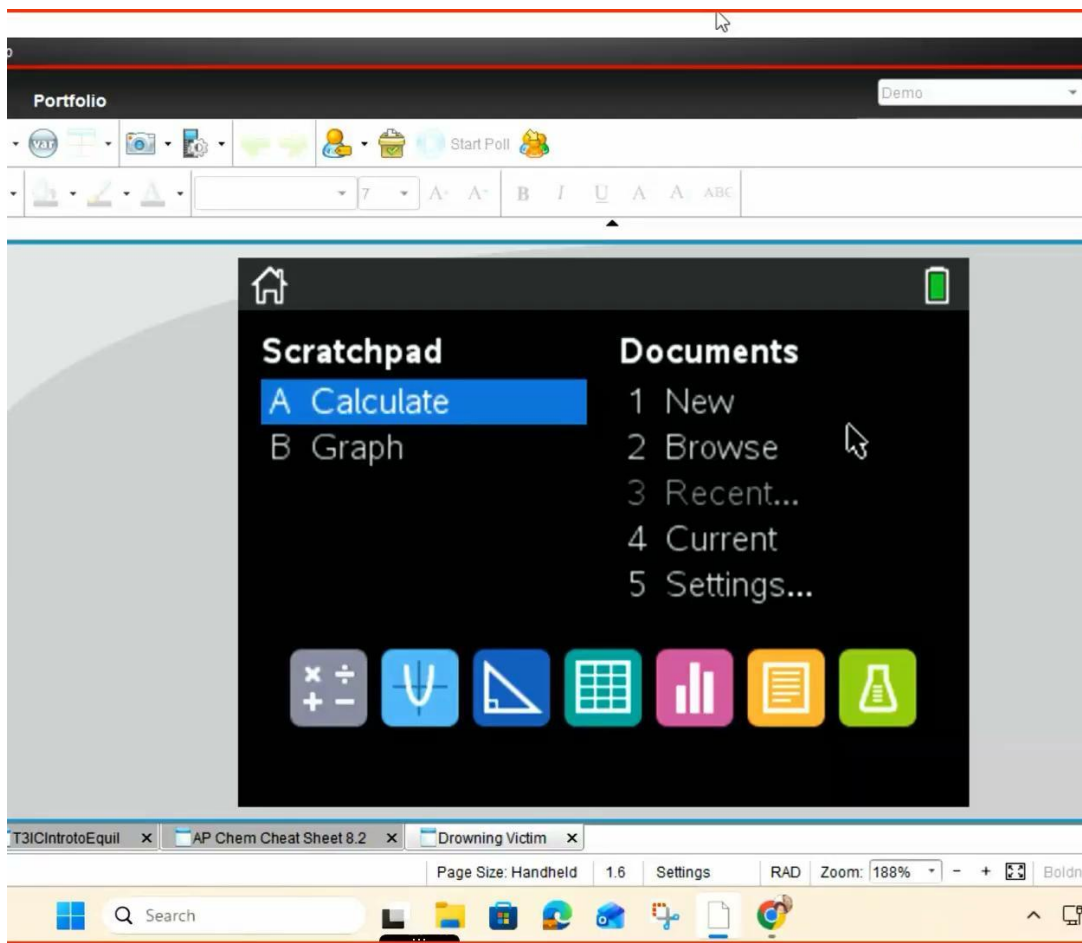
A sample of well water was taken from the home of this suspect. He rents a house from Apchem Annie, and there has been an ongoing disagreement over rent payments.



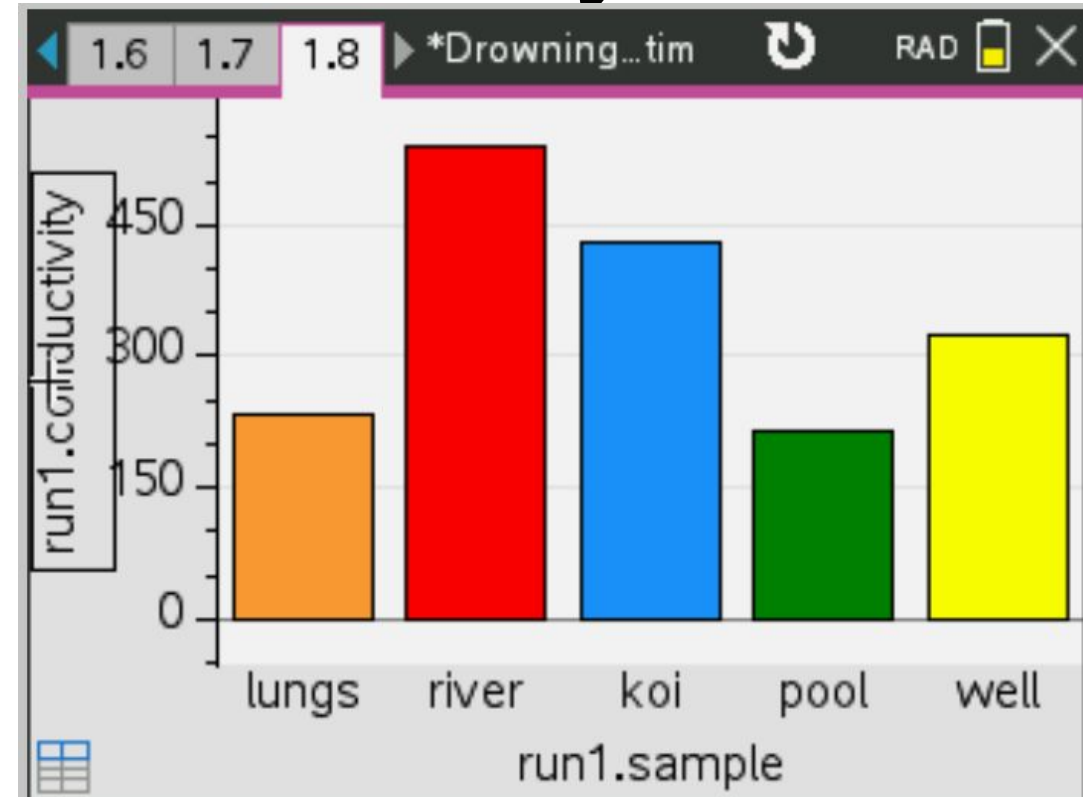
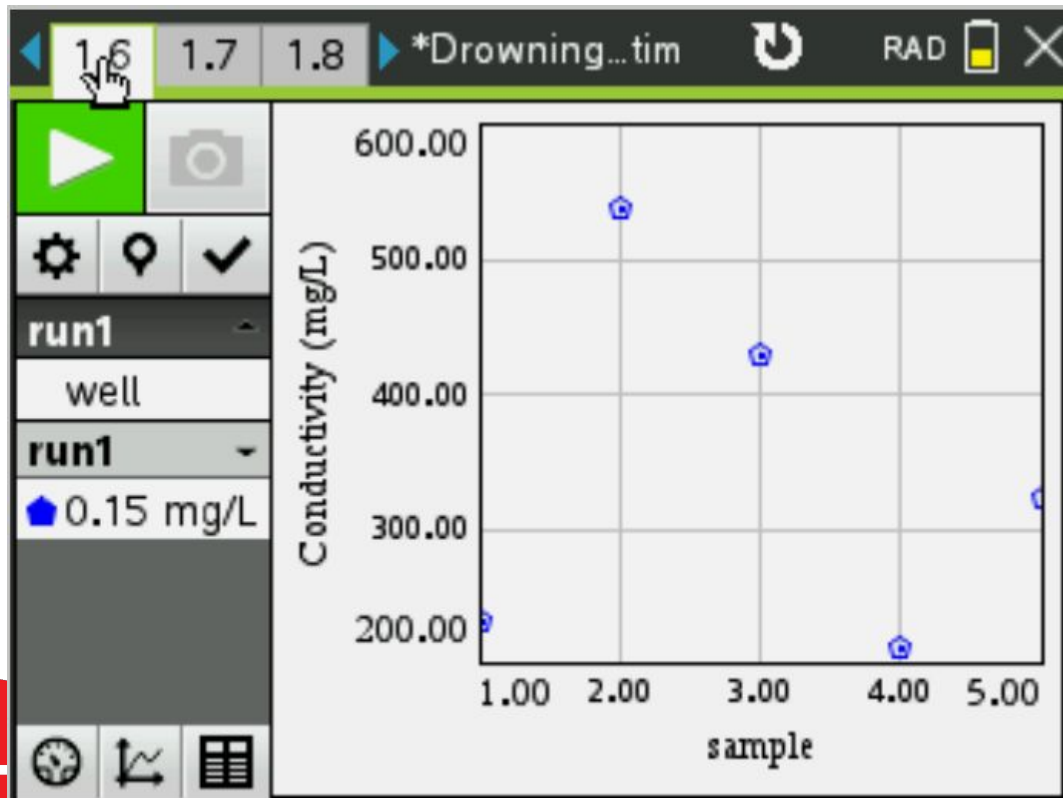
Forensics in Chemistry



Forensics in Chemistry

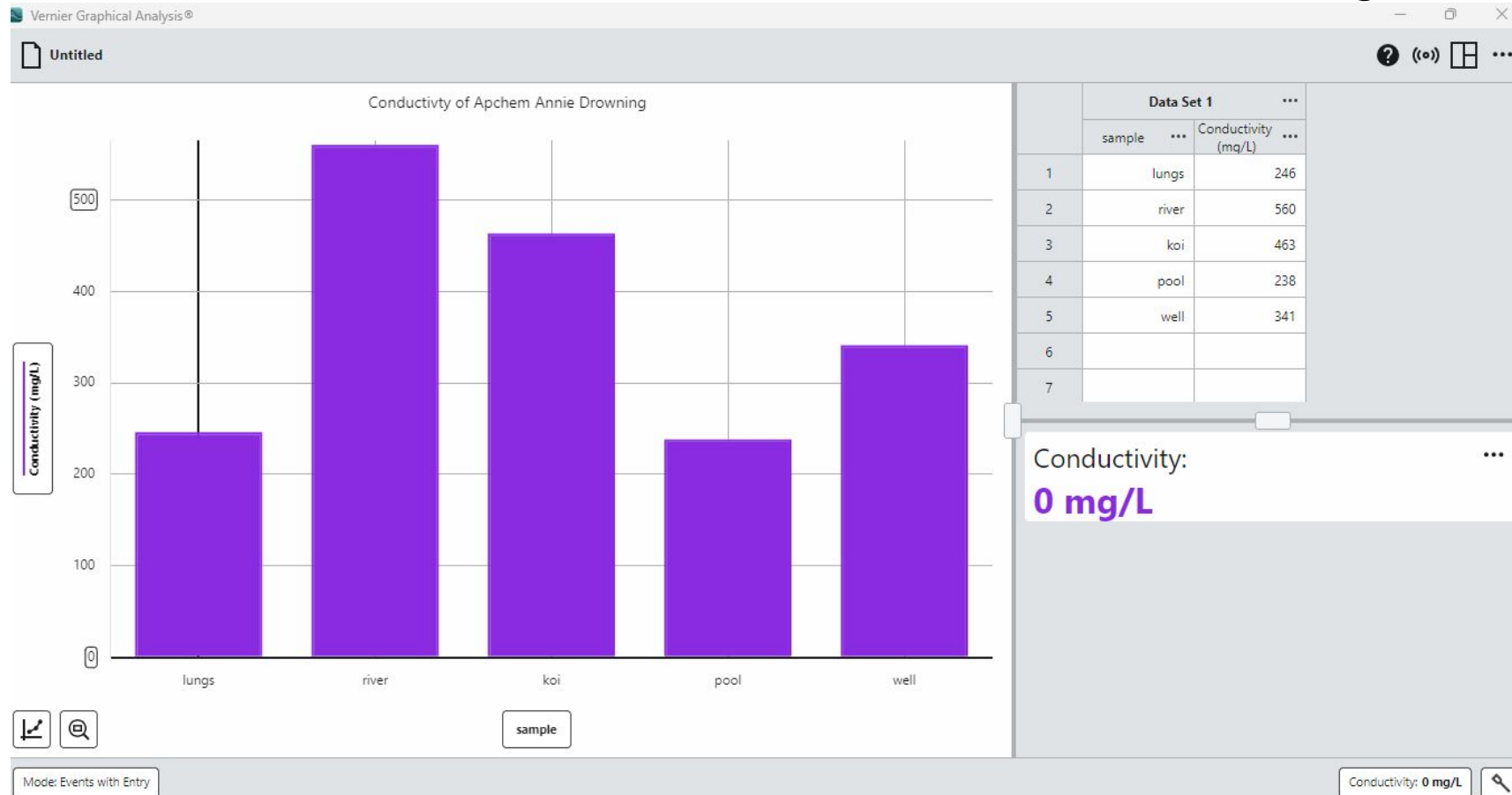


Forensics in Chemistry





Forensics in Chemistry



% Composition Stoichiometry

1. Solution concentrations in chemistry are most frequently expressed as molarity or moles per liter of solution. A common distribution of ions in groundwater is 45% sodium, 35% calcium, and 20% magnesium. Using this distribution, calculate the concentration of each of these ions in moles per liter for the water sample from the victim's lungs

45% Na

264mg

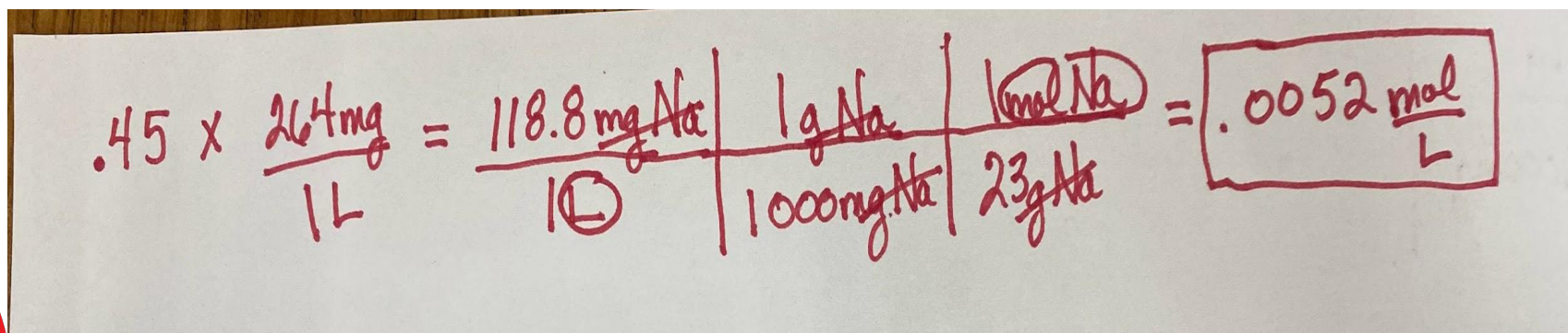
1L

1molNa

23gNa

1g

1000mg



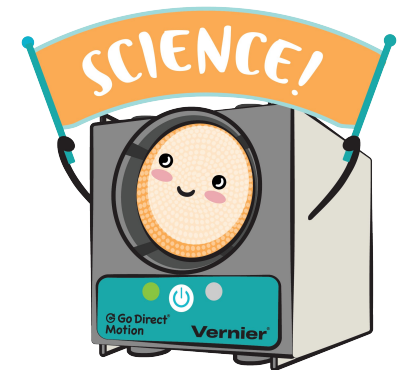
$$.45 \times \frac{264\text{mg}}{1\text{L}} = \frac{118.8\text{mgNa}}{1\text{L}} \times \frac{1\text{gNa}}{1000\text{mgNa}} \times \frac{1\text{molNa}}{23\text{gNa}} = \boxed{.0052 \frac{\text{mol}}{\text{L}}}$$



Forensics in Physics

Technology: Using ground-penetrating radar to locate buried objects.

Locate Mrs. Holloway's car and help solve this cold case.



Scenario

We have just received new information on this unsolved, highprofile case from several years ago. On May 6, 2000, the wife of billionaire oil tycoon Donald Holloway drove away in her car and never returned. As we never found any evidence of foul play, we believed that Mrs. Holloway left her husband and changed her identity. Recently, Mrs. Holloway's California vanity license plate, OIL GIRL, was found outside a remote gas station along the Desert Highway. This particular gas station happens to be quite close to lands owned by the Holloway oil empire. Also uncovered in recent weeks have been several documents detailing the purchase of some large properties along the road. It now looks like Holloway may have killed his wife and buried her and her car at one of the properties.

Scenario

From: jwinchester@ ZongoReelEstayt.com

Date: May 8, 2000

To: dholloway@hollowayoil.com

Subject: RE: your needs

Mr. Holloway –

Per your request, I have identified four abandoned sites along Desert Highway that would suit your needs. The following locations are very remote and have been untouched for years:

- » the old Two Tree golf course
- » the 1960s government rocket-testing site (now deserted)
- » the construction site on 31st and Desert
- » the abandoned Bright Days housing development

Good luck with your latest endeavor.

Classroom Set-Up

Investigation areas with appropriate labels:

- » Two Tree golf course
- » rocket-testing site
- » Construction Site
- » Bright Days housing

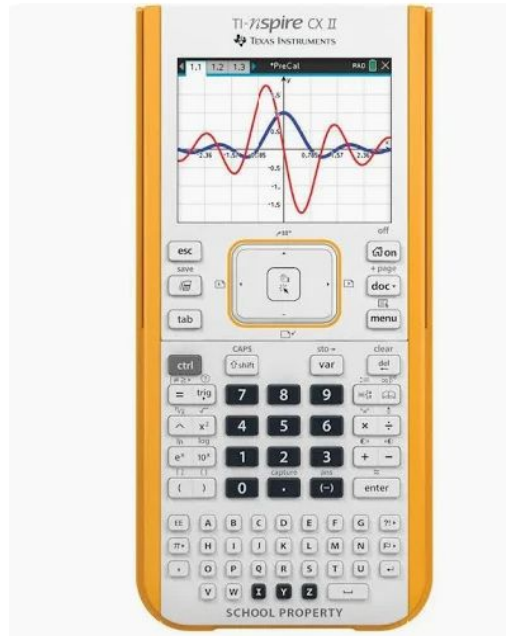
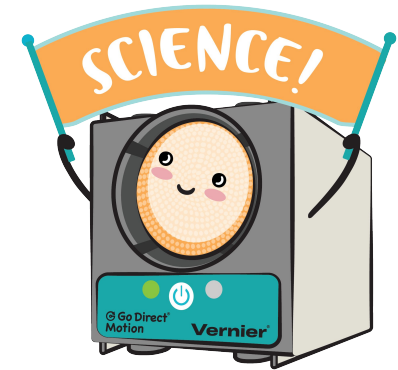
- 1 meter by 1 meter space - set-up for different regions
- different size objects or boxes



7001



Materials needed



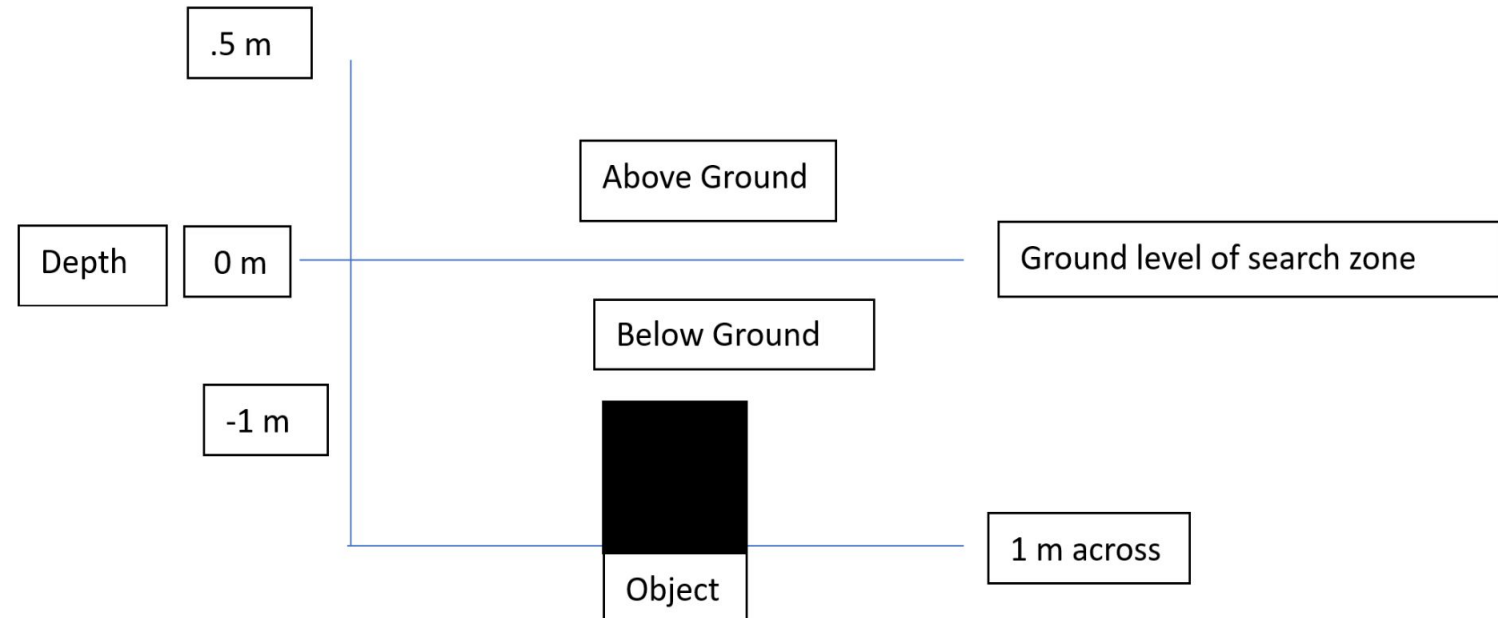
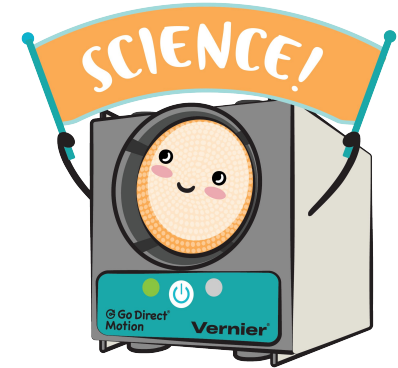
[Go Direct Motion](#)



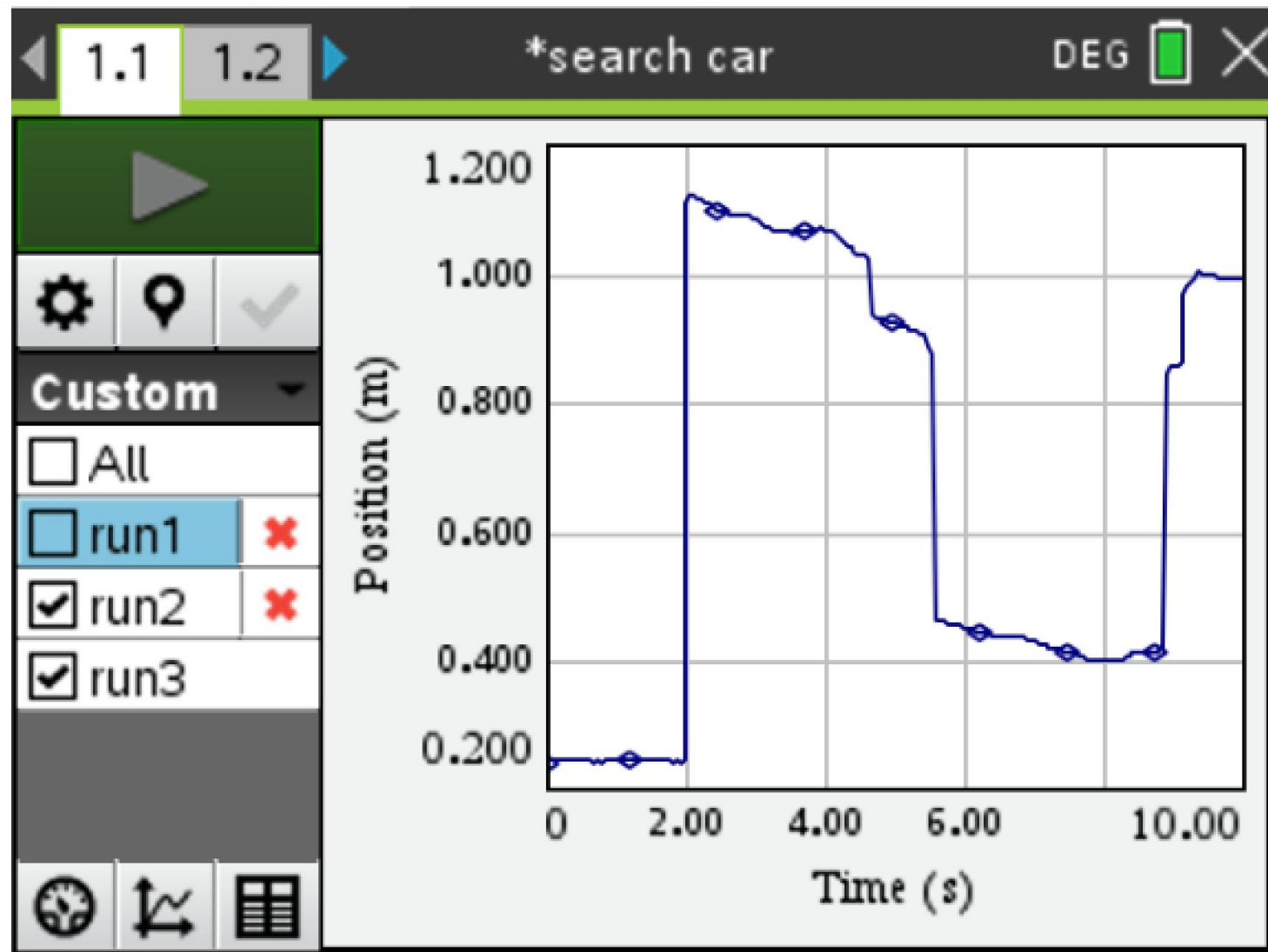
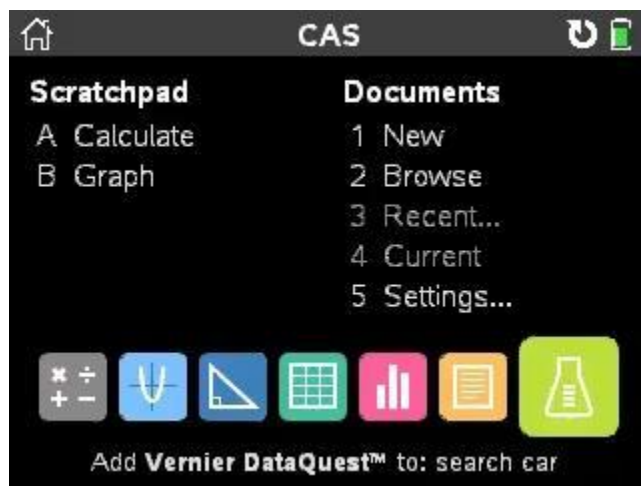
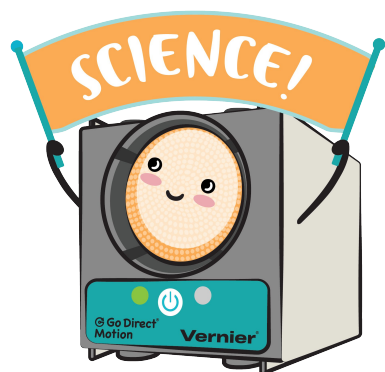
[Go Direct Sensor Connector](#)



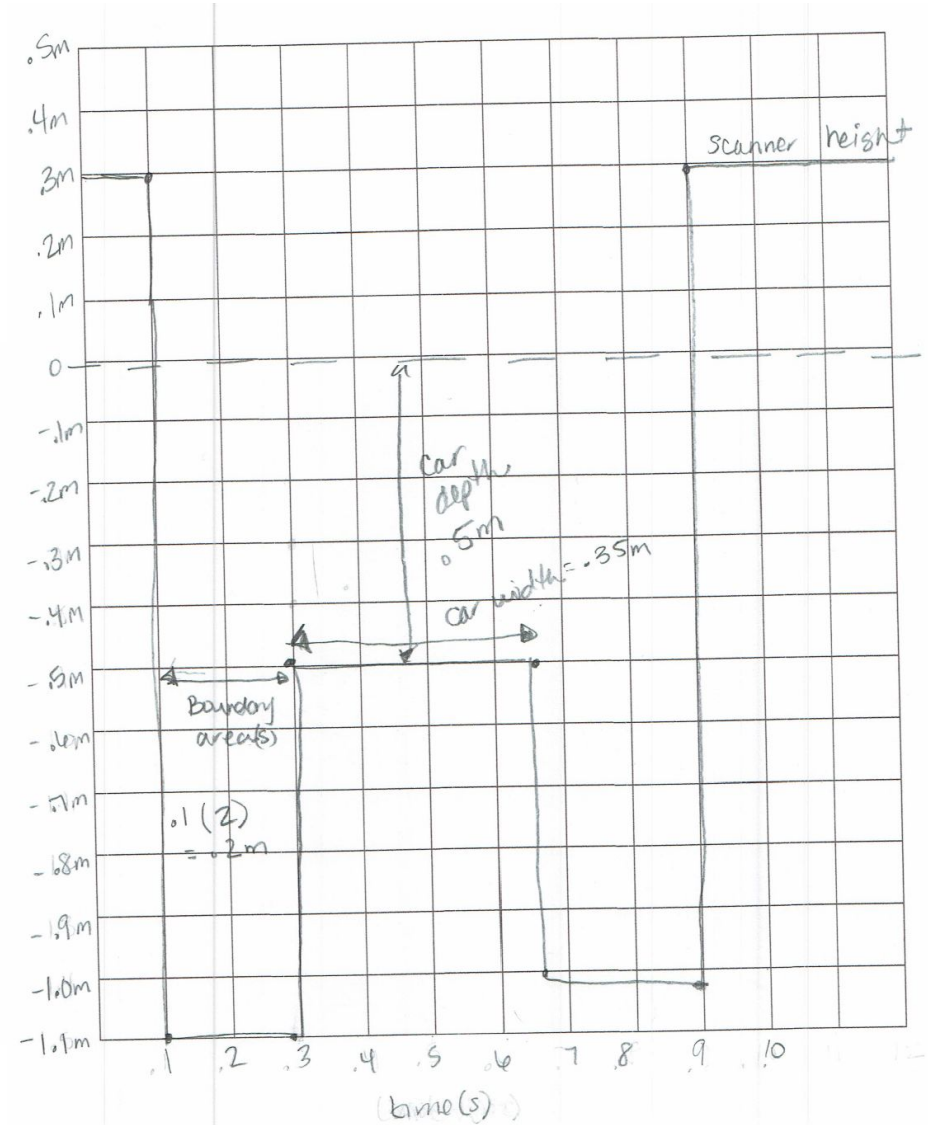
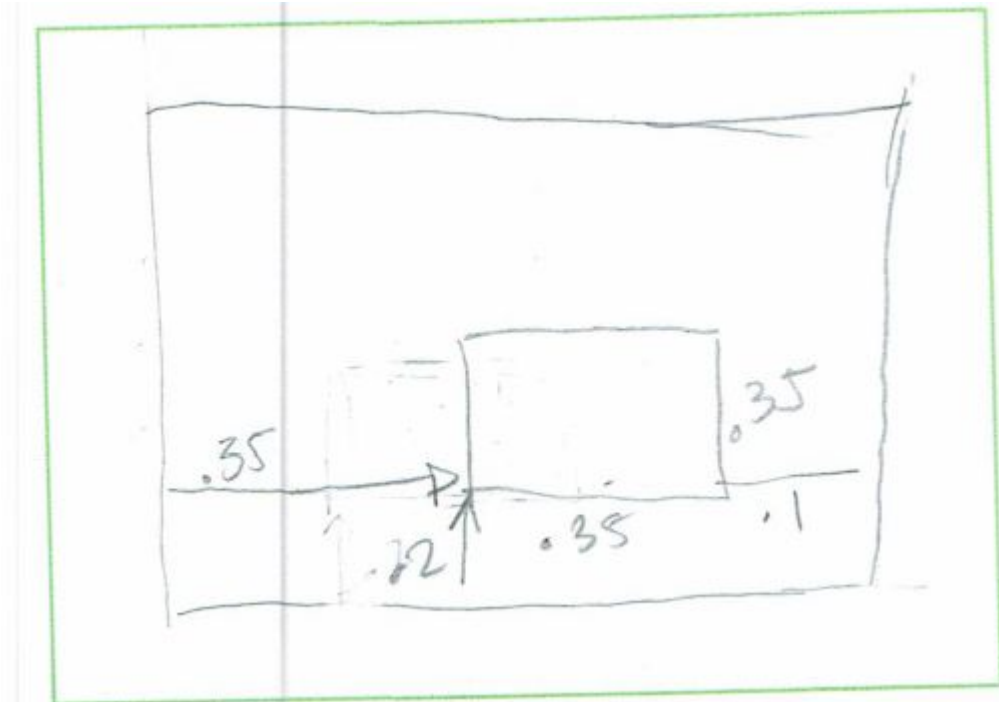
Students will be scanning a 1 meter by 1 meter square area. Where 1 meter is equivalent to 1 mile, in area units. For depth, have students scan about 1.5 meters above the floor. See diagram of setup



Area Data



Area Data and Calculations



Student Take aways

- Conceptual understanding of how sonar radar works in a professional environment.
- Simple set-up and simple use of data collection equipment.
- Collaborative effort

Similar activities:

[Mapping the Ocean Floor](#)