Conceptual Physics Strategies

Bree Barnett Dreyfuss & Jon Brix

Amador Valley High School

BBarnettDreyfuss@pleasanton.k12.ca.us

JBrix@pleasanton.k12.ca.us

Class Details

- Prior to 2010-2011 it was a freshmen only course; now open to all grade levels
- UC/CSU approved Lab Course
- A mix of high-achieving and low-achieving students
- Several Special Needs & Resource students; few English Language Learners

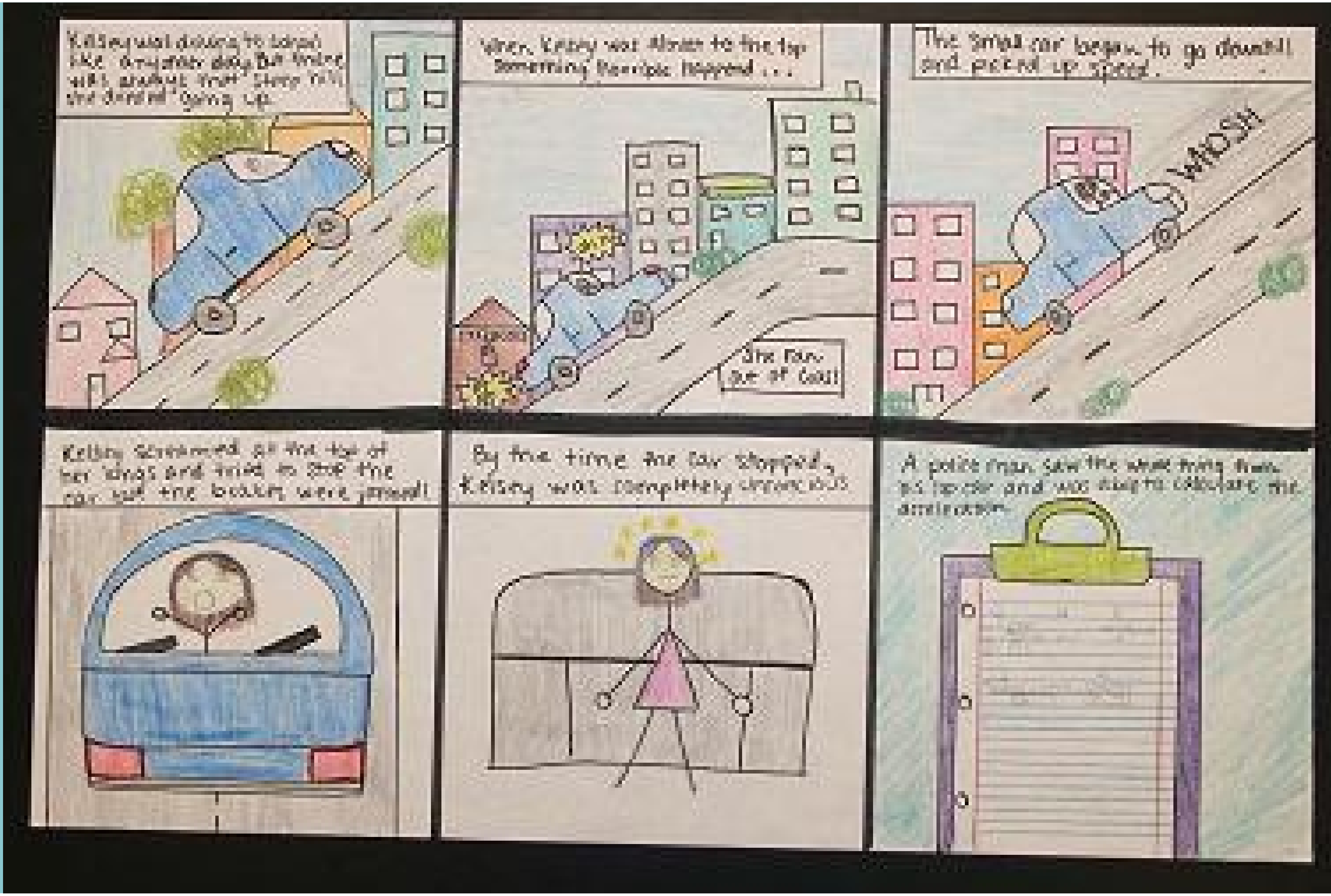
Hands-on Projects

Hands on projects allow students that are not typically academic *yet* to investigate properties kinesthetically.

Many students that “struggle” in science are able to demonstrate understanding through projects.

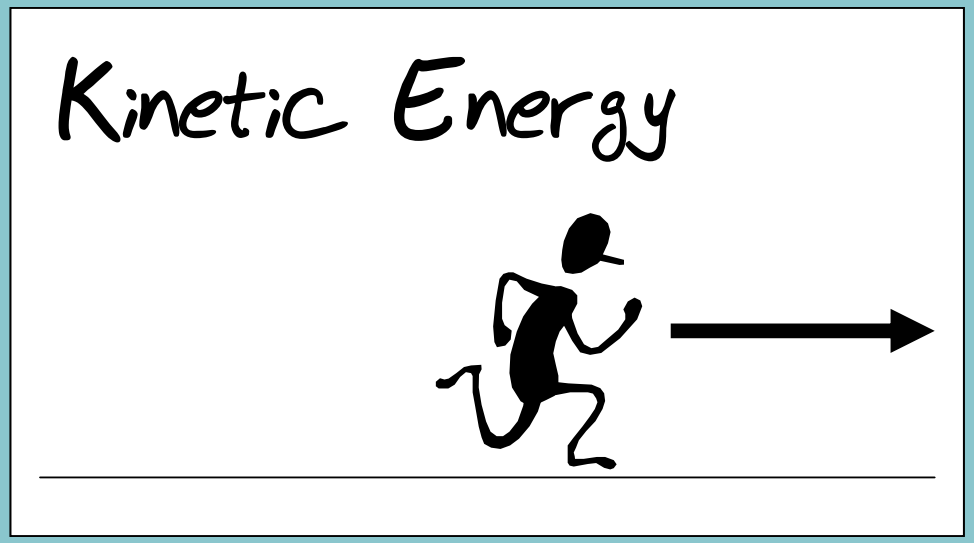
There are many hands-on projects:

- Acceleration Comic Books
- Friction Block Project
- Center of Mass Project
- Film Can Leyden Jar
- Skippy the Robot
- Electric House Project
- Minority Scientist Research Paper


The small car began to go downhill and picked up speed.
Kelsey screamed at the top of her lungs and tried to stop the car but the brakes were jammed!
By the time the car stopped, Kelsey was completely unconscious

Vocabulary Enforcement

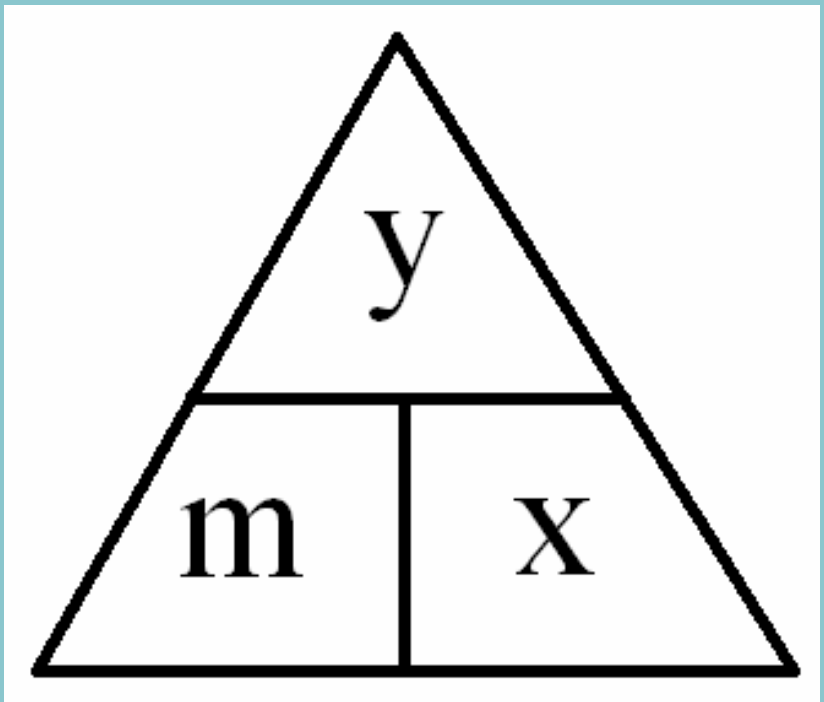
- Students receive an Unit Outline for each unit including vocabulary we will use
- Students create vocabulary cards for each of these terms during the course of the unit



Equations & Calculation Help

- We demonstrate both the *Triangle* and *Algebraic* method for most equations

$$y = mx$$



- Students learn the GUESS method for solving problems:

Givens – list given information in the problem

Unknown – list what you're solving for

Equation – list the equation you will use

Substitute the values given into your equation

Solve for the correct answer and circle it

G

$V = 15V$

$I = 3A$

U

$R = ?$

E

$R = \frac{V}{I}$

S

$$R = \frac{15V}{3A}$$

S

$$R = 5\Omega$$

Homework Packets

- We encourage students to review homework assignments to study
- Many students need organizational help
- Students record their nightly homework on a stamp sheet that is put on top of all their homework at the end of the unit

Partner work

- We frequently use partners for a variety of activities:
  - –Answering Review questions
  - –Lab simulations on a computer
  - –Writing practice problems
  - –“Think-Pair-Share”

Guided Reading

- Rather than assigning students to just read the sections or read and take notes, we assign **Guided Reading** worksheets.
- These worksheets have questions (short answer, fill in the blank, diagrams) that they can only answer by reading.