CAL Webinar
Kitchen Chemistry and Backyard Biology: Language and Science in the Home

Webinar
April 17, 2020

CAL Professional Development Team
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@CAL Linguistics
#languageapplied

Webinar Activities/Registration
http://cal.org/resource-center/freeresources

Poll #1

- Where are you on this rollercoaster today?
  1) Just getting buckled in, uncertain of the overall ride
  2) Rattling up the hill, gathering up energy and resources for this journey
  3) On the plateau, some dips and turns, but overall comfortable in a "new normal"
  4) In freefall, hoping a safe landing is coming soon
  5) All of the above

Introductions

- Resilient people respond resourcefully to even the most unexpected twists and turns in life.
- One way to be more resilient is to take care of your body and mind.
- Since we last met, name two ways that you are increasing your resilience.
Introductions

Annie Duguay

Marybelle Marrero-Colón

Dr. Kate Moran

Two ways I am increasing resilience is by:
1. Asking for support from friends & family, and trying not to overdo and resting when needed.
2. Drining every meal at home.

1. Meditating
2. Playing with my kids

1. Going for walks with our dogs.
2. Reconnecting with family and friends on a daily basis.

Maria Cieslak

2 ways I am increasing resilience:
1. Meditating
2. Playing with my kids

Since we last met, name two ways that you are increasing your resilience.

Chat

Agenda

- Introductions
- Educator Voices
- The language of science
- Science activities
- Brainstorming session

Goals and Objectives

- Content objectives
  - We will present and brainstorm resources and activities that promote interactive science concepts and language.

- Language objectives
  - We will talk and chat about how to promote science skills and language development in the home.

EDUCATOR VOICES

What does this quote mean to you?

Most of the fundamental ideas of science are simple and can usually be expressed in a language comprehensible to everyone.

- Albert Einstein

Chat
Our World of Color

- **Purpose:** Students will observe and learn how different natural compounds can affect chemical changes on fibers.
- **Connecting to the NGSS:** 2-PS1-2
- **Engineering, Technology, and Applications of Science**
  - Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world.
- **Literature Connections:**
  - *Hello Red Fox* by Eric Carle
  - *A Color of His Own* by Leo Lionni
  - *Planting a Rainbow* by Lois Ehlert
  - *Legend of the Indian Paintbrush* by Tomie De Paola

**Resources:**
- *Making Natural Dyes from Plants*
  - *Dyes From Plants: Learn More About Using Natural Plant Dyes*

**Objective:** Students will investigate various plant materials as a natural dye.

1. Record the name of your plant, the color and what you think the color of dye that it will produce.
2. Prepare a mordant bath of salt or vinegar in a crock pot. Place your fabric swatch or yarn in the mordant bath for at least 20 min. Then allow fabric or yarn to dry.
3. Cut or tear the plant material into small pieces and place it in a clean crock pot.
4. Add just enough water to cover the material. This is the dye bath.
5. Boil for one hour or more until the water reaches the color intensity you want.
6. Strain the dye bath using a strainer or colander.

**Did you know?** Different mordants will change the color of the dye.

7. Reheat the dye bath.
8. Add the fabric swatch to the dye bath. The longer it stays in the dye bath, the deeper the color.
9. Remove the cloth from the dye, and rinse with cold water.
10. Spread out the cloth to dry or hang to dry.
11. Record actual color of the dye in your science log.
12. Run fabric under cold water to help “set” the color.

**THE LANGUAGE OF SCIENCE**

Science is a language. We should teach it that way. To solve the problems of science education, we should think about language education rather than the same problems.
Take into consideration…

- Our science education system pays some attention to the idea that science is a language.
- Many science teachers have their students do journaling on the science learning and science use experiences.
- Some science teachers make use of cooperative learning— an environment that encourages students to communicate scientific and engineering ideas.
- Some science assessment instruments require that students explain what it is they are doing as they solve the scientific and engineering problems in the assessment.

Authentic Science Talk in Action

Next Generation Science Standards & ELs

- The Next Generation Science Standards sets higher expectations in science for all students, and teachers of English language learners must employ effective strategies to deepen understanding of science while learning English.
- The NGSS indicates 5 areas where teachers can support both science & language development.
  1. Incorporation of literacy strategies for all students
  2. Language support strategies with English language learners
  3. Discourse strategies with English language learners
  4. Home language support
  5. Home culture connections

Language of Science

- passive voice: is shown, was found, has been explained, etc.
- modals (or auxiliary verbs): could, might be, would, etc.
- embedded clauses: The latest research, developed from laboratories on three continents, indicates that...
- nominalization (changing verbs to nouns): rotate to rotation

Grammar of Science

- complex sentences: A growing number of research studies suggests, however, that such an increase in temperature could have a large impact on life, especially in coastal regions of North America and sub-Saharan Africa.
- steps of a process: Following evaporation, water vapor cools and falls to the earth as rain or snow.
- cause and effect: As a result of auto emissions, nitric oxide and sulfur dioxide combine with water in the air.
- main idea and details: The biomes in this area consist of grasslands, scrublands, deserts, and deciduous forests.
Question

- How do we make science language comprehensible?

Poll #2

- How much science are you adding to your home lessons?
  - A great deal, through hands-on activities and reading
  - Some, though hands-on activities and reading
  - Mostly through online videos or apps.
  - I've added a little science to our lessons and discussions
  - Not really adding science into our lessons and discussions

SCIENCE AND LANGUAGE ACTIVITIES

Digital Escape Room

- Purpose - some type of mystery to solve or goal to reach
- Clues - a series of puzzles or questions to solve, one puzzle at a time, eventually leading to the goal
- Something to Unlock – a combination lock or access code. The answers are provided by the clues that students solve along the way.
- A Time Limit (Optional) – students must complete the puzzles, open the locks, and reach the goal in a set amount of time. The choice to use a timer depends on your group of students. A time limit can drive motivation and focus, or it can add to much stress.

Digital Escape Room – The Clues

- Multiple Choice questions For example, your first clue can consist of five multiple choice questions. The correct answers may be – A-C-D-A-B. The key code that opens the lock - ACDAB
- Series of True/False questions TFTFF
- Fill in the blank or questions that have a very specific single word/phrase answer are also easy to use.

The only question type that can not be used to make a key code is an open-ended question.
Digital Escape Room

- Google Site, Google Form, Google Docs, Tutorial
- Visual learning platform- easy to embed images, videos, audio files, links, and virtual tours
- All text descriptions in image or video hotspots can be read with Immersive Reader in over 60 languages
- Can be used for presentations or lesson plan

Reflection Journals

- Activity to get learners outside and exploring plants at a deeper level
- Adaptable for different grade levels and language proficiency
- Could be done on a walk, in a park, or in the backyard
- Learners create field notes for 10 different plants
- Then could use an app to learn more
- Preview vocabulary before starting
- Afterward, learners could compare specimens with sentence frames
- Write about plants in their area with paragraph frames

Descriptive Vocabulary brainstorm

<table>
<thead>
<tr>
<th>Types</th>
<th>Parts</th>
<th>Texture</th>
<th>Physical Attributes</th>
<th>Habitat Attributes</th>
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<tbody>
<tr>
<td>plant</td>
<td>leaf</td>
<td>smooth</td>
<td>narrow</td>
<td>dry</td>
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<td>tree</td>
<td>stem</td>
<td>jagged</td>
<td>wide</td>
<td>wet</td>
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<td>grass</td>
<td>trunk</td>
<td>waxy</td>
<td>hard</td>
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<td>blossom</td>
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<td>rough</td>
<td>soft</td>
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<td>shrub</td>
<td>petals</td>
<td>bumpy</td>
<td>flexible</td>
<td>marshy</td>
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<tr>
<td>bush</td>
<td>veins</td>
<td>thin</td>
<td>rigid</td>
<td>rocky</td>
</tr>
<tr>
<td>flower</td>
<td>stamen</td>
<td>thick</td>
<td>shallow</td>
<td></td>
</tr>
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</table>

Backyard Botany

- Specimen | Rubbing/sample | Description | Habitat | Notes |
- Plant 1   |               |             |         |       |
- Plant 2   |               |             |         |       |
- Plant 3   |               |             |         |       |
- Plant 4   |               |             |         |       |
- Plant 5   |               |             |         |       |
- Plant 6   |               |             |         |       |
- Plant 7   |               |             |         |       |
- Plant 8   |               |             |         |       |
- Plant 9   |               |             |         |       |
- Plant 10  |               |             |         |       |
Garden or Park Plot

Fun New Apps
- There are some really great apps out there that help make basic earth science fun.
  - PictureThis
  - PlantSnapp...
  - LikeThat Garden,...
  - FlowerChecker,...
  - Plantifier....
  - Leavesnap,...
  - NatureGate....
- Just snap a picture of a plant or flower, and you will be able to identify its name, family, plant story, characteristics, and care.

Fun Home Demonstrations
- Make a tornado or whirlpool
- Materials
  - 2 – 2 liter plastic bottles
  - 1 roll of packaging tape or duct tape.
  - Dish soap – clear is preferable, but not required.
  - Blue glitter
- Directions
  - Fill one of the bottles 2/3 full with water.
  - Add 2 squirts of liquid soap.
  - Add about 1 teaspoon of glitter.
  - Place the other bottle on top and seal tightly using tape. Packaging tape works well because it is see through.
- Flip the bottles upside-down. Turn the bottle upside down and tilt it to give the water the chance to flow from the top to the bottom.
- Think of it like the motion of flipping an hourglass. The bottom bottle should now be filling with water, and the top bottle should be emptying of water. Hold the bottles for support.
- Do this 2 or 3 times. This is distributing the air pressure. There should be less air pressure in the top than the bottom.
- Now shake up the water in the bottle in a circular motion. It might take a few tries.
- When you stop, the water should empty in a circular cone-like format that mimics a tornado or whirlpool.
- The glitter attaches itself to the soap for a clearer view.
- Discussion: Why does this happen?

Science Memory
- Easy game, lots of learning.
- This is an activity where the students use their memory skills to review vocabulary or content concepts.
- Parents or teachers create some cards (can use small index cards). The create cards for words, definitions, and pictures.
- Students lay out cards on a table and turn them to match the word/concept and their definition. As a challenge you may add a visual representation (i.e. picture, formula, symbol, etc.).
- As students make their matches, they must restate the definition in their own words or they may not collect their cards. Students may work in teams.
- The one who matches the most wins.

Samples
- Nucleus
- Flower
- Root
- Igneous
Window Weather Reporting

- Compare and contrast the weather forecast with the actual weather.

Your Turn

- Which activities would you like to adapt and use from home?
- What science activities or resources have you been engaging in with your students or kids?

Upcoming Topics

<table>
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<th>Date</th>
<th>Topic</th>
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<tr>
<td>April 24, 2020</td>
<td>Engaging Culturally and Linguistically Diverse Students and their Families: Social-emotional Wellness in the Home</td>
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Other Online Learning Opportunities

- CAL’s self-paced asynchronous courses:
  - Academic Literacy Development for English Learners
  - Foundations of Literacy: The Nature of Reading
  - Fundamentals of Sheltered Instruction: Featuring the SIOP Model
  - Coming soon! Building Background and Comprehensible Input: CAL SIOP Essentials

  http://www.cal.org/what-we-do/online-courses

  - All courses are ~ 5 hours of course time
  - After completion, participants receive a CAL Certificate of Completion that can often be used to obtain continuing educational credits from your school or district.

Thank You

- View this webinar and download the handouts on our [CAL Resources page](http://www.cal.org/resource-center/freeresources)
- Join us next week, Friday, April 24, 3-4pm EST
  - Next week’s topic: Engaging Culturally and Linguistically Diverse Students and Families: Social-emotional Wellness in the Home
  - [https://attendee.gotowebinar.com/register/7057764445466330893](https://attendee.gotowebinar.com/register/7057764445466330893)