

Science Lesson Plan

<i>Title:</i>	Balancing a Trick Crayfish Investigation
<i>Topic/Strand:</i>	Balance and Motion
<i>Grade level:</i>	2nd grade
<i>Curriculum:</i>	FOSS Balance and Motion
<i>Teacher:</i>	Lorena Reyes
<i>Estimated time:</i>	60 minutes

1. Overview:

Balance and motion is an important unit of investigation because students can start exploring and learning more about the natural world. Balance is not foreign to second graders because they “love to engage in balance activities.” They try to balance pencils in their hands, basketballs in their fingers, soccer balls in their heads, stand on one foot and hop, etc. This investigation provides the opportunity for students to continue to explore and experience how stability is and can be affected, begin developing the importance of equilibrium, and far most have the opportunity to share their discoveries with their peers and friends.

In investigation 2, students will balance a crayfish tag board in their fingers. Then, they will have to balance the crayfish using counterweights. Students will record their findings paying close attention to the balance point and the position of counterweights. At the end of the lesson students will reflect on what they learned and write down any inquiry questions they may have as a result of the investigation.

2. Learning Goals and Standards

Science Learning Goals:

1. Students will come to know and understand that the position of an object can be described by locating it in relation to another object. (PS1A)
2. Students will come to know and understand that counterweights positioned in certain ways can help balance an object. (PS1A)
3. Students will come to know and understand that scientific progress is made by conducting careful investigations. (PS6A, PS6G)

Language learning Goals:

1. Students will be able to communicate effectively with classmates and the teacher about their findings. (ELD2, ELD3)
2. Students will be able to use concepts and academic vocabulary to complete writing activities that support concept development related to the study of balance.(ELD1, ELD3)
3. Students will be able to follow multi-step directions given verbally and in written form. (ELD3)

Standards Addressed

California Grade 2 Physical Sciences Standards

1. The motion of objects can be observed and measured. As a basis for understanding this concept:
 - a. Students know the position of an object can be described by locating it in relation to another object or to the background.

California Grade 2 Investigation and Experimentation Standards

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
 - d. write or draw descriptions of a sequence of steps, events, and observations
 - g. follow oral instructions for a scientific investigation

English Language Arts Standards (2nd Grade)

Listening and Speaking

- Comprehension 1.4 Give and follow three and four-step oral directions
- Organization & Oral Communication 1.6: Speak clearly and at an appropriate pace for the type of communication
- Organization & Oral Communication 1.9: Report on a topic with supportive facts and details

Reading Comprehension 2.0

- Structural features of informational materials 2.1: Use titles of contents, and chapter headings to locate information in expository text.
- Structural features of informational materials 2.4: Ask clarifying questions about essential textural elements of exposition

English Language Development (ELD) Standards K-2nd Grade.

EI = Early Intermediate; I = Intermediate

1. Writing: Language Conventions:

- Write simple sentences by using key words posted and commonly used in the classroom.(p.15) EI
- Produce independent writing that may include inconsistent use of capitalization, periods, and correct spelling. (pg. 18) I

2. Reading: Structural Features of Informational Materials (intermediate): While reading aloud in a group, point out basic text features such as the title, table of contents, and chapter headings. (pg. 12)

3. Listening and Speaking: Comprehension, Organization, & Delivery of Oral Communication (Early Intermediate) (Intermediate):

- Begin to be understood when speaking but may have some inconsistent use of standard English grammatical forms and sounds. (pg.1)EI
- Ask and answer instructional questions by using simple sentences. (pg.17) I
- Apply knowledge of content-related vocabulary to discussions and reading. (pg. 9) I
- Understand and follow some multiple-step directions for classroom related activities. (pg. 12). I

3. Assessments

Teacher: Formative assessment record sheet to record observations made throughout the lesson

Students: Science notebooks, Exit ticket

Learning goal	Data sources
PS1A	<ul style="list-style-type: none">• Exit Ticket• Science notebooks• Student verbal responses and talk
I&E4G	<ul style="list-style-type: none">• Student verbal responses and talk• Science notebooks
ELD1	<ul style="list-style-type: none">• Exit Ticket• Science notebooks
ELD2	<ul style="list-style-type: none">• Student verbal responses or gestures• Science notebooks
ELD3	<ul style="list-style-type: none">• Mixtures worksheets• Science notebooks• Student verbal responses and talk

*After grading the exit ticket, I will return it to the students and go over the common errors that I noticed. In their exit tickets I will write a comment/suggestion on how they can improve in their language conventions. With my formative assessment record sheet I will be able to pull students and make individual clarifications or explanations. If I see common errors or need of further explanation, I will let students know and/or do a mini lesson before beginning the next investigation.

4. Resources and Preparation

Visuals:

- pictures to demonstrate people and objects being balanced
- pictures of crayfish
- cognitive content dictionary (word, definition, picture, and oral sentence)
- sentence frames
- word wall

Materials:

- crayfish tag boards
- clothespins
- Science Notebook

Handouts:

- exit ticket

Editor's Note

The lesson uses the Guided Inquiry Supporting Multiple Literacies (GISML) lesson/activity structure developed by Palincsar and colleagues (2002). There are four types of activities in the lesson: 1) preparing to investigate; 2) investigation; 3) preparing to report; and 4) reporting. In the preparing to investigate portion, the teacher attempts to contextualize the learning, engage students' interest, teach a few key vocabulary words, and give students instructions about what to do during the investigation. During the investigation phase, students have the opportunity to explore the balancing phenomena, make observations and collect data. The preparing to report phase involves discussion, sensemaking and writing about what happened during the investigation. Finally, students have a chance to report on their ideas and conclusions about what happened.

Palincsar, A. S., Magnusson, S., Cutter, J., & Vincent, M. (2002). Supporting guided-inquiry instruction. *Teaching Exceptional Children*, 34(3), 88–91. <http://ow.ly/oQy35>

5. Instructional Plan

Segment/Activity	ELLISA Practice	Vocab
<p>Prepare to investigate ~ 10minutes</p> <p>Goals for today: Good afternoon physicists. Today you will begin your exploration of balance. By the end of the lesson you will be able to answer our focus question: How do you know when something is balanced?</p> <p>What do learners know about the subject already? (pre-assessment) Raise your hand if you have ever heard the word balance before. Now, I want you to take a moment to think about what you know or think you know about balance or you can give an example of when you have seen something balanced. Share with a partner. (3 students will share out loud).</p> <p>Balance is a stable position which means it's not falling over (will be showing several pictures demonstrating balanced things and people). Everyone stand up. (will write on board Yes/No I'm (not) in a balanced position because _____).</p> <p>Right now are you in a balanced position? (point to sentence frame).</p> <p>Yes you are in a balanced position because you are not falling over. Look at me am I in a balanced position? Correct, I am in a balanced position because I'm not falling over. Now, carefully stand in one foot. Are you in a balanced position? Tell your partner.</p> <p>I need one volunteer. (student will demonstrate a balanced position) Is he balanced? Correct, he/she is in a balanced position which means he/she is not falling over. In other words he/she is in a stable position. (write on board not falling over = stable position).</p> <p>One more volunteer. (student will not be balanced). Is this student in a balanced position? Correct he is not in a balanced because he is not stable, which means he is falling over.</p> <p>In a moment you are going to investigate and learn more about balance. Afterwards you will record your findings in your scientific journal. Remember to pay close attention to everything you do and learn. Remember scientists keep accurate and detailed records of their investigations and observations</p> <p>NOTE: ELLISA PRACTICES</p> <ul style="list-style-type: none"> Authentic Science Literacy (LIT) Science Vocabulary (Vocab) English Language Development (ELD) Scaffolding Science Content (SDAIE) Contextualizing Personal-Home-Community-Experiences (CX-Home) Contextualizing Physical & Local Environment (CX-Local) Science Talk (ST) Instructional conversations (IC) 	<p>CX (Vocab)</p> <p>(SDAIE: Visual aids)</p>	<p>balance stable</p>

<p>Investigation 2 Part 1: Trick Crayfish ~20 min</p> <p>Who can tell me what a crayfish is? Remember to respond with the subject first. “A crayfish is _____. (if students don’t know I will ask them if they know what cangrejo del rio/langostino/chacal is).</p> <p>Will show them pictures and a live crayfish to see if that elicits responses from the students.</p> <p><i>Investigation:</i></p> <p>I have a special crayfish that can do tricks. Its best trick is balancing on one of your fingers. Do you want to see? (demonstration).</p> <p>Would you like to try?</p> <p>Remember, as scientist you will be busy trying to figure out how to balance the crayfish, but you must also pay close attention to where you place your finger as you try to balance the crayfish.</p> <p>(IC) Will circulate around the room, engage in instructional conversation, and collect formative assessment data.</p> <p>(when students have balanced their crayfish)</p> <p>(IC) What did you discover? What did you do first? What did you think about when you were trying to find the balance point?</p> <p><i>Notebooks:</i></p> <p>Take out your scientific journals. (LIT)Write the title of the investigation trick crayfish (model on board). Remember that scientists and people in general title their work to help them remember and other people know about their writing. Remember it is important to write the date to keep record of our information. You will draw a picture of your tag board crayfish as it balanced in your finger. Then you will write a sentence describing the picture. This will help us in the future when we are reviewing our work to see what we were doing and learning even if several months have passed by. Ask students to be as accurate as possible with the illustration and label important positions, objectives.</p> <p>A possible sentence starter is:</p> <p>I balanced my tag board crayfish by/with _____.</p> <p>It was _____ (easy/hard) for me because _____.</p> <p>Does anyone else have a different sentence frame?</p> <p>Students write and share their sentences with their elbow partner. I will get two equity sticks and select 3 students to share out loud.</p>	<p>SDAIE</p> <p>(IC)</p> <p>(LIT)</p> <p>(ELD)</p>	
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Investigation 2 Part 1: Trick Crayfish with counterweights ~20min

Your next task is to balance your crayfish using clothespins. Now, last week we studied compound words (palabras compuestas) in Spanish class. Clothes are material that we wear and pins are the short, slender piece of wire with a point at one end and a head at the other, for fastening things together. When you combine these two base words you get the word clothespins which are forked piece of wood to hold clothing. (will show realia).

Vocab

counterweight

Clothespins are going to act as counterweight. (writes word and definition on chart).

IC

Now counterweight means a weight used to balance. Once again your task is to balance a crayfish using clothespins as counterweights. Remember to pay attention to what worked and didn't work in order to be able to tell me if it matters where you put the clothespins? **(IC)** Will circulate around the room, engage in instructional conversation, and collect formative assessment data.

IC

Discussion:

(IC) What did you do to get the crayfish to balance in its nose.

LIT

Does it matter where you put the clothespins?

Notebooks:

Take out your scientific journals. You will draw a picture of your tag board crayfish as it balanced in your finger with the counterweights. Then you will write a sentence describing the picture. (model example).

A possible sentence starter is

Vocab

I balanced my crayfish _____ .

I placed the counterweights _____.

ELD

Share your sentence with a partner.

Reading

(Vocab) We are going to read a couple of pages about balance. Scientists get information from their investigations but they also read to learn more information about what they are learning and investigating. Everyone open your books to the table of contents. Now find where it says Make it Balance! What page is that section located in? Open to that page. I will read one page and students will re-read the page. (Pages 6-9).

<p>Lesson wrap up ~15min</p> <p>Students write in their notebooks one thing that they learned and will be encouraged to write a question.</p> <p>I learned _____.</p> <p>I wonder...?</p> <p>I still don't understand why...?</p> <p>Why...?</p> <p>(Vocab) Review key concepts</p> <p>(CX) Assign homework: I want you to make observations of people or things that are balanced, in a steady position and we will share our findings tomorrow.</p> <p>Exit Ticket</p>	<p>CX</p> <p>LIT</p> <p>Vocab</p> <p>CX</p>	
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NOTE: ELLISA PRACTICES

1. Authentic Science Literacy (LIT)
2. Science Vocabulary (Vocab)
3. English Language Development (ELD)
4. Scaffolding Science Content (SDAIE)
5. Contextualizing Personal-Home-Community-Experiences (CX-Home)
6. Contextualizing Physical & Local Environment (CX-Local)
7. Instructional conversations (IC)

6. Related Resources

FOSS, G.L.A.D