



Paideia Seminar Lesson Plan



Text:

Spider Legs Problem

Grade/Subject

Upper ES / Math



Ideas, Values:

Mathematics, Estimation, Computation, Reasoning, Problem Solving



Pre-Seminar Content



Launch Activity:

Have participants work in pairs to identify various types of mathematical word problems they've seen or solved in the past. Ask participants to record their ideas on their own index cards. Share ideas as a whole group and allow participants to make additions or changes to their cards. Save the index cards for the *Transition to Writing* step post-seminar.



Inspectional Read:

Ask participants to read informally through the problem without solving it and identify what specific question they are being asked to answer. Have participants share a range of problem-solving strategies they might use in solving a problem such as this. Discuss as a whole group what the participants expect to learn from the text.

Background Information:

Participants should work in pairs to discuss the most important facts in the problem and what information we need about spiders and flies to be successful at answering the question. Record the facts on a board or chart where all participants can view them.

Vocabulary:

Read through the entire text slowly while participants raise their hands when they hear an unfamiliar word or phrase. Have a volunteer record the words/phrases. Add them to a word wall (if available) and then work as a class to define or clarify them. Be sure to have participants record the information needed about spiders and flies to successfully solve the problem.

Analytical Read:

Ask participants to read slowly through the problem a second and third time for clarification and begin working on attempting to find a solution. Allow ample time for participants to arrive at their own solutions, or test out strategies, without sharing their findings with one another. Participants should record their possible solutions and strategies below the problem on their own copies of the text.



Pre-Seminar Process

-  Define and state purpose for Paideia Seminar.
-  Describe the responsibilities of facilitator and participants.
-  Have participants set a Personal Goal.
-  Agree on a Group Goal.

Seminar Questions

Opening (Identify main ideas from the text.):

- ❖ Without providing a solution, what are the first steps you took in order to begin solving this problem? (round-robin response)
- ❖ Why did you take those steps? (spontaneous discussion)

Core (Analyze textual details.):

- ❖ What strategy do you think provides the most precise answer? Why?
- ❖ What strategy do you think provides the quickest answer? When would you use this strategy?
- ❖ In what ways does using a strategy that provides the quickest answer also provide the most precise answer and vice versa? Why?
- ❖ What process did you use to arrive at a solution? Is that the only process that can be used to find a solution?
- ❖ How can we determine if we have all the possible correct answers to this question?

Closing (Personalize and apply the ideas.):

- ❖ With what types of “real-world” problems would you logically choose to use some of the strategies we identified during this seminar?
- ❖ Why would you use those strategies with problems?

Post-Seminar Process



Have participants do a written self-assessment of their personal participation goal.

 Do a group assessment of the social and intellectual goals of seminar.

 Note reminders for next seminar.



Post-Seminar Content

 *Transition to Writing:*

Distribute the index cards from the *Launch Activity* and ask the same pairs of students to now add to their index cards (using the back or additional cards if necessary) strategies/mathematical concepts that were required to solve such problems.

 *Writing Task:*

Create your own (real-world) mathematical word problem that involves at least 3 of the strategies/mathematical concepts you listed on your card. In addition to creating your problem, write a full paragraph in which you discuss/analyze how your problem contributes to an understanding of the 3 strategies/mathematical concepts you selected from your card. Support your discussion with evidence/details from your mathematical word problem.

(LDC Task#: 16)



 *Brainstorm:*

Invite participants to talk in pairs for five minutes to share thoughts about what the writing task is asking. As appropriate, suggest a variety of possible (real-world) mathematical word problems that involve various strategies students have listed.

Structure the Writing:

Allow time for all to draft an outline for their writing and refine their thinking. Provide students with one or more possible organizational templates as needed.

First Draft:

Challenge all to draft their word problems and paragraphs defined by their outlines. Refer to the original problem in order to illustrate key points, strategies, and concepts.

Collaborative Revision:

Have participants work in pairs to read their first drafts aloud to each other with emphasis on reader as creator and editor. Listener says back one point heard clearly and asks one question for clarification. Switch roles. Give time for full revisions resulting in a second draft.

Edit:

Once the second draft is complete, have participants work in groups of three-four and this time take turns reading each other's second drafts slowly and silently, marking any spelling or grammar errors they find. (Have dictionaries and grammar handbooks available for reference.) Take this opportunity to clarify/reteach any specific grammar strategies you have identified your students needing. Give time for full revisions resulting in a third and final draft.

Publish:

Publish the final copies of the resulting word problems and strategies in math notebooks or on word processing software that enables printing. Share the published work with other math classes in your school or at other schools (via paper or cloud sharing) with whom you collaborate. Challenge the other math classes to solve the problems and identify strategies/concepts they used in solving the problems.

This Paideia Lesson Plan was created by:

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“Spider Legs” Problem

“Dad, where have you been?” asked Robert.

“I have been in the attic, son,” replied Dad. “And do you know what I saw up there? There was a big web with 17 spiders and flies on it.”

“How many spiders were there?” asked the little boy curiously.

“Well, there were a total of 114 legs on the web,” answered Dad with a smile.

“Now you can find out how many spiders there were by yourself.”

Help poor Robert find out how many spiders were on the web in the attic.