

Histogram Sorting Using Cooperative Learning

Instructor Lesson Plan

A Cooperative Learning lesson plans involve four steps:

1. Making preinstructional decisions.
2. Explaining the task and cooperative goal structure.
3. Monitoring and intervening during the lesson.
4. Assessing and processing the lesson.

Preinstructional Decisions

1. Group Size: Groups of 4 students.
2. Assigning student groups: Students count off in order to form groups of four. For example, in a class of 28 students ($28/4 = 7$), count off by 7. This creates seven groups of four students.
3. Roles: Within each group of four students, divide students into two pairs.
4. Room Arrangement: Groups of four students.
5. Materials: One copy of 15 pairs of graphs numbered one through 15 for each pair of students (i.e., 2 copies for each group of 4).

Explaining Task and Cooperative Goal Structure

1. Instructional Task: Today's lesson involves four steps.
 - a. First, each group of two students will be presented with 15 pairs of graphs. The mean for each graph (μ) is given just above each histogram. For each pair of graphs student pairs must:
 - i. Indicate whether one of the graphs has a larger standard deviation than the other or if the two graphs have the same standard deviation.
 - ii. Try to identify the characteristics of the graphs that make the standard deviation larger or smaller.
 - b. Second, after completing each page, groups of two will compare their answers with another group of two. The group of four must reach consensus about their answers and the characteristics of the graphs that underlie their answer.
 - c. Third, the instructor will randomly select one individual from different groups of four to justify their answer for a given problem.

- d. Fourth, individual students will complete a short quiz based on today's lesson.
2. Criteria for Success: (1) First, students are to indicate whether one of the graphs has a larger standard deviation than the other, or if the two graphs have the same standard deviation. (2) Second, students must be able to explain what characteristics of the graphs indicate why the standard deviations are larger or smaller.
 3. Positive Interdependence: To begin, each pair will complete one page of graphs. After completing each page, groups of two will then compare their answers with those of another pair. Each group of four must then reach consensus on the answers and the graph features underlying their decisions. At random, the instructor should ask one individual from each pair (or group of 4) to explain their answers.
 4. Individual Accountability: Each group member is responsible for presenting their results. I will call on individuals at random to explain their answers. Also, at the end of class we will individually take a quiz based on today's lesson. answer on a particular problem.

→ See sample assessment with the original activity at <http://www.causeweb.org/repository/StarLibrary/activities/delmas2001>.

5. Intergroup Cooperation: Should any group of four be unable to reach consensus, compare your categories with another group of four. If your answers differ, choose the best answer.
6. Expected Behaviors: I expect to see the following things while you are working: (1) group members will contribute ideas, and (2) group members will ask clarification when they do not understand a particular reason for a sorting category..

→ See "Teaching Social Skills" in the Cooperative Learning module for tips on encouraging expected behaviors.

Monitoring and Intervening

1. Systematically observe each group's taskwork (efforts to solve the problems) and teamwork (efforts to work together effectively).
2. When a group is struggling, watch for the right moment, then point out the problem (whether it be taskwork or teamwork). Then, ask the group what can be done about it. This establishes the teacher as a consultant rather "answer-giver".

Assessing and Processing

1. Assessment of Individual Learning: Randomly select a student to explain an answer.
2. Assessment of Group Productivity: Reward one bonus point for sorting and one bonus point for being able to explain the group's categories.

3. Small Group Processing: “How well did we manage our time?”
4. Whole Class Processing: Lead a discussion on how well groups worked together. Model good processing by sticking close to actual, specific observations of positive behaviors.
5. Celebration: Turn to your group and say, “We did it! Thanks for your help!”