

Grade 4 Mathematics

Data Analysis, Probability, and Discrete Mathematics:

Lesson 6

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol () by them.

Purpose of Lesson 6:

- In this lesson, the tutor and the students will
 - ✓ demonstrate an informal understanding of logic problems.

Equipment/Materials Needed:

- Copies of Student Sheet 117
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 6:

- Run one copy of Student Sheet 117 for each student.
- Have paper and pencils available.

Lesson 6: Data Analysis

Say:

Often you will be given problems that you need to solve by thinking logically. This process is called *logical reasoning*. You need to decide how the facts in a problem are related. Usually if you draw a picture, make a table, or make a list you can see the relationships.

 Give Student Sheet 117 to the students.

Say:

Look at problem 1. What is the problem asking? (In what order did the students finish the race?) **What could you do to organize the clues?** (Some will draw a picture showing 1st place, 2nd place, etc. Others will make a list.) Let them talk about what might help. **What does the first clue tell you?** (Carlos finished between Jack and Jill, so the order could look like either of these.)

Winner	Jack	Carlos	Jill
Winner	Jill	Carlos	Jack

What does the second clue tell you? (Carlos finished before Jill, so the order must look like this.)

Winner	Jack	Carlos	Jill
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What does the third clue tell you? (Harriett finished in first place. The order is the following.)

Winner	Harriett	Jack	Carlos	Jill
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Say:

Look at problem 2. What is the problem asking? (Which of the orders are possible?) What could you do to solve the problem? (Make a list of which order the students finished and check each answer.)

Clue 1 says Tom finished before Frank. So far the order is Tom, then Frank.

Clue 2 says Harry finished after Frank. Now the order is Tom, Frank, and Harry.

Clue 3 says Dick finished first. This clue makes the order Dick, Tom, Frank, and Harry. The only answer that makes sense is B.

Say:

Look at problem 3. What is the problem asking? (Who lives in which house?) **What do the clues tell you? It is always wise to read all of the clues before beginning the problem. In this problem, the last clues are the most useful.**

Clue 5 says Maude lives in the last house, so she lives in Number 28.

Clue 3 says Chrissie lives next to Maude, so she lives in Number 26.

Clue 4 says Janet lives in the first house, so she lives in Number 22.

Paula has to live in Number 24.

Note: These clues could have been used in many different orders.

Say:

Look at problem 4. What is the problem asking? (Which person has what occupation?) **What do the clues tell you?**

Clue 1: If Dudley went to lunch with the teacher, Dudley cannot be the teacher. Put an x in the teacher box for Dudley.

Clue 2: If Kim does not know how to drive a van, Kim cannot be the van driver. Put an x in the van driver box for Kim.

Clue 3: Isaac is the teacher. Put a check in the teacher box for Isaac. If Isaac is the teacher neither Kim nor Dudley can be the teacher, so put x in the teacher boxes for them. If Isaac is the teacher, Isaac cannot be the doctor or the van driver. Put x 's in those boxes for Isaac. This process leaves Dudley as the van driver, so Kim must be the doctor.

 Have one student summarize today's lesson. Emphasize that using tables, charts, and lists can make logical reasoning problems much easier.

Student Sheet 117 (Data Analysis: Lesson 6)

1. Carlos, Harriett, Jack, and Jill were in a race.
Clue 1: Carlos finished between Jack and Jill.
Clue 2: Carlos finished before Jill.
Clue 3: Harriett finished in first place.
In what order did they finish the race?

2. In another race, Tom finished before Frank. Harry finished after Frank. Dick finished first. Which of the following is possible?
A. Tom finished last. B. Tom finished before Harry.
C. Frank finished first. D. Dick finished after Tom.

3. Paula, Maude, Chrissie, and Janet live next door to each other on one street. The house numbers are 22, 24, 26, and 28. Who lives in which house?
Clue 1: Paula does not live in the first house.
Clue 2: Paula lives next to Chrissie.
Clue 3: Chrissie lives next to Maude.
Clue 4: Janet lives in the first house.
Clue 5: Maude lives in the last house.

4. Dudley, Isaac, and Kim are a teacher, a doctor, and a van driver, although not in that order. Decide who has which occupation. The table will help you organize the information.
Dudley went to lunch with the teacher.
Kim does not know how to drive a van.
Isaac is the teacher.

	Teacher	Doctor	Van Driver
Dudley			
Isaac			
Kim			