

Grade 4 Mathematics

Data Analysis, Probability, and Discrete Math:

Lesson 4

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 (\downarrow) by them.

Purpose of Lesson 4:

- In this lesson, the tutor and the students will
 - ✓ use lists and tree diagrams to generate and record all possible outcomes or choices of a set of objects, and
 - ✓ use lists and tree diagrams to generate and record all possible outcomes or choices in a given situation.

Equipment/Materials Needed:

- Copies of Student Sheet 84
- Paper and pencils
- Two coins of any kind
- Chalkboard

Preparations before beginning Lesson 4:

- Run one copy of Student Sheet 84 for each student.
- Have paper and pencils available.
- Get two coins.

Lesson 4: Data Analysis, Probability, and Discrete Math Measurement

Give Student Sheet 84 to the students. Have them read problem 1.

Say:

What is the question in the problem? (How many outfits can Scott make from the clothes he has packed?) You may need to make sure that students understand that an outfit for this problem means one shirt and one pair of pants. **What information is given?** (3 shirts – red, blue, and green – and 2 pants – gray and tan) **I want you to work the problem and be ready to explain what you did. Make sure you find all of the outfits.** Do not give a lot of help at first. You want to see whether the students are organized in their thinking. Have them share the way they worked the problem. Did they draw a picture, make a list, make a table, etc. Did they start with one color shirt and match it with the colors of pants? Did they start with one color pants and match it with each color shirt? Did they just randomly choose pants and shirts?

Answers: Some students will approach the task by matching one color shirt with different color pants.

<u>Shirts</u>	<u>Pants</u>
Red	Gray
Red	Tan
Blue	Gray
Blue	Tan
Green	Gray
Green	Tan

Some students will match each color shirt with one color pant.

<u>Shirts</u>	<u>Pants</u>
Red	Gray
Blue	Gray
Green	Gray
Red	Tan
Blue	Tan
Green	Tan

The answers are the same; just the order is different.

Say:

A *tree diagram* can help you organize your list. Let's let the shirts represent the tree trunk. Write the following on the board.

Tree Trunk

Shirts

red

blue

green

Let's look at the tree of red shirts. I could draw a branch for the gray pants and a branch for the tan pants. It would look like this. Draw the following on the board.

Tree Trunk

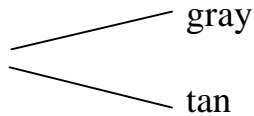
Branches

Shirts

Pants

Choices

red



red shirt, gray pants
red shirt, tan pants

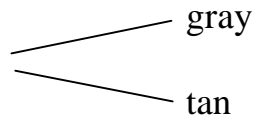
Have the students draw tree diagrams for the other two colors of shirts. It should look like the following:

Shirts

Pants

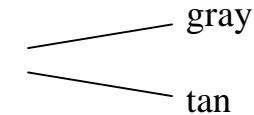
Choices

blue



blue shirt, gray pants
blue shirt, tan pants

green



green shirt, gray pants
green shirt, tan pants

Scott can make 6 different outfits from the clothes he has packed.

] Place one coin in front of the students. Then place two coins.

Say:

Suppose I toss this coin? What could happen? (We could get a head or tail.) **How many outcomes are possible?** (2) **What are the outcomes?** (heads or tails) **Suppose I toss two coins? What could happen? Make a list of the outcomes and draw a tree diagram.** Have one student write the list on the board and have another student draw the tree diagram.

Answers:

<u>First coin</u>	<u>Second coin</u>	<u>Outcomes</u>
Heads	Heads	Heads, Heads
Heads	Tails	Heads, Tails
Tails	Heads	Tails, Heads
Tails	Tails	Tails, Tails

<u>First coin</u>	<u>Second coin</u>	<u>Outcomes</u>
Heads	Heads	Heads, Heads
	Tails	Heads, Tails
Tails	Heads	Tails, Heads
	Tails	Tails, Tails

Give problems 2 and 3 from Student Sheet 84. If no one chooses to do a tree diagram for either problem, have students draw a tree diagram for problem 4. You want the students to have some practice on drawing tree diagrams, although either method is correct.

Answers:

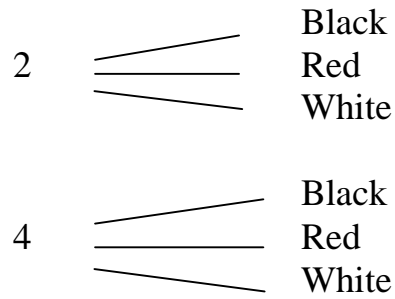
2. 9 Choices

	<u>Skirt colors</u>	<u>Blouse colors</u>
White	Red	Red
	White	White
	Blue	Blue
Blue	Red	Red
	White	White
	Blue	Blue
Black	Red	Red
	White	White
	Blue	Blue

3. 6 Choices

Number of Doors

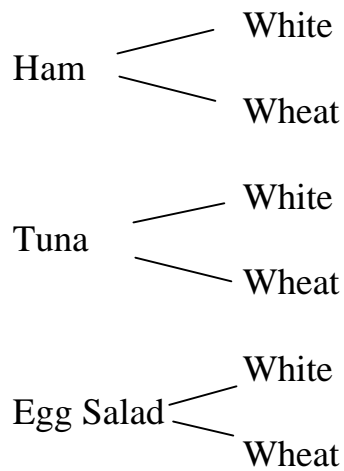
Car Color



4. 6 Choices

Filling

Bread



] Have one student summarize today's lesson. Making lists and drawing diagrams can help students organize their thinking.

Student Sheet 84 (Data Analysis: Lesson 4)

Make a list or draw a tree diagram to answer the questions.

1. Scott was packing for a trip and did not want to take too many clothes. He packed three shirts. One shirt was red, one blue, and one green. He packed two pairs of pants. One pair was gray, and the other was tan. **How many different outfits can Scott make from the clothes he has packed?**

2. The 4th grade class must decide on a uniform for girls. They have a choice of a white, black, or blue skirt, and a red, white, or blue blouse. **How many choices of outfits does the class have and what are the choices?**

3. Danny's family is buying a car. They can get a two-door or a four-door car. They are looking at black, red, or white cars. **How many choices does Danny's family have and what are the choices?**

4. The lunchroom serves sandwiches. You can get ham, tuna, or egg salad. You can choose white or wheat bread. **How many choices of sandwiches are offered and what are the choices?**