Problem of the Week
Problem C and Solution
Who Brought What When?

Problem

Xavier, **Y**vonne and **Z**ak arrived at school at three different times. They each brought one of their favourite snacks to share with the other two (one brought pretzels; one brought cookies; one brought licorice), and their favourite sports apparatus (one brought a baseball; one brought a soccer ball; one brought a football).

We know a few other facts:

1. The first to arrive did not bring cookies.
2. Xavier arrived second and brought a football.
3. Yvonne arrived before Zak.
4. The person who brought cookies also brought a baseball.
5. The person who brought pretzels did not bring a soccer ball.

Determine the order they arrived in, what they each brought for a snack, and which sports apparatus they each brought.

Solution

When solving logic problems, setting up a chart to fill in is generally a good way to start.

	Order of Arrival	Snack	Sports Apparatus
Xavier			
Yvonne			
Zak			

Some of the given information is often more helpful than other information. For example, in the second statement we learn that Xavier arrived second and brought a football. Now the third statement gets us the fact that Yvonne arrived first and Zak arrived third. (This is true since Yvonne arrived before Zak and she could not arrive second leaving only the first and third spots left.) We can add this information to the chart.

	Order of Arrival	Snack	Sports Apparatus
Xavier	2nd		football
Yvonne	1st		
Zak	3rd		

We can combine the first statement and the fourth statement. Yvonne did not bring cookies. The person who brought cookies also brought a baseball. This cannot be Xavier since he brought a football. Therefore, Zak brought cookies and a baseball. Since there is only one piece of sports apparatus unaccounted for, Yvonne must have brought the soccer ball. We will add this new information to our chart.

	Order of Arrival	Snack	Sports Apparatus
Xavier	2nd		football
Yvonne	1st		soccer ball
Zak	3rd	cookies	baseball

We can now use the fifth statement to conclude that Xavier brought pretzels since the person bringing pretzels did not bring a soccer ball and Xavier is the only one without a snack accounted for other than Yvonne (who brought the soccer ball).

	Order of Arrival	Snack	Sports Apparatus
Xavier	2nd	pretzels	football
Yvonne	1st		soccer ball
Zak	3rd	cookies	baseball

The only snack unaccounted for is the licorice and Yvonne is the only one whose snack is unknown. Therefore, Yvonne brought licorice and our chart can be completed.

	Order of Arrival	Snack	Sports Apparatus
Xavier	2nd	pretzels	football
Yvonne	1st	licorice	soccer ball
Zak	3rd	cookies	baseball

The information is summarized in the chart but will be stated below for completeness.

- Yvonne arrived first bringing licorice and a soccer ball.

- Xavier arrived second bringing pretzels and a football.

- Zak arrived third bringing cookies and a baseball.