

The Harvey Girls



Number & Operations

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Number & Operations and the Harvey Girls

In 1873, Fred Harvey, who had experience providing food service for the railroads, opened three restaurants along the Kansas Pacific Railroad. Within three years, Harvey had entered into an agreement with the Atchison, Topeka & Santa Fe Railroad to operate restaurants along its lines. The Santa Fe Railroad did not charge Harvey rent and in exchange he opened restaurants to provide services to the railroad's customers. The arrangement proved highly successful to both parties, as the Santa Fe Railroad's customers enjoyed the convenience of Harvey's restaurants and Harvey had access to a large group of customers who had few other choices.

At its peak, Harvey operated over 80 restaurants across the United States. Harvey also operated dining cars that were attached to Santa Fe Railroad trains. One of Harvey's biggest challenges was finding reliable help for his restaurants. To this end, he placed advertisements in newspapers across the nation seeking young women to work in his restaurants, many of which were located in out-of-the-way places. Harvey's ads sought single "young women, 18 to 30 years of age, of good character, attractive and intelligent." These women became known as the "Harvey Girls."

In an era when few women sought employment, especially far from home, the Harvey Girls came to represent a new horizon of opportunity for many women. The Harvey Girls had to serve customers quickly to allow them to catch their trains on time. The Harvey Girls also had to make change, coordinate orders, and live with their fellow employees. Paid a starting wage of \$17.50 per month, in time over 100,000 young women served as Harvey Girls, with over 20,000 eventually marrying gentlemen they met on the job.

Value of Money

Harvey Girls were responsible for taking customers' payment for meals. As a result, they needed to be very familiar with coins used and adept at making change. If a Harvey Girl made incorrect change, the difference would be deducted from her salary. Since many of the Harvey Girls took this sort of work in order to make money that they could send to their families back East, it was important that they be very familiar with the coins they used.

Coin Queries

Materials needed:

- 4 nickels;
- 2 pennies;
- 2 partners

With the coins hidden from view of two of the students, the first student presents his or her partners with the following clues in the sequence given. After each clue, the two students being quizzed discuss what they know for sure. After this, the first student asks the other two if they have sufficient information to guess the coins the first student has or if they desire another clue. The coins can be guessed from the following clues:

Clue No. 1: I have six coins.

Clue No. 2: I have only nickels and pennies.

Clue No. 3: I have at least two pennies.

Clue No. 4: I have more nickels than pennies.

Easier queries are more suitable for younger children. Be sure to provide students with coins to use for figuring.

Query No. 1: I have two coins worth six cents.

Query No. 2: I have three coins worth fifteen cents.

Query No. 3: I have four coins worth twelve cents.

Multiple Ways to Solve the Same Problem

The Harvey Girls needed to make change very quickly at times. Sometimes they needed to rush to make change so a customer would quickly be able to catch a train that was pulling out of the station. Because of this, the Harvey Girls practiced repeatedly so that they could make as many combinations as possible quickly. Practice with the exercise below and see how many combinations you can make.

Making Change

Materials needed:

- Pennies, at least 100;
- Nickels, at least 20;
- Dimes, at least 10;
- Quarters, at least 4;
- Paper and pencils.

Find all the ways to make change for \$0.50.

Easier version: Find all the ways to make change for a quarter.

Harder version: Find all the ways to make change for a dollar.

Keeping Track of Customers

The Harvey Girls needed to keep track of all the customers who sat in their sections of the restaurant, each customer's order, and which train each customer arrived upon and the time of his or her departure. Each Harvey Girl had a unique way of keeping track of these things, often using charts.

The 0-99 Chart

Materials needed:

- A 0-99 chart such as the one below;
- Red crayon or marker.

Follow these directions to color each of the 0-99 charts.

1. Color all the even numbers;
2. Color all the numbers with digits that add to 8;
3. Color the numbers with digits that differ by one;
4. Color all the numbers with a 4 in them;
5. Color the multiples of three;
6. Color the numbers with both digits the same.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Leisure Activities

Many of the Harvey Girls were away from home for the first time, and often were lonely and homesick. Many of the young women read to entertain themselves, sometimes with books they had bought from home, sometimes with books given to them by their families, and sometimes with books left behind by passengers who were hurrying to catch a train. One Harvey Girl entertained her friends with this problem she found in a book a passenger had left behind at her table. See if you can solve it!

Pascal's Triangle

Figure out how this pattern would extend to include additional rows beneath the ones provided. Look for patterns in rows and diagonals.

				1					
				1		1			
			1		2		1		
		1		3		3		1	
	1		4		6		4		1
1		5		10		10		5	
									1

Bonus: Find out who Pascal was!

Communication Home

The Harvey Girls frequently wrote letters home to their families. They sometimes also wrote letters to friends who had moved away and gotten married or to passengers whom they had met while working at the Harvey restaurants. As such they often needed to purchase postage stamps to send their letters. Knowing the various combinations of stamps was thus very important for them to communicate with families and friends

Postage Stamp Possibilities

You can use different denominations of stamps to get the proper postage to send a package or letter. Imagine you are trying to send a letter to your family. You are going to investigate the postage amounts that can be used when you are restricted to only using certain stamps.

To begin, imagine that the post office has run out of many denominations of stamps, and is only selling the ones they have left, that come in 2¢ and 8¢ denominations. What amounts of postage would be impossible to make? Is there a largest impossible amount? Explain your answers.

Do the same calculation if there were only 3¢ and 4¢ stamps. Then continue with other combinations of two denominations of stamps. For each combination, explain the following:

1. How many impossible amounts are there?
2. Is there a largest impossible amount and, if so, what is it?

Write an explanation for each of your answers.

