Name:_____ #_____
4.OA.4

Jason and Laura were at the soccer game. Jason told Laura that his two daughters, Penny and Lily, were celebrating birthdays that week. He didn't tell Laura how old they were. Instead, he gave Laura these clues about their ages:

- Each of their ages is a factor of 24
- 36 is a multiple of both Penny's age and Lily's age.
- 30 is a multiple of Lily's age, but not Penny's age.
- The sum of their ages is 14.

Use Jason's clues, the chart, and the space below to help figure what Penny and Lily's ages are.

Penny	Lily	**SUM**

Identify Penny and Lily's ages and explain how you figured out how old the girls are.

Teacher notes:

• Students may do calculations on the paper, either to solve or to check their work. You may also choose to give students extra paper on which they can do their work.
• The target concept of this task is described in 4.OA.4: *Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.*
• For this task, students should ultimately indicate that Penny is 12 and Lily is 2.
• Common errors for this task would be for students to identify a pair of ages that meets some but not all of the given criteria. For example, they might select 10 for Lily's age and 4 for Penny's age. These ages would meet some of the criteria (sum of 14, 30 is a multiple of 10 but not 4, 36 is a multiple of 4, 4 is a factor of 24) but not others (10 is not a factor of 24, 36 is not a multiple of 10). When scoring a task for a student who selects such numbers, it may be helpful to consider each number in the context of all the clues to see how many clues each answer meets. You may rate the student to indicate that he or she "got" the target concept if the numebrs meet many, but not all, of the clues.
• In addition, you may choose to use the level of student work to distinguish between a 3 and a 2 or a 2 and a 1 when scoring this task. If you decide to account for the student's work when grading, it is important to make sure the students know in advance of working that the task will be graded based on the correct answers and their work.
• The students' work can be helpful in determining whether students have a plan or strategy for finding factors (i.e., finding them in pairs or beginning with a low number and working up) or if students seem to be using a more random, guess-and-check style method.

Not yet: Student shows evidence of misunderstanding, incorrect concept or procedure.		**Got It:** Student essentially understands the target concept.	
0 Unsatisfactory: Little Accomplishment The task is attempted and some mathematical effort is made. There may be fragments of accomplishment but little or no success. Further teaching is required.	**1 Marginal: Partial Accomplishment** Part of the task is accomplished, but there is lack of evidence of understanding or evidence of not understanding. Further teaching is required.	**2 Proficient: Substantial Accomplishment** Student could work to full accomplishment with minimal feedback from teacher. Errors are minor. Teacher is confident that understanding is adequate to accomplish the objective with minimal assistance.	**3 Excellent: Full Accomplishment** Strategy and execution meet the content, process, and qualitative demands of the task or concept. Student can communicate ideas. May have minor errors that do not impact the mathematics.

Adapted from Van de Walle, J. (2004) Elementary and Middle School Mathematics: Teaching Developmentally. Boston: Pearson Education, 65