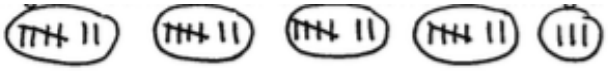
PROFICIENCY CHALLENGE 1 ANSWER KEY

AMV = “Answers May Vary”

1		One possible diagram is: 
	a	5 vans are needed to transport all 31 people.
	b	4 of the vans will be filled.
	c	4 more people can attend, bringing the total to 35 people.
	d	No it is not possible. If each van had 6 people, that would be 5 x 6 = 30 people. One more person would have to join a van, and that van would then have 7 people.

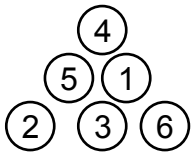
2		The spider will crawl out at the end of the 12th day. Common incorrect answers include days 13 or 14.

3	a	Mrs. Doodle bought 384 crayons.
	b	Each student should get 12 crayons.
	c	She needs 4 more crayons per student, or 2 more boxes of crayons.

4		A table similar to this one may be helpful, but is not required. While the role of length and width could be reversed, the dimensions and perimeter would not different from those already listed in the table.
	a	All dimensions are listed in inches: 120 x 1, 60 x 2, 40 x 3, 30 x 4, 24 x 5, 20 x 6, 15 x 8, 12 x 10
	b	The 12 inch by 10 inch rectangle has the smallest perimeter (44 inches).

Length (in inches)	**Width (in inches)**	**Perimeter (in inches)**
120	1	242
60	2	164
40	3	86
30	4	68
24	5	58
20	6	52
15	8	46
12	10	44

PROFICIENCY CHALLENGE 1 ANSWER KEY (Continued)

5	AMV; Answers should include going 3 blocks north and 1 block east. For example: "You are facing north. Go straight for three blocks. Turn right. Go straight for 1 block and you are there."
6	AMV; Examples include: $4 + \underline{5} = \underline{9}$; $\underline{3} \cdot \underline{7} = 2\underline{1}$; $\underline{2} \cdot \underline{4} = \underline{8}$; $6 - \underline{6} = \underline{0}$ $4 + \underline{1} = \underline{5}$; $\underline{3} \cdot \underline{9} = 2\underline{7}$; $\underline{2} \cdot \underline{4} = \underline{8}$; $6 - \underline{0} = \underline{6}$
7	AMV; For example: 

PROFICIENCY CHALLENGE 2 ANSWER KEY

AMV = “Answers May Vary”

1	AMV; For example: $(6 \div 6 + 6)^2$

2	320 square tiles are needed to cover the floor.

3

A table like the one below may be helpful, but is not required. The rows in the table represent possible ways for Kyrie to spend 35 cents. Note that the options below only include Kyrie spending exactly 35 cents. More options are available if Kyrie spends at most 35 cents.

Note the only option where Kyrie buys at least one of each item is 2 hard candies, 1 piece of gum, and 1 lollipop.

# of hard candies (5 cents each)	# of pieces of gum (10 cents each)	# of lollipops (15 cents each)
7	0	0
5	1	0
4	0	1
3	2	0
2	1	1
1	3	0
0	2	1

4

Scores which are possible: 14, 26, 30, 38, 42
Scores which are not possible: 6, 15, 23, 31, 58

6 and 58: Because Juan must score at least 2 for each of his 5 throws, he can earn a minimum score of 10. So a score of 6 is not possible. Likewise, since he scored at most 10 for each score, anything more than 50 is not possible.

15, 23, and 31: Odd scores are not possible because adding even scores together always results in a sum that is even.

Possible ways to get the remaining scores will vary. For example:
38 = 10 + 10 + 10 + 2 + 6
30 = 10 + 6 + 6 + 4 + 4
42 = 10 + 10 + 10 + 10 + 2
26 = 10 + 10 + 2 + 2 + 2
14 = 2 + 2 + 2 + 2 + 6

PROFICIENCY CHALLENGE 2 ANSWER KEY (Continued)

5	There are at least 119 eggs in the basket. The last clue tells us the number of eggs must be a multiple of 7, so 7, 14, 21, 28, 35, 42, 49, …. The first clue tells us that the number of eggs is odd. This means I could potentially have the following number of eggs: 7, 21, 35, 49, … The second clue tells us that the number of eggs is not a multiple of three (there will be 2 left over), so 21, 42, 63, 84, 105, … eggs are not possibilities. Continuing to analyze clues in this manner and eliminate options will leave 119 (which satisfies all clues) as the least number of eggs in the basket.

6	Jean's first jump was 1 foot 5 inches further than her second jump.

PROFICIENCY CHALLENGE 3 ANSWER KEY

1	$\frac{19}{20} > \frac{9}{10}$, $\frac{999}{1000} > \frac{99}{100}$, and $\frac{1000}{1001} > \frac{999}{1000}$ Reasons may vary. For example: Comparing the first pair of fractions to a whole, shows that $\frac{19}{20}$ is $\frac{1}{20}$ less than 1, while $\frac{9}{10}$ is $\frac{1}{10}$ less than 1. Since $\frac{1}{20} < \frac{1}{10}$ we know that $1-\frac{1}{20} > 1-\frac{1}{10}$ or $\frac{19}{20} > \frac{9}{10}$. Similar reasoning can be used for the following fraction pairs.

2	The ball will travel a total of 460 feet by the time it hits the floor for the 5th time. 160 + 80 + 80 + 40 + 40 + 20 + 20 + 10 + 10 = 460 AMV regarding how many times the ball will bounce before stopping and may depend on the type of ball in the problem.

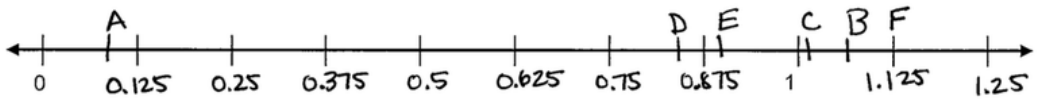
3	There are 18 floors in the building. Beginning at the middle floor, and then going down 5 floors and up 6 floors, puts you one floor above the middle floor. If going down 10 floors puts you on the ground floor, then the middle floor was the 9th floor. This would mean that there are 18 floors in the building.

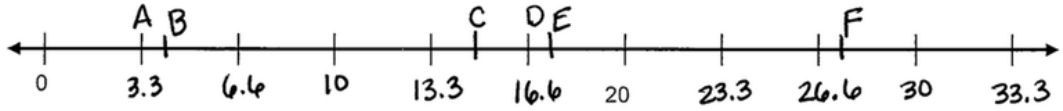
4	They need to reserve 23 sections to have enough seats for the employees and families. There are 270 seats in each section (15 x 18 = 270), and $6{,}000 \div 270 = 22r60$. There are 60 seats that are empty among the 23 sections. Since there are 23 sections and 60 empty seats, each section could have at least 2 empty seats. No, it is not possible to have an empty seat in every row since that would be 18 x 23 = 414 seats, and there are only 60 empty seats.

PROFICIENCY CHALLENGE 4 ANSWER KEY

1	Tigger will win the race. Every 5 feet (2 jumps) Roo and Tigger will be in the same spot. So at 5, 10, 15, 20, etc. they will be at the same location. That means at 120 feet, Roo and Tigger are tied again. At that point, Roo will jump 2 feet (to 122 feet), and Tigger will jump 4 feet (to 124 feet).

2	The perimeter is 42 feet. If the total area is 54 sq. ft., and there are 6 squares, each one has an area of 9 sq. ft. This would mean that the side length of each small square is 3 feet. 14 small square side lengths make up the perimeter of the figure, so the perimeter is 14 x 3 = 42 feet.

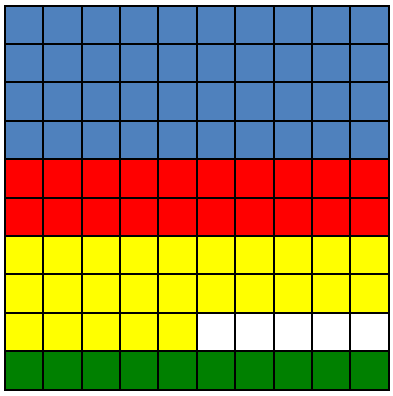
3	(A) 0.1 (B) 1.10 (C) 1.01 (D) 0.874 (E) 0.876 (F) $\frac{9}{8}$ 

4	(A) 3.3 (B) 3.3333 (C) 15 (D) 16.6 (E) 16.67 (F) $\frac{85}{3}$ 

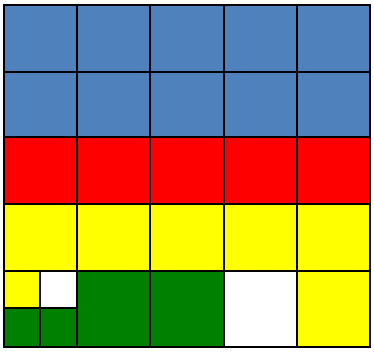
PROFICIENCY CHALLENGE 4 ANSWER KEY (Continued)

5

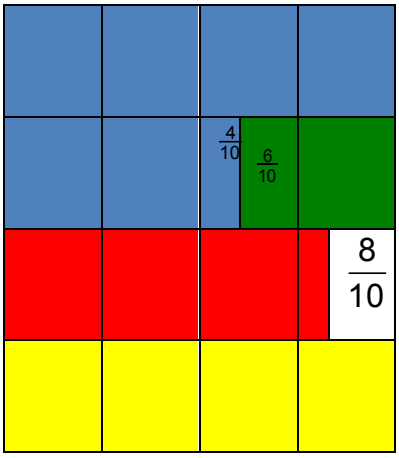
Placement of colors may vary.
There should be:



- 40% of the area is blue, so 40% of 100 squares is 40 squares.
- $\frac{1}{5}$ of the area is red, and $\frac{1}{5}$ of 100 squares is 20 squares.
- $\frac{25}{100}$ of the area is yellow, then 25 of the squares are yellow.
- One tenth of the area is green so 10 squares are green.
- 5% of the area is unshaded, and 5% of 100 squares is 5 squares.



- 40% of the area is blue, so 40% of 25 squares is 10 squares.
- $\frac{1}{5}$ of the area is red, and $\frac{1}{5}$ of 25 squares is 5 squares.
- $\frac{25}{100}$ of the area is yellow, then $6\frac{1}{4}$ of the squares are yellow.
- One tenth of the area is green so 2.5 squares are green.
- 5% of the area is unshaded, and 5% of 25 squares is 1.25 squares.



- 40% of the area is blue, so 40% of 16 squares is 6.4 squares.
- $\frac{1}{5}$ of the area is red, and $\frac{1}{5}$ of 16 squares is $3\frac{1}{5}$ squares.
- $\frac{25}{100}$ of the area is yellow, then 4 of the squares are yellow.
- One tenth of the area is green so 1.6 squares are green.
- 5% of the area is unshaded, and 5% of 25 squares is 0.8 squares.