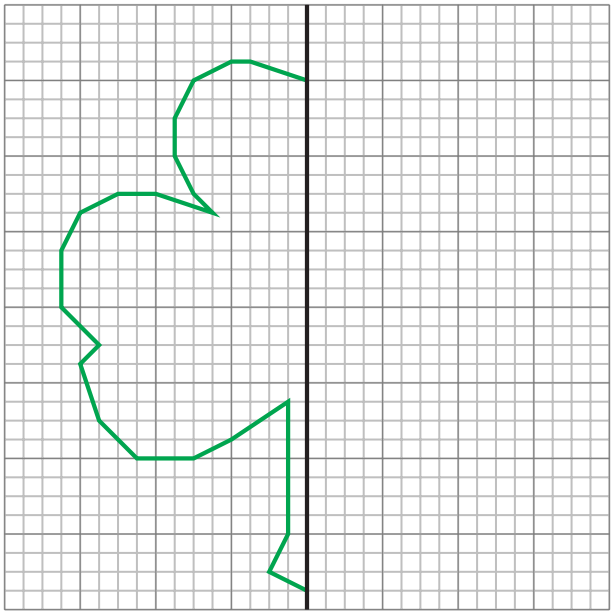
St. Patrick's Day Word Problems

Name: _____ Date: _____

1. Fionn and Eavan made green smoothies for their St. Patrick's Day party. Each smoothie required $\frac{3}{4}$ cup of milk, $\frac{1}{3}$ cup of vanilla yogurt, $\frac{1}{4}$ teaspoon mint extract, one banana, and $\frac{1}{8}$ teaspoon of green food coloring. How much of each ingredient did they use for twelve smoothies?

2. Draw the other side of the Shamrock by reflecting the existing drawing.



3. Briana had nine four-leaf clovers, twenty-nine three-leaf clovers, a two-leaf clover and a five-leaf clover. How many leaves were there in her collection?

4. Hugh wanted to paint his treehouse green for St. Patrick's Day. His mother said he needed to measure it and let her know the total surface area in order to get the correct amount of paint. He measured the six walls that needed painting and the three windows and two doors that were in the walls that didn't need painting.

Walls	Windows and Doors
$6' \times 5'$	$2' \times 2'$
$6' \times 3'$	$2' \times 2'$
$6' \times 3'$	$4' \times 2'$
$6' \times 4'$	$3' \times 5'$
$6' \times 7'$	$3' \times 5'$
$6' \times 8'$	

What surface area did he report to his mother?

5. Lenny the Leprechaun's pot of gold contained four diamonds, five rubies, twelve emeralds and 105 gold coins. In leprechaun currency, each diamond was worth $14.50, each ruby $12.75, each emerald $8.25 and each gold coin $3.50. How much was the contents of Lenny's pot of gold worth?

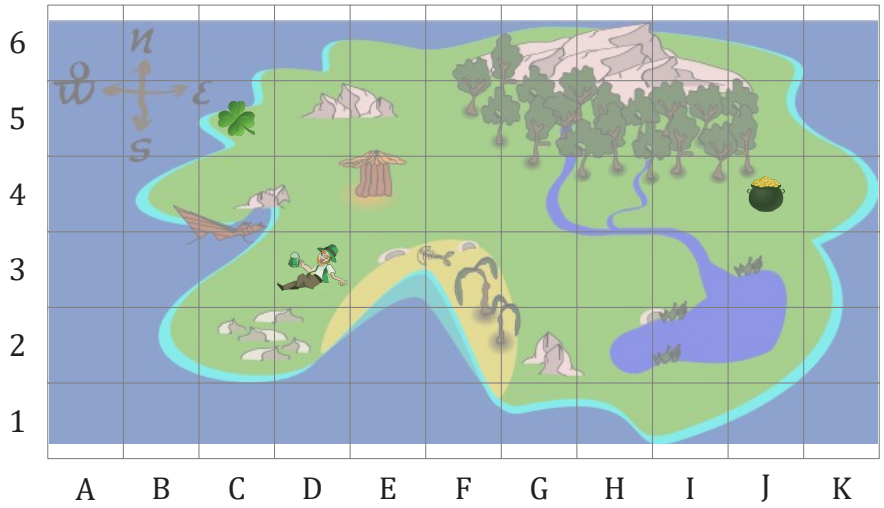
St. Patrick's Day Word Problems

6. Keela was making a flag of Ireland for St. Patrick's Day. She knew that the flag was exactly twice as long as it was tall and that there were three equally sized vertical bars in green, white and orange (from left to right). She used $9'' \times 12''$ construction paper to make her flag. The width of the green bar was exactly two short sides of the construction paper across minus a $\frac{1}{2}''$ overlap. What were the dimensions of the final flag and how many pieces of construction paper did it take?

7. The St. Patrick's Day parade in Shamrock followed a circuitous route through the city that only had streets running in a grid pattern from north to south and east to west. The parade started pointing east and had the following turns: right, right, left, right, right, left, left, right, left, right. In which direction did the parade end?

8. As everyone knows, shamrocks have three leaves and four-leaf clovers, well, they have four leaves. What possible combinations of shamrocks and four-leaf clovers would result in a total of 53 leaves?

9. At what map coordinates will you find the pot of gold? The four-leaf clover? The leprechaun?



10. If every letter is given a value based on its position in the alphabet (for example, a = 1, b = 2, c = 3 and so on), how much are the following worth in total? Which one is worth the most? SHAMROCK, SAINT PATRICK, LEPRECHAUN, FOUR-LEAF CLOVER

11. Sineads's dad was in charge of the door for the St. Patrick's Boogie. He counted 140 students come through the door and reported later that 84% of the boys and 80% of the girls were wearing green. If the total number of students wearing green was 115, how many boys and how many girls were at the boogie?

12. Niamh was looking at her calendar at 3:25 p.m. on February 15, 2016. She was really looking forward to the St. Patrick's Day party on March 17 at 2:00 p.m. How many days, hours and minutes did she have to wait? (2016 is a leap year)

St. Patrick's Day Word Problems

13. For St. Patrick's Day, Mrs. G's sixth grade class was given a choice of four different drinks. One-quarter of the class chose the green milkshakes, one-third of the class chose the green ginger ale, one-eighth of the class chose the green milk and one-sixth of the class chose the green juice. How many students did not have a drink?

14. The St. Patrick's Day jelly beans came in six colors: red, orange, yellow, green, blue and purple. Lochlan's package contained twice as many orange jelly beans as red. There were three more yellow jelly beans than green ones and five more purple than blue. There was one more green jelly bean than red and exactly the same number of green and blue. If there were 89 jelly beans in the package, how many of each color was there?

15. Ronan's art class was making a lot of shamrock cut-outs to decorate the halls of the school. Each shamrock required a square piece of green Bristol board. How many pieces of Bristol board would be required? If the students threw out the Bristol board that wasn't used for shamrocks, what percent of the Bristol board was wasted?

16. Lara the Leprechaun was very good at cartwheels and somersaults. Every cartwheel she did covered a distance equal to twice her arm's length from shoulder to wrist times 3.14. Her somersaults covered a distance of 3.14 times the distance from her chin to her knees (which was 15cm). If her arm length was 19 cm, approximately how far would she get in 25 somersaults and 25 cartwheels?

17. Larry the Leprechaun discovered that one of his nine coins was fake and the only way to tell was that the fake coin weighed slightly less than the real coins. Using his balance, he quickly discovered the fake coin after only two measurements. How did he do it? How many measurements would it take to discover one fake coin among 80 coins?

St. Patrick's Day Word Problems Answers

Name: _____ Date: _____

1. Fionn and Eavan made green smoothies for their St. Patrick's Day party. Each smoothie required $\frac{3}{4}$ cup of milk, $\frac{1}{3}$ cup of vanilla yogurt, $\frac{1}{4}$ teaspoon mint extract, one banana, and $\frac{1}{8}$ teaspoon of green food coloring. How much of each ingredient did they use for twelve smoothies?

They used:

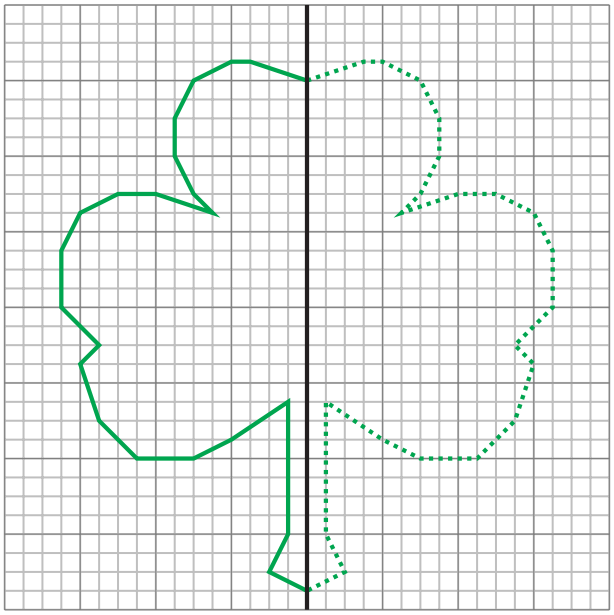
$12 \times \frac{3}{4} = 9$ cups of milk

$12 \times \frac{1}{3} = 4$ cups of vanilla yogurt

$12 \times \frac{1}{4} = 3$ teaspoons of mint extract

$12 \times \frac{1}{8} = 1\frac{1}{2}$ teaspoon of green food coloring

2. Draw the other side of the Shamrock by reflecting the existing drawing.



3. Briana had nine four-leaf clovers, twenty-nine three-leaf clovers, a two-leaf clover and a five-leaf clover. How many leaves were there in her collection?

$(9 \times 4) + (29 \times 3) + 2 + 5 = 130$ leaves in her collection.

4. Hugh wanted to paint his treehouse green for St. Patrick's Day. His mother said he needed to measure it and let her know the total surface area in order to get the correct amount of paint. He measured the six walls that needed painting and the three windows and two doors that were in the walls that didn't need painting.

What surface area did he report to his mother?

St. Patrick's Day Word Problems Answers

Walls	Windows and Doors	Walls SA	Windows and Doors SA
$6' \times 5'$	$2' \times 2'$	30 ft^2	4 ft^2
$6' \times 3'$	$2' \times 2'$	18 ft^2	4 ft^2
$6' \times 3'$	$4' \times 2'$	18 ft^2	8 ft^2
$6' \times 4'$	$3' \times 5'$	24 ft^2	15 ft^2
$6' \times 7'$	$3' \times 5'$	42 ft^2	15 ft^2
$6' \times 8'$		48 ft^2	
		180 ft^2	46 ft^2

180 ft^2 of walls minus 46 ft^2 of doors and windows equal 134 ft^2. Hugh reported to his mom that he needed to paint $\underline{134\ ft^2}$ of surface area.

5. Lenny the Leprechaun's pot of gold contained four diamonds, five rubies, twelve emeralds and 105 gold coins. In leprechaun currency, each diamond was worth \$14.50, each ruby \$12.75, each emerald \$8.25 and each gold coin \$3.50. How much was the contents of Lenny's pot of gold worth?

Lenny's pot of gold was worth:

$(4 \times \$14.50) + (5 \times \$12.75) + (12 \times \$8.25) + (105 \times \$3.50) = \underline{\$588.25}$

6. Keela was making a flag of Ireland for St. Patrick's Day. She knew that the flag was exactly twice as long as it was tall and that there were three equally sized vertical bars in green, white and orange (from left to right). She used $9'' \times 12''$ construction paper to make her flag. The width of the green bar was exactly two short sides of the construction paper across minus a $\frac{1}{2}''$ overlap. What were the dimensions of the final flag and how many pieces of construction paper did it take?

Width of the green bar: $(2 \times 9'') - \frac{1}{2}'' = 17\frac{1}{2}''$

The other two bars were the same width, so $17\frac{1}{2}'' \times 3 = 52\frac{1}{2}''$, or about six strips of colored paper wide. But there also needed to be a $\frac{1}{2}''$ overlap between the colors, so a further $2 \times \frac{1}{2}'' = 1''$ must be subtracted to get $52\frac{1}{2}'' - 1'' = 51\frac{1}{2}''$

The height of the flag is $51\frac{1}{2}'' \div 2 = 25\frac{3}{4}''$, which is a bit over two lengths of construction paper, so she had to use three lengths of construction paper for the height of the flag.

The dimensions of the final flag were $51\frac{1}{2}'' \times 25\frac{3}{4}''$, and she needed $6 \times 3 = 18$ pieces of construction paper to finish it.

7. The St. Patrick's Day parade in Shamrock followed a circuitous route through the city that only had streets running in a grid pattern from north to south and east to west. The parade started pointing east and had the following turns: right, right, left, right, right, left, left, right, left, right. In which direction did the parade end?

The parade ended up facing West, the opposite direction from which it started.

St. Patrick's Day Word Problems Answers

8. As everyone knows, shamrocks have three leaves and four-leaf clovers, well, they have four leaves. What possible combinations of shamrocks and four-leaf clovers would result in a total of 53 leaves?

Since 14 four-leaf clovers give us 56 leaves, we should try combinations from 1 to 13 four-leaf clovers, to find out how many shamrocks would be needed to reach exactly 53 leaves. There are only four possible combinations:

11 Four-Leaf Clovers + 3 Shamrocks

8 Four-Leaf Clovers + 7 Shamrocks

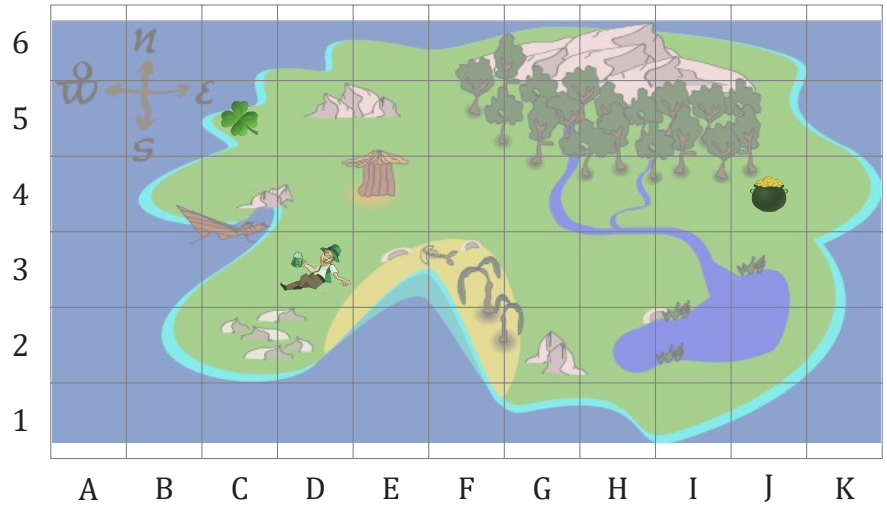
5 Four-Leaf Clovers + 11 Shamrocks

2 Four-Leaf Clovers + 15 Shamrocks

In algebraic terms, the following equation: $4f + 3s = 53$, where f represents the number of four-leaf clovers and s represents the number of shamrocks. From there we can rewrite the equation in terms of s: $s = \frac{53-4f}{3}$. We would have to replace f with values from 1 to 13, and select those for which s is a natural number (a positive integer).

E.g. $f = 5; s = \frac{53-4(3)}{3} = \frac{41}{3} = 13\frac{2}{3}$ (not a natural number)

9. At what map coordinates will you find the pot of gold? The four-leaf clover? The leprechaun?



The pot of gold is at J4, the four-leaf clover is at C5 and the leprechaun is at D3.

10. If every letter is given a value based on its position in the alphabet (for example, a = 1, b = 2, c = 3 and so on), how much are the following worth in total? Which one is worth the most? SHAMROCK, SAINT PATRICK, LEPRECHAUN, FOUR-LEAF CLOVER

SHAMROCK $= 19 + 8 + 1 + 13 + 18 + 15 + 3 + 11 = 88$

SAINT PATRICK $= 19 + 1 + 9 + 14 + 20 + 16 + 1 + 20 + 18 + 9 + 3 + 11 = 141$

LEPRECHAUN $= 12 + 5 + 16 + 18 + 5 + 3 + 8 + 1 + 21 + 14 = 103$

FOUR-LEAF CLOVER $= 6 + 15 + 21 + 18 + 12 + 5 + 1 + 6 + 3 + 12 + 15 + 22 + 5 + 18 = 159$

FOUR-LEAF CLOVER is worth the most.

11. Sineads's dad was in charge of the door for the St. Patrick's Boogie. He counted 140 students come through the door and reported later that 84% of the boys and 80% of the girls were wearing green. If the total number of students wearing green was 115, how many boys and how many girls were at the boogie?

If we make g = the number of girls and b = the number of boys, we have the following linear system:

$g + b = 140$

$0.8 \times g + 0.84 \times b = 115$

From there:

$0.8 \times g + 0.84(140 - g) = 115$

$0.8 \times g + 117.6 - 0.84 \times g = 115$

$117.6 - 0.04 \times g = 115$

$117.6 - 115 = 2.6 = 0.04 \times g$

$g = 2.6 \div 0.04$

$g = 65$

The number of girls wearing green was $0.8 \times 65 = 52$. The number of boys wearing green was $115 - 52 = 63$

12. Niamh was looking at her calendar at 3:25 p.m. on February 15, 2016. She was really looking forward to the St. Patrick's Day party on March 17 at 2:00 p.m. How many days, hours and minutes did she have to wait? (2016 is a leap year)

From February 15, 2016 to March 16, there were 14 days in February since it's a leap year, and 16 days in March.

$14 + 16 = 30$ days

From 3:25 p.m. on March 16, to 1:25 p.m. on March 17, there were $9 + 13 = 22$ hours

From 1:25 p.m. to 2:00 p.m. there were

$60 - 25 = 35$ minutes

Niamh has to wait 30 days, 22 hours and 35 minutes for the St. Patrick's Day party.

13. For St. Patrick's Day, Mrs. G's sixth grade class was given a choice of four different drinks. One-quarter of the class chose the green milkshakes, one-third of the class chose the green ginger ale, one-eighth of the class chose the green milk and one-sixth of the class chose the green juice. How many students did not have a drink?

$\frac{1}{4} + \frac{1}{3} + \frac{1}{8} + \frac{1}{6}$

$= \frac{7}{12} + \frac{1}{8} + \frac{1}{6}$

$= \frac{17}{24} + \frac{1}{6}$

$= \frac{21}{24} = \frac{5}{6}$

Five-sixths of the students had something to drink, so $1 - \frac{5}{6} =$ one-sixth of the students didn't drink anything.

14. The St. Patrick's Day jelly beans came in six colors: red, orange, yellow, green, blue and purple. Lochlan's package contained twice as many orange jelly beans as red. There were three more yellow jelly beans than green ones and five more purple than blue. There was one more green jelly bean than red and exactly the same number of green and blue. If there were 89 jelly beans in the package, how many of each color was there?

Taking the initial from each color, we have the following identities:

O = 2 x R
Y = G + 3
P = B + 5
G = R + 1
G = B
O + R + Y + G + P + B = 89

By replacing values in the last identity, we have:

(2 x R) + R + (G + 3) + (R + 1) + (B + 5) + G = 89

Grouping similar terms, and replacing again, we have

4 x R + (R + 1) + G + (R + 1) + 9 = 89
6 x R + (R + 1) + 11 = 89

7 x R + 12 = 89

7 x R = 89 - 12 = 77

R = 77 : 7 = 11

By replacing in the first identities, we have that

R = 11

O = 22

Y = 15

P = 17

G = 12

B = 12

15. Ronan's art class was making a lot of shamrock cut-outs to decorate the halls of the school. Each shamrock required a square piece of green Bristol board. How many pieces of Bristol board would be required? If the students threw out the Bristol board that wasn't used for shamrocks, what percent of the Bristol board was wasted?

As this is a numberless problem, students have to make a few assumptions based on their prior knowledge. How many shamrocks would the art class have to make to decorate the halls? How large is a piece of Bristol Board (it is usually 572 mm by 724 mm)? How large should the shamrocks be? How much of the space could you fill with shamrocks to minimize the amount of waste?

One approach would be to measure a piece of Bristol board, if there is one handy, then to decide on a size for the shamrocks based on the size of the Bristol board to maximize the amount used. The shamrocks would have to be large enough to be a wall decoration.

An example: Using the dimensions of the Bristol board in cm, $57 \div 3 = 19 and 72 \div 4 = 18$, so if each shamrock used an 18 cm by 19 cm piece of Bristol board, there wouldn't be large swaths of Bristol board wasted. Students might also realize that arranging alternate shamrocks rotated 180 degrees might maximize the Bristol board usage even more. Using the rectangular pieces of Bristol board, students could make $3 \times 4 = 12$ shamrocks from each piece (more with a creative arrangement). Depending on the size of the school, maybe 144 would be enough to decorate, so that would take $144 \div 12 = 12$ pieces of Bristol board. Students could use various methods to compare the amount of material that would be wasted, for example, they might make a shamrock and weight it and its waste to get an idea of the percentage. They could also use dot paper to determine how much would be waste and how much would be shamrock.

16. Lara the Leprechaun was very good at cartwheels and somersaults. Every cartwheel she did covered a distance equal to twice her arm's length from shoulder to wrist times 3.14. Her somersaults covered a distance of 3.14 times the distance from her chin to her knees (which was 15cm). If her arm length was 19 cm, approximately how far would she get in 25 somersaults and 25 cartwheels?

Somersaults: $15 \text{ cm} \times 3.14 \times 25 = 1177.5 \text{ cm}$

Cartwheels: $(19\,\text{cm} \times 2) \times 3.14 \times 25 = 2983\,\text{cm}$

$1177.5\,\text{cm} + 2983\,\text{cm} = 4160.5\,\text{cm} \approx 41.6\,\text{m}$

Lara would get approximately 42 m in 25 somersaults and 25 cartwheels.

17. Larry the Leprechaun discovered that one of his nine coins was fake and the only way to tell was that the fake coin weighed slightly less than the real coins. Using his balance, he quickly discovered the fake coin after only two measurements. How did he do it? How many measurements would it take to discover one fake coin among 80 coins?

Larry divided his coins into 3 groups of 3 and weighed the first two groups. If the two groups weighed the same, then the fake coin was in the third group. If one group weighed less, the lighter group contained the fake coin. Once he knew which group contined the fake coin, he could select two of them to weigh against each other. If they were the same weight, the fake coin was the one he didn't weigh. If one was lighter than the other, it was the fake.

For 80 coins, it would take 4 measurements. The first measurement would balance two groups of 27 with the third group of 26 set aside. The second measurement would balance two groups of 9 and leave the third group of 8 or 9 coins aside. The third measurement would balance two groups of 3 and leave the third group of 2 or 3 coins aside. The final measurement would balance 1 coin vs. 1 coin with a possible third coin left aside.