GRADE 6 LEARNING EXPERIENCE

Solid Waste Surveys

Summary

In this engaging math lesson, students learn about percentages through recycling activities. Students create an online survey to assess their classmates' recycling habits and analyze the data.

Objective

To learn about percentages and how to analyze and present quantitative data.
To learn about and encourage recycling within the school community.

Pre-Activity

WHAT IS PER CENT?

DIRECTIONS

PRESENTATION

Use the **"What is Per Cent?" (Appendix 1)** presentation provided to explain percentages to your class.

COLOUR BY NUMBERS

Have students complete the colour by numbers percentage activity.

NOTE: *By following the directions, the coloring should reveal a dog.*

MATERIALS

Appendix 1
What is per cent? (PDF)

Appendix 2
Colour by numbers

DURATION
30 mins

Activity

SURVEYS

DIRECTIONS

Explain that percentages can be used to express data that shows how many people respond to a question in a certain way.

Write the following question on the board with the these answer options: "Do you like scary movies?"

A) Yes B) No C) Sometimes

By show of hands, tally the total for each response (A, B, C) and record it on the board. Then, show each answer as a fraction (responses/total students). Divide the class total by the response total, then multiply by 100 to get the percentage.

MATERIALS

Whiteboard and markers

DURATION
30 mins

MAIN LEARNING OUTCOME

GRADE: 6

SUBJECT:

Math

Outcome 6
Students will be expected to demonstrate an understanding of per cent (limited to whole numbers) concretely, pictorially, and symbolically.

Indicators

- Explain that "per cent" means "out of 100."
- Explain that per cent is a ratio out of 100.
- Represent a given per cent concretely and pictorially.
- Record the per cent displayed in a given concrete or pictorial representation.
- Express a given per cent as a fraction and a decimal.
- Identify and describe per cent from real-life contexts, and record them symbolically.
- Solve a given per cent problem involving benchmarks of 25%, 50%, 75%, and 100%.

CROSS-CURRICULAR LINKS

IC Technology

Outcome 3: Communication
Students will use digital tools to communicate and work collaboratively, including at a distance, to support individual learning and to contribute to the learning of others.

divertNS.ca

Share on social media!
#NothingWasted

ABOUT DIVERT NS

Divert NS is a not-for-profit organization championing recycling in Nova Scotia. For over 20 years we've helped build a culture of recycling through environmental stewardship, education, and innovation.

Divert NS operates the Beverage Container Deposit-Refund Program and the Used Tire Management Program. In addition, we work in collaboration with government, industry, and academia to divert waste-resources from landfill.

Divert NS, in partnership with municipalities, delivers education and awareness programs to schools, businesses, and community groups. Divert NS also works to develop stewardship agreements and funds innovative research and development initiatives.

We welcome feedback from students and teachers on these lesson plans and resources. Please send your feedback to:

Toll-free
1.877.313.7732

info@divertns.ca

divertNS.ca

STUDENT/CLASS SURVEYS (cont'd)

DIRECTIONS

SURVEY ACTIVITY

Students will create a survey to analyse the recycling habits of the class (or of the school). In groups of 3–5, or as a class, ask students to come up with 5 or more multiple choice questions for the survey.

SAMPLE QUESTIONS:

Do you recycle at home? A) Always B) Mostly C) Sometimes D) Never

If you don't recycle at home, why not? A) We have no recycle bins, B) I am not sure what is recyclable, C) The garbage is easier, D) Other

Do you take your refundable containers back for money? A), B), etc.

Do you recycle more at school, or at home, A), B), etc.

Students can create paper copies of the survey, or use Google forms *(see tutorial link, right)*. When surveys are finished, students can post to Google classroom and have classmates complete the survey.

MATERIALS

Class set of Chromebooks or computer lab

Internet access (if using Google forms or classroom)

DURATION
1 hour

Tutorial on how to use Google forms:
sites.google.com/a/gnspes.ca/provincial/drive/forms

OPTION Surveys could also be shared on the school website or with other classes.

Post-Activity
SURVEY ANALYSIS / GRAPHS AND POSTERS

DIRECTIONS

After survey responses have been collected, students can analyze the data. If using Google forms, they can click on the "responses" tab at the top of their survey.

Have a class discussion about the findings.

- *For example: Why do people recycle? Or why not?*

Using the survey data, have students create graphs for their posters. Ask them how they can encourage more students to recycle. Have them add some of those ideas onto their posters

OPTION Have the graph posters displayed around the school or present results at an assembly.

MATERIALS

Poster paper

Coloured pencils, markers or crayons

Internet access (if using Google forms or classroom)

DURATION
1 hour

Assessment

FORMATIVE Evaluate student understanding of percentages by observing the results of the color by numbers sheet.

SUMMATIVE (OPTIONAL) Evaluate the posters that the students make to represent the data they have collected.

TRY A SIMILAR ACTIVITY **Garbage Collectors** (Grade 6)

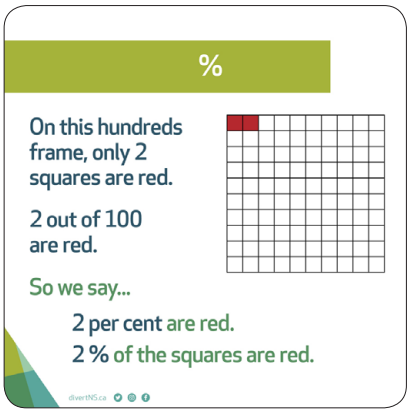
APPENDIX 1

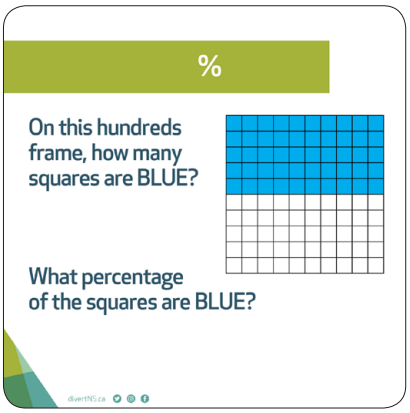
SOLID WASTE SURVEYS

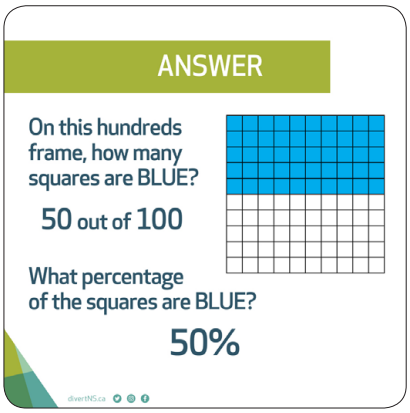
What is "per cent"?

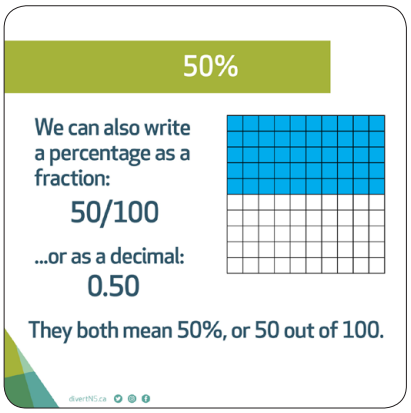
The following is a slide summary for "What is per cent"

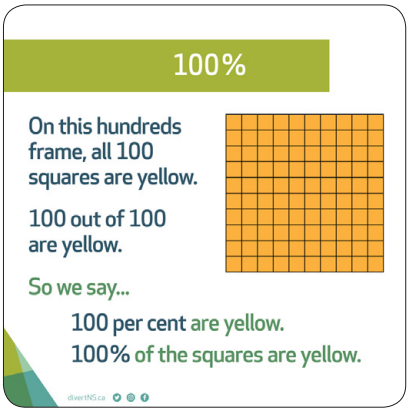
For full-sized slides, see the file:
GR-6-Solid-Waste-Surveys-Appx1-Per-Cent.pdf

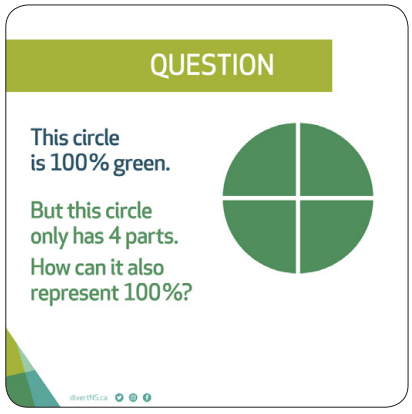


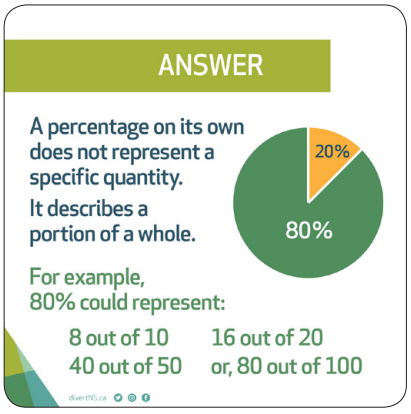












(cont'd)

APPENDIX 1

WHAT IS PER CENT (CONT'D)

QUESTION

If this equals
100% or 4/4

What does this equal?

ANSWER

If this equals
100% or 4/4

What does this equal?

100%
or 4/4

QUESTION

What percentage is yellow?

What percentage is white?

ANSWER

What percentage is yellow?

25%

What percentage is white?

50%

IN REAL LIFE

You can use percentages to find out a sale price:

Reg. Price $60

Sale Price:

?

IN REAL LIFE

You can use percentages to find out a sale price:

Reg. Price $60

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$60 x .50 = $30

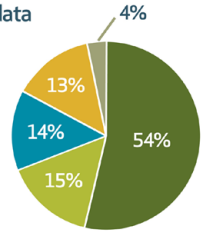
and don't forget to add 15% HST!

IN REAL LIFE

Or to better compare and understand data

How space is used in my neighbourhood

Houses	54%
Apartments	15%
Playground	14%
Roads	13%
Empty lots	4%



YOUR TURN

What percentage of students in your class is wearing a red shirt today?

What percentage of students in your class have a first name that starts with the letter "C"?

APPENDIX 2

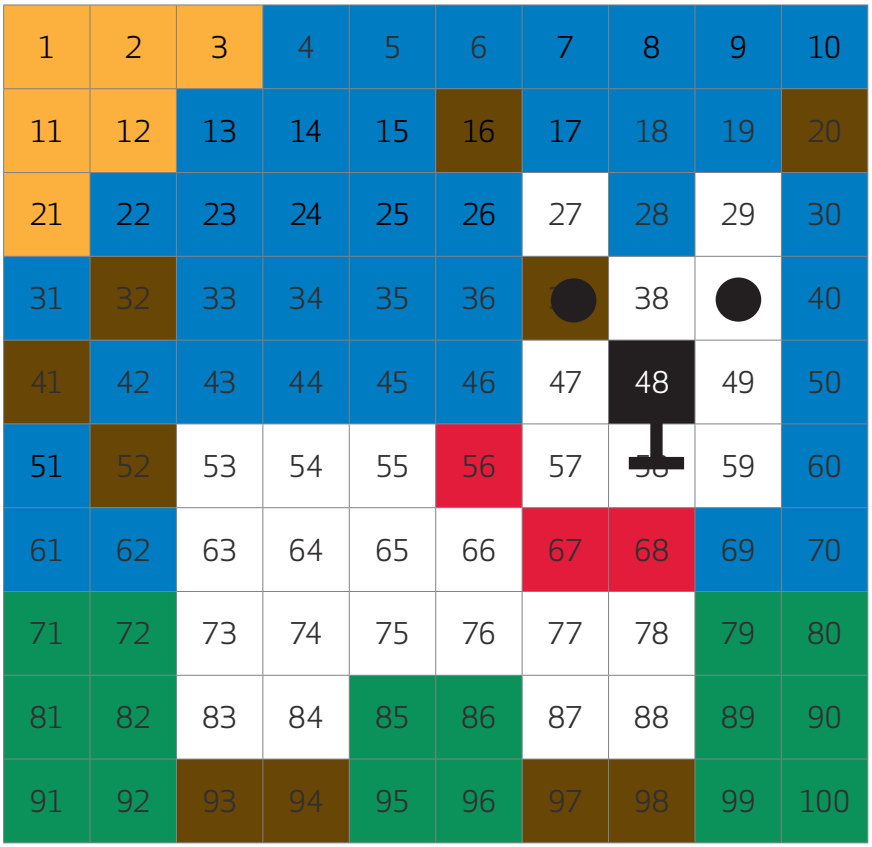
SOLID WASTE SURVEYS

Name Answer key

Colour by Numbers

1. Draw a **black dot** in the centre of square **37** and square **39**.
2. Draw an **upside down capital T** in the upper half of square **58**.
3. Colour the numbered squares in the colours below:

Black	48
Yellow	1 to 3, 11, 12, 21
Blue	4 to 10, 13 to 15, 17 to 19, 22 to 26, 28, 30, 31, 33 to 36, 40, 42 to 46, 50, 51, 60 to 62, 69, 70
Green	71, 72, 79, 80 to 82, 85, 86, 89 to 92, 95, 96, 99, 100
Brown	16, 20, 32, 37, 41, 52, 93, 94, 97, 98
Red	56, 67, 68



4. Count the number of squares for each colour. Express that number as a fraction of 100 and as a percentage.

Colour	Number of blocks of that colour	Fraction	Percentage
Black	1	1/100	1%
Yellow	6	6/100	6%
White *	26	26/100	26%
Green	16	16/100	16%
Brown *	10	10/100	10%
Red	3	3/100	3%

* Since there is black on some "face" squares, **Brown = 9** or **White = 24** is also correct.

APPENDIX 2

SOLID WASTE SURVEYS

Name _____

Colour by Numbers

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Brown	16, 20, 32, 37, 41, 52, 93, 94, 97, 98
Red	56, 67, 68

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	100

4. Count the number of squares for each colour. Express that number as a fraction of 100 and as a percentage.

Colour	Number of blocks of that colour	Fraction	Percentage
Black	1	1/100	1%
Yellow			
White			
Green			
Brown			
Red			

GRADE 6 LEARNING EXPERIENCE

What is "per cent"

%

N06 Students will be expected to demonstrate an understanding of per cent (limited to whole numbers) concretely, pictorially, and symbolically. [C, CN, PS, R, V]

%

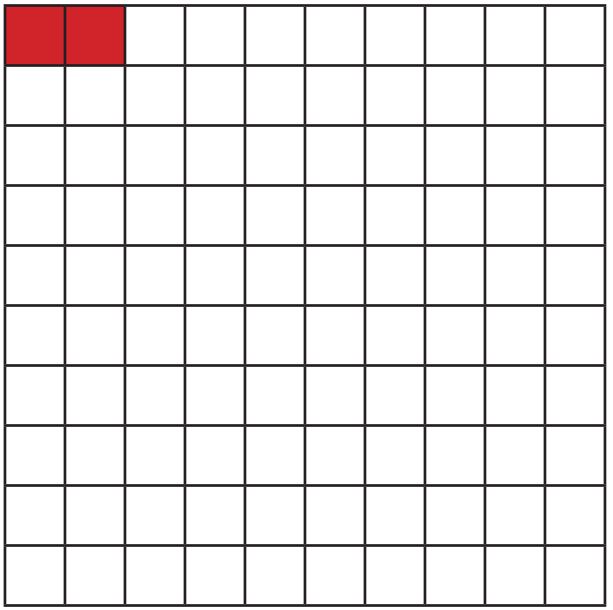
Per cent means “out of 100” or “per hundred.”

Did you know...

“Cent” is French for “100”

%

On this hundreds frame, only 2 squares are red.



2 out of 100 are red.

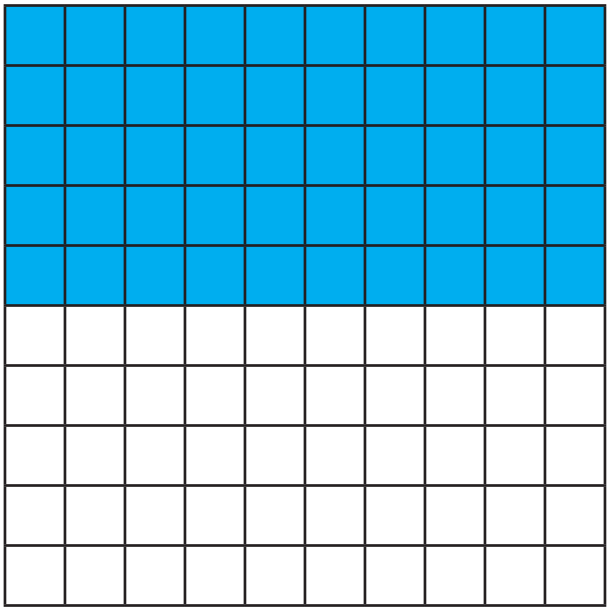
So we say...

2 per cent are red.

2 % of the squares are red.

%

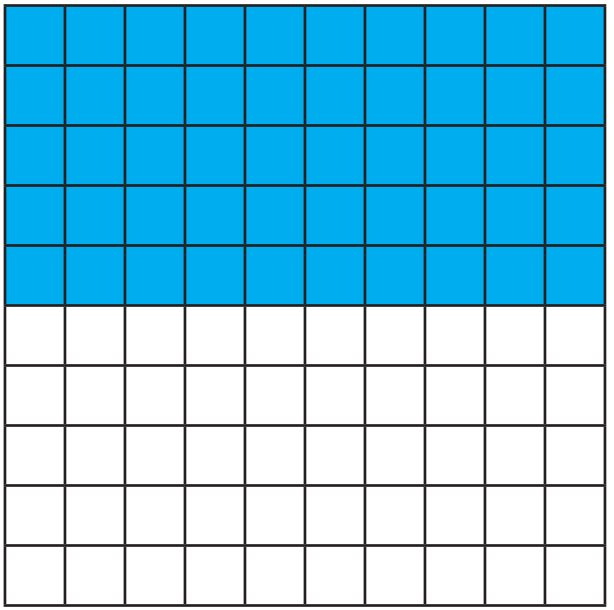
On this hundreds frame, how many squares are BLUE?



What percentage of the squares are BLUE?

ANSWER

On this hundreds frame, how many squares are BLUE?



50 out of 100

What percentage of the squares are BLUE?

50%

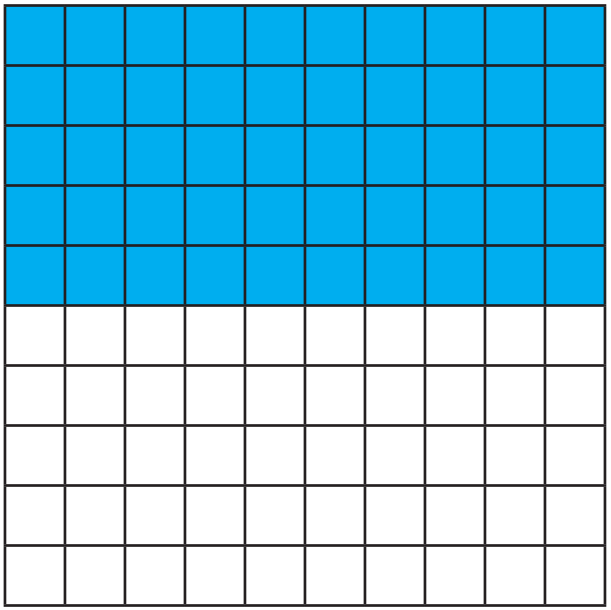
50%

We can also write a percentage as a fraction:

50/100

...or as a decimal:

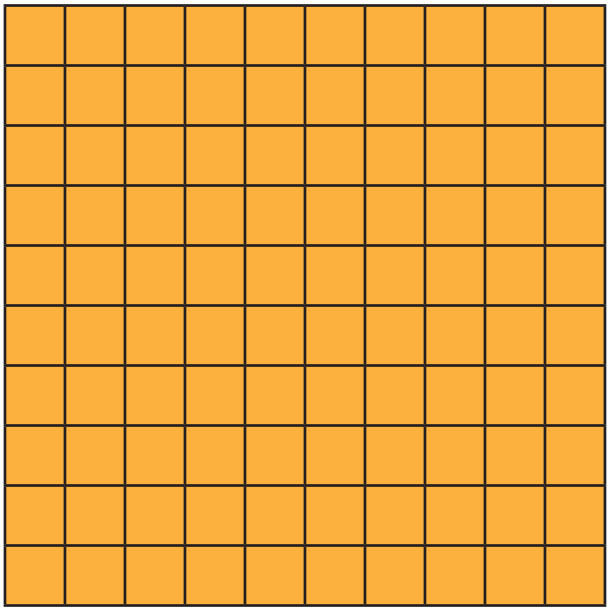
0.50



They both mean 50%, or 50 out of 100.

100%

On this hundreds frame, all 100 squares are yellow.



100 out of 100 are yellow.

So we say...

100 per cent are yellow.

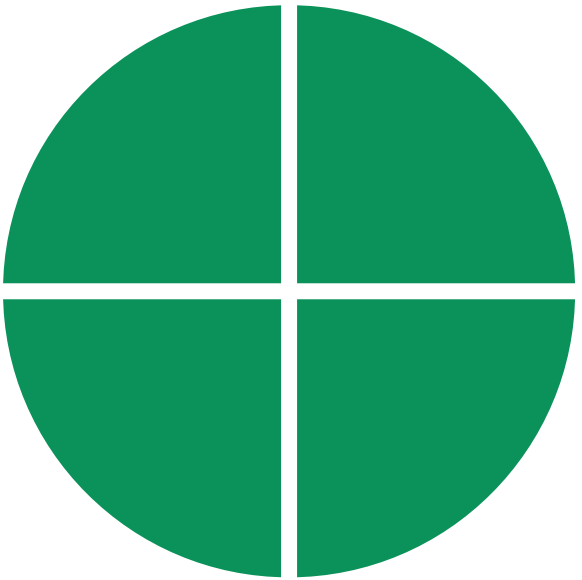
100% of the squares are yellow.

QUESTION

This circle
is 100% green.

But this circle
only has 4 parts.

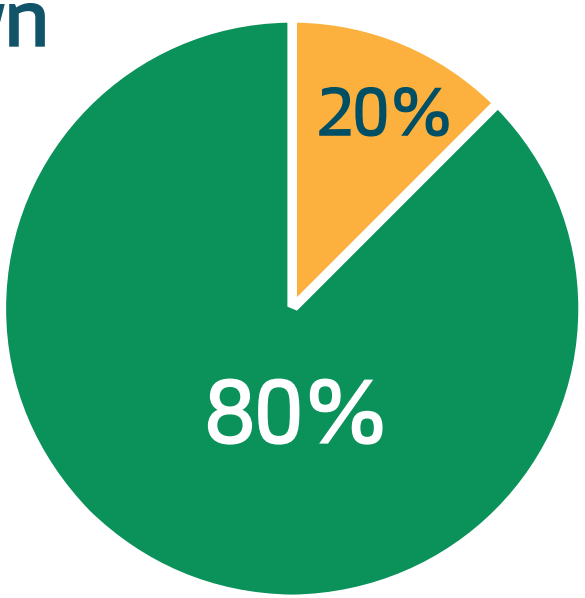
How can it also
represent 100%?



ANSWER

A percentage on its own does not represent a specific quantity.

It describes a portion of a whole.



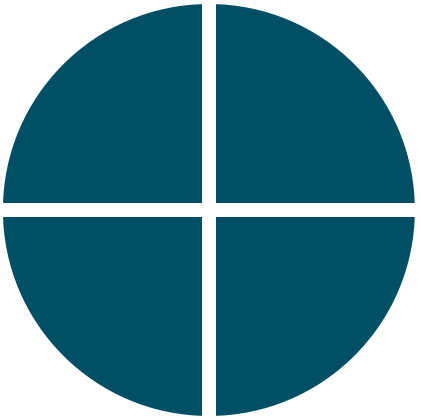
For example,
80% could represent:

8 out of 10
16 out of 20
40 out of 50
or, 80 out of 100

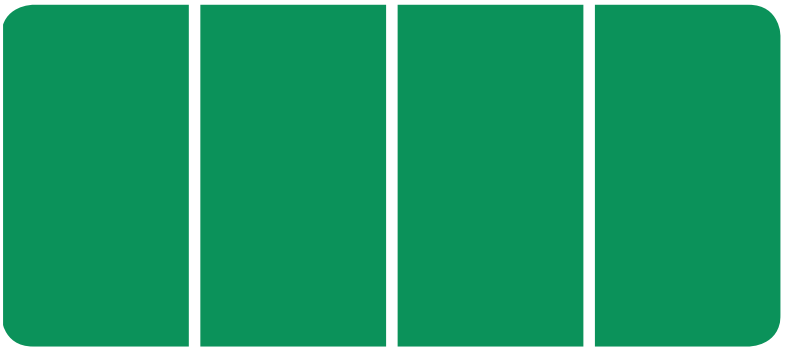
QUESTION

If this equals

100% or 4/4



What does this equal?



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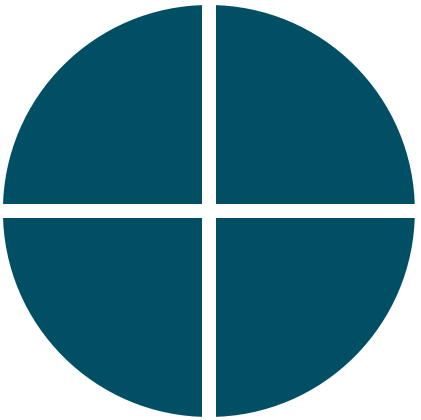

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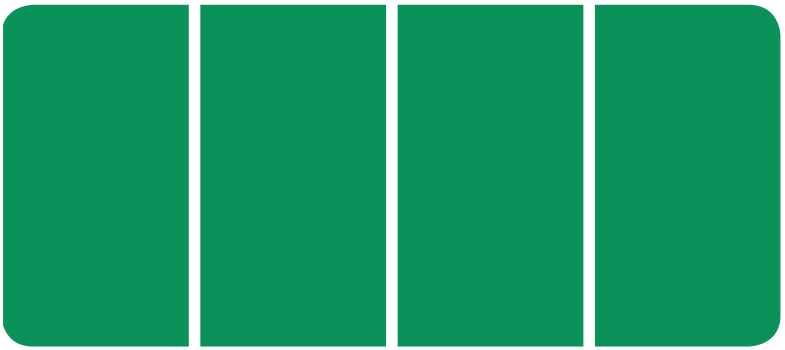
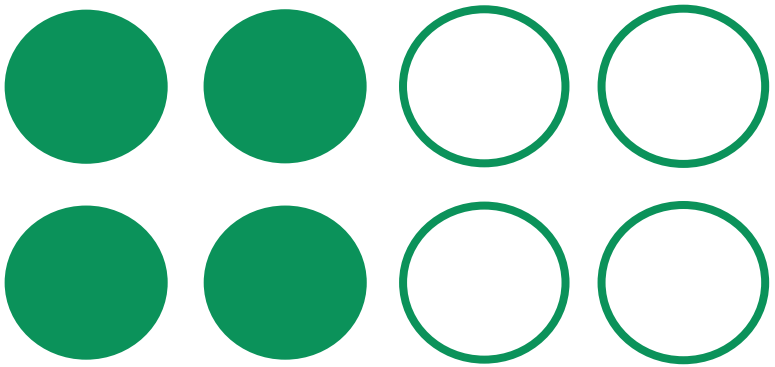


QUESTION

What percentage is yellow?

What percentage is white?



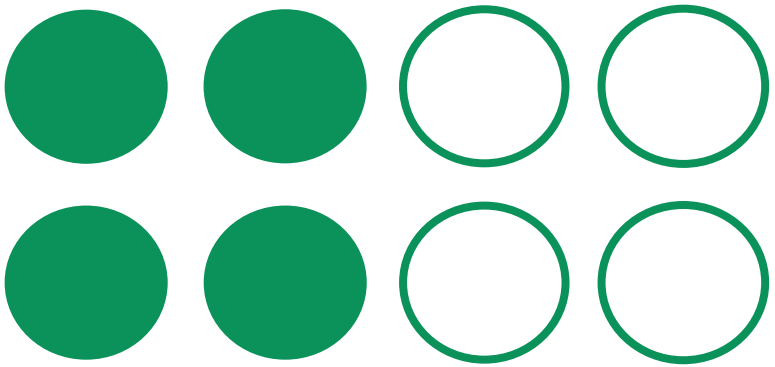
ANSWER

What percentage is yellow?

25%

What percentage is white?

50%



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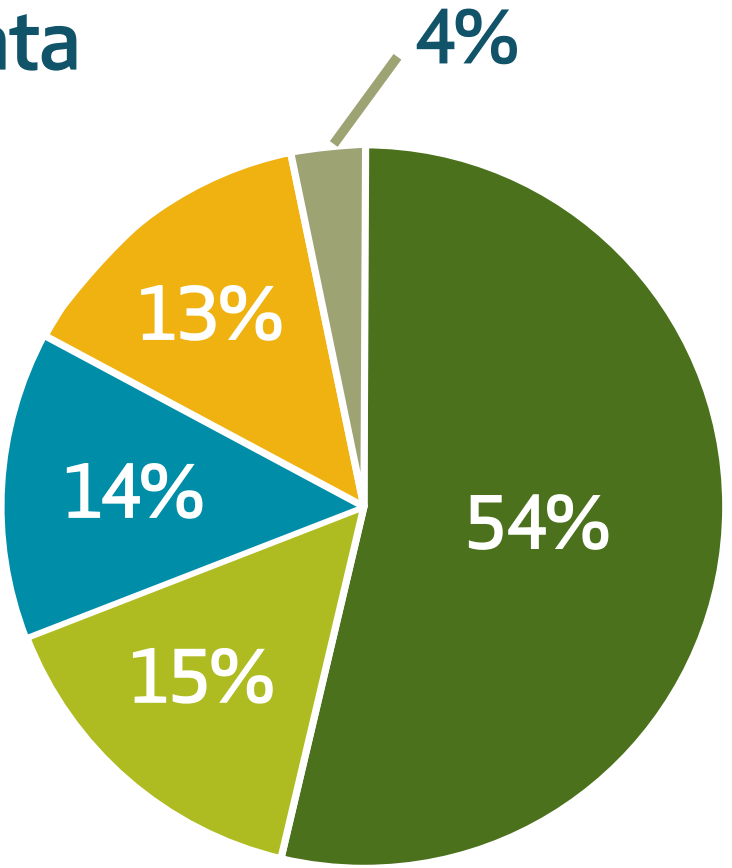

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