

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.

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

Appendix 1:
What is per cent? (PDF)

Appendix 2:
Colour by numbers

DURATION
30 mins

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

Social Studies



Outcome 4: Students will examine how traditions relate to culture in a region.

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

Tell the students they will create surveys to learn about the recycling habits of their classmates (or of the school).

As a class, brainstorm types of survey questions you could ask —

- e.g. *Do you recycle? Do you compost? How often do you recycle? Do you take your bottles back for money? Why do you recycle?*

Have each student create at least five multiple choice questions. Students can create paper copies of their surveys or use Google forms.

When surveys are finished, students can post to Google classroom and have classmates complete the survey.

For a tutorial on how to use Google forms visit:

sites.google.com/a/gnspes.ca/provincial/drive/forms

OPTION: The surveys could also be shared on the school website or with other classes.

MATERIALS

Class set of Chromebooks or computer lab

Internet access (if using Google forms or classroom)

DURATION

1 hour

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: What are the attitudes on recycling and composting? Why do people do it? Or why not? What are the benefits?*

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

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.

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](#)

GRADE 6 LEARNING EXPERIENCE

What is “per cent”

%

NSW Students will be expected to demonstrate an understanding of percent (limited to whole numbers) concretely, pictorially and symbolically. (C, CN, PS, R, V)

%

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

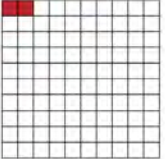
Did you know...
“Cent” is French for “100”



%

On this hundreds frame, only 2 squares are red.

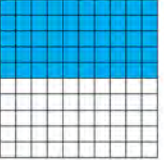
2 out of 100 are red.



So we say...
2 per cent are red.
2 % of the squares are red.

%

On this hundreds frame, how many squares are BLUE?

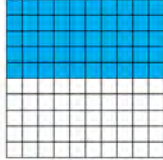


What percentage of the squares are BLUE?

ANSWER

On this hundreds frame, how many squares are BLUE?

50 out of 100



What percentage of the squares are BLUE?

50%

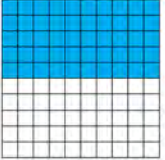
50%

We can also write a percentage as a fraction:

$50/100$

...or as a decimal:

0.50

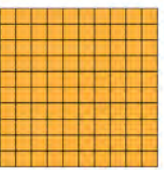


They both mean 50%, or 50 out of 100.

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.

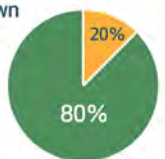
But this circle only has 4 parts.



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

APPENDIX 1


WHAT IS PER CENT (CONT'D)

QUESTION

If this equals
100% or $\frac{4}{4}$




What does this equal?




ANSWER

If this equals
100% or $\frac{4}{4}$




What does this equal?

100%
or $\frac{4}{4}$




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
Sale Price:
 $\$60 \times .50 = \30



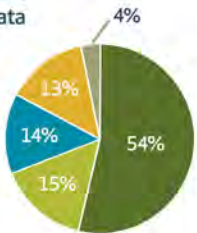
and don't forget to add 15% HST!

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"?

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

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	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.

Colour by Numbers

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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.

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White			
Green			
Brown			
Red			