![ABLE - Adult Basic & Literacy Education]

Program Information	*[Lesson Title]* *The Art of Decimals, Fractions, and Percents*	**TEACHER NAME** Jolene Seuffert	**PROGRAM NAME** **Parma City School District**
	[Unit Title] *Decimals, Fractions, and Percents*	**NRS EFL(s)** **1 – 2**	**TIME FRAME** **150 minutes**

ABE/ASE Standards – Mathematics

Numbers (N)		**Algebra (A)**		**Geometry (G)**		**Data (D)**	
Numbers and Operation	**N.2.14** **N.3.15**	Operations and Algebraic Thinking		Geometric Shapes and Figures		Measurement and Data	
The Number System		Expressions and Equations		Congruence		Statistics and Probability	
Ratios and Proportional Relationships		Functions		Similarity, Right Triangles. And Trigonometry		**Benchmarks identified in RED are priority be benchmarks. To view a complete list of priority benchmarks and related Ohio ABLE lesson plans, please see the Curriculum Alignments located on the Teacher Resource Center (TRC).**	
Number and Quantity	**N.2.12**			Geometric Measurement and Dimensions			
				Modeling with Geometry			

Mathematical Practices (MP)			
☐	Make sense of problems and persevere in solving them. (MP.1)	☐	Use appropriate tools strategically. (MP.5)
x	Reason abstractly and quantitatively. (MP.2)	☐	Attend to precision. (MP.6)
☐	Construct viable arguments and critique the reasoning of others. (MP.3)	☐	Look for and make use of structure. (MP.7)
☐	Model with mathematics. (MP.4)	☐	Look for and express regularity in repeated reasoning. (MP.8)

LEARNER OUTCOME(S)	ASSESSMENT TOOLS/METHODS

• Students will be able to recognize the relationship between decimals, fractions and percents as it relates to 'parts of a whole'. Whole represented as 100 or 100%.
• They will be able to recognize real-world decimal to fraction to percent equivalents within the context of graphing and charting.
• They will be able to demonstrate (90%) accuracy in counting colors on grid and transferring counts to column 1 (colors) on chart.
• Students will be able to demonstrate (85%) proficiency in completing the *The Class Exercise Worksheet* chart correctly by converting color counts to decimals, fractions and percents based on whole of 100.
• They will be able to transcribe a decimal, fraction, and percent from grid counting parts of a whole (ex. count 3 red squares out of a 100 from grid and write this in decimal, fraction, and percent form).
	Formative:
	• Verbal check-in with students as they are working on the assignments (circulating the room) to see if they are completing the grid and worksheet or have problems or need assistance.
	   o Sit and walk-through a problem or two if student is struggling.
	   o Pause individual or small group exercise and work through first few rows on board/chart as a class if group is struggling. Re-teach if necessary.
	• Review exercise as a class for accuracy and areas of difficulty.
	• Provide red/green post-its for students to stick to their desks to indicate understanding.
	• Provide more practice problems in form of worksheets if group/individual needs more time. Select and print any worksheet deemed appropriate from www.math-drills.com.
	Summative:
	• Collect worksheets for grading.
	• Pop-quiz: score as assessment.
	• Collect homework for grading/ or review as class next session (instructor choice).
	Next-Steps
	• Class exercise worksheets and homework will be used to assess if students are ready to move on, or need further review. Possible next step would be decimal-fraction-percent basic conversions.

LEARNER PRIOR KNOWLEDGE:

- Terms: decimal, fraction, percent, equivalent, part, whole.
- Math concepts: recognizing and understanding 'part of a whole'.

| INSTRUCTIONAL ACTIVITIES	RESOURCES
1. Warm-up activity: As a class/group, come up with a list of 5 possible human characteristics (e.g., brown hair, male, senior citizen, etc.) and write on the board/chart paper for group to see. 2. Together discuss results of how many in the class/group meet the characteristics. Instructor portrays results to class verbally or written, as decimal, fraction, percent or all three. Can differentiate and have students work together in pairs/small groups with their own characteristic lists, rather than class activity. 3. Class exercise: Hand out *The Art of Decimals, Fractions, and Percents* class exercise worksheet (attached). Instructor choice to have students work individually, in pairs, or as small groups. Exercise directions are included in handout. 4. Follow-up practice: Online math game called Decention. 5. Optional: Pop-quiz. Teacher/class selects a new theme. Teacher draws grid on board (similar to exercise). Fill in column one results together. Class pulls out piece of paper and completes remaining grid columns (decimal, fraction, percent columns). Examples may include: out of class, employment sectors (how many in the class work in retail, how many are unemployed, how many are in hospitality, etc.). 6. Homework: Leveled math equivalent worksheets (attached).	Whiteboard/Chalkboard/Chart paper (select one) Colored pencils or markers (4-6 per student/group) for exercise Red and green post-its Computer access with internet for each student or pair of students to play online math game Decention. Retrieved from: http://www.mathplayground.com/Decention/Decention.html Student copies of *Class Exercise Worksheet - The Art of Decimals, Fractions and Percents* (attached) Student copies of *Homework Worksheets* (attached) • *Homework Worksheet 1 Parts of a Whole – Basic* • *Homework Worksheet 2 Parts of a Whole – Advanced* Student copies of *Vocabulary Sheet – The Art of Decimals, Fractions, and Percents* - for lower-level students (attached) Website for additional teacher choice practice worksheets (as mentioned in assessment tools/methods above). Retrieved from: www.math-drills.com

DIFFERENTIATION (options)

- Distribute *Vocabulary Sheet – The Art of Decimals, Fractions, and Percents* for lower-level students (attached).
- Structure small groups to include low-level and high-level students (allow higher-level students to help others solve problems) during warm-up and/or class exercise.
- Pair higher-level student with lower-level student to play online game Decention together.
- Higher level option of reducing fractions during *Class Exercise Worksheet – The Art of Decimals, Fractions, and Percents* (listed in the "Challenge Options" at the bottom of the worksheet).
- Circulate room to provide additional assistance throughout activities/exercises/worksheets.

Class Exercise: The Art of Decimals, Fractions and Percents

Directions: Use 4-6 different colored markers or pencils. Color in the individual squares in the grid. You decide what type of pattern to utilize.
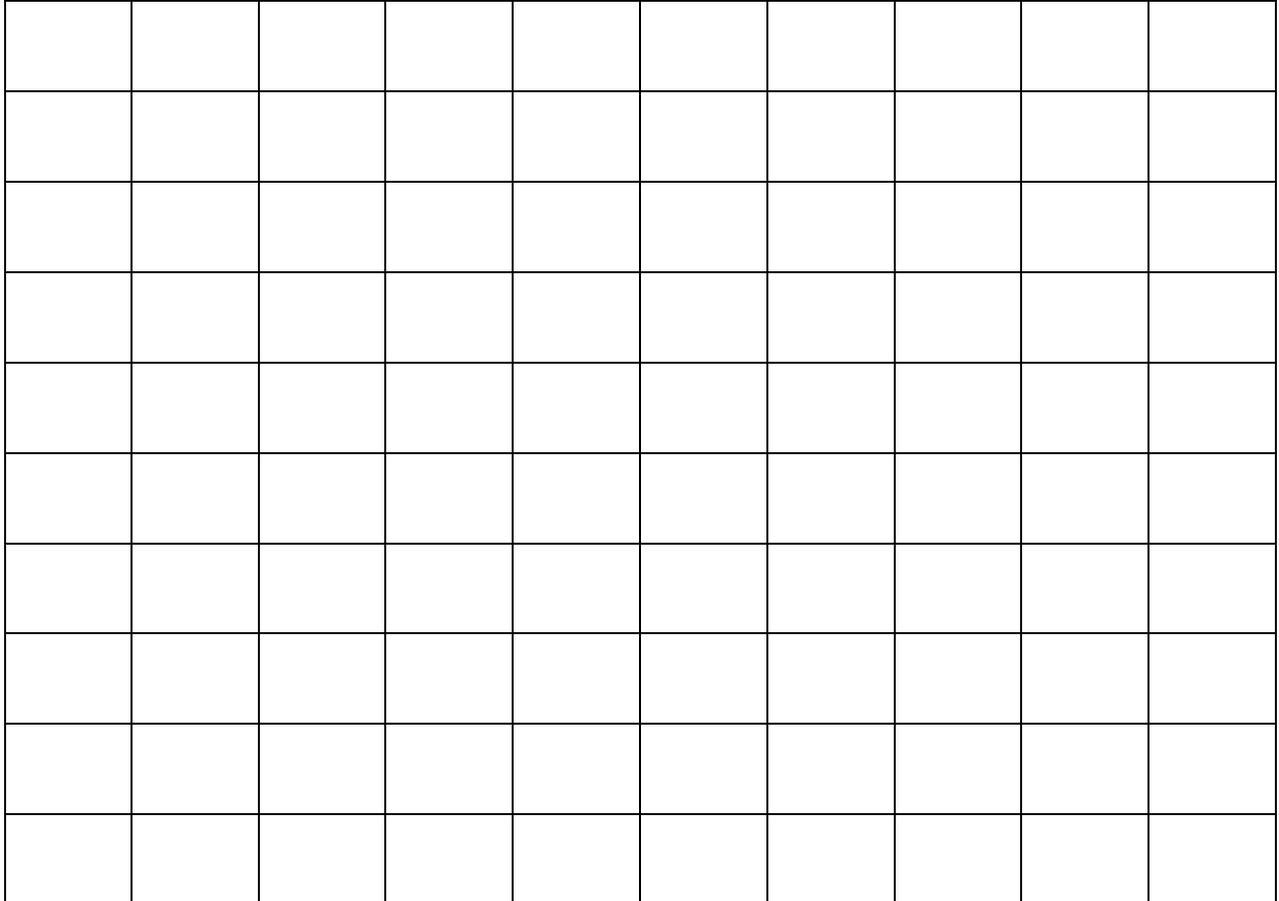
Class Exercise: The Art of Decimals, Fractions and Percents

Directions: Based on the colorful grid, fill in the chart with the appropriate decimal, fraction and percent conversions.

- Each of the small squares represents .01 as a decimal.
- Each of the small squares represents 1 / 100 as a fraction.
- Each of the small squares represents 1% as a percent.

For example, 3 green squares represents
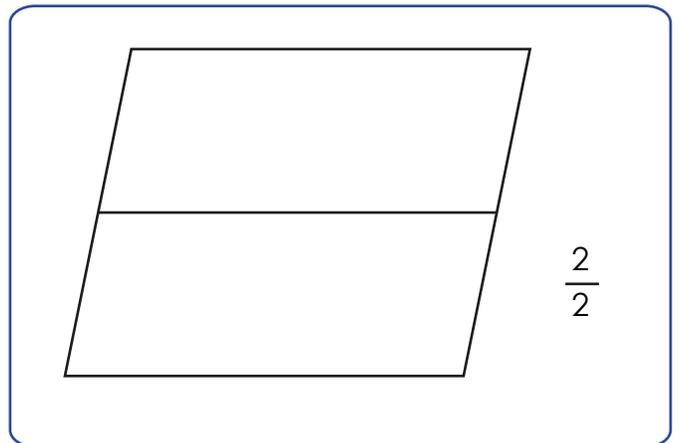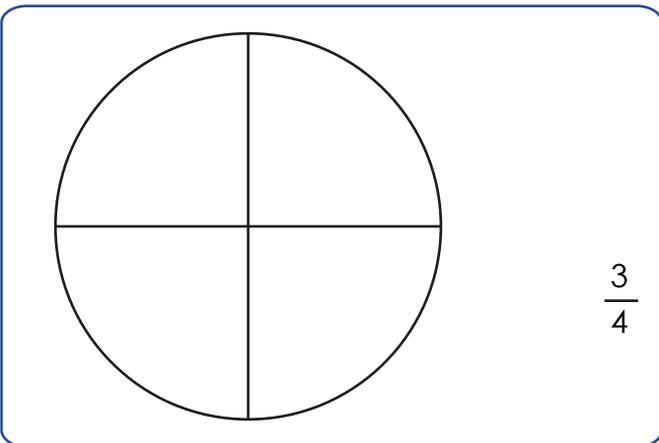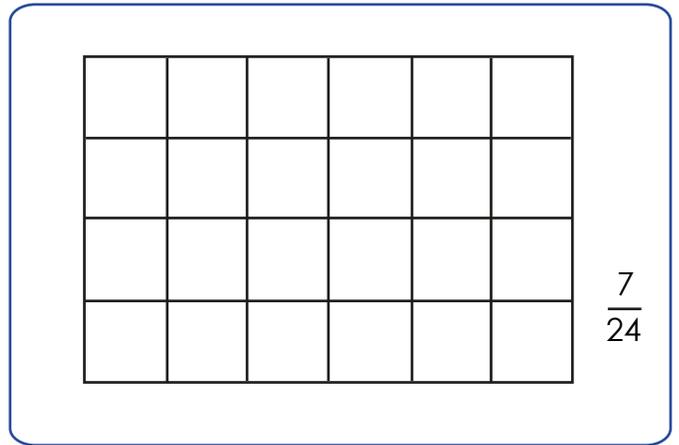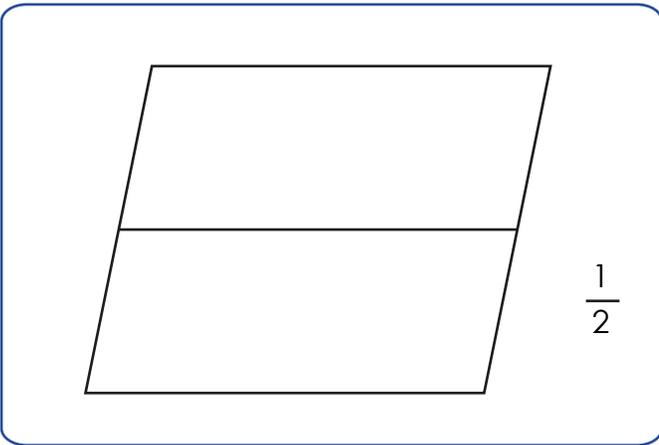Decimal - .03 of the whole
Fraction - 3/100
Percent - 3%

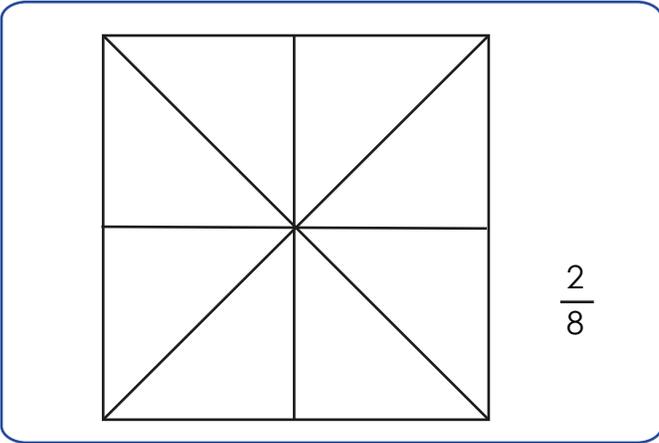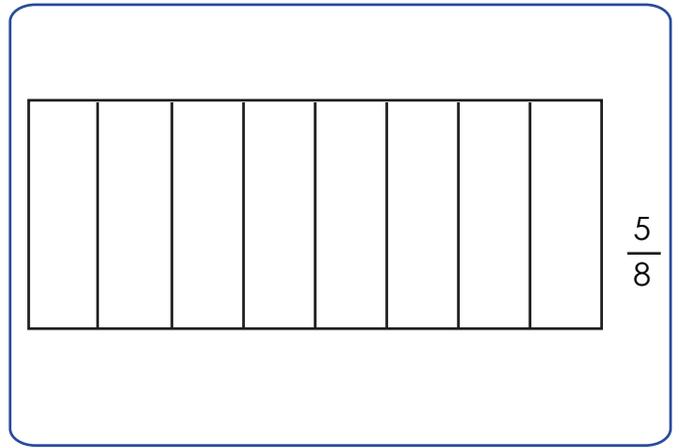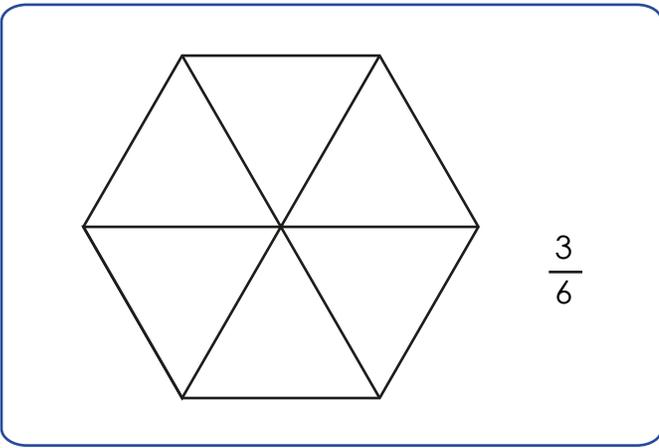| Color	# Shaded	Decimal	Fraction	Percent

*Challenge option 1: Reduce fractions to the lowest terms in the fraction column
*Challenge option 2: Highlight in the same color equivalent rows
*Challenge option 3: Circle the smallest fraction and underline the largest fraction
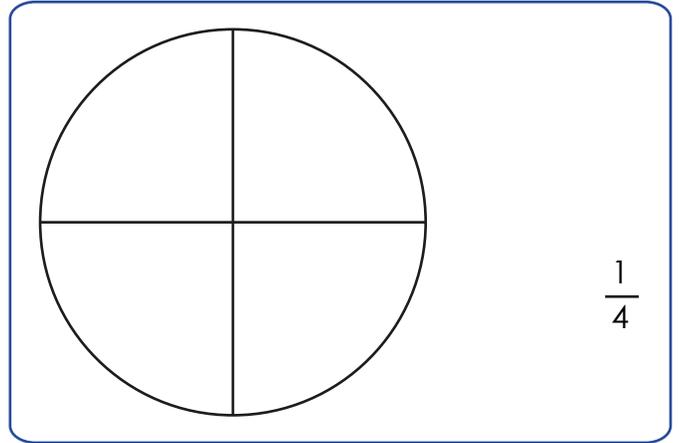
Color areas on the shapes that represent the following fractions.

$\frac{3}{6}$

$\frac{5}{8}$

$\frac{2}{8}$

$\frac{1}{4}$

$\frac{1}{2}$

$\frac{7}{24}$

$\frac{3}{4}$

$\frac{2}{2}$

Interpreting circle graphs

32 children voted for their favorite ice-cream flavors.
How many children voted for chocolate?

$\frac{3}{8}$ of 32 is 12

12 children voted for chocolate.

12 children

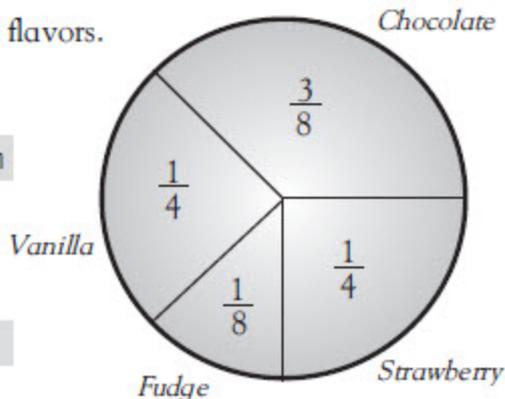How many children voted for fudge?

$\frac{1}{8}$ of 32 is 4

4 children voted for fudge.

4 children

Chocolate

$\frac{3}{8}$

$\frac{1}{4}$

$\frac{1}{4}$

$\frac{1}{8}$

Vanilla
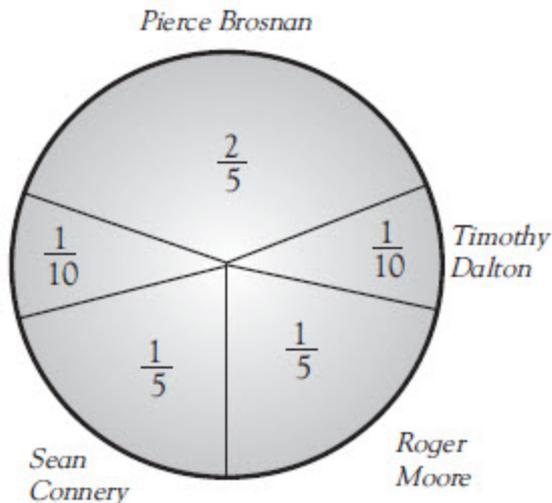
Fudge

Strawberry

A class of 30 children voted for their favorite
actor who has played James Bond.

How many voted for Sean Connery?

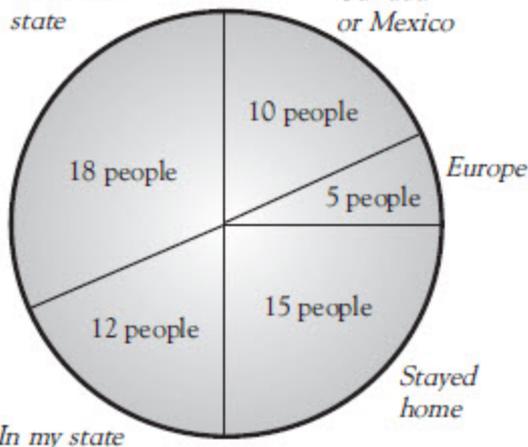How many did not vote
for George Lazenby?

How many more children voted for
Pierce Brosnan than Roger Moore?

How many children altogether voted
for Sean Connery and Roger Moore?

Pierce Brosnan

$\frac{2}{5}$

*George
Lazenby* $\frac{1}{10}$

$\frac{1}{10}$ *Timothy
Dalton*

$\frac{1}{5}$

$\frac{1}{5}$

*Sean
Connery*

*Roger
Moore*

---

60 people were asked where they went
on vacation last year. The circle graph shows
the results.

*Another
state*

*Canada
or Mexico*

10 people

18 people

5 people *Europe*

12 people

15 people

*Stayed
home*

In my state

What fraction of people vacationed
in another state?

What fraction of people vacationed
in Canada or Mexico, or in Europe?

What fraction of people did
not stay at home?

What fraction of people vacationed
in their state or another state?

Interpreting circle graphs

32 children voted for their favorite ice-cream flavors.
How many children voted for chocolate?

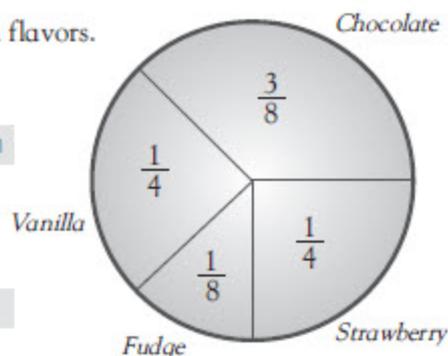| $\frac{3}{8}$ of 32 is 12 | 12 children |
| 12 children voted for chocolate. | |

How many children voted for fudge?

| $\frac{1}{8}$ of 32 is 4 | 4 children |
| 4 children voted for fudge. | |

Chocolate

$\frac{3}{8}$

$\frac{1}{4}$

Vanilla

$\frac{1}{8}$ $\frac{1}{4}$

Fudge   *Strawberry*

A class of 30 children voted for their favorite actor who has played James Bond.

How many voted for Sean Connery?   **6**

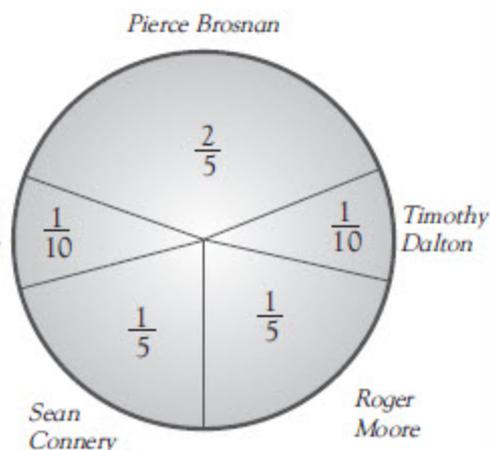How many did not vote for George Lazenby?   **27**

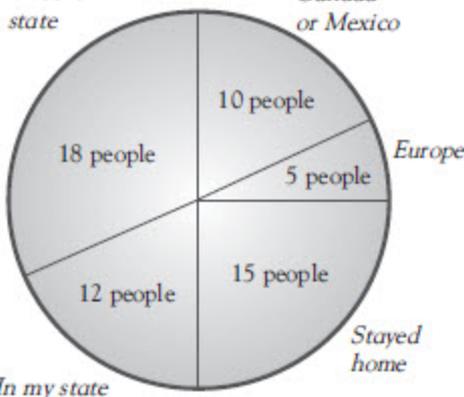How many more children voted for Pierce Brosnan than Roger Moore?   **6**

How many children altogether voted for Sean Connery and Roger Moore?   **12**

Pierce Brosnan

$\frac{2}{5}$

George Lazenby $\frac{1}{10}$ $\frac{1}{10}$ *Timothy Dalton*

$\frac{1}{5}$ $\frac{1}{5}$

Sean Connery   *Roger Moore*

Another state   *Canada or Mexico*

10 people

18 people   *Europe*

5 people

12 people   15 people

Stayed home

In my state

60 people were asked where they went on vacation last year. The circle graph shows the results.

What fraction of people vacationed in another state? $\frac{3}{10}$

What fraction of people vacationed in Canada or Mexico, or in Europe? $\frac{1}{4}$

What fraction of people did not stay at home? $\frac{3}{4}$

What fraction of people vacationed in their state or another state? $\frac{1}{2}$

This page introduces pie charts. In the first section children are required to find fractions of an amount. If unsure, remind the child to divide the total by the denominator and multiply by the numerator. The most likely errors will come from misreading the question.

Vocabulary: 'The Art of Decimals, Fractions and Percents

Terms:

Decimal: a number with a decimal point

      Ex. 1.5, 3.9

      (The number before the decimal is a whole number, the number is a power of 10)

Fraction: a numerical quantity that is not a whole number

      Ex.   ½ (one half);   2/3 (two thirds)

Percent: refers to parts of a 100, designated with a percent symbol %

      Ex. 100%, 50%, 33%

Equivalent: Equal in value even if expressed differently

      Ex. ½ if equal, or equivalent to, 50%

Concepts:

Part of a whole: a relationship that suggests one entity or unit (a whole) is made-up of individual parts

Equivalent: when one unit, entity or expression is equal to another/others