

Learning Objective:	Census, Sampling & Bias	Name:	
		Date:	

Do NOW Activity:

- 1 Find the **nth term** 6, 10, 14, 18
- 2 **Simplify** the ratio 108 : 18
- 3 **Work out** $6 \times \text{£}15.99$
- 4 Work out the **median** 5, 2, 12, 6, 4, 7
- 5 Complete the **equivalent fraction** $\frac{3}{7} = \frac{?}{63}$

PRIOR KNOWLEDGE CHECK:

1. I can find multiples and factors

THE MAIN EVENT

WORKED EXAMPLE #1:

POPULATION: The entire group of people/things you want to carry out your investigation on. Eg. UK, England, Oasis Academy Isle of Sheppey.

CENSUS: Is when you ask every member of or collect data in regards to every member of the population.

- Eg. A survey of every person living in the UK, A survey of every person living in the England.
A survey of every student at Oasis Academy Isle of Sheppey.

Ques. 1

Colin wants to investigate who is doing better out of the girls and boys in his GCSE Maths class at school.

i) State the population in this scenario.

Students in Colin's GCSE Maths class.

ii) Is Colin likely to use a census or sample in this case?

Explain your answer.

Census. Class size likely to be small enough.

PRACTICE #1:

1. The local council interviews people who are arriving in the city centre on a warm, sunny day. People are asked which of the following methods of transport they have used:

Walking <input type="checkbox"/>	Cycling <input type="checkbox"/>
Bus <input type="checkbox"/>	Car <input type="checkbox"/>

- (a) Explain why the results may not be reliable for deciding transport policies.
- (b) Suggest how the council should collect more data.

2. (a) Describe the *advantages* of using a census rather than a sample.
(b) Describe the *disadvantages* of using a census rather than a sample.

WORKED EXAMPLE #2:

SAMPLE: A small selection of people/objects from the population.

Eg. The pupils at Oasis Academy Isle of Sheppey is the population. The pupils in 8E/Ma1, 8F/Ma2 and 8G/Ma3 are samples from the population.

Eg. The pupils in 8E/Ma is the population. The boys in 8E/Ma1 are samples from the population.

A random sample

A random sample is one where everyone has an equal chance of being chosen.

PRACTICE #2:

- 1 A telephone directory has 250 pages. On each page there are 400 names.
(a) Describe how you could use random numbers to select a random sample from the telephone book.
(b) Explain why the sample is *not* a random sample from the whole population of the area.
2. A large school has 1800 pupils. The head teacher wants to find out how far the pupils have to travel to school. Advise him whether to carry out a census or to use a sample.
Explain why you give this advice.

WORKED EXAMPLE #3:

BIAS: Anything that affects how the data is represented

Comment on the questions below:

- | | | |
|---|-----|--------------------------|
| 1. Do cars cause pollution in the city centre? | YES | <input type="checkbox"/> |
| | NO | <input type="checkbox"/> |
| 2. Do cars cause traffic hold-ups in the city centre? | YES | <input type="checkbox"/> |
| | NO | <input type="checkbox"/> |
| 3. Are some car drivers a danger to pedestrians in the city centre? | YES | <input type="checkbox"/> |
| | NO | <input type="checkbox"/> |
| 4. Do you think that cars should be banned from the city centre? | YES | <input type="checkbox"/> |
| | NO | <input type="checkbox"/> |

Solution

The questions are biased. The first three are designed to focus on the disadvantages and dangers of cars, so that people are more likely to say 'yes' when they answer question 4.

PRACTICE #3:

1. Rewrite the following questions so that they are not biased in any way:
(a) Do you agree that maths is boring?
(b) Are you in favour of town centre car park charges being increased in order to discourage car drivers from using their cars?
(c) The price of a school lunch has not increased for 2 years. Do you think that school lunches are good value for money?
2. Design biased questionnaires that would encourage people to reach the conclusion that the government:
(a) dislikes motorists,
(b) encourages motorists.