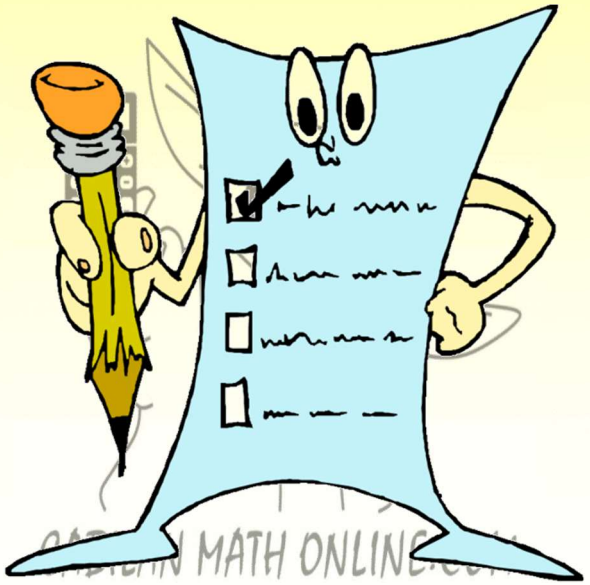
ST. JEAN DE BREBEUF
MATHEMATICS

CHAPTER 3.2

COLLECT AND ANALYSE DATA



CHAPTER 3.2 COLLECT AND ANALYSE DATA

KEY CONCEPTS

Someone who collects data for their own use is a **primary source**.

EXAMPLE:

Performing a science lab experiment

A database or research collected by someone else is a **secondary source**.

EXAMPLE:

Getting information from the Internet

Bias is an intentional or unintentional distortion of the data collected in a survey. A survey should be as free of bias as possible.

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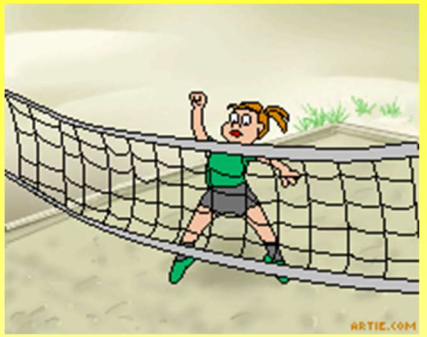
EXAMPLE 1 *Response Bias*



A parent council survey is conducted to learn if a physical education course in volleyball should be offered in school. The survey question reads:

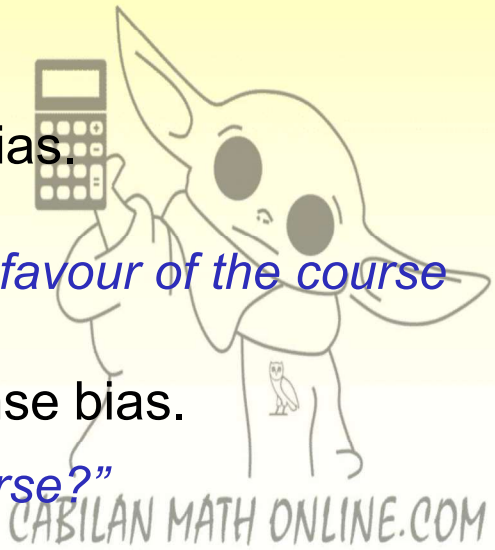
A course concentrating on the basics of volleyball will help develop hand-eye coordination and will promote physical activity in high school students. Should the school offer a volleyball course for the next academic school year?

a) Explain why this question may result in response bias.

Opinion is stated prior to the question
→Increases the chances for parents to vote in favour of the course rather than give an honest response

b) Rewrite the question to *eliminate* possible response bias.

"Would you enroll your child in a volleyball course?"



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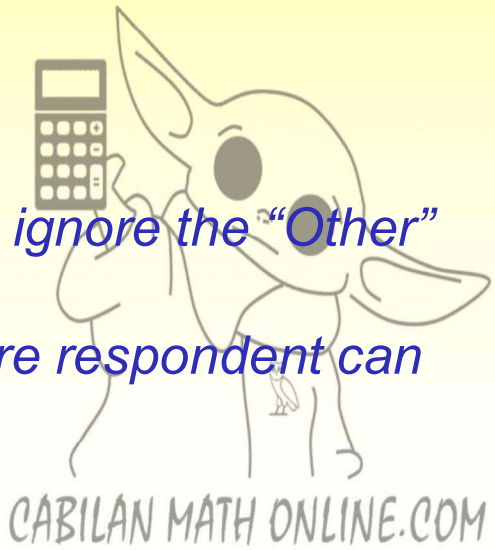
EXAMPLE 2 *Measurement Bias*

Jamal wrote this survey question: Who do you think is the best athlete of all time?

Tiger Woods
LeBron James
Michael Jordan
Sidney Crosby
Other: _____

Identify any **weaknesses** in this survey.

The choices provided may lead respondent to ignore the "Other" section
→better to make this survey open-ended where respondent can freely give a response



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EXAMPLE 3 *Non-Response Bias*

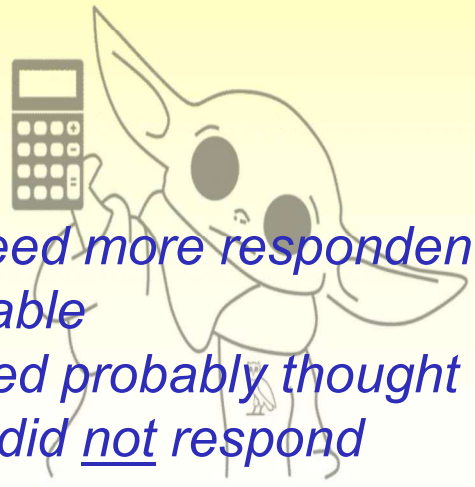
At a new restaurant, wait staff ask every *fifth* customer to answer a questionnaire about food quality and service once they have finished their meal. About **30%** of customers surveyed fill out the questionnaire. The majority of customers who fill out the questionnaire complain about poor service. The restaurant manager concludes that the wait staff needs more training.

Is her conclusion reasonable?

NO

→Low rate of response (30%); need more respondents to make conclusion more reasonable

*→All those who actually responded probably thought the service **was** poor; those who did not respond probably had no complaints*



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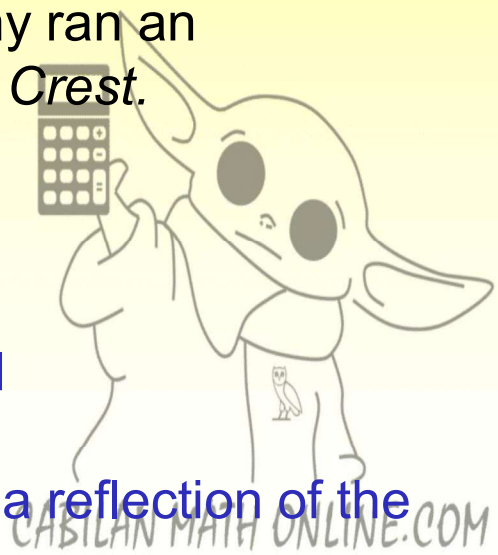
EXAMPLE 4
(page 117 #13)

A marketing company gave four dentists two brands of toothpaste to try. *Crest* has ingredients that provides protection against cavities, gingivitis, and plaque. *Colgate* simply freshens breath. The dentists were asked which toothpaste they prefer: *Crest* or *Colgate*.

All preferred *Crest* to *Colgate*. The marketing company ran an advertisement stating: *Four out of four dentists prefer Crest.*



a) Is the marketing claim <u>true</u>? Explain.

YES
... Only because **four dentists** were surveyed
But in reality...
NO since the *sample* (the four dentists) is not a reflection of the entire population (all dentists)

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b) Why might the marketing company have conducted the survey in this way?

Many factors
→**Convenience sampling** (very easy to collect data from only four dentists)
→Dentists were paid???

c) How could you **redesign** the survey to determine if four out of four dentists truly prefer *Crest*?

Increase sample size to obtain accurate/valid data
But...
Virtually impossible since all dentists surveyed would have to prefer *Crest*!

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Homework

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