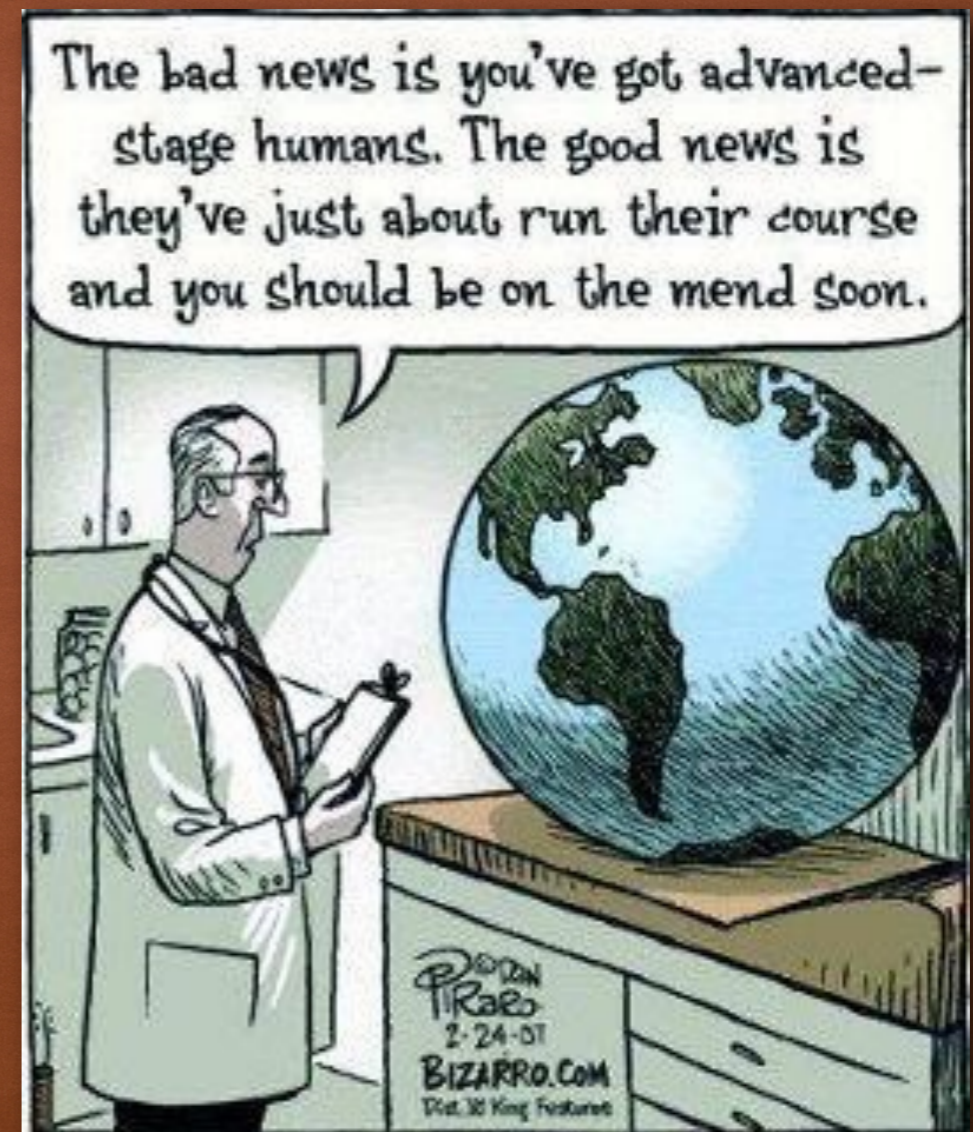


DETERMINING ENVIRONMENTAL VALUE SYSTEMS



YOUR TASK

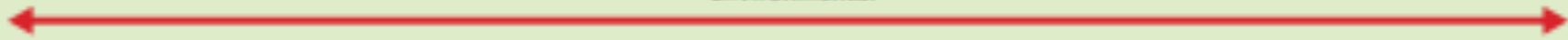
- Introduction to the internal assessment.
- Develop a better understanding of the Environmental Value Systems.



ENVIRONMENTAL VALUES RECAP

- Environmental Values are affected by context of:
 - Religion
 - Education
 - Culture
 - Media
 - Economics
 - Society

Environmental



Ecocentrism
(nature centred)

Holistic world view. Minimum disturbance of natural processes. Integration of spiritual, social and environmental dimensions. Sustainability for the whole Earth. Self-reliant communities within a framework of global citizenship. Self-imposed restraint on resource use.

Deep ecologists

- 1 Intrinsic importance of nature for the humanity of man.
- 2 Ecological (and other natural) laws dictate human morality.
- 3 Biorights – the right of endangered species or unique landscapes to remain unmolested.

Anthropocentrism
(people centred)

People as environmental managers of sustainable global systems. Population control given equal weight to resource use. Strong regulation by independent authorities required.

Self-reliance soft ecologists

- 1 Emphasis on smallness of scale and hence community identity in settlement, work and leisure.
- 2 Integration of concepts of work and leisure through a process of personal and communal improvement.
- 3 Importance of participation in community affairs, and of guarantees of the rights of minority interests. Participation seen as both a continuing education and a political function.

Technocentrism
(technology centred)

Technology can keep pace with and provide solutions to environmental problems. Resource replacement saves resource depletion. Need to understand natural processes in order to control them. Strong emphasis on scientific analysis and prediction prior to policy-making. Importance of market and economic growth.

Environmental managers

- 1 Belief that economic growth and resource exploitation can continue assuming:
 - a suitable economic adjustments to taxes, fees, etc.
 - b improvements in the legal rights to a minimum level of environmental quality
 - c compensation arrangements satisfactory to those who experience adverse environmental and/or social effects.
- 2 Acceptance of new project appraisal techniques and decision review arrangements to allow for wider discussion or genuine search for consensus among representative groups of interested parties.

Comucopians

- 1 Belief that people can always find a way out of any difficulties, whether political, scientific or technological.
- 2 Acceptance that pro-growth goals define the rationality of project appraisal and policy formulation.
- 3 Optimism about the ability of humans to improve the lot of the world's people.
- 4 Faith that scientific and technological expertise provides the basic foundation for advice on matters pertaining to economic growth, public health and safety.
- 5 Suspicion of attempts to widen basis for participation and lengthy discussion in project appraisal and policy review.
- 6 Belief that all impediments can be overcome given a will, ingenuity and sufficient resources arising out of growth.



- 4 Lack of faith in modern large-scale technology and its associated demands on elitist expertise, central state authority and inherently anti-democratic institutions.
- 5 Implication that materialism for its own sake is wrong and that economic growth can be geared to providing for the basic needs of those below subsistence levels.

DEVELOPING A RESEARCH QUESTION

Your first task is to develop a research question related to the Environmental Values being studied.

- The question must be focused: Narrowly defined with clearly identified variables.
- The question must be coherent: Include valid ESS terminology (EVS) and be something researchable.
- The question must be relevant: Have something related to the environmental values. In this case, directly related.

Questions

- To what extent does level of education (post graduate, graduate, diploma, high school, primary only) affect the waste disposal habits of people? Does higher education lead to more ecocentric people?
- To what extent does the consumption of social media (Hours spent per day/types of platforms visited), affect the environmental awareness of people. Does more social media consumption increase ecocentric attitudes?
- To what extent does type of employment affect the amount of air pollution being created? Are people in more professional jobs more ecocentric?

EXPLAINING THE CONNECTION BETWEEN THE ISSUE AND THE RESEARCH QUESTION

- Now link the research question and the issue you've discussed.
- Justify why you've chosen this issue and this research question.
Landfills are a major problem for Hong Kong with landfills closing by 2025 and no suitable alternative being proposed.
- Explain why this issue is related to the RQ. *If people were more ecocentric, we would have small scale local solutions that would help manage the waste problems locally rather than the government trying to arrange a solution.*
- Explain how this RQ could lead to a better understanding of the **issue**. *If we can determine the environmental value and the reasons why the shared environmental values have developed, then we can look for ways to solve the problem.*

THE RUBRIC FOR PLANNING

Planning (6)

This criterion assesses the extent to which the student has developed appropriate methods to gather data that is relevant to the research question. This data could be primary or secondary, qualitative or quantitative, and may utilize techniques associated with both experimental or social science methods of inquiry. There is an assessment of safety, environmental and ethical considerations where applicable.

Achievement level	Descriptor
0	The student's report does not reach a standard described by any of the descriptors given below.
1–2	The student's report: <ul style="list-style-type: none"> • designs a method that is inappropriate because it will not allow for the collection of relevant data • outlines the choice of sampling strategy but with some errors and omissions • lists some risks and ethical considerations where applicable.
3–4	The student's report: <ul style="list-style-type: none"> • designs a repeatable* method appropriate to the research question but the method does not allow for the collection of sufficient relevant data • describes the choice of sampling strategy • outlines the risk assessment and ethical considerations where applicable.
5–6	The student's report: <ul style="list-style-type: none"> • designs a repeatable* method appropriate to the research question that allows for the collection of sufficient relevant data • justifies the choice of sampling strategy used • describes the risk assessment and ethical considerations where applicable.

*Repeatable, in this context, means that sufficient detail is provided for the reader to be able to replicate the data collection for another environment or society. It does **not** necessarily mean repeatable in the sense of replicating it under laboratory conditions to obtain a number of runs or repeats in which all the control variables are exactly the same.

STEP 2: PLANNING

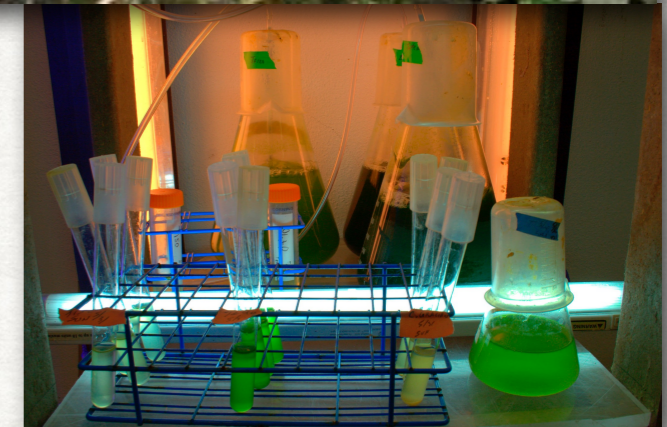
- Designing a method
- Sampling
- Risks
- Ethical implications

DESIGN

- Develop a REPEATABLE method to collect data.
 - The steps should be detailed enough for another person to follow it and achieve the same results.
- Develop a method to collect SUFFICIENT data.
 - The method should have the opportunity to collect enough data for the study to be reliable. 2 samples from 2 trials is not enough.
 - 5 rule: 5 samples x 5 trials minimum.
- Develop a method collect to RELEVANT data.
 - Collect data to answer the research question.
 - The variables must be related to the RQ.
 - ex. Is plant growth dependent on water levels?
 - Data to collect: Water input and plant growth (simplified)

DATA COLLECTION METHODS

- Values and attitude surveys or questionnaires
 - Interviews (Peoples' environmental value)
- Observational fieldwork (number of vehicles vs. Air quality)
- Field manipulation experiments (tree growth in different soils)
- Ecosystem modelling (including mesocosms or bottle experiments)
 - Laboratory work (pH of acids vs corrosion rates of materials)
 - Environmental impact assessments
- Secondary demographic, development and environmental data



DATA

We collect **data** (values, typically words or numbers) in order to test a hypothesis, for example, 'Boys are taller than girls'.

There are four stages to testing hypotheses:

- Specify the problem (RQ, hypothesis and variables)
- Collect the data (dependent, independent and control)
- Analyse and present the data (statistical tests, tables, graphs, and charts)
- Interpret the results (discussion of the meaning of the results)

Types of data

Data is a collective name for information recorded for statistical purposes. There are many different types of data:

- **qualitative data** - data that can only be written in words, not numbers, for example, the colours of cars in a car park
- **quantitative data** - data that can be written in numbers, for example, the heights of children

Sampling data

If you want to test the hypothesis '*Boys are taller than girls*', it is impossible to measure the height of every boy and girl in existence.

A sensible way around this would be to take a selection of boys and girls, measure their heights, and use this information to judge whether the statement is likely to be true or not. This process is called sampling.

You should only use sampling when you have a large population.

Using the entire population

Advantages

- All opinions are accounted for
- Results are more reliable

Disadvantages

- Takes a long time
- Expensive

Using a sample

Advantages

- Quick to conduct
- Cost-effective

Disadvantages

- Only a selection of opinions
- Selection method could cause bias
- Different samples may produce different results

PRACTICE

For each of the following scenarios decide whether it would be sensible to use a sample.

- Beth wants to find out how many times people in Northern Ireland attend the cinema per week.
- Matthew wants to find out if people in his form class prefer burgers or chips.
- Stephen wants to know which brand of baked beans in his local supermarket is the cheapest.
- Sean wants to find out which brand of dog food is more popular among pet owners – 'PoochChow' or 'CaneDine'.

SAMPLING

Random sampling is where each member of a population is equally likely to be selected. Possible methods include using a random number generator from a computer programme, rolling a number of dice or using the random number button on a scientific calculator

Stratified sampling is used to select a sample that is representative of different groups. If the groups are of different sizes, the number of items selected from each group will be proportional to the number of items in that group.

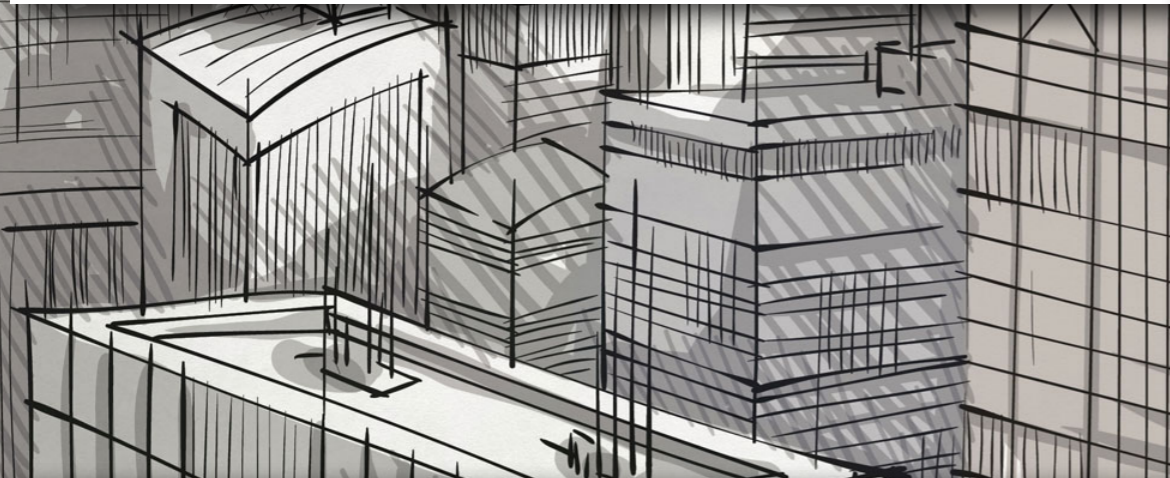
Example

- Billy wants to survey 25 customers of a restaurant to find out which dessert they prefer. He decides to use a stratified sampling technique to work out how many people of each age group he should select.
- The table below shows how many customers attended the restaurant in the last week. This is the total population. The sample size is the number of customers Billy wants to survey, 25 in this example. The strata size is the number of people in each group, 12, 34, 48, 21 and 3 in this example.

Age group	Number of customers
11-20	12
21-30	34
31-40	48
41-50	21
51+	3

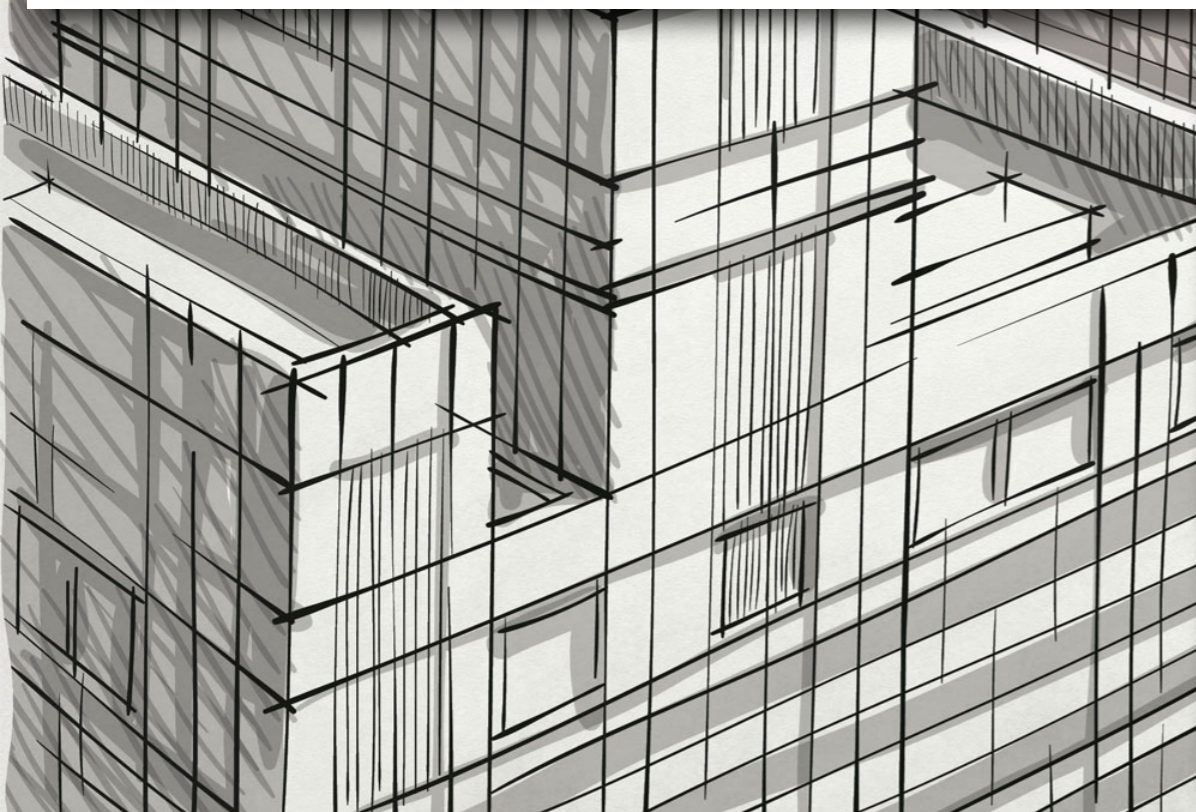


The total number of customers = 12 + 34 + 48 + 21 + 3 = 118.



$$\text{Number selected from each strata} = \left(\frac{\text{strata size}}{\text{total population}} \right) \times \text{sample size}$$

Age group	Number in sample
11-20	$\left(\frac{12}{118} \right) \times 25 = 2.54 \text{ (3 customers)}$
21-30	$\left(\frac{34}{118} \right) \times 25 = 7.20 \text{ (7 customers)}$
31-40	$\left(\frac{48}{118} \right) \times 25 = 10.17 \text{ (10 customers)}$
41-50	$\left(\frac{21}{118} \right) \times 25 = 4.45 \text{ (4 customers)}$
51+	$\left(\frac{3}{118} \right) \times 25 = 0.63 \text{ (1 customer)}$



QUESTION

- A toy store has staff from several different countries in the UK (as shown by the table below). The organisation wants to create a focus group of 50 staff to represent the four different countries.
- If company bosses decide to use a stratified sampling methodology, how many people from each country should make up the focus group?

Country	Number of staff members
Wales	563
England	1408
Scotland	425
Northern Ireland	211

THIS TIME THE QUESTIONNAIRE



SAMPLING

- You must plan to collect enough data to make your research valid.
 - Sufficient enough numbers to give you a valid answer.
 - Unbiased
 - Ex. What is the Teacher Environmental Value System?
 - 3 teacher all from Maths
 - 20 teachers but all from Chinese
 - 5 teachers from each subject.

CATEGORICAL QUESTIONS

- If you're looking for a simple count, like "35% of people said ABC" or "20% of men and 24% of women..." then there's a variety of question types you can use: **Yes/No, checkbox, or multiple choice** question type. These types of questions are also called "nominal" questions.
- Analysis of categorical-level questions can include counts and percentages—"22 respondents" or "18% of students", for example—and they work great for bar graphs and pie charts.

YES/NO

- The simplest survey question— You'll ask a question, then have two options:
 - Example: Are you a vegetarian? Yes/No

MULTIPLE CHOICE

- Need more detail than a Yes/No answer gives? Multiple choice is what you need. You can add as many answers as you want, and your respondents can pick only one answer to the question.
 - Example: What's your favourite food? Pizza/Pasta/Salad/Steak/Soup/Other

CHECKBOX

- Have a multiple choice-type question where you think some people will want to choose more than one option?
- Checkbox questions add that flexibility. Add as many answers as you want, and respondents can pick as many answers to the question as you want.
 - Example: Which types of meat do you like? Beef/Pork/Chicken/Fish/Duck/Other

Ordinal Questions

- When question responses have a clear order (like "Allowance of \$0-\$1K, \$1K-2K, \$2K+"), we call them "ordinal" questions. You could collect ordinal data with Multiple Choice questions, or you could use drop-down or ranking questions.
- Analysis for ordinal questions is similar to analysis for nominal questions: you can get counts and percentages. You cannot find averages or test correlations with ordinal-level data.

DROP-DOWN

- Drop-down questions work much like a multiple choice question—you'll have several different possible answers, and respondents can only choose one option. But you'll need to list the answers in order—perhaps largest to smallest—for ordinal data.
- You could also use this question to gather demographic data like their country or state of residence.
 - Example: What's your monthly allowance? \$0-1k/\$1-2k/\$2-3k/\$3k+

RANKING

- Ranking questions let you list a number of answers and respondents can rearrange them all into the order they want. That way, they can give feedback on every answer you offer. It's a great way to see which items people like most and least at the same time.
- Example: What's your favourite beverages? Rank in order of preference. Milk/Water/Juice/Coffee/Soda/Wine/Beer

Interval/Ratio Questions

- For the most precise data analysis, use the interval or ratio question type. These questions allow you to conduct advanced analysis, like finding averages, testing correlations, and running regression models. You'll use ranking scale, matrix, or text fields in your survey app to ask these type of questions.
- Interval questions are questions that are often asked on a scale of 1-5 or 1-7, like from "Strongly Disagree" to "Strongly Agree" or from "Never" to "Always." Ratio questions have a true zero and often ask people to input an actual number into the survey field (like How Many Cups of Coffee Do You Drink Per Day? ____") You don't really have to worry about the differences between the two types.

RANKING SCALE

- The default choice for interval questions, ranking scale questions look like a multiple choice question with the answers in a horizontal line instead of a list. There will likely be 3 to 10 answers, either with a number scale, a like/love scale, a never/always scale, or any other ratio interval. It's a great way to find a more precise measure of people's thoughts than a Yes/No question could give.
 - Example: On a scale of 1-5, how would you rate our store cleanliness? 1/2/3/4/5

- MATRIX

- Have a lot of interval questions to ask? Use a matrix if your survey app includes it. You can list a number of questions in a list, and use the same scale for all of them. It simplifies gathering data about a lot of similar items at once.
 - Example: How much do you like the following: oranges, apples, grapes? Hate/Dislike/Ok/Like/Love

TEXTBOX

- For ratio questions—or direct feedback, or personal data like names—you'll need the textbox question. There's usually a small and large textbox option, so choose the size that's appropriate for the data you're collecting. You'll add the question, and then there will be a blank where your respondent can enter their answer on their own.
 - Example: How many apps are installed on your phone? Enter a number: _____

6 BEST PRACTICES FOR WRITING SURVEY QUESTIONS

1. Use Simple, Direct Language

- Avoid using big words, complicated words, and words that could have multiple meanings. Your question should be short, simple, and clear.

2. Be Specific

- Some concepts may mean different things to different people. Try to be as specific as possible when you ask questions. For example, instead of asking "Do you exercise regularly?" you could ask "How many days per week, on average, do you exercise?" This gives you a more precise, objective answer.

3. Break Down Big Ideas into Multiple Questions

- Another way to deal with broad concepts that mean different things to different people is by breaking them down into multiple, more tangible questions.
- "Wellness" is a common topic that schools want to explore, and it's a big question packed with smaller ideas. Instead of asking "How Happy Are You with This Class?", you could instead ask people to give their opinion on three separate statements (asking them to weigh in on a scale of "Strongly Disagree" to "Strongly Agree")

4. Avoid Leading Questions

- Sometimes, researchers' opinions can seep into survey questions, subtly encouraging respondents to answer in a certain way and compromising survey results.
 - For example, asking "Do you think the school should cut the gym budget to pay for crossing guards?" would likely prompt a different answer than asking, "Should the school employ crossing guards to protect our children?" even though both questions are related to the same topic.
- To avoid leading questions, ask a friend or classmate to review your survey for any questions that seem like they have a right or wrong answer. If your friend can guess what kind of answer you're looking for, consider rewriting the question.

5. Ask One Thing per Question

- Each of your survey questions should ask one thing, and one thing only. It seems simple enough, but many survey writers fall into the “double-barreled” question trap.
- For example, “Do you eat fruits & veggies on a daily basis?” can actually be a hard question to answer. What if somebody eats just fruits or just veggies? There’s not a clear way for them to answer this question. A better option is to split the question into two separate ones.
- You can check your survey for double-barreled questions by looking for words like “and” or “or” in your questions.

Use More Interval Questions

- One simple way to take your survey from good to great is by changing your Yes/No and multiple choice questions to interval questions. Make a statement, and ask people to answer it on a 1-5 or 1-7 scale, like "Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, or Strongly Agree."
- Researchers use scales of 1-5 or 1-7 because they do a good job capturing variation in answers, without causing information overload for the respondent.
- Then, instead of looking at each question individually, like most people do, you can add on another layer of analysis by looking at how questions relate to one another.
 - When you ask interval questions, you open the door to check correlations, which allow you to say "People who are more likely to ABC are less likely to think DEF."
 - You can say "Factors G, H, and I have the biggest impact on J." More simply, you can take averages and say things like "students, on average, exercise more often than teachers."

RISK AND ETHICS

- Are there any safety concerns involved?
- Where might someone get injured or hurt?
- What are the ethical implications of this research?
 - What will you do with the results?
 - Will privacy be kept?
 - Will you share your data with anyone?
 - Are the questions offensive?
 - Are measurements harmful to a species?



YOUR TASK FOR NEXT LESSON

- Complete the context and planning sections
- Next week, your peers will observe and comment on these sections.
- If your work is sufficiently done, you can start on the data collection preparation. Most likely the questionnaire.