

A STATING THE PROBLEM

A.1 FINDING POPULATIONS

MCQ 1: You're studying how long kids play outside each day. Your question is: **"How many hours do kids spend playing outside each day?"**

Which population is best to study?

Check the correct answer:

- ☐ "All adults in a city."
- ☒ "All kids in a school."
- ☐ "All dogs in a neighborhood."
- ☐ "All teachers in a country."

Answer:

- "All adults in a city." **False** – The question is about kids, not adults.
- "All kids in a school." **True** – The question is about kids, and a school has kids to study.
- "All dogs in a neighborhood." **False** – Dogs aren't kids and don't play like them.
- "All teachers in a country." **False** – Teachers are adults, not kids.

MCQ 2: You're studying pets in homes. Your question is: **"How many families own a pet in our town?"**

Which population is best to study?

Check the correct answer:

- ☐ "All kids in a playground."
- ☐ "All birds in a forest."
- ☐ "All workers in a factory."
- ☒ "All families in our town."

Answer:

- "All kids in a playground." **False** – The question is about families, not kids.
- "All birds in a forest." **False** – Birds aren't families or pets.
- "All workers in a factory." **False** – Workers aren't families.
- "All families in our town." **True** – The question is about families, and this population fits.

MCQ 3: You're studying reading habits. Your question is: **"How many books do students borrow from the school library each month?"**

Which population is best to study?

Check the correct answer:

- ☐ "All librarians in a state."
- ☒ "All students in a school."

- ☐ "All books in a bookstore."
- ☐ "All parents in a neighborhood."

Answer:

- "All librarians in a state." **False** – The question is about students, not librarians.
- "All students in a school." **True** – The question is about students, and a school has students to study.
- "All books in a bookstore." **False** – Books don't borrow; the question is about students.
- "All parents in a neighborhood." **False** – Parents aren't students.

MCQ 4: You're studying nature. Your question is: **"How tall are the oak trees in a national park?"**

Which population is best to study?

Check the correct answer:

- ☒ "All oak trees in a national park."
- ☐ "All rivers in a country."
- ☐ "All clouds in the sky."
- ☐ "All rocks on a mountain."

Answer:

- "All oak trees in a national park." **True** – The question is about oak trees, and this population fits.
- "All rivers in a country." **False** – The question is about oak trees, not rivers.
- "All clouds in the sky." **False** – Clouds aren't trees.
- "All rocks on a mountain." **False** – Rocks aren't trees.

A.2 SORTING DATA TYPES

MCQ 5: What type of data is: favorite subject (e.g., Maths, Science, English)?

- ☐ Quantitative variable
- ☒ Qualitative variable

Answer: Qualitative variable. "Favorite subject" groups subjects like Maths or Science—it's not a number.

MCQ 6: What type of data is: number of siblings?

- ☒ Quantitative variable
- ☐ Qualitative variable

Answer: Quantitative variable. "Number of siblings" is a number you count, like 1 or 2.

MCQ 7: What type of data is: type of vehicle (e.g., car, bicycle, bus)?

- ☐ Quantitative variable

☒ Qualitative variable

Answer: Qualitative variable. "Type of vehicle" groups vehicles like car or bus—it's not a number.

MCQ 8: What type of data is: height of students (in cm)?

☒ Quantitative variable

☐ Qualitative variable

Answer: Quantitative variable. "Height of students" is a number you measure, like 150 cm.

MCQ 9: What type of data is: level of education (e.g., high school, bachelor's, master's)?

☐ Quantitative variable

☒ Qualitative variable

Answer: Qualitative variable. "Level of education" groups levels like high school—it's not a number.

MCQ 10: What type of data is: annual income (in dollars)?

☒ Quantitative variable

☐ Qualitative variable

Answer: Quantitative variable. "Annual income" is a number you measure, like 30,000 dollars.

A.3 WRITING A SURVEY QUESTION

Ex 11: Write a survey question about music that would enable you to collect numerical data.

Answer: A good survey question about music should ask for a number in a clear way, so you can collect numerical data. An example like "How many hours do you listen to music each day?" is a good question because it asks students for a number of hours, like 1 or 2, which you can count or measure. Other good examples could be "How many songs do you listen to each week?" or "How many times do you play music each day?" These questions help you gather numerical data about music in a way that Grade 5 students can answer easily.

Ex 12: Write a survey question about music that would enable you to collect categorical data.

Answer: A good survey question about music should ask for a category in a clear way, so you can collect categorical data. An example like "What type of music do you like best?" is a good question because it asks students to pick a category, like pop or rock, which you can group and count. Other good examples could be "What is your favorite music band?" or "Which music app do you use most?" These questions help you gather categorical data about music in a way that Grade 5 students can answer easily.

Ex 13: Write a survey question about food that would enable you to collect categorical data.

Answer: A good survey question about food should ask for a category in a clear way, so you can collect categorical data. An example like "What type of food do you like best?" is a good question because it asks students to pick a category, like pizza or salad, which you can group and count. Other good examples could be "What is your favorite dessert?" or "Which meal do you like most?" These questions help you gather categorical data about food in a way that Grade 5 students can answer easily.

Ex 14: Write a survey question about food that would enable you to collect numerical data.

Answer: A good survey question about food should ask for a number in a clear way, so you can collect numerical data. An example like "How many times do you eat snacks each day?" is a good question because it asks students for a number of times, like 1 or 2, which you can count or measure. Other good examples could be "How many fruits do you eat each week?" or "How many meals do you have each day?" These questions help you gather numerical data about food in a way that Grade 5 students can answer easily.

A.4 COMPLETING FREQUENCY TABLES

Ex 15: The class took the temperature at lunchtime for 20 days:

19°C, 18°C, 19°C, 20°C, 19°C, 20°C, 20°C, 20°C,
19°C, 18°C, 20°C, 19°C, 20°C, 19°C, 18°C, 20°C,
18°C, 17°C, 19°C, 20°C

Complete the table to show how many times each temperature happened:

Temperature (°C)	Frequency
17	1
18	4
19	7
20	8

Answer: To find the frequency, count how many times each temperature appears in the list:

- 17°C: 1 time (day 18).
- 18°C: 4 times (days 2, 10, 15, 17).
- 19°C: 7 times (days 1, 3, 5, 9, 12, 14, 19).
- 20°C: 8 times (days 4, 6, 7, 8, 11, 13, 16, 20).

Ex 16: The class recorded the number of siblings for 20 students:

1, 2, 1, 0, 1, 2, 2, 3, 1, 0,
2, 1, 3, 1, 0, 2, 1, 0, 2, 1

Complete the table to show how many times each number of siblings happened:

Number of Siblings	Frequency
0	4
1	8
2	6
3	2

Answer: To find the frequency, count how many times each number of siblings appears in the list:

- 0 siblings: 4 times (students 4, 10, 15, 18).
- 1 sibling: 8 times (students 1, 3, 5, 9, 12, 14, 17, 20).
- 2 siblings: 6 times (students 2, 6, 7, 11, 16, 19).
- 3 siblings: 2 times (students 8, 13).

Ex 17: Count the vowels (a, e, i, o, u) in this sentence: "I love Mathematics. It is so fun to solve problems and discover cool patterns."

Complete the table:

Vowel	a	e	i	o	u
Frequency	4	5	5	5	2

Answer: Count each vowel in "I love Mathematics. It is so fun to solve problems and discover cool patterns." (ignore spaces and punctuation):

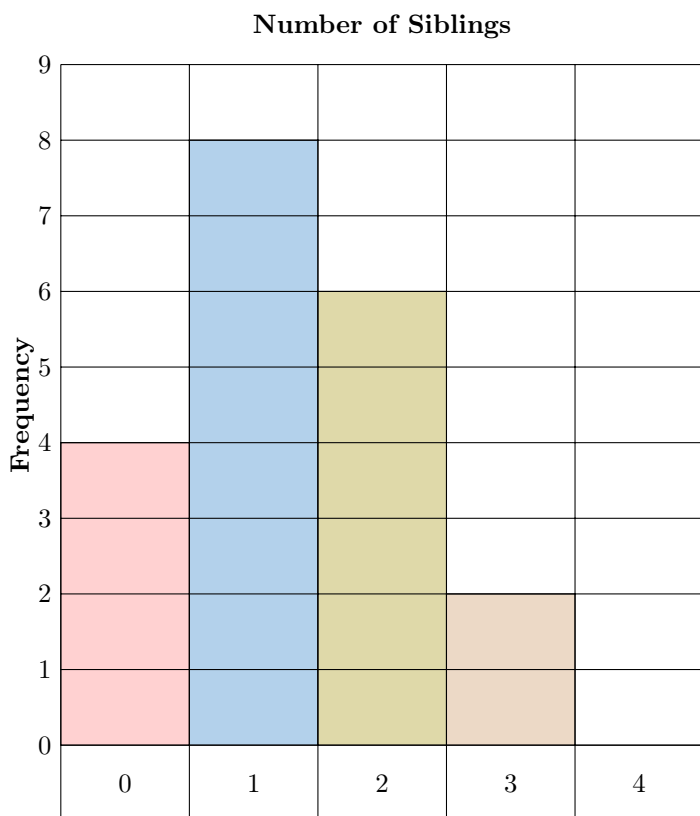
- a: 4 times (in "Mathematics," "Mathematics," "and," "patterns").
- e: 5 times (in "love," "Mathematics," "solve," "problems," "discover").
- i: 5 times (in "I," "Mathematics," "It," "is," "discover").
- o: 5 times (in "love," "to," "so," "solve," "cool").
- u: 2 times (in "fun," "discover").

B REPRESENTING DATA

B.1 INTERPRETING BAR CHARTS

Ex 18: In his class, Hugo asks the students: "How many siblings do you have?"

He represents the result with a bar chart:



How many students have 2 siblings?

6 students

Which number of siblings is the most common?

1

Which number of siblings is the least common?

4

Answer: To find the totals, count the number of students for each number of siblings from the bar chart:

- 0 siblings: 4 students (height of bar at 4).
- 1 sibling: 8 students (height of bar at 8).

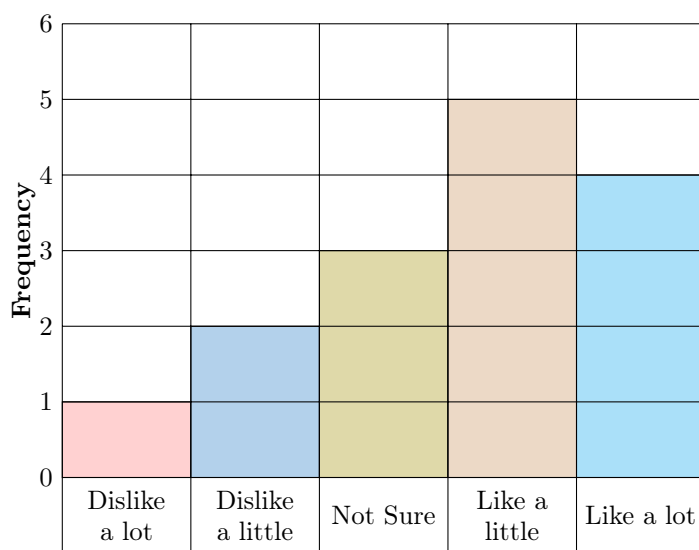
- 2 siblings: 6 students (height of bar at 6).
- 3 siblings: 2 students (height of bar at 2).
- 4 siblings: 0 students (height of bar at 0).

1. For 2 siblings, there are 6 students.
2. The most common number is the one with the highest number of students. 1 sibling has 8 students, which is more than 2 (6), 0 (4), 3 (2), and 4 (0). So, 1 sibling is the most common.
3. The least common number is the one with the lowest number of students. 4 siblings has 0 students, which is less than 1 (8), 2 (6), 0 (4), and 3 (2). So, 4 siblings is the least common.

Ex 19: In his class, Hugo asks the students: "How much do you like playing board games?"

He represents the result with a bar chart:

Liking Board Games



How many students like playing board games "Not Sure"?

3 students

Which feeling is the most common?

Like a little

Which feeling is the least common?

Dislike a lot

Answer: To find the totals, count the number of students for each feeling from the bar chart:

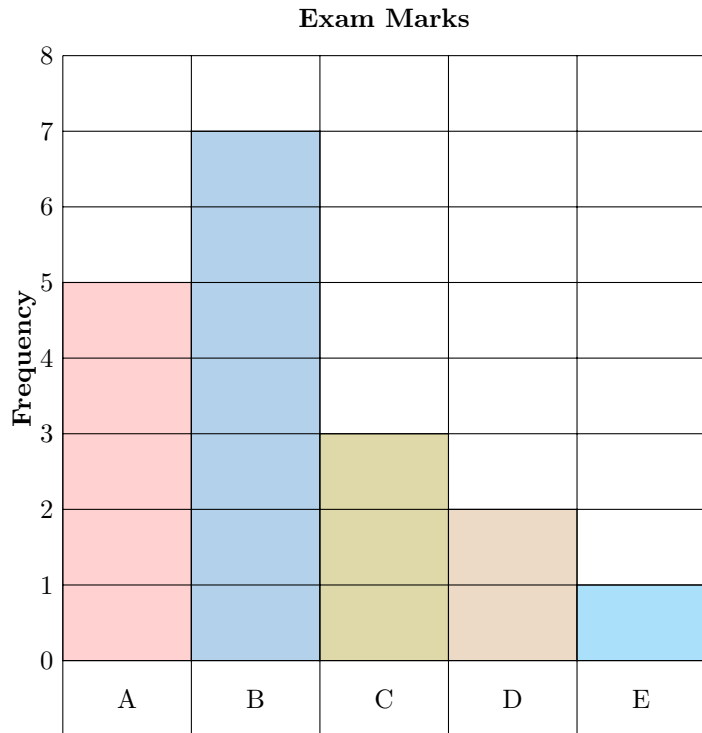
- "Dislike a lot": 1 student (height of bar at 1).
- "Dislike a little": 2 students (height of bar at 2).
- "Not Sure": 3 students (height of bar at 3).
- "Like a little": 5 students (height of bar at 5).
- "Like a lot": 4 students (height of bar at 4).

1. For "Not Sure", there are 3 students.
2. The most common feeling is the one with the highest number of students. "Like a little" has 5 students, which is more than "Like a lot" (Beaucoup, 4), "Not Sure" (Moyen, 3), "Dislike a little" (Un peu, 2), and "Dislike a lot" (Pas du tout, 1). So, "Like a little" is the most common.

3. The least common feeling is the one with the lowest number of students. "Dislike a lot" has 1 student, which is less than "Like a little" (Bien, 5), "Like a lot" (Beaucoup, 4), "Not Sure" (Moyen, 3), and "Dislike a little" (Un peu, 2). So, "Dislike a lot" is the least common.

Ex 20: In his class, Hugo asks the students: "What mark did you get in your last exam?"

He represents the result with a bar chart:



How many students got a B mark?

students

Which mark is the most common?

Which mark is the least common?

Answer: To find the totals, count the number of students for each mark from the bar chart:

- A: 5 students (height of bar at 5).
- B: 7 students (height of bar at 7).
- C: 3 students (height of bar at 3).
- D: 2 students (height of bar at 2).
- E: 1 student (height of bar at 1).

1. For B, there are 7 students.
2. The most common mark is the one with the highest number of students. B has 7 students, which is more than A (5), C (3), D (2), and E (1). So, B is the most common.
3. The least common mark is the one with the lowest number of students. E has 1 student, which is less than B (7), A (5), C (3), and D (2). So, E is the least common.