Population Census (Level 3)

Description	Learners will collect and collate data from members of the school/ community to know them better. They will analyse the collected data using mean, median, and mode to find trends and interesting observations. They will then present this data interestingly and engagingly before an audience.
Leading question	Can we conduct a mini census to learn more about our school/ community?
Subjects covered	Math, English, Social and Emotional Learning
Total time required	40-60 min a day for 4 days
Resources required	Papers, colours, pencils/ pens
Learning outcomes:	By the end of this project, learners will be able to: Knowledge-Based Outcomes: 1. Collate data in a tabular form. 2. Represent data using bar graphs. 3. Calculate the mean of the data set. 4. Calculate the mode of the data set. 5. Calculate the median of the data set. 6. Identify trends and unique observations in a data set. 7. Create a questionnaire and appropriate groups. 8. Interview people to collect data. 9. Present their findings in a fun and engaging way. 10. Reflect critically on their own experience of doing the project. 21st Century Skill Outcomes: 1. Use creativity in making the presentation fun and engaging for the audience. 2. Collaborate effectively with their group members to create the questionnaire, collect data, and analyse it. 3. Communicate effectively to collect data in the given time.
Previous Learning	Arithmetic operations to calculate the mean, arranging numbers in ascending/descending order
Supervision required	Medium

Day 1 -

Today, you will create questions and groups to gather data about school/ community members.

Time	Activity and Description

10 minutes	**Introduction**
	- Think of all your family members. How many of them are male and how many female?
	- Do you know your country's population? How do we find this information?
	
	Note:
	- *Encourage learners to make estimates, even if they don't know the exact answers.*
	- *Once done, explain that estimation is a valuable skill used in daily life, like when grocery shopping.*
	  - *It's not a random guess but an educated one based on available information.*
	  - *For instance, knowing the number of students in their class and the number of classes in the school, they can estimate the total number of students in the school*
	- *Explain that a country's population is determined through a population census, where government officials visit every household to count and collect information for planning facilities like schools and hospitals.*
	- *Inform them that in this project, they will conduct a mini-school/ community census to learn more about their school/ community.*
	
	The **Leading Question** for this project is: Can we conduct a mini census to learn more about our school/ community?
	- For the next three days, you will work to answer this question.
	- You will make a questionnaire, collect data from people in your school/ community, analyse it, and engagingly share the findings with an audience on the fourth day.
	
	Tip: *If learners struggle with estimating, begin with simpler activities using objects around them. For example, ask them to estimate the number of pages in their notebook, their height, or the current time of day.*

15 minutes	**Create the Questionnaire** Select a theme for the school/ community census, like level of schooling, hobbies, differences in roles of men and women, ambitions, or family structure. Once the themes are chosen, create questions for the participants in your notebooks. You should interview at least 5 participants. ***Tip***: - *The teacher can suggest the learners keep two parts in the questionnaire: the first part collects basic information like name, age, gender, and occupation, while the second part contains theme-related questions (at least 3).* - *If students have trouble creating questions, offer guidance by sharing sample questions from the appendix section.*
15 minutes	**Create the Class Intervals** Go through the set of questions that you have finalised and identify the ones for which groups or class intervals can be created.

	- For example, the answers to 'What is your name?' will have a unique response. So you cannot create groups for this question.
	- However, 'How many people are in your home?' can have the following response categories:
	  - 1-4
	  - 5-10
	  - More than 10
	These groups can help you categorise responses to simplify analysis later on.
	
	Note: *Once the learners have identified the questions for which groups can be made, they will work in their groups to create them. Remind them that these groups must be able to capture all responses to a given question. Give them some examples:*
	Age categories:
	- *Under 18*
	- *19-30*
	- *31-60*
	- *Over 60*
	Gender Categories:
	- *Female*
	- *Male*
	- *Others*
	Finalise the groups and create a final version of the questionnaire to collect responses in the next class.

At-Home Activities	Show your questions to an elder in the family/ community and seek their feedback on them. Improve the questions accordingly.

Day 2

Today, you will plan engaging final presentations, choose your research participants, and collect data using your questionnaires.

Time	Activity and Description
10 minutes	**Decide the Form of Presentation** Remember that you will present the census findings before an audience on the fourth and final day of the project! Think of creative ways to share your findings! You can use ideas such as: - starting with a fun game, an engaging activity or a quiz, - challenging the audience to guess the findings before revealing them.
5 minutes	**Identify the Participants** Now, it's time to put your questionnaire to use. - You will interview 5 people from your school community. - Think about who these 5 people can be!
25 minutes	**Collect the Data**

	Note: *Learners will use the questionnaire they created to collect data from 5 participants each. They will record the responses using the following table. They can add more columns if there are more than three theme-based questions in their questionnaires:*

Participant	*Name*	*Age*				*Gender*			*Work*	*Q 1*	*Q 2*	*Q 3*
		U-18	*19-30*	*31-60*	*O-60*	*M*	*F*	*O*				
1												
2												
3												

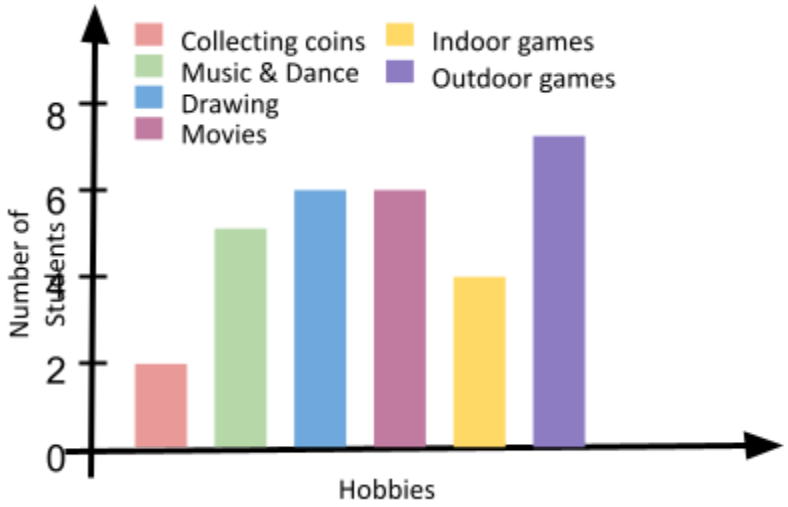
Remind them to keep the following points in mind as they collect the information:

- *Record the information to all the questions correctly.*
- *Be polite while asking questions.*
- *Listen carefully as they answer.*
- *Translate the questions to the locally spoken language if the participants do not understand English.*
- *Thank the participants at the end of the interview.*

Day 3 –

Today, you will create bar graphs to show your findings. You will also calculate the mean, median, and mode for specific data sets to find trends.

Time	Activity and Description
15 minutes	**Create Bar Graphs to Present Data** The data that you have collected can be represented visually in several ways. One such way is using bar graphs. - A bar graph is like a chart with bars that show information. - Each bar represents something, like numbers or amounts, and the taller the bar, the more there is of that thing. ***Note:*** *Instruct the learners to identify any 3 data points that they would like to present through bar graphs. For example, gender, hobbies, or age groups of the participants. Tell them that they can use these graphs in the final presentation. Share with them the following steps to make a bar graph:* 1. *Choose a scale. The scale on a bar graph tells us the value or size of each bar. For example, 1 unit=10 years.* 2. *Represent the scale on the vertical axis or the y-axis.* 3. *Represent the data using bars on the horizontal axis or the x-axis.* 4. *Name the bars to indicate what they represent.*

	For example, a bar graph to show the hobbies of 30 participants may look like this: 
25 minutes	**Understanding Mean, Mode, and Median** **Calculating Mean** Look at the table where you have put together all the data your group collected. It's a lot of numbers! - Sometimes, when we have so much data, it can be hard to make sense of it all. That's where measures of central tendency like mean, median, and mode come in handy. - The most common value in a set of data is called the 'mean' or 'average.' To find the mean, you can use this formula: Sum of all observations ÷ Number of observations - For instance, to figure out the average age of the participants, add up all their ages and then divide that total by how many participants there are. Calculate the average age of the participants. **Calculating Mode** Mode is also a measure of central tendency that helps to make sense of large amounts of data. - The observation that occurs most often in a set of observations is known as the mode. - To find the mode, you must look for the most repeated value/observation. - From the data your group collected, find out: 1. Which age group is most common in your data set? 2. Which gender is most common in your data set? 3. Are there other data points for which you can calculate the mode? **Calculating Median**

	Median refers to the value which lies in the middle of the data (when arranged in an increasing or decreasing order) with half the observations above it and the other half below it. Follow these steps to calculate the median: 1. Arrange the data from smallest to largest. 2. If you have an odd number of data points, the median is the middle value. For example, if you have 1, 3, 6, 8, 9, the median is 6 because it's in the middle. 3. If you have an even number of data points, find the two middle numbers, add them together, and then divide the sum by 2. For example, in the data set 1, 3, 5, 8, add the middle numbers, 3 + 5 = 8, and divide by 2. So, the median is 4 in this case. 4. Imagine you have to divide your participants into two equal groups based on their educational qualification with one group having more qualified people than others, how would you do that? ***Tip:*** *If learners know what mean, median, and mode mean and how they help in identifying trends or patterns, encourage them to identify data points for which they can calculate these measures of central tendency.*

Day 4 –

Today, you will discuss and present your findings engagingly before an audience and reflect on your learnings through this project.

Time	Activity and Description
15 minutes	**Preparation for the Presentation** Decide the findings you want to present and how you want to present them. Some points they must keep in mind while working on their presentations are: - Present the most interesting findings or trends that they observed in their data. - The use of visuals like bar graphs helps the audience understand the trends or observations being discussed. So, they can make a chart showing showing graphs for their presentation. - Use methods discussed on Day 1 of the project to make the presentation more engaging like including a fun game or quiz at the end of the presentation, an engaging activity in the beginning, or getting the audience to guess the findings before presenting them.
15 minutes	**Presentation** ***Note:*** *For this section, get learners to invite school/ community members, and the people they interviewed.* Come forward and present their findings, explaining the trends while engaging the audience. As you perform, ask your audience to note the following things: - What did they find the most interesting observation/trend? - Did they find the presentation interesting?

	- What could they do to make the presentation even more engaging for the audience?
10 minutes	**Reflection** Congratulations on completing your census and presentations! Now, let us reflect on our experience of working on this project. Think and share: - What did you enjoy the most? What did you find the most challenging? - Which observation/trend surprised or shocked you? - What would you do differently if you could do this project again?

Additional enrichment activities:	- Learners can add more questions to the census and come up with the appropriate groups. - After completing the census, learners can try to identify the hobbies and ambitions that most learners in their school have. They can work with the school community (teachers, principals, staff members) to provide opportunities for learners to engage in the hobbies of their choice and get access to more information to make their ambitions come true.
Modifications for simplification	- Reduce the number of questions or categories. - Reduce the number of participants. - Give learners focussed targets to analyse data such as age categories, gender, and occupation. - Allow learners to interview each other instead of others in the school

ASSESSMENT CRITERIA

A majority of my students were able to:

- ☐ Create at least 3 questions and appropriate groups to collect data.
- ☐ Interview at least 3 people to collect data.
- ☐ Collate the collected data in tabular form.

☐ Present data using pictographs and bar graphs.
☐ Calculate the mean, median, and mode of a given set of data.
☐ Present the findings in an interesting and engaging way before an audience.