Lesson Plan 5
Population Change

CRITICAL OUTCOMES

CO #4: Collect, analyze, organize and critically evaluate information.
CO #5: Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation.
CO #7: Demonstrate an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation.

LEARNING OUTCOMES

LO #1: The learner will be able to act confidently on curiosity about natural phenomena, and to investigate relationships and solve problems in scientific, technological and environmental contexts.

Process skills:

Communicating scientific information
Recording information
Interpreting data

ASSESSMENT STANDARDS

Conducts investigations and collects data
Evaluates data and communicates findings

TEACHING THE LESSON

Introduce vocabulary

Population: all the people in a country or region; number of animals in a region

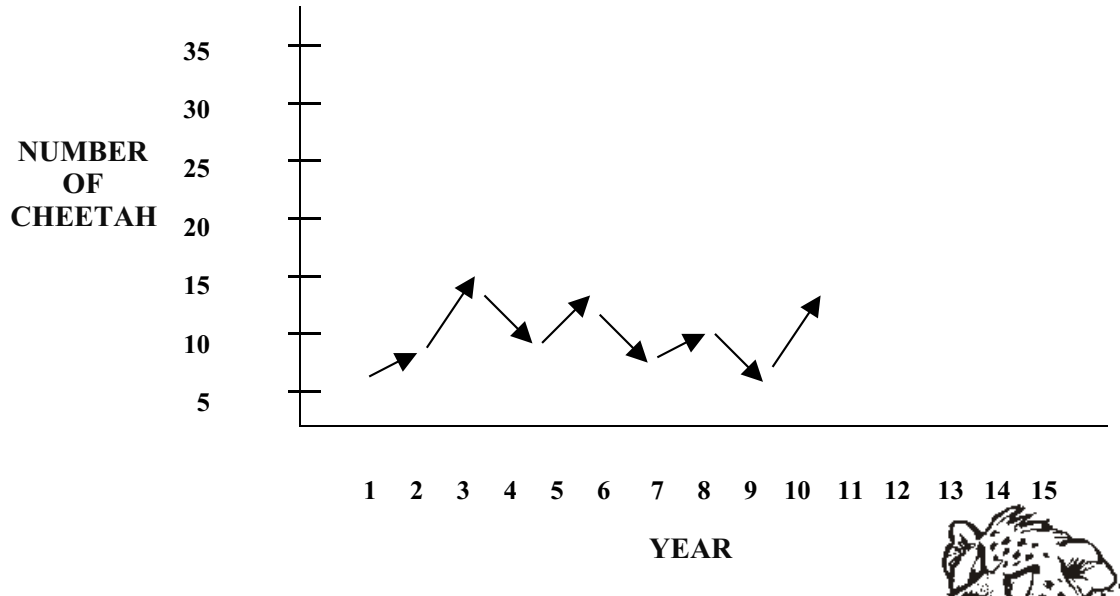
Community: any group living in the same area or having interests in common

ACTIVITY 1 – cheetah challenge with graphing activity

Procedure

1. Ask the students to count off in fours. Have all the "ones" go to one side of the activity area and the rest to the other side.
2. The "ones" become cheetahs. Ask the students what a cheetah or any animal needs to survive - food, water, shelter & space. For the purpose of this activity, assume that the cheetahs have enough water in which to drink. The "ones" need to find food, shelter, & space. If a cheetah (the "ones") want to find food they clamp their paws over their stomachs. If the cheetah is looking for shelter, it puts its paws over its head. If it is looking for space, it crosses its paws across its chest (like hugging itself). A cheetah can choose to look for one of its needs during each round and can change what it is looking for in the next round, if it survives. The cheetah can not change its sign when it sees what is available during that round.

3. The twos, threes, and fours are food, shelter and space - components of a habitat. Each student is allowed to choose at the beginning of each round which component he or she will be during that round. The students depict which component they are in the same way the cheetah show what they are looking for; that is, hands on stomach for food, etc.
4. The activity starts with all players lined up on each side of the activity area (cheetah on one side, habitat components on the other side) and with their backs facing the students along the other side of the area.
5. Begin the first round by asking the students to make their signs - each cheetah deciding what it is looking for, each habitat component deciding what it is. Give the students a few moments to put their hands in place. (The two lines of students normally will display a lot of variety in signs. As the activity proceeds, sometimes the students will confer with each other and all will make the same sign. That's okay, and you may encourage it. For example, all students in the habitat might decide to be shelter. This could represent a drought year with no food or water.)
   Note: Switching symbols in the middle of a round can be avoided by telling the students if they are caught cheating they will not participate.
6. When the students are ready, say: "Cheetah Challenge!" Each cheetah and each habitat component turn to face the opposite group, continuing to hold their sign clearly.
7. When the cheetahs see the habitat component they need, they run to it. Each cheetah must hold the sign of what it is looking for until getting to the habitat component student with the same sign. Each cheetah that reaches its necessary habitat component takes the "food", "shelter", or "space" back to the cheetah side of the activity area.
8. "Capturing" a habitat component represents the cheetah successfully meeting its needs and successfully reproducing as a result. Any cheetah that fails to find its food, shelter, or space dies and becomes part of the habitat.
   Note: When more than one cheetah reaches a habitat component, the student who arrives first survives. Habitat components stay in place until a cheetah chooses them. If no cheetah needs a particular habitat component during a round, the habitat component just stays where it is in the habitat. That habitat component can, however, change which component it is from round to round.
9. Record the number of cheetah at the beginning of the activity and at the end of each round. Continue the activity for approximately 15 rounds. If possible, have a student or two assist you in recording the numbers.
10. After each round, ask the students to observe what is happening to the cheetah population? Why did it increase?
11. At the end of 15 rounds, use an overhead projector, flip chart or chalkboard, post the data recorded during the activity. The number of cheetah at the beginning of the activity and at the end of each round represents the number of cheetah in a series of years. That is, the beginning of the activity is year one; each round is an additional year. Cheetah can be posted by fives for convenience. For example:



Have the learner record the posted data in the form of a graph. The students will see this as a visual reminder of what they experienced during the activity: the cheetah population fluctuated over a period of years. This process is natural as long as the factors that limit the population do not become excessive, to the point where animals cannot successfully reproduce. With the graph, have the students write a brief paragraph regarding what was happening with the cheetah population with thoughts on how habitat components are affecting the population numbers. (eg: is the population stable- does it fluctuate within acceptable levels does it crash and why what would happen if one of the four components was totally removed from the system etc.)

Extension: Try to record numbers for all four of the habitat components as well as cheetah numbers on each round and graph the results with a discussion one what you see.

ASSESSMENT

Checklist for Graph:

Assessment Statements	Yes	No
Graph has a heading		
Both Axis are labelled		
Axis labels are correct (number of cheetahs vs years)		
Axis are divided into relevant intervals		
Data is plotted accurately		
The graph is neat and legible		

Rubric for paragraph:

1	2	3	4
The student struggled with the graph and could not interpret the data in terms of the processes affecting it.	The student could transfer the data correctly into graph format, but showed a lack of understanding of the processes behind the data.	The student could record the information in a graph and showed good understanding of the processes indicated by the graph.	The student exceeded expectations in the interpretation of the data correctly displayed in the graph.

Mathematics links:

LEARNING OUTCOME	ASSESSMENT STANDARDS
LO1: Number Operations and Relationships	Solves problems in context including contexts that may be used to build awareness of other Learning Areas as well as environmental issues.
LO5: Data Handling	Draws a variety of graphs to display and interpret data