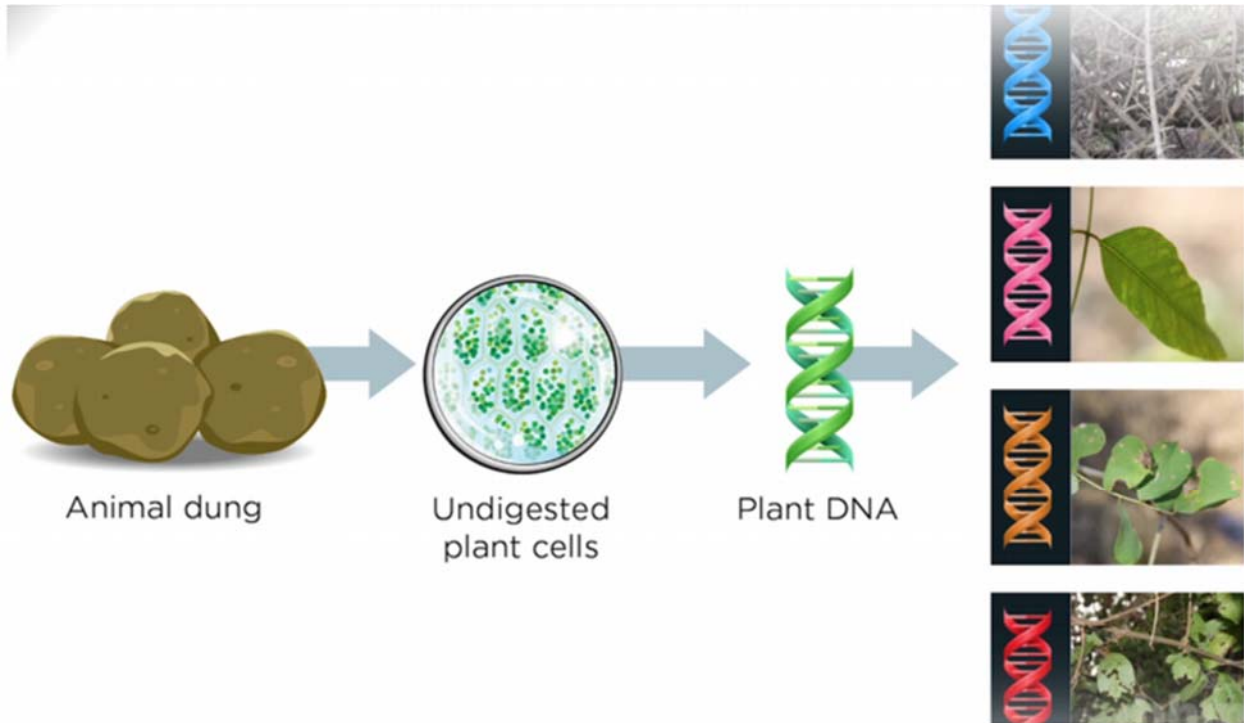Name                                          **Niche Video  Worksheet**


This worksheet complements the short video "Niche Partitioning and Species Coexistence" from the Scientists at Work series (https://www.hhmi.org/biointeractive/niche-partitioning-and-species-coexistence).

List two pieces of evidence from the film justifying the claim that "termite mounds are an advantage to the savanna ecosystem.


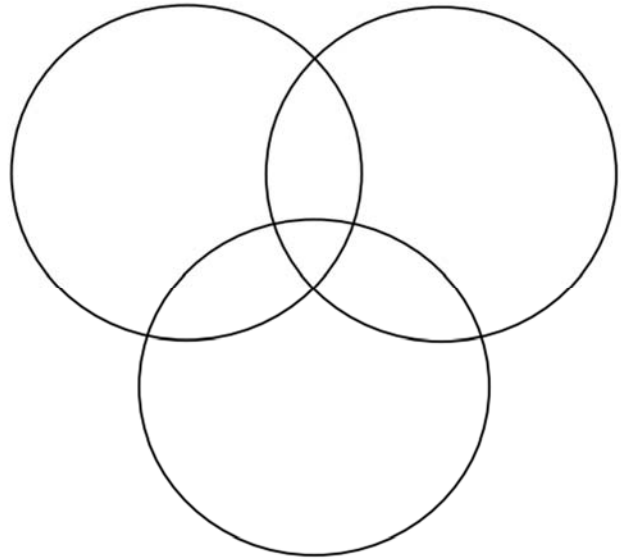Dr. Pringle is using DNA metabarcoding, summarized here:



Provide two reasons why it is important to isolate undigested plant cells.




In order to use this DNA technique, the research team first collected DNA from 400 plant species that grow on the African savanna and entered the sequence data into a database. Explain why this was a necessary first step.

| | Plant Taxa | Buffalo | Cattle | Impala |
|---|---|---|---|---|
| 1 | Hirpicium diffusum | Yes | Yes | Yes |
| 2 | Gutenbergia (genus) | Yes | Yes | Yes |
| 3 | Emilia discifolia | Yes | Yes | Yes |
| 4 | Osteospermum vaillantii | No | Yes | Yes |
| 5 | Helichrysum glumaceum | No | Yes | Yes |
| 6 | Asteraceae (family) | No | No | Yes |
| 7 | Eragrostis sp. | Yes | Yes | No |
| 8 | Digitaria (genus) | No | Yes | Yes |
| 9 | Tragus berteronianus | No | Yes | Yes |
| 10 | Setaria sphacelata | Yes | No | No |
| 11 | Eragrostis papposa | No | Yes | No |
| 12 | Urochloa brachyura | Yes | No | Yes |
| 13 | Echinochloa pyramidalis | Yes | No | No |
| 14 | Harpachne schimperi | Yes | Yes | Yes |
| 15 | Panicum maximum | Yes | Yes | Yes |
| 16 | Garnotia (genus) | Yes | No | No |
| 17 | Brachiaria eruciformis | Yes | No | No |
| 18 | Sporobolus agrostoides | Yes | No | No |
| 19 | Dinebra retroflexa | No | Yes | No |
| 20 | Pennisetum hohenackeri | Yes | No | No |

Data from Kartzinel, et al. (2015). PNAS *112*(26), 8019–8024.

The table to the left is from another metabarcoding study by Dr. Pringle. Use the table to complete a Venn diagram illustrating the different plants eaten by three different animals. Label a circle for each of the animals and then **place a dot** in the appropriate area of the graph for each plant taxa.



Which two animals have the most overlap in their diets? Justify your response.

Cattle and buffalo share a similar fundamental niche, the entire set of conditions under which a population can survive and reproduce. A realized niche is the set of conditions actually used by a given population. Explain what the data in the Venn diagram suggest about the realized niches of the cattle and buffalo and their ability to coexist. Use evidence to support your explanation.

If plant species #10, 13, 16, 17, 18, and 20 were no longer available to the buffalo, predict what would occur in this ecosystem using your understanding of fundamental vs realized niche.