

GENERAL RUBRIC (COPY AND PASTE TO ADD THINGS)

	Partially Met	Approaching	Met	Exceeds
Required components	Includes minimum components: <i>list</i> .	Includes most but not all required components (see Met for complete list)	Includes all required components: <i>list</i> .	Includes all required components and additional components: <i>list</i> . Or describes the multiple levels of organization of components: <i>list examples</i> .
Interactions	Draws or indicates the minimum interactions necessary to explain the phenomenon: <i>list</i> .	Draws or indicates some interactions necessary to explain the phenomenon but some interactions represented are inaccurate (see Met for complete list)	Draws or indicates all interactions and labels interactions to explain phenomenon: <i>list</i>	Draws or indicates all needed and additional (<i>list</i>) interactions and labels interactions to explain phenomenon (see met), all interactions represented are accurate
Includes correct causal mechanisms that explains the phenomenon	Includes at least one mechanism in writing (see Met), but mechanism is insufficient to explain the cause-and-effect relationships	Includes and describes in writing how some but not all (see Met) of the mechanisms account for the cause-and-effect relationships	Includes and describes in writing how each mechanism works to explain each cause-and-effect relationship between components: <i>list, could</i>	Includes and describes in writing how each required mechanism explains the phenomenon and describes how mechanisms work

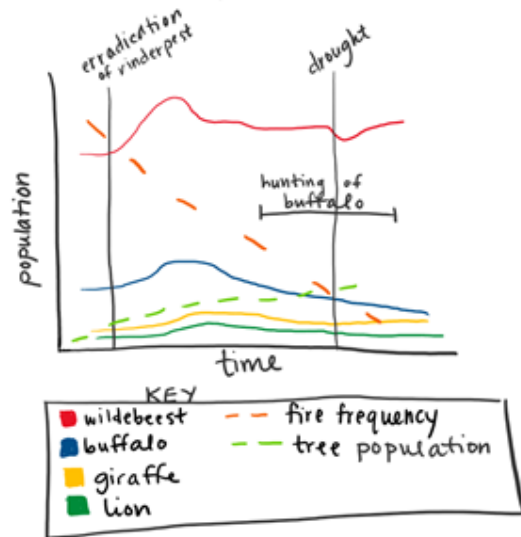
			<i>include drawings.</i>	<p>together (for example, glucose from photosynthesis travels via the phloem to cells in the trunk for mitosis) to explain the phenomenon</p> <p>Or describes extra mechanisms: <i>list.</i></p>
Reflection for how model has been revised in light of new information or evidence gathered	Does not describe a revision made	Describes revision made, but if reason for revision is given, it does not pertain to new information or evidence gathered	Describes one revision and includes why it was revised in light of new information or evidence gathered	Describes more than one revision and includes why each revision was done in light of new information and evidence gathered

Bend 1: Serengeti

	Partially Met	Approaching	Met	Exceeds
Required components	Includes minimum components: <ul style="list-style-type: none"> • <i>Population changes of</i> <ul style="list-style-type: none"> ○ <i>Buffalo</i> ○ <i>Wildebeest</i> • <i>Grass</i> 	Includes most but not all required components (see Met for complete list)	Includes all required components: <ul style="list-style-type: none"> • <i>Population changes of</i> <ul style="list-style-type: none"> ○ <i>Buffalo</i> ○ <i>Wildebeest</i> ○ <i>Giraffe</i> ○ <i>Lion</i> • <i>Geographic area</i> • <i>Grass</i> • <i>Trees</i> 	Includes all required components and additional components: <ul style="list-style-type: none"> • <i>Hunting/human impacts</i>
Interactions	Draws or indicates the minimum interactions necessary to explain the phenomenon: <ul style="list-style-type: none"> • <i>Causes of population change</i> <ul style="list-style-type: none"> ○ <i>Rinderpest</i> 	Draws or indicates some interactions necessary to explain the phenomenon but some interactions represented are inaccurate (see Met for complete list)	Draws or indicates all interactions and labels interactions to explain phenomenon: <ul style="list-style-type: none"> • <i>Causes of population change</i> <ul style="list-style-type: none"> ○ <i>Rinderpest</i> ○ <i>Predation</i> ○ <i>Drought</i> 	Draws or indicates all needed and additional (<i>Wildfire frequency, tree population, wet and dry seasons</i>) interactions and labels interactions to explain phenomenon (see met), all interactions represented are accurate
Includes correct causal mechanisms that explains the	Includes at least one mechanism in writing (see Met), but	Includes and describes in writing how some but not all (see Met) of	Includes and describes in writing how each mechanism works to	Includes and describes in writing how each required mechanism

phenomenon	mechanism is insufficient to explain the cause-and-effect relationships	the mechanisms account for the cause-and-effect relationships	explain each cause-and-effect relationship between components: <ul style="list-style-type: none"> • <i>Food availability for buffalo population</i> • <i>Migration patterns of Wildebeest</i> • <i>Green biomass across the Serengeti</i> 	explains the phenomenon and describes how mechanisms work together to explain the phenomenon Or describes extra mechanisms: <ul style="list-style-type: none"> • <i>Cause and effect of wildfires</i> • <i>Food availability for giraffes</i> • <i>Hunting policy changes effects on populations</i>
Reflection for how model has been revised in light of new information or evidence gathered	Does not describe a revision made	Describes revision made, but if reason for revision is given, it does not pertain to new information or evidence gathered	Describes one revision and includes why it was revised in light of new information or evidence gathered	Describes more than one revision and includes why each revision was done in light of new information and evidence gathered

POPULATION CHANGES



There are always more wildebeest than the other species. However, the other species follow similar patterns of population size that we see the in the wildebeests. The buffalo population decreases more, proportionally, than the wildebeest after the spike.

The giraffe and lion populations both tend to increase over the same time.

The tree population also increases because the larger population of wildebeest eat more grass which helps reduce fire frequency.

Bend 2: Trees

	Partially Met	Approaching	Met	Exceeds
Required components	<p>Includes minimum components:</p> <ul style="list-style-type: none"> • Tree • CO2 • Sun • O2 • Water • Leaves 	<p>Includes most but not all required components (see Met for complete list)</p>	<p>Includes all required components:</p> <ul style="list-style-type: none"> • Tree • CO2 • H2O • Light energy • O2 • Glucose • Fungus • Leaf litter • Xylem • Phloem • Decomposer • Cellulose/fiber • Leaf • Stoma • Chloroplast • Vascular cambium • Cells • Starch • Nitrogen/Phosphorus • Protein • DNA • Mitochondria 	<p>Includes all required components and additional components:</p> <ul style="list-style-type: none"> • Mycorrhizae • Humans • Industrial CO2 • Heat energy <p>Or describes the multiple levels of organization of components:</p> <ul style="list-style-type: none"> • N, P, C make up cells and DNA • Cells make up tissues, • Tissues makes up trees • Carbon is chemically bonded to form larger molecules like glucose, cellulose and starch

Interactions	<p>Draws or indicates the minimum interactions necessary to explain the phenomenon</p> <ul style="list-style-type: none"> • Leaves take in CO₂, H₂O and light energy to make glucose and oxygen through photosynthesis 	<p>Draws or indicates some interactions necessary to explain the phenomenon but some interactions represented are inaccurate (see Met for complete list)</p>	<p>Draws or indicates all interactions and labels interactions to explain phenomenon:</p> <ul style="list-style-type: none"> • Leaves take in CO₂, H₂O and light energy to make glucose and oxygen through photosynthesis • Mycorrhizae help roots absorb water through osmosis • Sunlight excites chloroplasts • CO₂ enters leaves through stoma • Vascular cambium uses the cellulose and starch to create more wood by mitosis • Tree cells get the materials they need (C, N, P) from soil • Tree cells use N and P from soil to make DNA and proteins for mitosis • Tree cells use 	<p>Draws or indicates all needed and additional (see below) interactions and labels interactions to explain phenomenon (see met), all interactions represented are accurate</p> <ul style="list-style-type: none"> • Surface tension plays a role in the transport of glucose through the phloem and water through the xylem • Human activities such as the burning of fossil fuels add CO₂ to the atmosphere • CO₂ in the atmosphere traps heat energy
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			<p>glucose to make energy for mitosis in the mitochondria through the process of cellular respiration</p> <ul style="list-style-type: none"> ● Cellular respiration uses glucose and oxygen to make CO₂, water and useable energy ● Decomposers live in the soil and break down leaf litter to add carbon to the soil ● Trees transport water through the xylem via transpiration ● Trees transport glucose through the phloem ● Trees remove CO₂ in the atmosphere and use it to grow via carbon sequestration 	
Includes correct causal	Includes at least one	Includes and describes	Includes and describes	Includes and describes

<p>mechanisms that explain phenomena</p>	<p>mechanism in writing (see Met), but mechanism is insufficient to explain the cause-and-effect relationships</p>	<p>in writing how some but not all (see Met) of the mechanisms account for the cause-and-effect relationships</p>	<p>in writing how each mechanism works to explain each cause-and-effect relationship between components to explain the phenomenon:</p> <ul style="list-style-type: none"> • Photosynthesis • Osmosis • Transpiration • Mitosis • Cellular Respiration • Carbon Sequestration • DNA Replication • Transport of glucose and water 	<p>in writing how each required mechanism explains the phenomenon and describes how mechanisms work together (for example, glucose from photosynthesis travels via the phloem to cells in the trunk for mitosis) to explain the phenomenon</p> <p>Or describes extra mechanisms:</p> <ul style="list-style-type: none"> • Diffusion • Surface tension • CO2 trapping heat • Humans using O2 • Human activities adding CO2 to atmosphere
<p>Reflection for how model has been revised in light of available evidence/info</p>	<p>Does not describe a revision made</p>	<p>Describes revision made, but if reason for revision is given, it does not pertain to new information or evidence gathered</p>	<p>Describes one revision and includes why it was revised in light of new information or evidence gathered</p>	<p>Describes more than one revision and includes why each revision was done in light of new information and</p>

evidence gathered

