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Name Date
3 Thing I Noticed: Think because Observe Observe
Name Date
3 Thing I Noticed: Think because Observe December Decem

Name	Date
Levels of Organization	
	e animal. Then sketch a population, nd biosphere for your animal.
Organism	Population
Biosph	Ecosystem Ecosystem

Name	Date			
Levels of Organization				
Sketch & label you favorite animal. Then sketch a population, community, ecosystem, and biosphere for your animal.				
Organism				
	Community			
Biosphere	Ecosystem			

Name	Date		Name	Date	
Factors in an Ecosystem			Factors in an Ecosystem		
Eco	systems	\backslash	Eco	systems	
Biotic Factors	Abiotic Factors]	Biotic Factors	. Abiotic Factors	
Definition:	Definition:		Definition:	Definition:	
Examples:	Examples:		Examples:	Examples:	
Sketch:	Sketch:	$\prod_{i=1}^{n} \left(\frac{1}{2} \right)^{i}$	Sketch:	Sketch:	
Sketch an ecosystem and include label each factor.	4 biotic and 2 abiotic factors. Circle a		Sketch an ecosystem and include label each factor.	4 biotic and 2 abiotic factors. Circl	e and
was removed.	ld change if one of the factors you dre		was removed.	ld change if one of the factors you	

Name Date	Name Date
Ecological Relationships	Ecological Relationships
Next to each description, write the type of relationship in the blank.	Next to each description, write the type of relationship in the blank.
Orangutans will find ant colonies and use their thick fur to trap ants. They then eat the ants tangled in their fur.	Orangutans will find ant colonies and use their thick fur to trap ants. They then eat the ants tangled in their fur.
A pearlfish lives inside the intestines of a sea cucumber, which is a nice safe place to live. It will come out at night to eat. The sea cucumber doesn't get anything from the pearlfish.	A pearlfish lives inside the intestines of a sea cucumber, which is a nice safe place to live. It will come out at night to eat. The sea cucumber doesn't get anything from the pearlfish.
Honey guide birds will help direct honey badgers to beehives. The honey badger will destroy the hive to get to the honey. After it is done, the honey guide bird will get some of the leftover honey, but the bees are no longer a concern.	Honey guide birds will help direct honey badgers to beehives. The honey badger will destroy the hive to get to the honey. After it is done, the honey guide bird will get some of the leftover honey, but the bees are no longer a concern.
There is a type of fungus that will take over the nervous system of insects and cause them to climb up high before killing the host insect as the fungus uses it for food and to spread more spores.	There is a type of fungus that will take over the nervous system of insects and cause them to climb up high before killing the host insect as the fungus uses it for food and to spread more spores.
Prairie dogs dig holes in the prairies to use as shelter. Snakes, burrowing owls, and other small animals will also use these holes for shelter.	Prairie dogs dig holes in the prairies to use as shelter. Snakes, burrowing owls, and other small animals will also use these holes for shelter.
Using the last example, explain a prairie dogs' habitat vs its niche.	Using the last example, explain a prairie dogs' habitat vs its niche.
Black footed ferrets will eat prairie dogs. The prairie dog is the	Black footed ferrets will eat prairie dogs. The prairie dog is the and the ferret is the
Ticks will feed on the blood of other animals, such as deer. The tick is the	Ticks will feed on the blood of other animals, such as deer. The tick is the and the deer is the

Name		Date
Competition		paramecium in isolation
Image modified from "Com Which 2 species are s	nunity ecology: Figure Z," by Ophown in the graphs?	paramecium in isolation P. caudatum alone 70 60 10 10 15 10 15 20 Time (days) penStax College, Concepts of Biology, CC BY 4.0. P. caudatum alone 70 60 70 70 Time (days) penStax College, Concepts of Biology, CC BY 4.0.
Why do you think bot number of days?	Both species groves 150 150 150 150 150 150 150 150 150 150	relia P. caudatum
How does the popula	tion growth change	when they are grown together?
shows interspecific co		ra- means within. Which graph Which shows intraspecific

Name Date			
Competition			
·			
Population growth of single-celled paramecium in isolation P. aurelia alone			
What difference do you notice about the size of each population? Why do you think both populations start to decrease slightly after a certain			
number of days?			
Both species grown together 250 P. durelia 150 150 P. caudatum 5 10 15 20 Time (days)			
How does the population growth change when they are grown together?			
The prefix inter- means between and intra- means within. Which graph shows interspecific competition? Which shows intraspecific competition?			

Name	ne Date			
Ecosystems Vocabula definitions.	ry-Match the following	g words to the correct		
A. Adaptation	B. Symbiosis	C. Commensalism		
D. Predation	E. Community	F. Population		
G. Biotic Factor	H. Competition	J. Biosphere		
K. Organism	L. Ecosystem	M. Abiotic Factor		
N. Mutualism	O. Parasitism	P. Limiting factor		
Q. Habitat	R. Niche			
close rela	ationship of 2 organisn	ns in the same area.		
one orga	nism consumes anoth	er for energy.		
the role	that an organism plays	in its environment		
all of the	all of the organisms living in an area.			
all factors in an area that are living or were once living.				
all of the life supporting areas on Earth				
any trait that helps an organism survive and reproduce.				
all of the organisms of the same species living in an area.				
when 2 organisms need to use the same resource in an area				
where an organism lives				
a single i	ndividual			
one orga	nism is benefited, but	the other is unaffected.		
anything	in an ecosystem that o	could limit population growth		
an area t	hat includes the living	and nonliving things in the		
things in	an area that are not li	ving		
when dif	when different species help each other			
when on	e organism lives off ar	nother and harms the host		

Name	Date			
•	lary-Match the following	g words to the correct		
definitions.				
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close re	elationship of 2 organism	ns in the same area.		
one org	ganism consumes anoth	er for energy.		
the role	e that an organism plays	in its environment		
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all factors in an area that are living or were once living.				
all of the life supporting areas on Earth				
any trait that helps an organism survive and reproduce.				
all of the organisms of the same species living in an area.				
when 2 organisms need to use the same resource in an area				
where	an organism lives			
a single	e individual			
		the other is unaffected.		
anything in an ecosystem that could limit population growth				
area	i that includes the living	and nonliving things in the		
	n an area that are not li	_		
when d	lifferent species help ea	ch other		
when c	ne organism lives off ar	other and harms the host		

Na	me Date
Foo	od Webs
	ONSUMPTION. DECOMPOSITION. F. C.
1. 2.	Which letter represents producers? Which letter represents primary consumers?
3.	Give an example of an organism that is a secondary and tertiary consumer.
4.	Which organism will get less energy than the frog? How do you know?
5.	Which letter represents decomposers?
6.	Which letter would represent the feeding level with the fewest individuals?

7. Which letter represents the feeding level that would have the highest concentration of toxic chemicals in an ecosystem? _____

Nar	me Date
Foc	od Webs
	ONSUMPTION. DECOMPOSITION.
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Name Date
Biomagnification
PCBs are released from multiple sources into Puget Sound
PHYTOPLANKTON ABSORB PCBs 2 2
3 ZOOPLANKTON HERRING EAT ZOOPLANKTON
SALMON EAT HERRING
8 8 8 8 9 9 9
Biomagnification
LARGE MAMMALS (ORCA WHALES)
EAT SALMON
Chart not to scale
This Photo by Unknown Author is licensed under CC BY-NC-ND
Which organisms in this diagram are producers?
Which organisms in this diagram are primary consumers?
Which organism is the top carnivore?
What do the dots represent?
What happens to the concentration of the dots as you move up the food chain?
Look up the term biomagnification and write the definition

Name Date
Biomagnification
PCBs are released from multiple sources into Puget Sound
PHYTOPLANKTON ABSORB PCBs O O O O O O O O O O O O O O O O O O O
ZOOPLANKTON HERRING EAT
ZOOPLANKTON
SALMON
EAT HERRING
Biomagnification LARGE MAMMALS (ORCA WHALES) EAT SALMON
Chart not to scale
This Photo by Unknown Author is licensed under <u>CC BY-NC-ND</u>
Military and a second s
Which organisms in this diagram are producers?
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What do the dots represent?
What happens to the concentration of the dots as you move up the food chain?
Look up the term biomagnification and write the definition

Name	D-+-	Name	Data
Name	Date	Name	Date
Adaptations		Adaptations	
Explain how the adapta	tion listed helps the organism survive. Then,	Explain how the ada	aptation listed helps the organism survive. Then,
come up with a second adaptation for survival the organism has.		come up with a sec	ond adaptation for survival the organism has.
(Ears)		(Ears) _	
	Fins)		(Fins)
(Needle-like	e leaves)	(Needle	e-like leaves)
(Feathe	rs)	(Fe	athers)
(Co	ones open after fire)		(Cones open after fire)

Name	Date
1	Energy Flow in Ecosystems
	Decomposers: break down waste and dead things Consumers Secondary Consumers Consumers Consumers
•	Primary Consumers converted to chemical energy through cellular respiration Producers convert light energy to chemical energy through photosynthesis
	Solar
-	orb 25,000 J of energy, how much will be available to the umers?
Give an example	of a producer that is not a plant
If an organism co	ould be a primary or secondary consumer, it is known as
	ng to the 90% of energy that isn't available to the next
Explain why ther	re is less biomass at the higher trophic levels as well as

less energy. _____

Energy Flow in Ecosystems
Decomposers: break down waste and dead things Tertiary energy to Consumers Secondary environment Consumers Primary Consumers converted to chemical energy through convert light energy to chemical energy through photosynthesis Solar Energy Solar Energy
If producers absorb 25,000 J of energy, how much will be available to the secondary consumers?
Give an example of a producer that is not a plant.
If an organism could be a primary or secondary consumer, it is known as an
What is happening to the 90% of energy that isn't available to the next trophic level?
Explain why there is less biomass at the higher trophic levels as well as less energy.

Date _____

Name _____

Name	e Date	
Energy Vocabulary R	eview-match the words	s to the correct definitions.
A. autotrophs	B. consumers	C. omnivores
D. food chain	E. heterotrophs	F. herbivores
G. decomposers	H. food web	I. producers
J. carnivores	K. detritivores	L. ecological pyramid
M. trophic level	N. biomagnification	ı
organisi	ms that only eat other a	animals
organisi	ns that can make their	own food using sunlight (2
letters)		
organis	ms that eat dead organ	isms
occurs v	when toxins increase in	concentration as they move
up the trophic levels		·
organisi	ms that must eat other	organisms to get energy (2
letters)		
diagram	showing that energy o	lecreases as you go up
trophic levels		
organis	ms that can eat plants o	or animals
simple of	diagram that shows fee	ding relationships between a
few organisms		
feeding	level	
organis	ms that only eat plants	
complex	x diagram that shows m	nultiple feeding relationships
in an ecosystem		
organisi	ms that breakdown was	ste and dead organic matter
to recycle nutrients i	n an ecosystem	

Name	Date	
Energy Vocabulary R	Review-match the words	to the correct definitions.
A. autotrophs D. food chain G. decomposers J. carnivores M. trophic level	B. consumers E. heterotrophs H. food web K. detritivores N. biomagnification	C. omnivores F. herbivores I. producers L. ecological pyramid
organis	ms that only eat other a	nimals
organis	ms that can make their	own food using sunlight (2
organis	ms that eat dead organi	isms
up the trophic levels		concentration as they move
organis	ms that must eat other	organisms to get energy (2
diagran	n showing that energy d	ecreases as you go up
organis	ms that can eat plants o	or animals
simple few organisms	diagram that shows feed	ding relationships between a
feeding	level	
organis	ms that only eat plants	
comple	x diagram that shows m	ultiple feeding relationships
organis to recycle nutrients		ite and dead organic matter

Name Date	Name Date
Plants & Nutrients	Plants & Nutrients
Review (look up if necessary):	Review (look up if necessary):
1. What 3 things do plants need to carry out photosynthesis? a. b. c. 2. What are 2 functions of plant roots? a. b. b.	 What 3 things do plants need to carry out photosynthesis? a. b. c. What are 2 functions of plant roots? a. b.
Look up the following information:	Look up the following information:
 3. What are the "big 3" elements found in fertilizer? a b c 4. These elements are important nutrients for plants. What structure do plants use to absorb these elements? 5. Which two elements are considering the most limiting? 	 3. What are the "big 3" elements found in fertilizer? a b c 4. These elements are important nutrients for plants. What structure do plants use to absorb these elements? 5. Which two elements are considering the most limiting?
6. What do plants and animals use each of these elements to make? a b.	6. What do plants and animals use each of these elements to make? a
b 7. These nutrients are absorbed by plants in an ecosystem. How do animals get the nutrients they need?	b7. These nutrients are absorbed by plants in an ecosystem. How do animals get the nutrients they need?
8. What happens if plants don't get enough nutrients?	8. What happens if plants don't get enough nutrients?
9. How would this affect animals?	9. How would this affect animals?

Name Date	Name Date
Eutrophication Video Bellringer	Eutrophication Video Bellringer
Watch the video at bit.ly/3mZYG0f and answer the following questions.	Watch the video at bit.ly/3mZYG0f and answer the following questions.
What is a "dead zone" in the ocean?	What is a "dead zone" in the ocean?
What are 2 ways that photosynthetic organisms are important to marine ecosystems?	What are 2 ways that photosynthetic organisms are important to marine ecosystems?
Other than sunlight, what 2 nutrients do producers need? &&	Other than sunlight, what 2 nutrients do producers need? &
What is eutrophication?	What is eutrophication?
Why is an increase in algae growth on the surface a problem?	Why is an increase in algae growth on the surface a problem?
What happens when large amounts of producers die and start decomposing?	What happens when large amounts of producers die and start decomposing?
What are some major sources of pollutants that lead to an increase in algae growth?	What are some major sources of pollutants that lead to an increase in algae growth?
How do these dead zones affect us?	How do these dead zones affect us?
What are some ways to prevent run-off that contributes to these dead zones?	What are some ways to prevent run-off that contributes to these dead zones?

Name	Date
Carbon Cycle Bellringer	
CARBON	CYCLE
Burning fossil fuels Decay Respiration Soil and organic matter Coal, oil, gas Weathering and run-off Sediments and sedimentary rock Rock formation © 2007-2010 The University of Waikato www.sciencelearm.org.nz	Photosynthesis Carbon stores Processes Processes Carbon dioxide exchange Ocean surface Phytoplankton Deep circulation Deep ocean
Circle the 2 processes that remove carb	oon from the atmosphere. Put a
star next to the 4 processes that releas	e carbon into the atmosphere.
Explain one path carbon could take to oback again.	cycle from the atmosphere and
What happens when we disrupt any of	the carbon sinks (storage)?
What does CO ₂ do in the atmosphere?	
What is something we could do to reverse much CO ₂ ?	•
Which type of biomolecule is produced	during photosynthesis?

Name	Date
Carbon Cycle Bellring	er
	CARBON CYCLE
Burning fossil fuels Decay Soil and organic matter	Atmosphere Processes Processes Processes Carbon stores Processes Carbon dioxide exchange Carbon dioxide exchange
Coal, oil, gas	Weathering and run-off and run-off Phytoplankton Ocean surface Ocean sur
© 2007-2010 The University of Waik	Rock formation Sinking sediment Deep ocean sto www.sciencelearn.org.nz that remove carbon from the atmosphere. Put a cesses that release carbon into the atmosphere.
© 2007-2010 The University of Walk Circle the 2 processe star next to the 4 pro	s that remove carbon from the atmosphere. Put a
© 2007-2010 The University of Waik Circle the 2 processe star next to the 4 pro Explain one path carl back again.	s that remove carbon from the atmosphere. Put a cesses that release carbon into the atmosphere.
© 2007-2010 The University of Walk Circle the 2 processe star next to the 4 pro Explain one path carl back again.	s that remove carbon from the atmosphere. Put a cesses that release carbon into the atmosphere. on could take to cycle from the atmosphere and we disrupt any of the carbon sinks (storage)?
© 2007-2010 The University of Walk Circle the 2 processe star next to the 4 pro Explain one path carl back again. What happens when What does CO ₂ do in	the atmosphere? the atmosphere? the could do to reverse the problem of releasing too

Name	Date
Nitrogen Cycle Bellringer	
Ammonium (NH ₄ ⁺)	Assimilation Denitrifying Bacteria Nitrates (NO ₃) Soic rification Nitrites (NO ₂) ring bacteria
star next to the process that puts nitrogen could take to back again.	cycle from the atmosphere and
Nitrogen fixation converts atmospheric Which organisms perform this process?	
Why do plants need nitrogen?	
If the nitrogen cycle is disrupted, which affected first?	

Name Date
Nitrogen Cycle Bellringer
Atmospheric Nitrogen (N ₂) Plants Assimilation Denitrifying Bacteria living in legume root nodules Decomposers (aerobic and anaerobic bacteria and fungi) Ammonification Nitrification Nitrification Nitrifying bacteria Nitriogen-fixing soil bacteria Nitrifying bacteria
Circle the 2 processes that remove nitrogen from the atmosphere. Put a star next to the process that puts nitrogen back into the atmosphere.
Explain one path nitrogen could take to cycle from the atmosphere and back again
Nitrogen fixation converts atmospheric nitrogen into usable nitrogen. Which organisms perform this process? Why do plants need nitrogen?
If the nitrogen cycle is disrupted, which group of organisms would be affected first?

Name	Date	Name	Date
Succession & Stability Bellringer		Succession & Stability Bellringer	
Label each example as either primary (P) or secondary (S) succession.		Label each example as either primary (P) or secondary (S) succession.	
Volcanic activity	Forest fire	Volcanic activity	Forest fire
Plowing a field	Retreating glacier	Plowing a field	Retreating glacier
Flood	Tornado	Flood	Tornado
Hurricane	Paving a sidewalk	Hurricane	Paving a sidewalk
Explain how each of the following could affect biodiversity & ecosystem stability.		Explain how each of the following could affect biodiversity & ecosystem stability.	
Cutting down native forest to plant crop trees		Cutting down native forest to plant crop trees	
introducing a non-native species that is able to reproduce quickly and		Introducing a non-native species that is able to reproduce quickly and	
doesn't have many predators		doesn't have many predators	
Using a small area to plant native grasses and wildflowers in a lawn		Using a small area to plant nativ	e grasses and wildflowers in a lawn