1. 2.	Use the axes to the right for the following: a. Draw and label a line that represents linear growth. b. Draw and label a line that represents exponential growth. List the four most populated countries in the world. (1) (3) (2) (4)	Population	
3.	Define the term ecological footprint		Time
4. 5.	Write an equation for the rule of 70: Perform the following calculations: (Show all of your work in a logical progra	ession to the final answ	wer.)

-	enorm the following eared automs. (Show an of your work in a logical progression to the final answer.)
а	A. A city has a population of 50,000 in 2012. If the population of the city grows at an annual rate of 2%, the year in which the
	population will reach 100,000 is and the year it will reach 200,000 is
5	Show work:

- A country's population was 12 million in 1992 and in 2012 it is 24 million. If the population grew at a constant rate, that percent rate of growth was \_\_\_\_\_.
   <u>Show work</u>:
- 6. Complete the following table by writing "high" or "low" in each box below.

	Characteristic	More Economically Developed Counties (MEDCs)	Less Economically Developed Countries (LEDCs)
	per capita GDP	,	
	degree of industrialization		
	infant mortality rate		
	per capita fossil fuel use		
	ecological footprint		
	greenhouse gas emissions		
	risk from heart disease		
	risk from infectious diseases		
Ic	lentify three examples of renewab	le resources and three examples of nonrene	wable resources.
	(1)		(1)
	Renewable: (2)	Nonrenewable	<u>e</u> : (2)
	(3)		(3)
D	efine the following:		
a.	total fertility rate		
b	replacement level fertility		
C.	infant mortality rate		
d	crude birth rate		
e	crude death rate		
D	escribe the circumstances that will	l result in a Tragedy of the Commons.	
_			
-			
D	escribe an example of a Tragedy	of the Commons.	
_			

() 	of growth for that year is	
3. ]	Describe an example of a positive feedback loop.	Time
-		
4. T	Use the axes below to draw and label lines representing the birth rate, death rate and total popul demographic transition of a country. Include, written directly onto the graph, an explanation for death rate and total population size.	lation size during the idealized each change in the birth rate,
	Rate / Population size	
	Time	
. ( {	On the axes below, draw and completely label four age-structure diagrams that represent slow g growth, and zero population growth (include labels on the x- and y-axes)	growth, rapid growth, negative
5.]	Describe an example of a negative feedback loop.	
-		
-		

18. List the following types of visible light in order from shortest to longest wavelength: Green, Orange, Red, Yellow, Blue, Violet.

19.	Identify three ex	amples organic	compounds and three exam	ples of inorganic compoun	ds.
	Organic:	(1)(2)	Inorganic:	(1)	
20.	Using the axes of early-loss, late lo	(3)	and label three survivorsh -loss species.	(3)	Jurvivorship

11. On the axes to the right, draw a line showing a population that exemplifies logistic

population has the following characteristics: the crude birth rate is 45, the crude death

12. Perform the following calculation. Show all of your work. In a particular year a

growth. (s-curve) and label the carrying capacity.

1.	List three consequences	of global warming.				
	(1)					
	(2)					
•	(3)	111.1		•		
2.	List three things you cou	Id do to decrease your con	ntribution to global	warming.		
	(1)					
	(2)					
2	(3) List four grouphouse gas	20				
3.	(1)	es. (2)			1	
	(1)	(5)	<u> </u>			
4	(2)	(4)				
4.	Draw a line represer	tor the following.	ara			
	b Label each layer of t	he Farth's atmosphere an	d identify where th	a (F		
	greenhouse effect of	curs and the ozone layer	is situated			
5	Humans began agricultur	re approximately	vears ago	, opi		
5. 6	A man-made product is a	also known as	yours uge	,		
7	The molecular formula o	f ozone is	·	<		
8.	In the box below, write o	out a series of chemical eq	uations that illustra	ite		
0.	the destruction of the ozo	one in the ozone laver.				
					Tem	perature (°C)
					Tem	perature (°C)
9.	The acronym HCFC refe	rs to			, whic	h is:
10.	Identify three examples of	of biotic components of an	n ecosystem and the	ee example	s of abiotic components	of an ecosystem.
	(1)	)			(1)	
	<u>Biotic:</u> (2	)		Abiotic:	(2)	
11	(3)	)			(3)	
11.	Troit	able for these blogeocher	Nitrogon		Dhaanhamua	Watan
		Carbon	Introgen		1 nosphor us	water
	Importance to life					
	Largest reservoir					
	Methods of transport					
Су	cle duration (long/short)					
12.	Write the balanced chem	ical equation for photosy	thesis in the box			1
	on the right.			Photosynt	hesis:	
13.	The approximate age of t	the Earth is	vears.			
14.	Write the balanced chem	ical equation for cellular	respiration in the			
	box on the right.	1	1	Cellular R	espiration:	
15.	Match the following:					
	a. generalist species	Zel	bra mussel			
	b. specialist species	Ga	lapagos tortoise			
	c. invasive species	An	nerican Alligator			
	d. keystone species	Tig	ger salamander			
	e. indicator species	No	rway rat			
	f. endemic Species	Gia	ant Panda			
16.	Define the term biodiver	sity.				
17						
1/.	Define the term blome					

- 18. Sketch and/or label the following on the map of the world below:
  - a. the equator
  - b. the tropic of Cancer and the tropic of Capricorn
  - c. the Mid-Atlantic Ridge
  - d. the location of suppressed upwelling characteristic of the occurrence of El Niño
  - e. the location of China, India, Ethiopia, Brazil, Bangladesh, and Fremont



19. Complete the following table:

Type of Biome	<b>Typical Location</b>	<b>Typical Climate</b>	Characteristic adaptations for survival
Tropical Rain Forest			Plants – Animals –
Temperate Deciduous Forest			Plants – Animals –
			Plants –
Taiga (Boreal) Forest			Animals –
Tropical Grasslands			Plants –
(Savanna)			Animals –
Temperate Grassland			Plants –
(Prairie)			Animals –
Tundra			Plants –
(Cold Grassland)			Animals –
			Plants –
Desert			Animals –

20. Describe the circumstances that will result in cultural eutrophication.

21. Explain the increasing concentration of carbon dioxide in the atmosphere leads to ocean acidification.

1.	Name the following:	
	NO	NO <sub>2</sub>
	NO <sub>2</sub>	N <sub>2</sub> O
	N <sub>2</sub>	NH <sub>3</sub>
	NH4 <sup>+</sup>	HNO <sub>3</sub>
_	NO <sub>x</sub>	
2.	In the box to the right, sketch a house and the surroundings of a house that is designed to make the greatest use of passive solar energy in the northern hemisphere. Include, inside the box, the location of both the winter and summer sun, and labels to indicate the compass direction that the house faces.	
	World Animal Protein Production Per Person, 1961-2009	3. Use the information in the diagram on the left, to answer the
	40	ionowing:
	35 - Pork 30 -	he percent change in the per capita global production of protein from poultry between 1980 and 2000 was approximately
	25 Poultry	b. T
	Stand 20 Beef	he percent change in the per capita global production of protein from farmed fish between 1980 and 2000 was approximately
	15 Farmed	c. T
	10 Fish	he percent change in the per capita global production of protein from beef between 1961 and 2009 was approximately
	5	4. The founder of the Sierra Club was
C	Sneep and Goats           0         1980         1970         1980         1990         2000         2010	5. Rachel Carson wrote the book <i>Spring</i> to raise people's awareness of the harmful effects of the pesticide
0.		a phenomenon that occurs in
		the ocean.
7.	Place the following nine events in chronological order,	beginning with the most recent: the oil spill of the Exxon Valdez; the
	meltdown of the reactor at <b>Chernobyl</b> ; the explosion o The first <b>Earth Day</b> ; the leak of methyl isocyanate in <b>H</b> <b>Montreal Protocol</b> passage of the <b>US Endangered S</b>	of the <b>Deepwater Horizon</b> ; the discovery of contamination at <b>Love Canal</b> ; <b>Bhopal</b> ; the drafting of the <b>Kyoto Protocol</b> ; the ratification of the <b>necies Act</b>
	(1) (4)	(7)
	(2) (5)	(8)
8.	(3) (6) Strengthen this weak statement: "Fossil fuel use release	(9)es carbon dioxide, which causes the greenhouse effect."
9.	The acronym BOD refers to	, which is:
10.	The acronym GMO refers to	, which is:
11.	Perform the following calculation. Show all of your we rate of 1 cm/day, the average volume of grass that is ad grasses that grow in the grassland averages 400 kg/m <sup>3</sup> , $g/m^2/vear$	ork. If the grasses on a 100-hectare area of grassland grow at an average lded to the grassland each day is $m^3$ . If the density of the the net primary productivity is approximately $g/m^2/day$ or

Show work:

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- 12. Strengthen this weak statement: "Protecting endangered species like the Giant Panda costs too much and should be stopped."
- 13. Perform the following calculation. Show all of your work. A 40 m<sup>2</sup> solar array is installed on a house where the average insolation is 6 kWh/m<sup>2</sup>/day if the average total electricity output of the array is 1.2 kWh/hr, the efficiency of the array is <u>\_\_\_\_\_</u>. <u>Show work</u>:

Female Secondary Education and Total Fertility Rates

inferred from the data it presents. 8 7 6 15. The first National Park was \_\_\_\_\_\_ National Park. **Fotal Fertility Bate** 5 16. Match the ten most populous urban areas in the world with its respective continent: Seoul 3 Mexico City а Asia New York City b. N. America 2 c. S. America Mumbai d. Africa Jakarta  $R^2 = 0.7058$ e. Australia Sao Paulo 20 40 60 80 100 0 Europe Delhi f. Percent of Girls Enrolled in Secondary School Osaka/Kobe Antarctica g. Shanghai Tokyo 17. Define the following... Watershed: \_\_\_\_\_ Clean Air Act: Clean Water Act: Clean Drinking Water Act: \_\_\_\_\_ El Niño: Baghouse filter Electrostatic precipitator: \_\_\_\_\_ \_\_\_\_\_ Dioxin: 18. List three sources of methane that are amplified by human activities. (1)\_\_\_\_\_ (2)\_\_\_\_\_ (3) 19. The box to the right contains a crude depiction of a mountain, use it to sketch and label the essential atributes of a rain shadow. Include labels for the direction of the prevailing winds and nearest ocean. 20. NO<sub>2</sub> is converted to N<sub>2</sub> and O<sub>2</sub> in a \_\_\_\_\_ \_\_\_\_\_, which also converts \_\_\_\_\_ to \_\_\_\_\_. 21. Explain the causes of an urban heat island.

14. Consider the graph on the right and explain what can be

1.	Perform the following cale a. A rectangular area of kilometers and <u></u> <u>Show work</u> :	culations: (Show all of your work.) forest that measures 10 thousand meters by 300 thousand meters has an area of square hectares.	
	b. A 60-Watt light bulb <u>Show work</u> :	hat is used for an average of 4 hours each day uses kilowatt-hours of electricity per year	
2.	List two characteristics of	an r-selected species.	
3.	List two characteristics of	a K-selected species.	
4.	A Pacific Yew is a/an	and it is endangered because of the following:	
5.	A Piping Plover is a/an	and it is endangered because of the following:	_
6.	An Orangutan is a/an	and it is endangered because of the following:	_
7.	A Dodo was a/an	and it is extinct because of the following:	_
8.	Complete the following ta	ble:	
ŀ	Cosystem Component	An economically valuable ecosystem services it provides	
	honey bee		
	water cycle		
	forest		
	bat		
	bacteria		
	coral reef		
	wetland		
9.	A company is importing r company may have violate (1) (2) (3)	re tropical hardwood to manufacture furniture, list three laws, regulations, treaties, or acts that the ed.	
10. 11	Whaling is justified in the Two islands, different dist	name of research, by the countries of and	
12. 13.	A fishing practice that is c		
14. 15.	% of the Earth is co available and relatively ac Arrange the following par (1)	vered with water. Of all the water on Earth% of it is saltwater,% is frozen, and% is cessible. ticles in order of smallest to largest: clay, sand, silt (2) (3)	S

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16.	o live a healthy, active life most adults need to consume approximately calories of food each day.	
17.	Arrange the following foods in order of highest to lowest in terms of global production: corn (maize); rice; wheat.	
	1) (2) (3)	
18.	ist four innovations that led to the Green revolution.	
	(1) (3)	
	$(2) \qquad \qquad$	
19.	Atch the following:	
	. anemia iron deficiency	
	. goiter vitamin A deficiency	
	. scurvy vitamin D deficiency	
	. rickets iodine deficiency	
	. blindness vitamin C deficiency	
20.	Use the axes below to draw and label an illustration of the pesticide treadmill.	
	Pest Population	
	Time	
21.	Explain how the biomagnification of DDT led to the demise of the Bald Eagle population in the US.	

22.	List three things you could do to conserve water.
	(1)
	(2)
	(3)

23. Perform the following calculations: (Show all of your work.)

a. A family of 5 replaces a 6-gallon/minute showerhead with a new 2-gallon/minute low-flow showerhead. If every member of the family takes one 10-minute shower per day, the family will save \_\_\_\_\_ gallons of water in one year.
 <u>Show work</u>:

A family has a rectangular swimming pool that measures 15 feet by 20 feet. If water evaporates from the pool at a rate of 50 gallons per square foot per year and a pool cover will reduce evaporation by 90 percent, the family can save \_\_\_\_\_\_ gallons of water per year by using a pool cover.
 Show work:

### 24. Define the following:

рп:
Turbidity:
•
Water hardness:
Biological oxygen demand:
Organic waste:
Cholera:
Schistosomiasis
Giardia

1. Completely label the following diagram of a sewage treatment plant and list the items removed at each step.

2.	In the box to the right, list the ranks of coal in order from highest to lowest energy content (indicate the direction in the box)
3. 4.	List three air pollutants that are emitted during the burning of coal. (1) (2) (3) List seven products that are derived primarily from crude oil:
5.	The acronym OPEC refers to , which is important because:
6.	Fracking is a common name for and it is a concern because
7.	Explain what the Deepwater Horizon was, where it went, and why it is significant.
8.	The acronym ANWR refers to, which is important because:
9.	<ul> <li>Perform the following calculations: (Show all of your work in a logical progression to the final answer.)</li> <li>a. A family has a total of 1500 Watts of light bulbs throughout their house, if they replace them all with LED light bulbs, which use 90% less energy, the family will now use Watts of electricity.</li> <li><u>Show work</u>:</li> </ul>
	<ul> <li>A space heater operates at 1500 Watts, if it is used for 10 hours each day for one week and the cost of electricity is 20 cents per kilowatt-hour, it will cost to operate the heater for the week.</li> <li><u>Show work</u>:</li> </ul>
10.	The acronym CAFE refers to, which is important because:
11.	List two species that may be threatened by the construction of a solar power tower in the California Desert. (1) (2) (2)

12. \_\_\_\_\_ is the active element in most photovoltaic cells.

13.	List four	things	you	could	do	to	conserve	energy
-----	-----------	--------	-----	-------	----	----	----------	--------

- List four things you could do to conserve energy.
  (1)
  (2)
  (3)
  - (4)

14. State where Chernobyl is located and explain what happened there.

15. Complete the following of	chart.	
Mining Technique	Description	Environmental consequences
Open-Pit mining		
Subsurface mining		
Strip mining		
Mountaintop removal		
Drilling		

16. Strengthen this weak statement: "Mining causes pollution that may disrupt the environment."

#### 17. Match each of the following elements with its ore:

- a. aluminum \_\_\_\_ galena
- b. iron

quartz

bauxite

- c. uranium
- lead hematite d.
- \_\_\_\_ pitchblende silicon e.
- 18. Explain what happened at Three Mile Island, and why it is significant.
- 19. Explain how thermal pollution is produced by power plants.
- 20. Explain what happened at Fukushima Daiichi and why it is significant. \_\_\_\_
- 21. Perform the following calculation. Show all of your work. A radioactive cloud may contain Iodine-131, which has a half-life of 8 days. If the waste must decay to a concentration of less than 0.1% to be considered safe, it will take approximately \_\_\_\_\_ days to reach safe levels. Show work:
- 22. Perform the following calculation. (Show all of your work in a logical progression to the final answer.) A family has a 75 m<sup>2</sup> solar array on their house, which has an efficiency of 10%. If the average insolation on their array is 6 kWh/m<sup>2</sup>/day and their average cost of electricity is 20 cents per kilowatt-hour, the family has the capacity to produce \_\_\_\_\_\_ worth of electricity daily, and annually, from the sun.

Show work:

1. For each of the following substances, draw an arrow that points to an unambiguous location along the line, below, representing pH: orange juice; normal rain; ammonia; lime (calcium carbonate); sulfuric acid; acid rain; human blood.

What is d				e	ant.							
	lifferent abo	out growing pl	ants hydrop	oonically?								
In the boy	x below, wr	ite a series of	chemical re	eactions tha	t leads to	o the for	rmation o	of troposp	heric ozo	one in pho	otochemic	al smo
The acror	nym POP re	fers to					W	hich is:				
Explain w	what a water	shed is and w	hy it is sigr	nificant.								
List two e	environmen	tal benefits of	wetlands.									
In the box electricity List four of classified 1) 2) Explain w	x to the righ y is produce characterist as "hazard what an <i>El N</i>	t, draw a diag d by a dam ics that will re ous" 3) 4) <i>liño</i> event is a	ram that ille esult in was	ustrates how te being s significan	w							
What is a	wet scrubb	er and how do	pes it work?	)								
What is a	n electrosta	tic precipitato	r and how o	loes it worl	k?							
In the boy	x below, wr	ite a series of	chemical re	eactions tha	t leads to	o the for	rmation o	of acid rai	n.			
Kwashior Marasmu	rkor is											
If the cost	t of gas is \$ \$/m <u></u> \$/m	3.50 per gallo i, or	n and the a	verage gas ii.	mileage	of a car	is 25 mp	pg, the cos	st of driv	ng the ca	r per mile	e is

18.	Identify significant sources of the following air pollutants:
	Formaldehyde:
	Radon:
	Mercury:
	Carbon monoxide:
	Nitrous oxide:
19	List three specific health effects of lead on humans
17.	List three specific health checks of head on humans.
20.	What was the Green Revolution and why is it important?
21.	Label the four major zones of life in the
	appropriate areas on the diagram representing
	a temperate lake in the box to the right.
22.	For each of the following biomes, identify a
	specific country in which each biome occurs
	in relative abundance:
	Taiga Desert
	Tropical rainforest Temperate grassland
	Tropical grassland Coral reef
	Temperate deciduous forest Tundra
23.	List three disinfectants that are commonly used to make drinking water safe during in the water treatment process.
-01	1) 2) 3)
24.	In the box below, write the chemical equation for the formation of carbonic acid from the reaction of water with carbon dioxide.
	Identify two places in the environment where the above reaction occurs naturally.
	1)
	2)
25.	Sketch and/or label the following on the map of the world below:
	a. the equator
	b. the Mediterranean Sea
	c. the Ogallala Aquifer
	d. the island of Mauritius (where the Dodo once lived)
	e. the location of Saudi Arabia, Indonesia, Philippines, Panama, Iceland, California
	- 7
	s men si
	and the second of the second o
	i which i have
	al The for the last
	Fly hand i
	En 23 A
	and with the
	In a star 5
	man and a company