

Test - Thursday

1. Test Review

2. Wonders of Galapagos

3. Internet Detective - Online Tutorial: Internet Research
<http://www.vtstutorials.ac.uk/detective/brief.html>



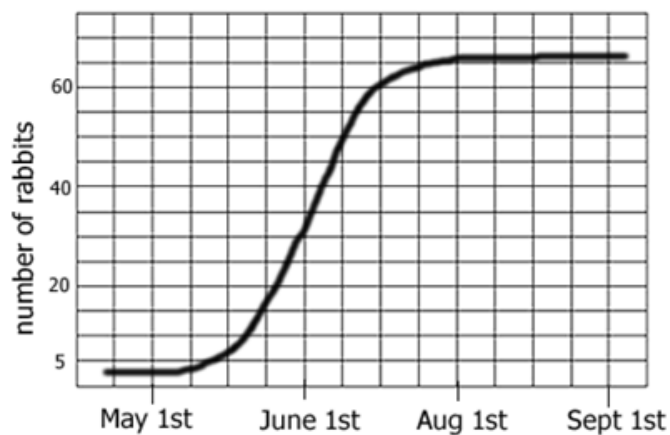
Introduction to Environmental Science 120

Review – Test #1



1. Alaska has the lowest population density of any state in the United States. It has 626,932 people in 570 374 mi². What is its population density? Round to the nearest person per square mile.
2. Analyze the following situation. You captured, marked, and released 5 turtles from a pond, and caught 10 unmarked turtles the next day. Would you have enough information to estimate the population using the mark-recapture method?
3. There are 4 foxes in 10 square kilometers of a forest. How many foxes would you expect to find in 50 square kilometers?
4. Suppose you want to know how many box turtles are in a wooded park. On the first day, you hunt through the woods and capture 24 turtles. You place a spot of paint on each turtle's shell and release all turtles back where you found them. A week later you return, and with an extraordinary effort, catch 60 turtles. Of these, 15 are marked and 45 are unmarked. What is the estimated size of the box turtle population?
5. The population in the town of Huntersville is presently 38 300. The town grows at an annual rate of 1.2%. What will be the population of Huntersville in 18 years?
6. A biologist originally marked 40 butterflies in Wilson Park. Over a month long period butterfly traps caught 200 butterflies. Of those 200, 120 did not have tags. What would be the estimated size of the butterfly population in Wilson Park?
7. On October 15, 1984 at the beginning of the squirrel-hunting season, biologists counted 95 gray squirrels in a 20-acre forest. On December 15, 1984, 42 gray were counted in the forest.
 - a) What was the density of the gray squirrel population on October 15, 1984?
 - b) What was the density of the gray squirrel population on December 15, 1984?
 - c) What factors could have affected the density of the population?
8. Schushville is an island of 5000 square miles off the coast of Northville. There are currently 250,000 inhabitants of the island. Last year, there were 12,000 new children born and 10,000 people were recorded as deceased. It is believed that the island could support a population as dense as 150 people/square mile.
 - a) What is the current population density and what do you expect will happen to the density as time goes on?
 - b) What was last year's population?
 - c) If Schushville's population growth rate is 0.8065%, how many years will it take for its population to double?

9. A population of 100 frogs increases at an annual rate of 22%. How many frogs will there be in 5 years?
10. Study the graph below.
- What type of growth is shown in the graph?
 - Indicate on the graph where exponential growth occurs.
 - What is the rabbit population's carrying capacity?
 - What factors prevent populations from growing at their biotic potential?
 - As the graph levels off, what is happening to the rabbit population?



11. With what type of organisms should the mark-return-recapture method be used?
12. What environmental issues are depicted below?



13. What is meant by an eco-centric point of view?
14. What is ethical consumerism? Give four examples of ethical consumerism.
15. a) What two process lead to evolution?
 b) According to Darwin, how do species originate?
 c) What type of adaptation is illustrated by the beaks of Darwin's finches?
 d) Where can evolution in action be observed?

Review - Test #1

1. $\boxed{\text{pop density}} \times \text{area} = \text{population}$

$$\text{pop density} = \frac{\text{pop}}{\text{area}}$$

$$= \frac{626,932}{590,774 \text{ mi}^2}$$

$$= 1 \text{ person/mi}^2$$

2. $P = \frac{T_F T_L}{M}$ $T_F = 5$
 $T_L = 10$
 $M = 0$

If only 10 turtles were captured the next day and none were marked, you cannot calculate P because you would be dividing by 0. If so marked turtles were caught, you would need to know how many were marked to calculate P.

3. $\frac{4}{10} = \frac{x}{50}$ $\text{pop density} = 4 \text{ / km}^2$
 $x = 20$ $\text{pop} = 0.4 \text{ foxes / km}^2 \times 50 \text{ km}^2$
 $\text{pop} = 20 \text{ foxes}$

4. $T_F = 24$ $P = \frac{T_F T_L}{M}$
 $T_L = 60$
 $M = 15$ $P = 96$
 $P = ?$

5. $P = 38,300$ $A = P(1+r)^t$
 $r = 1.2\% = 0.012$ $A = 47,473$
 $t = 16 \text{ years}$ $1.2\% = \frac{1.2}{100} = 0.012$

6. $T_F = 40$ $P = \frac{T_F T_L}{M}$
 $T_L = 200$ $P = 100 ?$
 $M = 80$
 $P = ?$

This population does not sense if 200 butterflies can be caught.

7. a) $\frac{95}{20} = 4.75 \text{ squirrels/acre}$

b) $\frac{42}{20} = 2.1 \text{ squirrels/acre}$ (if you round)

c) weather, death hunters, food, water (if you round)

8. a) $\frac{250,000}{500 \text{ mi}^2} = 50 \text{ people/mi}^2$

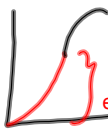
\Rightarrow pop inc because births are greater than deaths.

b) $250,000$ $\frac{12,000 \text{ births} - 10,000 \text{ deaths}}{2,000 \text{ people}}$

~~248,000~~

c) Rule of 70 $\frac{70}{0.8065\%} = 87 \text{ years}$

10. a) logistic growth

b)  exponential growth

c) ~ 66

d) water, light, shelter, disease

e) births = deaths.

11. \Rightarrow large, mobile organisms
(not too fast)

12. a) urban sprawl/urbanization

b) habitat destruction

c) environmental refugees

13. Living and non-living parts of the environment are equally important.

14. - buying products perceived to be made in an ethical manner (no exploitation of humans, animals, environment)

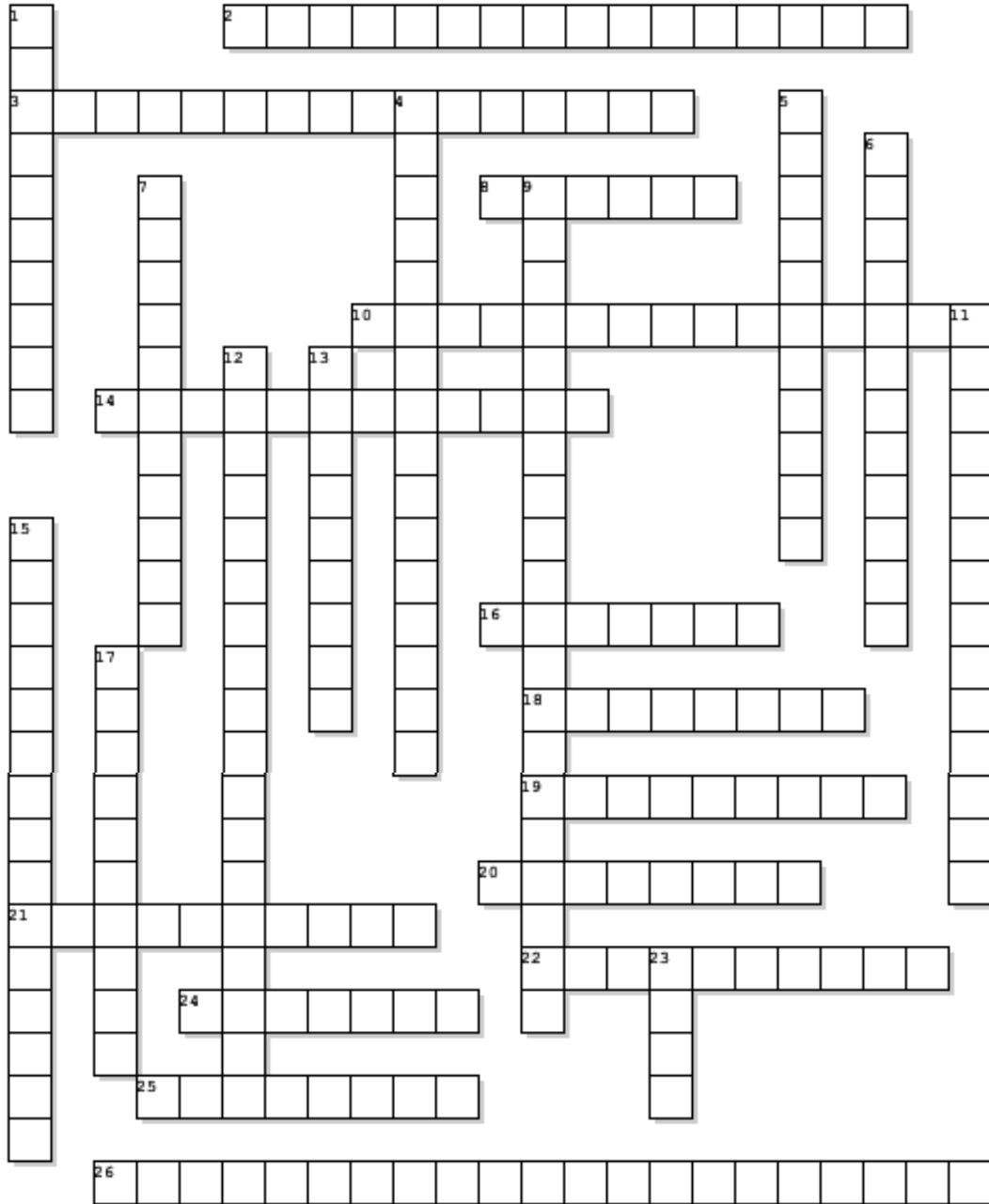
15. a) genetic variation and changing environmental conditions

b) natural selection

c) structural adaptation

d) Daphne Major (Galapagos Island)

Review - Test #1



Across

- 2 best adapted organisms survive and reproduce
- 3 protective from UV radiation
- 8 count of a population
- 10 maximum rate at which a population can increase
- 14 process in which an increasing proportion of a population lives in cities or suburbs
- 16 the Lorax was this for the trees
- 18 S or _____ curve
- 19 driving force of adaptation to environmental change
- 20 can be caused by external environmental agents
- 21 elimination of a species from existence
- 22 act of leaving
- 24 structural adaptation
- 25 sum of all genes in a population
- 26 the process of assisting the restoration of an ecosystem

Down

- 1 formation of two or more species from one
- 4 the taking of a biological resource that does not exceed the capacity of the resource to reproduce and replace itself
- 5 does not monetarily affect the producer of a good, but influences the standard of living of society
- 6 the variety of living things in the world
- 7 person who studies populations
- 9 person forced to leave his or her home because of droughts, floods, etc.
- 11 water
- 12 caused by urban sprawl, agricultural practices, etc.
- 13 behavioral adaptation
- 15 view that humans are the center of the universe
- 17 view that life is the center of the universe
- 23 segment of DNA

Review - Test #1

