

Primary Productivity Worksheet

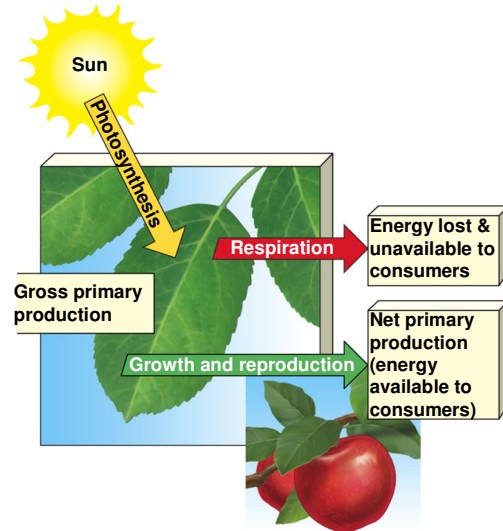


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Edited from: <http://www.nido.cl/~doehlke/productivityws.pdf>

Use your notes and the book for questions 1-6

1. What percent of the sunlight is actually converted into chemical energy via photosynthesis?
2. What percent of the sunlight is reflected and/or absorbed?
3. What is the word equation for the process of photosynthesis?
4. What is the word equation for cellular respiration?
5. What is meant by the term 'gross primary productivity'?
6. What is the relationship between net primary productivity and gross productivity? Write the equation.
7. Look at the gross primary productivity map of the USA at <http://earthobservatory.nasa.gov/IOTD/view.php?id=636>
Where is the GPP the highest?
The lowest?
Why?
8. Look at the chart of net primary productivity. Green are biomes, blue are aquatic life zones. List the 2 areas that produce the greatest percentage of the Earth's NPP and the 2 areas that produce the least. <http://home.hiroshima-u.ac.jp/er/Resources/Image1057.gif>
Greatest: _____ Least: _____
9. The open ocean does not contain as much life per unit area, but is responsible for a large amount of the Earth's NPP. Why?

11. Why do you think tropical rain forests and marshes have high NPP? Why should these areas be protected?

12. With the amount of sunlight it receives, why is the NPP of a desert so low?

Click here to answer the following questions:

<http://qldscienceteachers.tripod.com/junior/biology/foodchains.html>

13. According to the 2nd law of thermodynamics, the biomass stored in plants can not all be used to feed other organisms. What percentage of the energy stored as biomass in plants is transferred, on average to the next trophic level of the food chain? _____% Explain why.

14. Draw a food web, including the sun, two primary producers, three primary consumers, two secondary consumers, two decomposers, and respiration energy loss. Use arrows to show energy flow.

15. Now go to this link from NASA showing upwelling and phytoplankton productivity from the Benguela current off the coast of Africa.

<http://disc.sci.gsfc.nasa.gov/oceancolor/additional/science-focus/locus/tutorials/module3.shtml> .

Read about upwelling and phytoplankton productivity. Then look at the images showing the ocean surface temperatures and the chlorophyll concentrations for Jan-Dec 2003, Jan 2003, and July 2003.

What is the relationship between the cold current upwelling and the primary productivity?

15. Go to the link showing the visible Earth primary productivity.

http://visibleearth.nasa.gov/view_set.php?categoryID=2375.

Click on an image to read the description of the project.

What do the colors show?

Why are the colors different on the planet at different times of the year? Give a specific example.