

# Biology research



**ASSIGN  
BUSTER**

Biology Research Question Suppose an experiment is performed in which Plant 1 is supplied with normal carbon dioxide but with water that contains radioactive oxygen atoms. Plant 2 is supplied with normal water but with carbon dioxide that contains radioactive oxygen atoms. Each plant is allowed to perform photosynthesis, and the oxygen gas and sugars produced are tested for radioactivity. Which plant would you expect to produce radioactive sugars, and which plant would you expect to produce radioactive oxygen gas. Why

Answer 1: The oxygen gas would be radioactive in the plant that was supplied with water that contained radioactive oxygen. This is due to the light reaction of photosynthesis, which splits the water molecule and releases the oxygen in the process.

The sugar would be radioactive in the example where the plant was supplied with carbon dioxide with radioactive oxygen. This is a result of the Calvin cycle, which uses the carbon dioxide to process into sugar.

Question 2: Some animal species can reproduce either asexually or sexually depending on the state of the environment. Asexual reproduction tends to occur in stable, favorable environments; sexual reproduction is more common in unstable or unfavorable circumstances. Discuss the advantages or disadvantages this pattern might have on the survival of the species in an evolutionary sense or on survival of individuals.

Answer 2: Asexual reproduction has the advantage of creating many offspring that are generally mature plants and not as frail as sexual seedlings. They reproduce easily and efficiently and are able to cover a habitat and reduce competition from other species. However, because they are essentially clones, they are sensitive to adverse environments such as

pathogens and disease, which could wipe out the entire stand.

Sexual plants, dependent on seeds, have the disadvantage of producing seeds which must germinate and grow. This requires ideal conditions to establish new plants. They have the advantage of being a more diverse population and less prone to population devastation by any one environmental event such as pathogens or disease. They also are able to disperse the population by the mobility of the seeds which gives them greater range.

Question 3: Biologist E. O. Wilson has estimated that 27, 000 species go extinct each year. Some skeptics, however point out that scientists have documented the disappearance of only 1100 species over the past 500 years. Does this observation demonstrate that Wilson's estimate is inaccurate Explain your answer.

Answer 3: Wilson derives his figure by estimating the number of species in a habitat and calculating the amount of lost habitat. It also takes into consideration that we have knowledge of only a small fraction of the existing species on the planet. Some estimates place the known species at as low as 3% and no higher than 10% of the worldwide total. He further indicates that the figures for the last 500 years is low because we are in a cycle of accelerated extinction. Man made reduction of tropical rain forest has caused species extinction that rivals the greatest natural disasters in earth's history. Because the figure of 1100 species in the last 500 years fails to account for the other reasonable variables, it is likely that Wilson's number is more accurate.