

## Solution A

Scientists discovered a gene-silencing technique to turn off the expression of polyphenol oxidase, which causes cut fruit to turn brown. By suppressing this gene, no polyphenolics are produced and no browning occurs.



## Solution B

Scientists use a process called *transformation* to copy traits from one organism and insert them into another organism's cell. By copying a protein from a **virus** and inserting it into the seed of a fruit, the fruit becomes resistant to that virus.



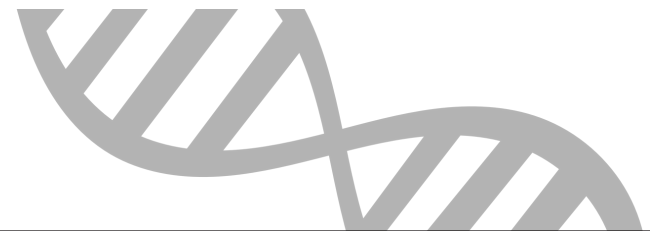
## Solution C

A naturally occurring soil bacterium—*Bacillus thuringiensis* (or Bt)—produces a protein that is toxic to **caterpillars** but safe for other insects, mammals, birds, and fish. Scientists insert the Bt gene into a plant's genetic code which then produces a protein that is toxic to caterpillars.



## Solution D

Many farmers use glyphosate (an herbicide) to control weeds. Glyphosate prevents plants from growing by stopping the production of amino acids. Using a gene gun, scientists can insert germ cells from bacterium into crop seeds so they're still able to produce amino acids. Now, when glyphosate is sprayed on crops, it kills the weeds but leaves the desired crop.



## **Solution E**

Many fruits and flowers that are orange produce beta-carotene which is necessary to produce vitamin A. Scientists added two genes (one from a grass and one from a bacterium) to turn on the carotenoids. The resulting grain was golden in color and produced beta-carotene.



## **Solution F**

Scientists discovered a gene-sequencing technique using RNA from a wild plant species to suppress natural enzymes. The gene sequence from the wild plant species is so similar that the domesticated plant easily recognizes it. This means that bruising can be reduced by up to 40%.

