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## Testing Plant Storage Organs for Starch and Sugar

### Information : Plant Storage Organs

Plant Storage Organ	Formed from
	Potatoes are tubers. They are formed by the swelling of sections of underground stems.
	Carrots are formed by swollen tap (main) roots.
	Bulbs are formed from the swollen bases of leaves.
crocus corm	A corm is a short, condensed, swollen stem.

### Method

1. Cut a quarter of a small potato into small pieces.
2. Place the pieces of potato into a mortar and cover them with distilled water.
3. Use a pestle to mash the potato into a pulp.
4. Place about 1cm in height of the potato pulp into two test tubes. Use one of these tubes for each of the two tests detailed on the next page:

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**Test for Starch**

1. Add a few drops of iodine solution and mix the contents of the tube.
2. Record your results.

**Test for Sugar**

1. Add 1cm in height of Fehling's solution to the potato pulp and mix the contents of the tube.
2. Label this test tube with your name and place the label near the mouth of the tube. Place the test tube in a water bath at 90°C for 3 minutes.
3. After 3 minutes record the results.

Repeat the method with each of the other three storage organs in turn.

**Results**

Complete the following table:

Plant Storage Organ	Starch Test with iodine solution	Sugar test with Fehling's solution
Potato		
Tap Root		
Bulb		
Corm		

**Conclusion**





Iodine solution turns blue/black in the presence of starch.  
 Fehling's solution (which is blue) will change colour when heated in the presence of sugar. Green indicates a small amount of sugar (+), yellow means that more sugar is present (++) and orange indicates a lot of sugar (+++).

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Complete the following table:

Food Storage Organ	Starch (+ = present, - = absent)	Sugar ( - = absent, + = trace, ++ = some, +++ = a lot)
Potato		
Tap Root		
Bulb		
Corm		

Study the diagrams below and answer the questions which follow them:

			
The potato tuber uses its stored energy to produce roots and leaves	The old potato shrinks. The food made by the leaves is stored in new potato tubers.	The leaves continue to make food. The new potatoes increase in size.	As autumn approaches the parts of the plant above ground wither and die. The new potatoes will be able to develop new plants in the spring.

A. Which types of food are stored in the potato tuber?

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B. Which parts of the potato plant make these high energy foods?

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C. What is the stored food used for?

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Complete the following table:

<b>Summary of the conditions needed for the growth of a potato plant</b>		
Factors needed above ground	Factors needed below ground	Ways of surviving winter