

# Design a biodegrade test



Age 11+  
(adult supervision)



20 minutes

## Details

### What you need per group

- Half a potato
- Part of a plastic carrier bag
- Cork borer
- Knife
- Cutting tile
- Ruler
- 4x Petri dishes
- Pen to label dishes
- Balance (to share)
- Student Sheet 3c

### Equipment to change conditions:

- Soil
- Salt water
- Oil

## Safety and Guidance



### Precautions

Students may cause injury with knives and cork borers. Remind students and demonstrate how to conduct investigation safely.

Count the knives and borers handed out and count the knives and borers returned.

Students should be careful not to ingest rotten potato. Encourage students to wash their hands after handling.

Rotting potato has the potential to breed fungus and bacteria. Ensure that samples are disposed of at the end of the activity

## Overview

In this activity students will compare how plastic and potato (a proxy for starch-based bioplastic) degrade in different conditions. Note that results cannot be gathered in the same lesson.

## Preparation

- Ask technicians to supply you with individual trays containing the essential equipment.
- In separate trays, or on top of the technician trolley, have a selection of optional equipment for students to choose from.

## Running the activity

1. Use the borer to remove 4 cylinders of potato.
2. Cut all 4 pieces of potato into the same length.
4. Place each potato cylinder into a petri dish.
5. Cut out 4 squares of plastic carrier bag to the same size.
6. Add a plastic carrier bag square to each of the 4 petri dishes.
7. Change the environment for each petri dish (temperature, oxygen availability).
8. Leave your samples for a fixed time.

## Expected results

Students are likely to predict that the potato (naturally polymer made of starch) will biodegrade more easily than the conventional plastic bag (man made polymer made of hydrocarbons derived from oil). Students will notice that by adjusting availability of microbes, oxygen, or changing the temperature, they can increase the appearance of decay in the potato.