Ecosystems beyond Earth • Biosecurity testing

**Year 7**

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| --- | --- |
| Name: | Date: |
| Other members of your team: |

**Aim**

To model the biosecurity testing procedures used to detect an introduced fungus.

**Materials**

* 5 objects in plastic bags that were identified as possibly being a biosecurity risk
* 5 x swabs or cotton wool
* 6 x 50 mL beakers
* Water
* Universal indicator
* Permanent marker

**Procedure**

1. Half-fill a 50 mL beaker with tap water.
2. Dip a clean swab or cotton wool in the water so that it becomes damp. This will allow it to collect any dust particles, fungal spores, or bacterial spores on the items.
3. Wipe the wet swab or wool over every surface of one of the objects.
4. Place the wet swab or tissue in the beaker of water. Gently mix the beaker to detach any particles that may have wiped off the object.
5. Use the permanent marker to label the beaker with the object's name.
6. Repeat steps 1-5 for each of the remaining objects, carefully labelling each beaker.
7. Keep one beaker of water clear of any swabs or cotton wool. This is your negative control.
8. Add 6 drops of universal indicator into each beaker containing the swabs or cotton wool.
9. A negative result (with no contamination) will be green. A positive result of contamination will become a purple/blue colour.
10. Record your results in the table below.

**Results**

Table 1: High-risk objects tested for biosecurity contamination

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| --- | --- |
| **Object** | **Positive or negative for contamination** |
| Negative control: beaker of water (no swabs or cotton) |  |
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**Discussion**

1. Explain the reason for testing the beaker of water that was not used for the biosecurity test.
2. Identify the objects that tested positive for the introduced fungus.
3. Explain why these objects would not be allowed into a space settlement.
4. Describe how certain you are that there are no contaminants on the other objects.
5. Describe the consequences to plants in the space settlement if your negative tests are false negatives.
6. Identify one way a test could provide a false negative result. Describe how you would change the method to avoid the false negative.