

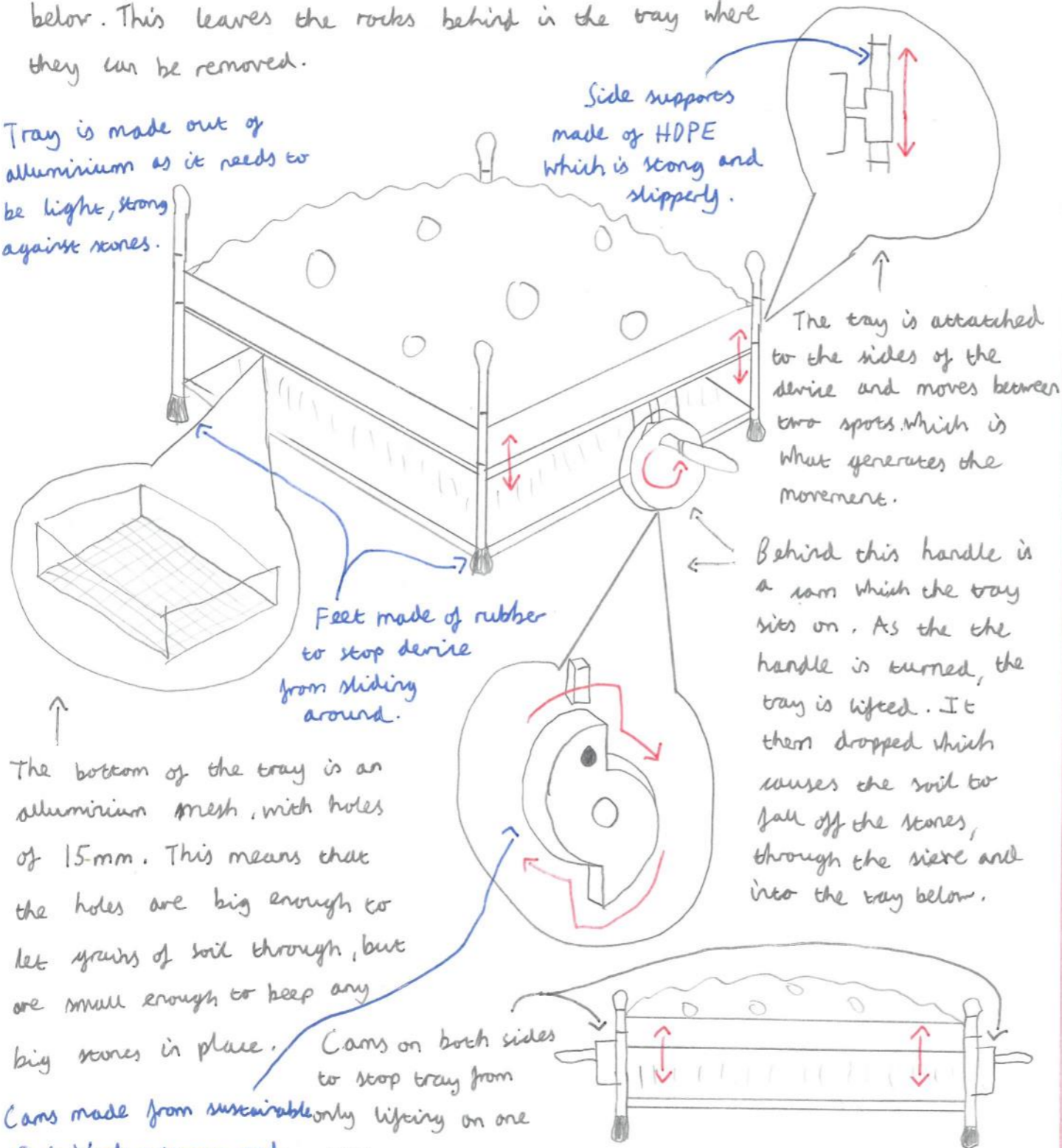
Please staple here

### IDEA ONE:

In this design, soil with stones is loaded into the top of the device. The user then turns a handle which shakes the top half of device. This motion causes the soil to pass through the sieve into the tray below. This leaves the rocks behind in the tray where they can be removed.

Tray is made out of aluminium as it needs to be light, strong against stones.

Side supports made of HDPE which is strong and slippery.



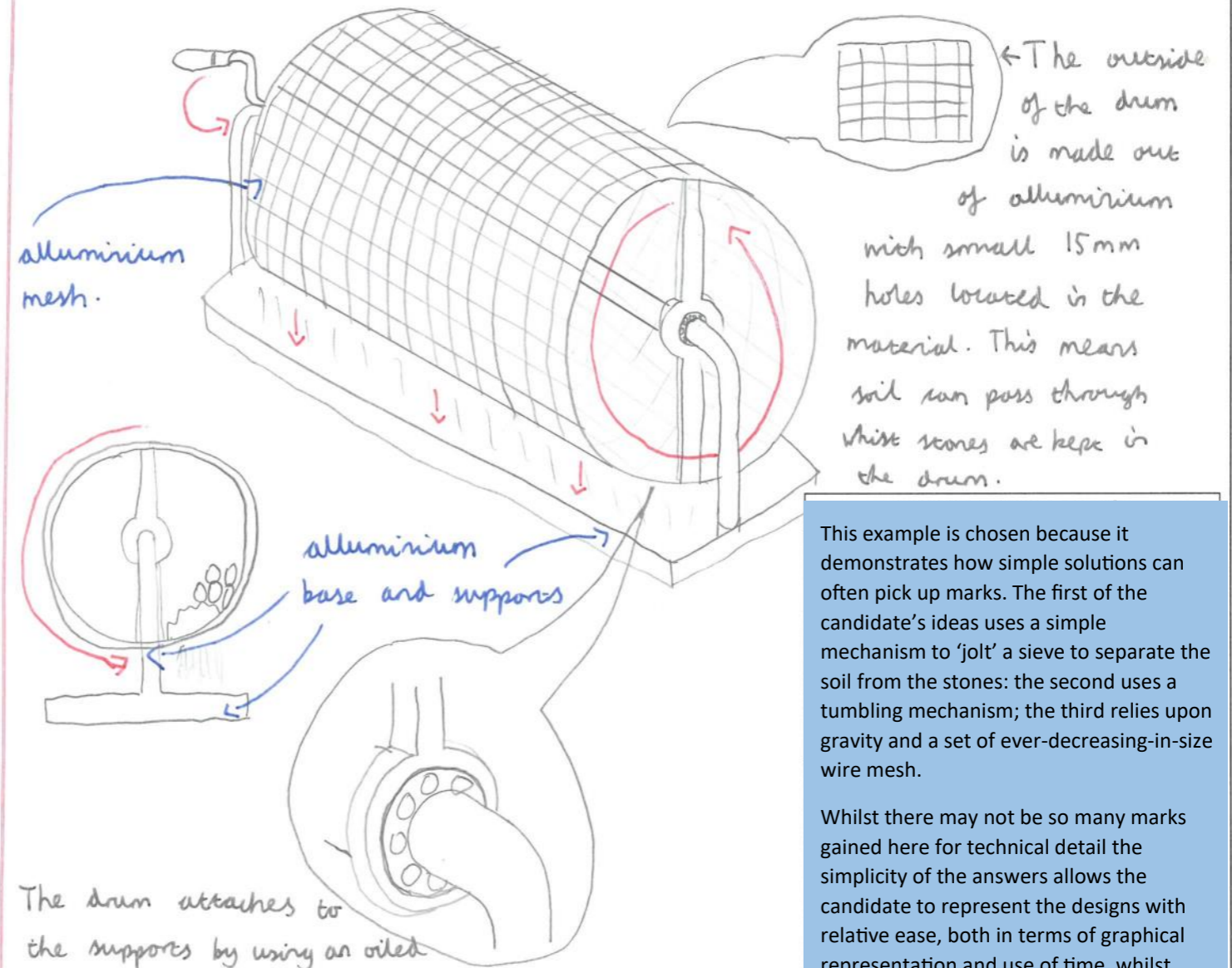
The bottom of the tray is an aluminium mesh, with holes of 15mm. This means that the holes are big enough to let grains of soil through, but are small enough to keep any big stones in place.

Cams on both sides to stop tray from slipping on one side. Cams made from sustainably lifting on one side. Oak Wood - strong and cheap.

### IDEA TWO:

In this design, soil with stones is loaded into a big metal drum which is spun with a handle. This motion causes the soil to sieve through the drum and into the tray below. The stones are left in the drum where they can be removed.

# Arkwright Scholarships Trust



aluminium mesh.

aluminium base and supports

The outside of the drum is made out of aluminium with small 15mm holes located in the material. This means soil can pass through while stones are kept in the drum.

The drum attaches to the supports by using an oiled bearing. This helps to keep the drum turning smoothly and for longer. It also helps reduce the amount of friction that is produced which can damage components.

This example is chosen because it demonstrates how simple solutions can often pick up marks. The first of the candidate's ideas uses a simple mechanism to 'jolt' a sieve to separate the soil from the stones: the second uses a tumbling mechanism; the third relies upon gravity and a set of ever-decreasing-in-size wire mesh.

Whilst there may not be so many marks gained here for technical detail the simplicity of the answers allows the candidate to represent the designs with relative ease, both in terms of graphical representation and use of time, whilst picking up valuable marks for creativity.

Movement arrows are put to excellent use to explain how the ideas work and 'exploded design details also help to convey information in a clear and helpful way. The annotations are also easy to read.

Marker's Comments

Name:

School:

Section A or B:

A

Question Number:

3

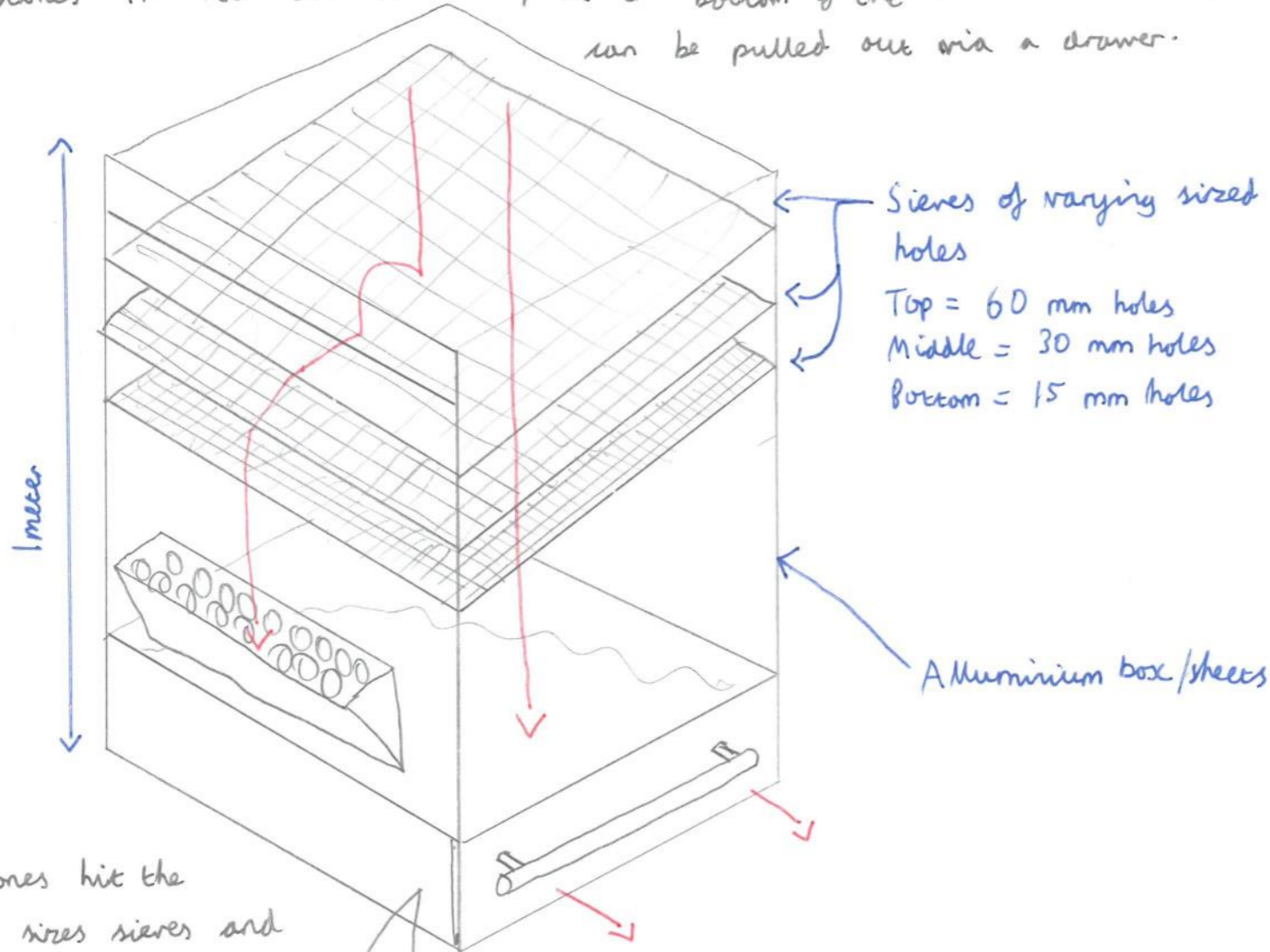
Page: 1 of 3



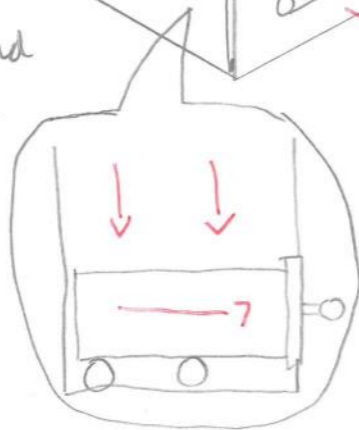
Please staple here

### IDEA THREE:

In this design, soil with stones is loaded in to the top hole of the machine. The soil then passes through a series of sieves which separate the soil from the stones. The soil then builds up at the bottom of the device into a tray which can be pulled out via a drawer.



The stones hit the different sized sieves and roll out of the machine and into the box which is attached next to the machine. This allows for easy removal.



The drawer sits on rollers which allow it to be pulled out by the user

| For Examiner use only |  |             |
|-----------------------|--|-------------|
| Section A             | Quality of the 3 Concepts - Flair and Creativity | /30         |
|                       | Reasoning  | /10         |
|                       | Technical knowledge                              | /10         |
|                       | <b>Total for Section A</b>                       | <b>/50</b>  |
| Section B             | Functionality of Proposal                        | /30         |
|                       | Materials & Components                           | /10         |
|                       | Construction Method                              | /10         |
|                       | <b>Total for Section B</b>                       | <b>/50</b>  |
| <b>Total</b>          |  | <b>/100</b> |

Marker's Comments:

Name: \_\_\_\_\_

School: \_\_\_\_\_

Section A or B: A

Question Number: 3

Page: 2 of 3