PLANT SALES FUNDRAISER

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Problem

Using Mathematical Modelling share a complete plan outlining “Annual Fundraiser event through sale of plants grown by our own school students”.

Assumptions

Plant types- Mint, coriander, omavalli, Cosmos, marigold, Tomato, peas

Kit average cost- 1600

Fundraiser in January

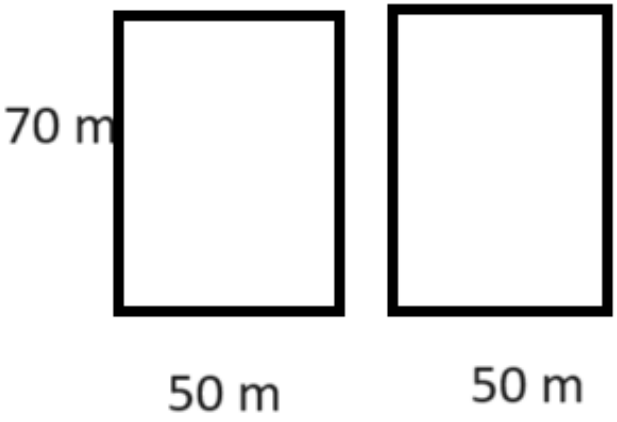
School will provide money to buy water

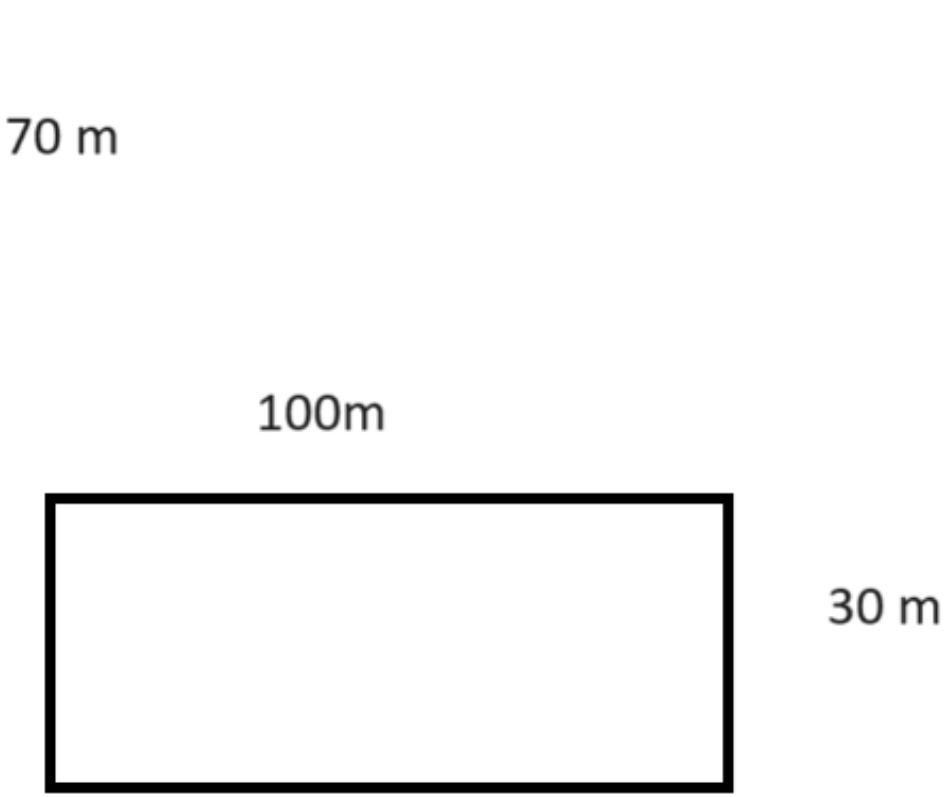
Order of demand of plants- Tomato > Peas > Cosmos > Marigold > Mint > Coriander > Omavalli

Soil will be at density of 1.25 g/cm^3 in the plants

Bag has height of 25 cm

Free space in school to grow plants
(we will be using space with dimensions 100*30 m)





Area needed to house plants

Area occupied by one 5-inch bag = 0.012668 sq.m

Area occupied by one 10-inch bag = 0.05067 sq.m

1 row=30 m

= 30/0.015 = 2000 plants with 5 inch bag in 1 row

Since we have 1,550 such bags, we will require 1 row (no fractional rows)

So, 1 row=30 m = 30/0.052 = 600 plants in 1 row

Since we have 8500 such bags, we will require 15 rows.

Total= 16 rows. After considering placement of materials like water cans and tool kits, we can approximate to 18 rows.

Choice of Plants

We have about 250 students in our school, and we are selling plants which are desired by many people because of their properties. Thus, many people will come to buy, as we are also selling the plants at a grown stage. We can advertise by sending messages through large groups, which can let many people know of this fundraiser. By giving 5 plants to each student, we can grow about 10,000 plants..

All plants can be put in 5 inch bags.

The demand for the plants- Tomato > Peas > Cosmos > Marigold > Mint > Coriander > Omavalli.

So, we can split the plants according to ratio- 4:3:2:1:1:1:1. So we will have- 3077 tomato plants, 2308 peas plants, 1538 cosmos plants and 769 marigold, mint, coriander and omavalli plants.

Money management

Money is required to purchase below items

1. Tool kit
1. Plant bags
1. Seeds
1. Soil

Money management- Tools, Seeds

Suppose 50 children use 1 tool kit and water can, we need 3500 rupees totally.

Seeds- Coriander 480 rupees- (769 plants)- herb

Omavalli-3076 rupees- herb (769 plants)

Mint- 1538 rupees- herb (769 plants)

Cosmos- 2170 rupees (1538 plants)- flowers

Marigold- 960 rupees (769 plants)- flowers

Tomato- 2480 rupees (3077 plants)- vegetable

Peas- 2350 rupees (2308 plants)- vegetable

Total- 13,000 rupees

Money management- Soil purchase

Volume of soil = 75 % of cylinder bag volume (pi*r^2*h)

6.35*6.35*3.14159*25*0.75= volume of soil in cm^3. Converting cm^3 to kg= 2.375 kgs

So, 2.375*10,000= 23750 kgs of soil need

Using 5 inch bags entirely costs too much soil- costing 14 lakh rupees

(23750 * 300 / 5 = 14 lakhs approx)

So, we can use 2 inch bags. We can assume three, 2 inch bags cost 1 rupee.

Soil cost- 2.54*2.54*3.14159*20*0.75= volume or soil in cm^3. In kg= 0.304/bag

=0.304*10,100= 3070 kg totally

5 kg =300 rupees,

So 3070 kg= (3070*300)/5. So cost of soil is 1,20,000 rupees (after discount).

Money management- Bag, total expenditure

Bag cost

3 bags- 1 rupee

=10,100 bags- 10,100/3= 3367 rupees.

Total expenditure-

Bags- 3400 rupees

Soil- 1,20,000 rupees

Seeds- 13,000 rupees

Materials- 3500 rupees

Total expenses - Rs. 1,40,000

Profiting

Assumption- Tomatoes and Peas have most demand. So we can sell, vegetables for Rs. 50, flowering plants for Rs. 40 and herbs for Rs. 40.

Thus amount obtained by selling plants can be,

Tomato- 3077*50= Rs. 1,53,850

Peas- 2308*50= Rs. 1,15,400

Cosmos- 1538*40= Rs. 61,520

Marigold- 769*40= Rs. 30,760

Omavalli- 769*40= Rs. 30,760

Mint- 769*40= Rs. 30,760

Coriander- 769*40= Rs. 30,760

Income-	Rs 4,53,810
Spent cost-	Rs.1,40,000
Profit-	Rs. 3,13,810

Plant Growth Chart

Plant	Germination time	Sapling growth	Total days	Planting month
Mint	2-3 days	5cm/week	25 days	December
Coriander	3-4 days	2cm/week	40 days	November
Omavalli	2-3 days	5 leaves in 10 days	25 days	December
Marigold	3-4 days	2cm/week	40 days	November
Cosmos	1 week	2cm/week	45 days	October/ November
Tomato	3-4 days	8cm/week	15 days	December
Peas	3-4 days	8cm/week	15 days	December

Plant Growth Timeline plan

September/ October

Buying materials

October

Arranging materials

October/ November

Coriander, Cosmos, Marigold planting

December

Mint, Omavalli, Tomato, Peas planting

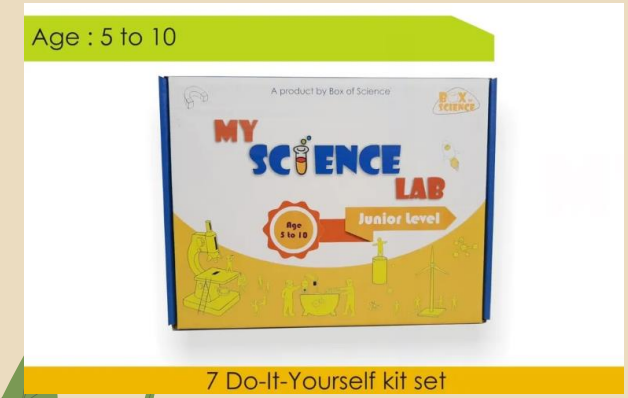
December

Getting ready for fundraiser

January

Fundraiser event

STEM Kit Donation



7 Do-It-Yourself kit set

With the money generated, we can buy the science kits for the nearby underprivileged school and help them grow.

We can buy close to 200 STEM SIY kits each costing around Rs. 1500

10 Do-It-Yourself kit set