Quarter 2 Practice Task Name:____KEY_____

I am creating a starter kit for planting an herb garden. The kit will include the following items at the following costs:

Basil Seeds: $3.65

Chamomile Seeds: $3.25

Cumin Seeds: $3.45

Oregano Seeds: $3.85

Thyme Seeds: $7.45

Cilantro Seeds: $3.65

Sage Seeds: $7.45

Parsley Seeds: $3.25

Mint Seeds: $7.45

Chive Seeds: $3.45

Propagation Heat Mat: $35.95

2" Square Peat Pot Kits: $25.95

Seed Starting Mix: $11.95

I am going to make a case for the kit using high density plastic which has a density of 0.97 g/cm^3. The high density plastic will be $\frac{1}{16}$" thick and cost $0.02 per square inch. The kit needs to be 21 inches long and wide and 10 inches tall.

1) Find the density of high density plastic in pounds per cubic inch.

$$0.97\frac{g}{cm^3}\cdot 0.0022\frac{lb}{g}\cdot 16.387\frac{cm^3}{in^3}=0.035\frac{lb}{in^3}$$

2) Determine the cost of the case for my kit if it was a rectangular prism or cylinder (surface area).

Rectangular Prism:

Dimensions: $21\times 21\times 10$

Surface Area:

$2(21)(21)+2(21)(10)+2(21)(10)$

$=1{,}722\ in^2$

$1722\cdot .02=34.44$

$34.44

Cylinder:

Radius: $\frac{21}{2}=10.5$

Surface Area:

$2\pi(10.5)^2+2\pi(10.5)(10)$

$\approx 1{,}352.46\ in^2$

$1352.46\cdot .02=27.05$

$27.05

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3) Determine the weight of the case for my kit if it was a rectangular prims or cylinder (volume of material and density of material).

Rectangular Prism:

$Volume\ of\ Material = SA \cdot Width$

$1722 \cdot \frac{1}{16} = 107.625$

$Volume\ of\ Material \cdot Density$

$107.652 \cdot 0.035 \approx 3.8$

3.8 lbs

Cylinder:

$Volume\ of\ Material = SA \cdot Width$

$1352.46 \cdot \frac{1}{16} \approx 84.53$

$Volume\ of\ Material \cdot Density$

$84.53 \cdot 0.035 \approx 3.0$

3 lbs

4) Amount of space my kit will take up if it was a rectangular prism or cylinder (volume).

Rectangular Prism:

Dimensions: $21 \times 21 \times 10$

Volume:

$(21)(21)(10)$

$= 4{,}410\ in^3$

Cylinder:

Radius: $\frac{21}{2} = 10.5$

Volume:

$\pi(10.5)^2(10)$

$\approx 3{,}463.61\ in^2$

5) What shape of kit would you recommend I use? Justify your choice using the information from #2-4.

Answers may vary. It would be reasonable for students to choose the cylinder shape because the cost, weight, and space taken up are less than the rectangular prism. Students may also choose the rectangular prism because it's a typical and friendly design.

6) Determine the total cost of my kit including the case and items in the kit.

The sum of the items going into the kit is $120.75. The cost of the kit depends on the choice of the student.

Rectangular Prism:

$120.75 + 34.44 = 155.19$

$155.19

Cylinder:

$120.75 + 27.05 = 147.80$

$147.80

7) Determine the selling price for my kit if I want to mark up the cost of my kit by 35%.

The answer will depend on which kit the student chose.

Rectangular Prism:

$155.19 \cdot 1.35 = 209.51$

$209.51

Cylinder

$147.80 \cdot 1.35 = 199.53$

$199.53