



Problem of the Week

Problem A and Solution

Fund Raising

Problem

Flynn's class is raising money for a tree-planting charity by recycling electronics. They have found a local company that will give them \$5 for each pound of cell phone e-waste and \$2 for each pound of computer e-waste.

The school has gathered the following electronics for recycling, but has weighed them in grams instead of pounds.

Cell Phones	Computers
10 uPhones: 200 g each	5 Bonobo laptops: 800 g each
5 Mixel phones: 100 g each	7 uPads: 500 g each

Knowing that 1 pound is about 454 g, estimate how much money Flynn's class will make. Justify your answer.

Solution

Solutions may vary, possibly resulting in different estimations. We will show two different approaches.

Since 1 pound is about 454 g, we will approximate 1 pound as 500 g. Then 2 pounds is approximately 1000 g.

Solution 1

In this solution, we find the total mass of each type of item and then estimate this in pounds before finding the total mass of all items.

Phones:

- uPhones: Each uPhone is 200 g, so 10 uPhones are $10 \times 200 = 2000$ g. Since 1000 g is approximately 2 pounds, then 2000 g is approximately 4 pounds.
- Mixel phones: Each Mixel phone is 100 g, so 5 Mixel phones are $5 \times 100 = 500$ g, which is approximately 1 pound.

This is approximately $4 + 1 = 5$ pounds of cell phone waste. The cell phone e-waste is worth approximately $\$5 \times 5 = \25 .

Computers:

- Bonobo laptops: Each laptop is 800 g, so 5 laptops are $5 \times 800 = 4000$ g. Since 1000 g is approximately 2 pounds, then 4000 g is approximately $4 \times 2 = 8$ pounds.
- uPads: Each uPad is 500 g, which is approximately 1 pound, so 7 uPads are approximately 7 pounds.

This is approximately $8 + 7 = 15$ pounds of computer waste. The computer e-waste is worth approximately $\$2 \times 15 = \30 . Therefore the total value is approximately $\$25 + \$30 = \$55$.



Solution 2

In this solution, we will find the total mass of computer waste and the total mass of cell phone waste, and then estimate these totals in pounds.

Phones:

- uPhones: Each uPhone is 200 g, so 10 uPhones are $10 \times 200 = 2000$ g.
- Mixel phones: Each Mixel phone is 100 g, so 5 Mixel phones are $5 \times 100 = 500$ g.

This is $2000 + 500 = 2500$ g. Since 500 g is approximately 1 pound and 1000 g is approximately 2 pounds, then 2500 g is approximately $2 + 2 + 1 = 5$ pounds. The cell phone e-waste is worth approximately $\$5 \times 5 = \25 .

Computers:

- Bonobo laptops: Each laptop is 800 g, so 5 laptops are $5 \times 800 = 4000$ g.
- uPads: Each uPad is 500 g, so 7 uPads are $7 \times 500 = 3500$ g.

This is $4000 + 3500 = 7500$ g. Since 500 g is approximately 1 pound and 1000 g is approximately 2 pounds, then 7500 g is approximately $2 \times 7 + 1 = 15$ pounds. The computer e-waste is worth approximately $\$2 \times 15 = \30 . Therefore the total value is approximately $\$25 + \$30 = \$55$.