

## Solution – Pseudocode

### Part 1 – Writing Pseudocode

1.
  - a.  $50 \times 5 \times \$5 + \$0$  for gravel +  $0 \times \$100$  for parking = \$1,250
  - b.  $100 \times 10 \times \$5 + \$500$  for asphalt +  $2 \times \$100$  for parking = \$5,700
  - c.  $600 \times 10 \times \$5 + \$1,000$  for concrete +  $8 \times \$100$  for parking = \$31,800
  - a.  $10 \times 5 \times \$5 + \$500$  for asphalt +  $0 \times \$100$  for parking = \$750, so \$1,000

2. Get a value for length in feet

Get a value for width in feet

Get a value for material

Get a value for parking

Set cost to length \* width \* 5

If (material = "asphalt") Then

Set cost to cost + 500

If (material = "concrete") Then

Set cost to cost + 1000

Set cost to cost + (parking \* 100)

If (cost < 1000) Then

Set cost to 1000

Print "Total cost is"

Print cost

### Part 2 – Reading Pseudocode

1.
  - a. Your change is
    - 0 quarters
    - 1 dimes
    - 0 nickels
    - 4 pennies
  - b. Your change is
    - 1 quarters
    - 0 dimes
    - 0 nickels
    - 0 pennies
  - c. Your change is
    - 3 quarters

2 dimes  
1 nickels  
4 pennies

2. This algorithm will determine how to make change for an amount of money in US currency. In this case, it will start with all pennies, then attempt to substitute larger coins up through quarters.
3. Depending on how comfortable students are with modulus and integer division, there are a couple different ways to approach making the algorithm better. The first answer is longer, but it doesn't use modulus and integer division.

Get a value for `change` (in cents)  
Set `pennies` to `change`  
Set `nickels`, `dimes`, `quarters` to 0

While (`change` >= 25)  
    Set `quarters` to `quarters` + 1  
    Set `change` to `change` - 25

While (`change` >= 10)  
    Set `dimes` to `dimes` + 1  
    Set `change` to `change` - 10

While (`change` >= 5)  
    Set `nickels` to `nickels` + 1  
    Set `change` to `change` - 5

Set `pennies` to `change`

Print "Your change is"  
Print the value of `quarters` and "quarters"  
Print the value of `dimes` and "dimes"  
Print the value of `nickels` and "nickels"  
Print the value of `pennies` and "pennies"

If you are comfortable with modulus and integer division, you could do

Get a value for `change` (in cents)

```
Set quarters to change / 25
Set change to change mod 25
Set dimes to change / 10
Set change to change mod 10
Set nickels to change / 5
Set pennies to change mod 5
```

```
Print "Your change is"
Print the value of quarters and "quarters"
Print the value of dimes and "dimes"
Print the value of nickels and "nickels"
Print the value of pennies and "pennies"
```

#### 4. Get a value for change (in cents)

```
Get a value for quarters in machine
Get a value for dimes in machine
Get a value for nickels in machine
Get a value for pennies in machine
```

```
While (change >= 25 and quarters > 0)
  Set quarters to quarters - 1
  Set change to change - 25
```

```
While (change >= 10 and dimes > 0)
  Set dimes to dimes - 1
  Set change to change - 10
```

```
While (change >= 5 and nickels > 0)
  Set nickels to nickels - 1
  Set change to change - 5
```

```
If (pennies >= change) Then
  Print "There is enough money to make change"
Else
  Print "There is not enough money to make change"
```

1.



