Exploring the Area of Rectangles and their Applications

OBJECTIVES

- Students will be able to calculate the area of rectangles.
- Students will be able to apply their knowledge of area in a real-life situations.

Standard # 3

- Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

Key Idea

- Students estimate and find measures such as length, perimeter, area, and volume using both nonstandard and standard units

Materials

- Computer Lab
- Image Tool from Project Interactivate
- A pre-designed house plan
- GSP
- TI-84
- Excel
- STELLA
- Worksheets

Activities

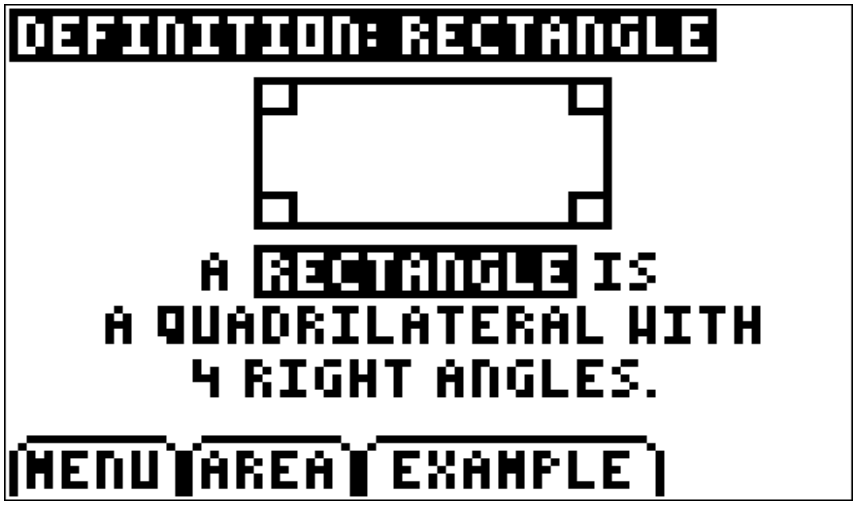
- We will explain how to find the area of rectangles using the TI 84 tutorial.
- We will use “Area Explorer” from Project Interactivate to demonstrate how to find the area of different rectangular shapes.
- A Pre-designed house plan from GSP will be given to the students (to be loaded in each computer) to simulate a floor renewal. Students will calculate different areas from the house floor plan and collect the data.

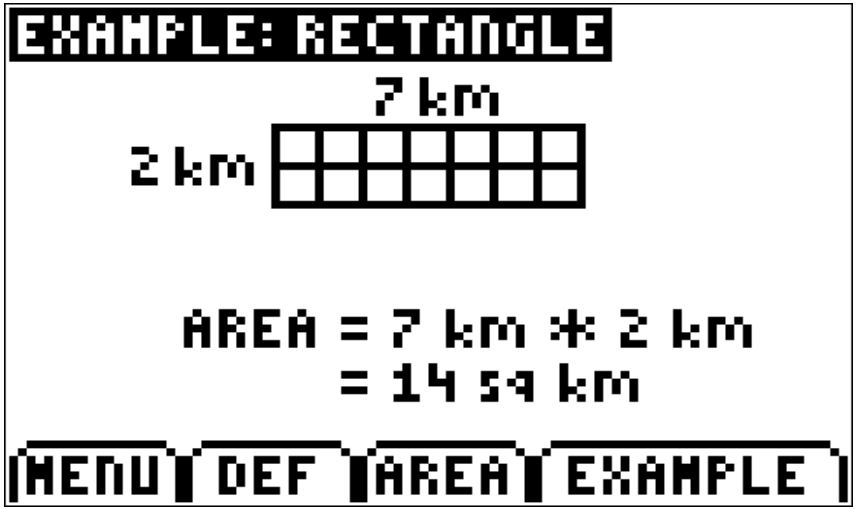
Activities Continued

- The class will be divided into four groups; Group 1 will work with GSP, Group 2 will work with STELLA, Group 3 will work with Excel and Group 4 will work with the TI 84.
- We will give them the price of the materials to be used and the cost of installation. The students will calculate the total cost of the project.
- To evaluate the students' understanding, we will provide a worksheet on which the students will calculate the area of the given figures.

Activity 1

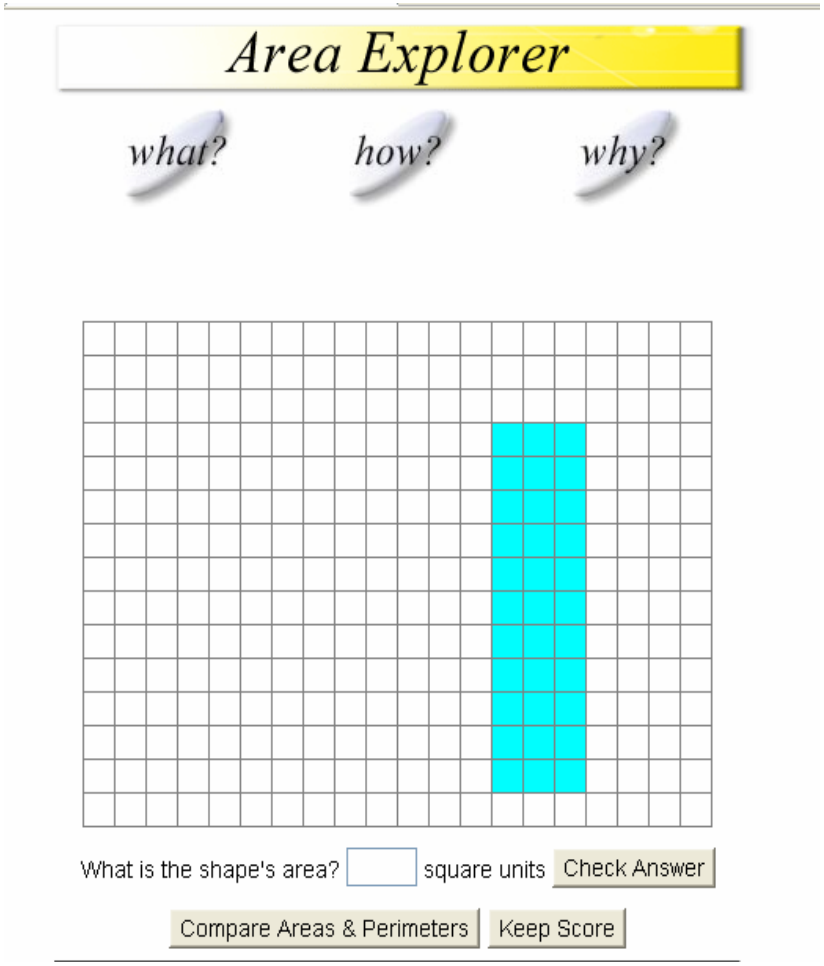
- We will explain how to find the area of rectangles using the TI 84 tutorial.





Activity 2

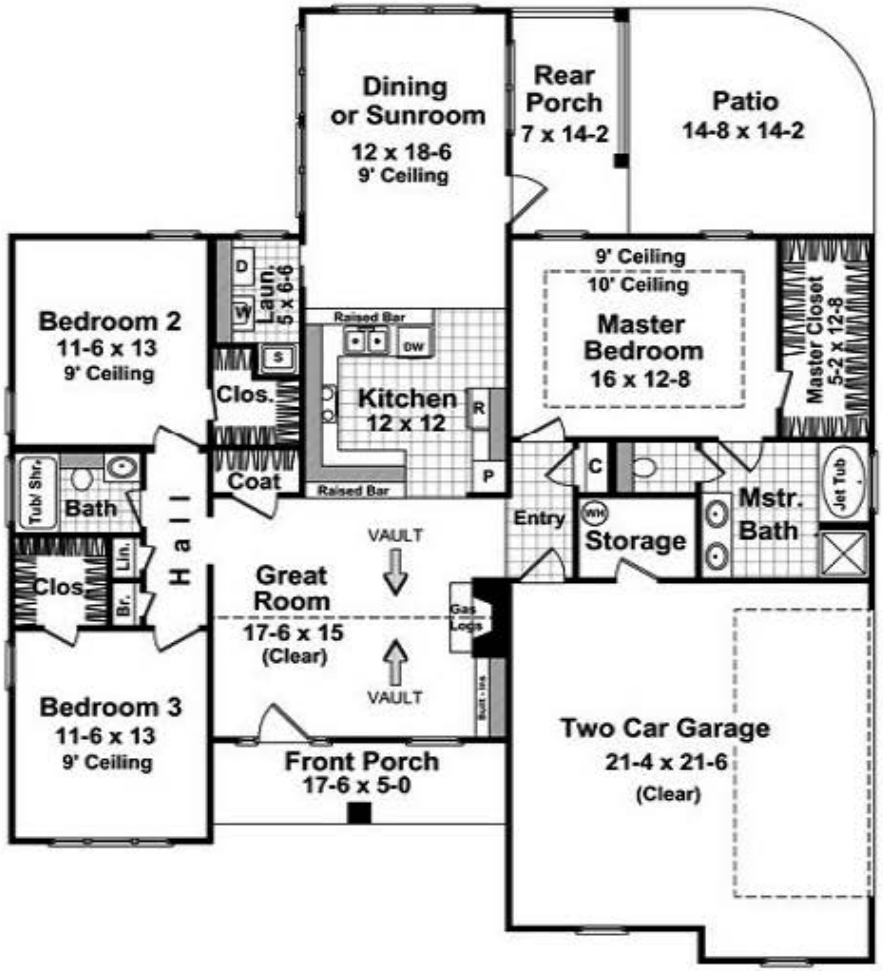
- We will use “Area Explorer” from Project Interactivate to demonstrate how to find the area of different rectangular shapes.



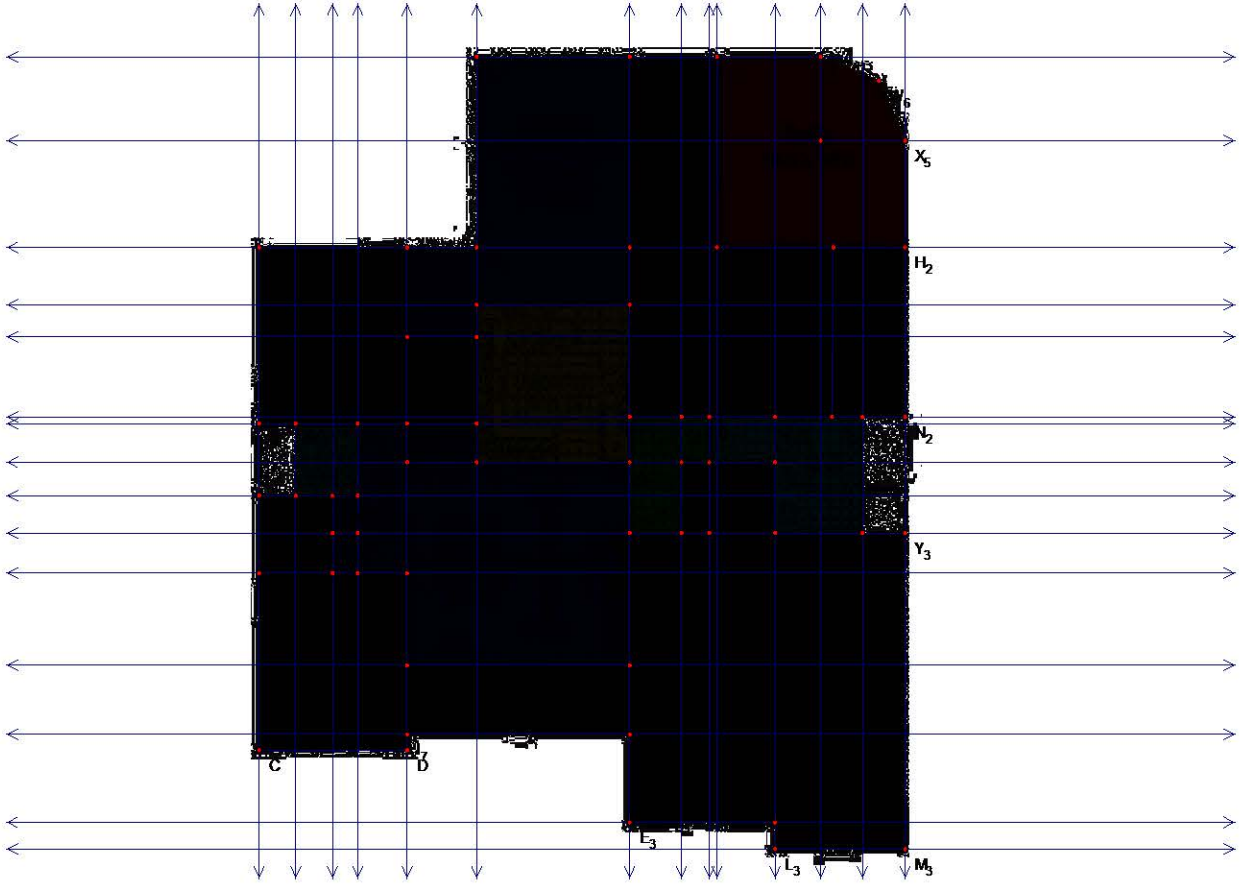
Activity 3

- A Pre-designed house plan from GSP will be given to the students (to be loaded in each computer) to simulate a floor renewal. Students will calculate different areas from the house floor plan and collect the data.

House Plan


Dining
or Sunroom
12 x 18-6
9' Ceiling
Rear
Porch
7 x 14-2
Patio
14-8 x 14-2
Bedroom 2
11-6 x 13
9' Ceiling
D
W
Laun.
5 x 6-6
S
Clos.
Coat
Raised Bar
DW
Kitchen
12 x 12
R
P
Raised Bar
9' Ceiling
10' Ceiling
Master
Bedroom
16 x 12-8
Master Closet
5-2 x 12-8
Tub/ Shr.
Bath
Hall
Clos.
Lin.
Br.
VAULT
Great
Room
17-6 x 15
(Clear)
VAULT
Gas Logs
Built-ins
Entry
C
WH
Storage
Mstr.
Bath
Jet Tub
Bedroom 3
11-6 x 13
9' Ceiling
Front Porch
17-6 x 5-0
Two Car Garage
21-4 x 21-6
(Clear)

GSP House Plan



Activity 4

- Divide the class into four groups:
- Group 1: GSP
- Group 2: Stella
- Group 3: Excel
- Group 4: TI 84

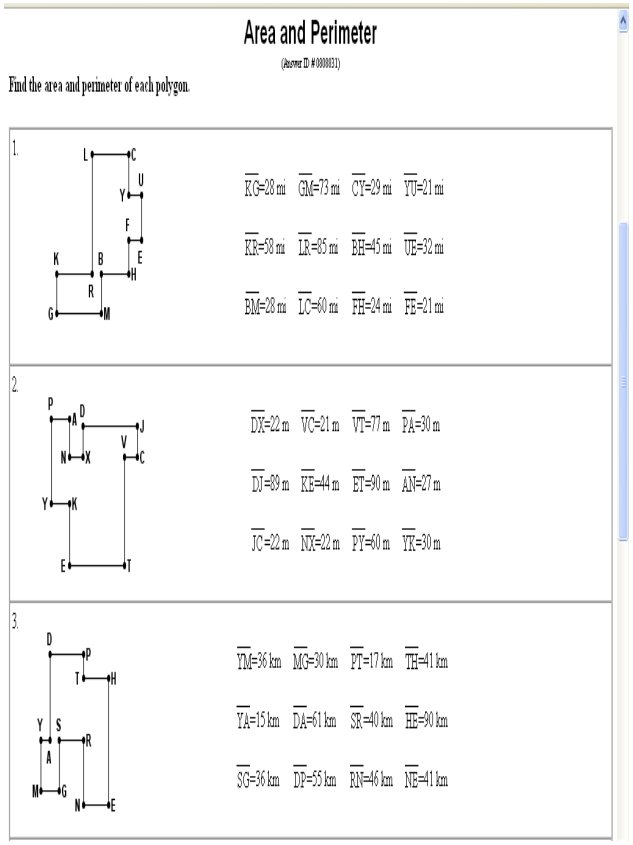
Activity 5

- We will give them the price of the materials to be used and the cost of installation. The students will calculate the total cost of the project.

	Carpet	10.26
	Hardwood	6.26
	Bath Tiles	7.43
	Kitchen Tiles	7.66
	Laundry Tiles	9.99
	Patio Paint	1.3
	Entry Tiles	10.47
	Porch Paint	1.3
	Garage Paint	0.8

Activity 6

- To evaluate the students' understanding, we will provide a worksheet on which the students will calculate the area of the given figures.



Area and Perimeter

(Answer ID # 0000031)

Find the area and perimeter of each polygon.

1.

$\overline{KG}$=28 mi $\overline{GM}$=73 mi $\overline{CY}$=29 mi $\overline{YU}$=21 mi

$\overline{KR}$=58 mi $\overline{LR}$=85 mi $\overline{BH}$=45 mi $\overline{UE}$=32 mi

$\overline{BM}$=28 mi $\overline{LC}$=60 mi $\overline{FH}$=24 mi $\overline{FE}$=21 mi

2.

$\overline{DX}$=22 m $\overline{VC}$=21 m $\overline{VT}$=77 m $\overline{PA}$=30 m

$\overline{DJ}$=89 m $\overline{KE}$=44 m $\overline{ET}$=90 m $\overline{AN}$=27 m

$\overline{JC}$=22 m $\overline{NX}$=22 m $\overline{PY}$=60 m $\overline{YK}$=30 m

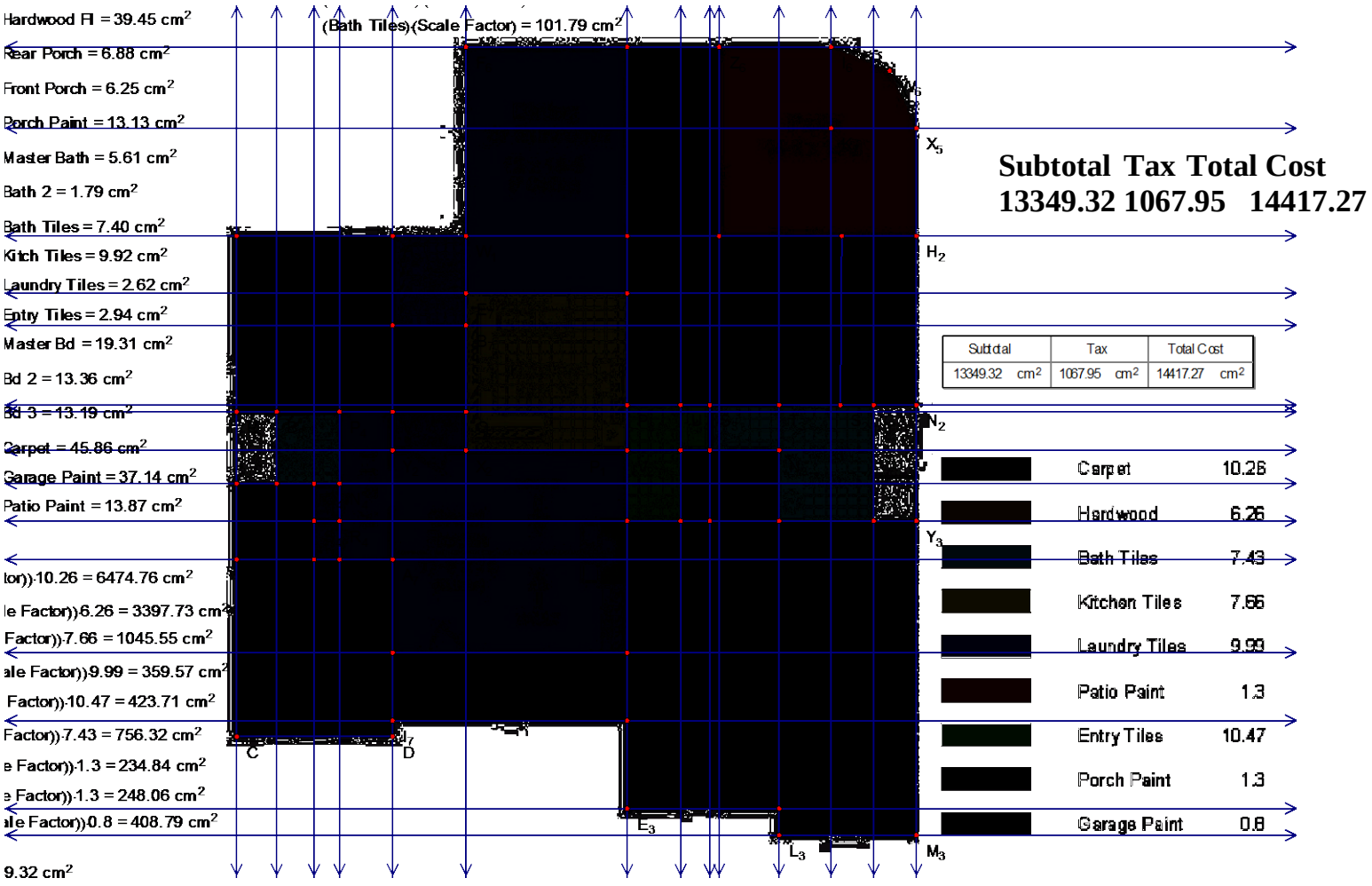
3.

$\overline{YM}$=86 km $\overline{MG}$=30 km $\overline{PT}$=17 km $\overline{TH}$=41 km

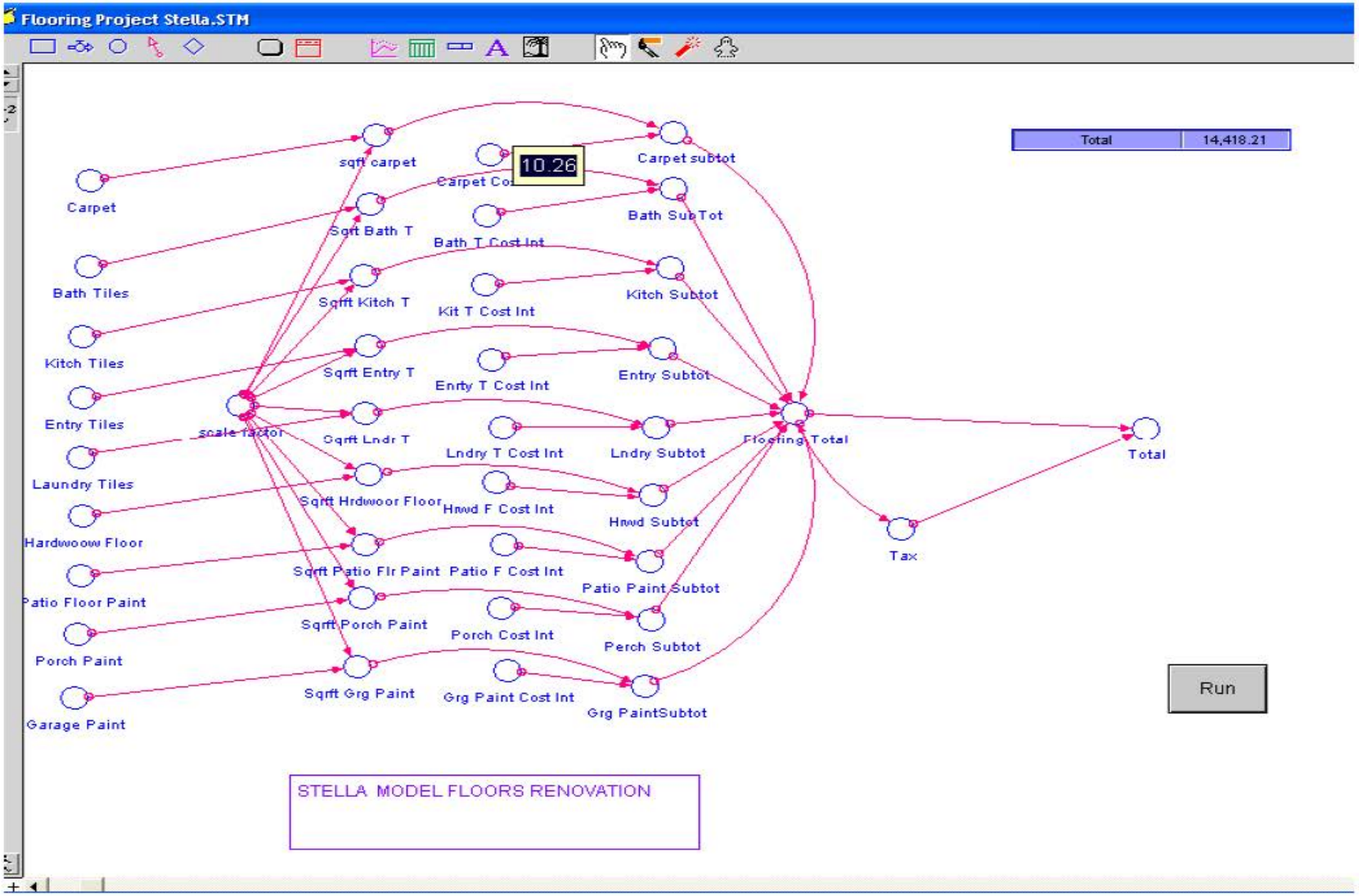
$\overline{YA}$=15 km $\overline{DA}$=61 km $\overline{SR}$=40 km $\overline{HE}$=90 km

$\overline{SG}$=36 km $\overline{DP}$=55 km $\overline{RN}$=46 km $\overline{NE}$=41 km

GSP Final Product



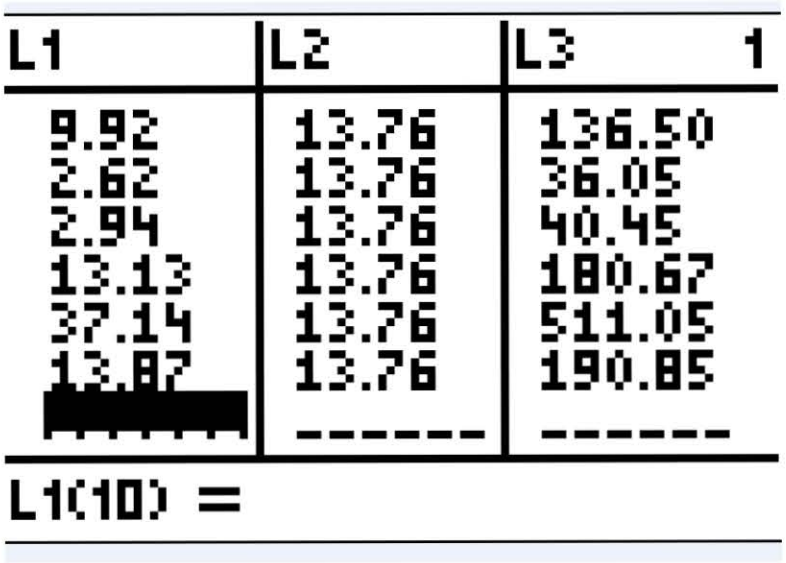
STELLA Final Product



Excel Final Product

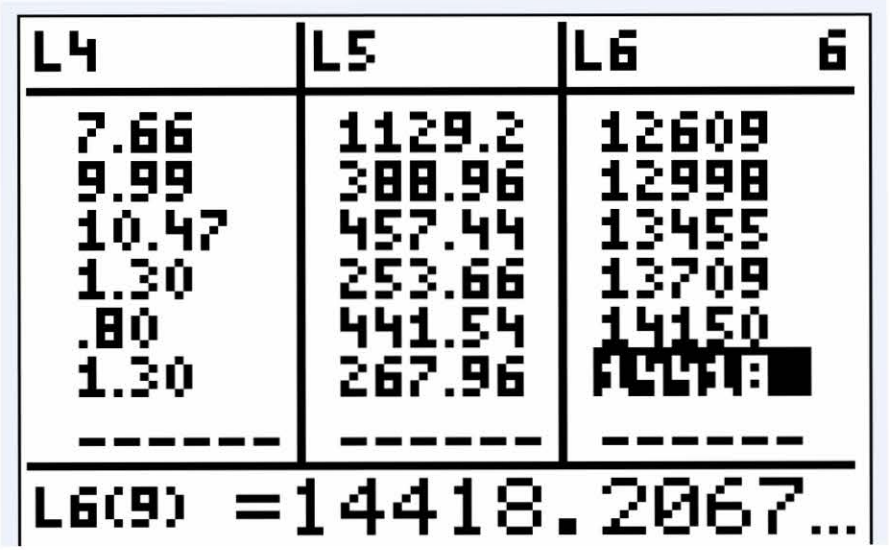
Floor Renovation Project							
Kind of Floor	**Sq. cm**	**Scale Factor**	**Sq. Ft**	**Cost/Inst**	**Subtotal**	**Tax**	**Total**
Carpet	45.86	13.76	631.0336	10.26	6474.405	0.08	6992.357
Bath Tiles	7.4	13.76	101.824	7.43	756.5523	0.08	817.0765
Kitchen Tiles	9.92	13.76	136.4992	7.66	1045.584	0.08	1129.231
Laundry Tiles	2.62	13.76	36.0512	9.99	360.1515	0.08	388.9636
Entry Tiles	2.94	13.76	40.4544	10.47	423.5576	0.08	457.4422
Hardwood Floor	39.45	13.76	542.832	6.26	3398.128	0.08	3669.979
Porch Paint	13.13	13.76	180.6688	1.3	234.8694	0.08	253.659
Patio Paint	13.87	13.76	190.8512	1.3	248.1066	0.08	267.9551
Garage Paint	37.14	13.76	511.0464	0.8	408.8371	0.08	441.5441
						Total Cost	**14418.21**

TI 84 Final Product



L1	L2	L3 1
9.92	13.76	136.50
2.62	13.76	36.05
2.94	13.76	40.45
13.13	13.76	180.67
37.14	13.76	511.05
13.87	13.76	190.85
[redacted]	------	------

L1(10) =



L4	L5	L6 6
7.66	1129.2	12609
9.99	388.96	12998
10.47	457.44	13455
1.30	253.66	13709
.80	441.54	14150
1.30	267.96	[redacted]
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L6(9) =14418.2067...

Rubrics

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Skills: Area, scale, unit cost, total cost.	Incomplete work. Demonstrates little understanding of topic.	Demonstrates an elementary understanding skills.	Demonstrates an adequate understanding of skills some wrong answers but not many	A complete understanding of skills no mistakes	
Computer Use: GSP, STELLA, Excel, TI 84	Incomplete	Shows little understanding of GSP, STELLA, Excel and TI 84	Demonstrates an adequate understanding of GSP, STELLA, Excel, TI 84.	Demonstrates a exemplary understanding of GSP, STELLA, Excel, TI 84.	
Quality of Research	Incomplete	Shows minimal understanding of researching costs. Poor decision making.	Shows adequate research and understanding of cost of materials. Adequate decision making.		
				TOTAL	

Presenters

- Brian Cheyne
- Bonnie Bush
- David Iachetta
- Pablo Lopez
- Bruce Peachey