



Issue 2  
2007-2008  
Middle School

## *Home Sweet Home*

The activities in this packet were written by Julie Koenig, Great Oaks Career Development Program

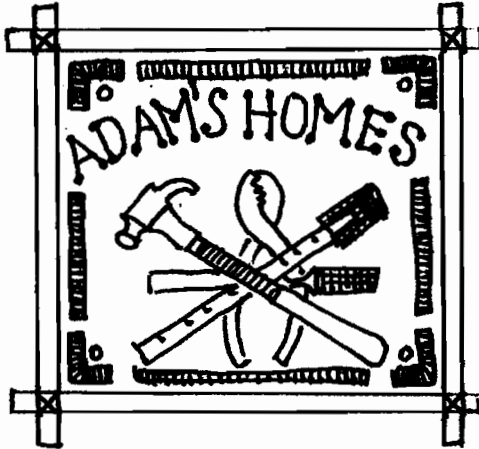
The packet was illustrated by Annie King, Ohio Hi-Point Career Development Program



For additional activities, visit our site at [www.ohiocad.com](http://www.ohiocad.com)

**Featuring Ohio's Academic Content Standards:**  
*Home Sweet Home: Mathematics: Measurement, Grades 5-7, C, G; Geometry and Spatial Sense, Grades 5-7 G; Mathematical Processes, Grades 5-7 B*

# Home Sweet Home



Adams Homes is a company that builds customized homes for families. They are in the process of building a house for the McCleary family. Use the floor plans included to determine the various measurements and calculations needed for workers to complete construction.

Plans included:  
Exterior View  
First Floor  
Second Floor

## Siding

The family has decided to use siding for the exterior of the house. Based on the dimensions given, what is the total surface area of the house? (Do not include the roof.)

Total Surface Area = \_\_\_\_\_

Now calculate the area of the doors and windows--these dimensions will not be sided.

Window A: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

Window B: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

Window C: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

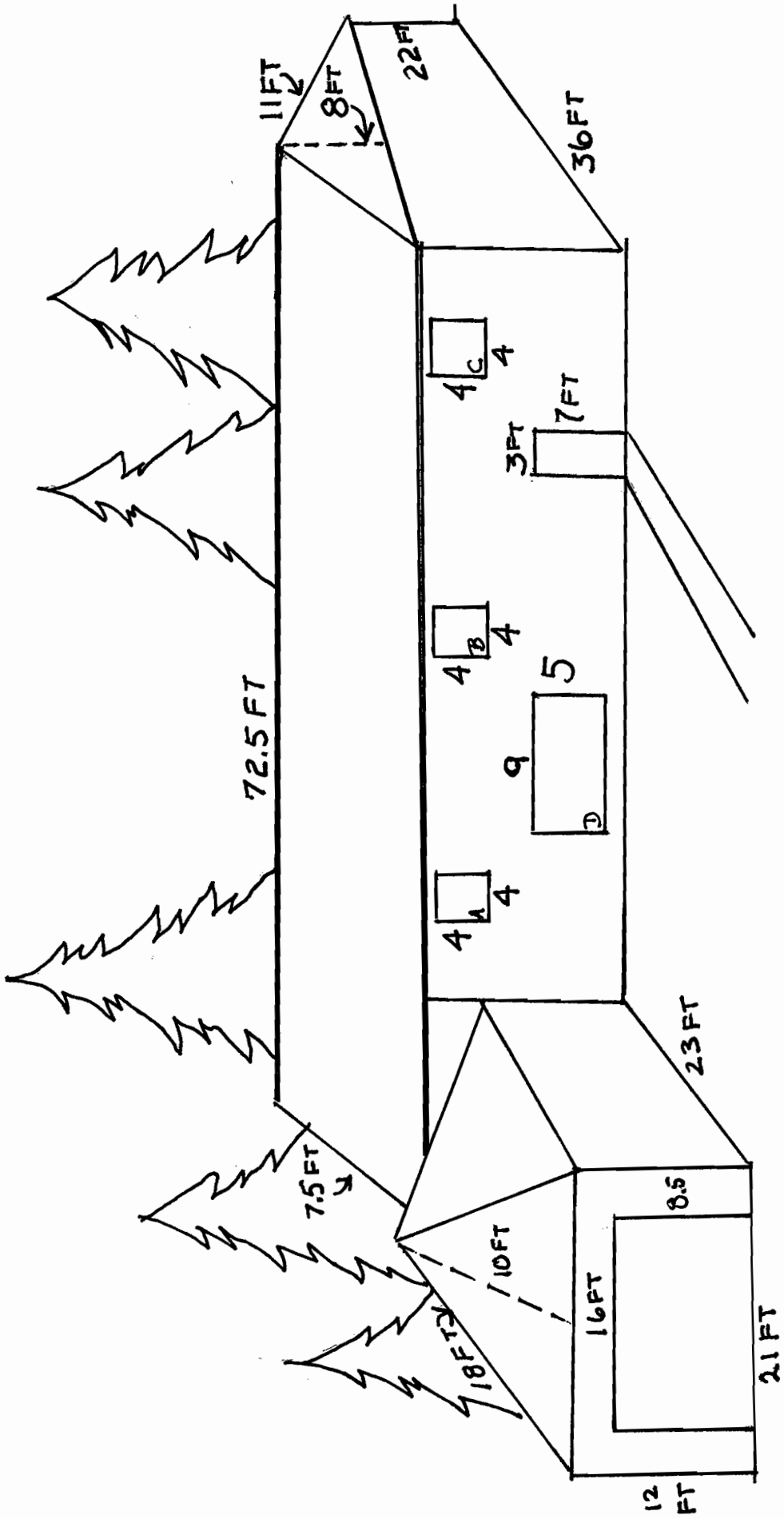
Window D: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

Front Door: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

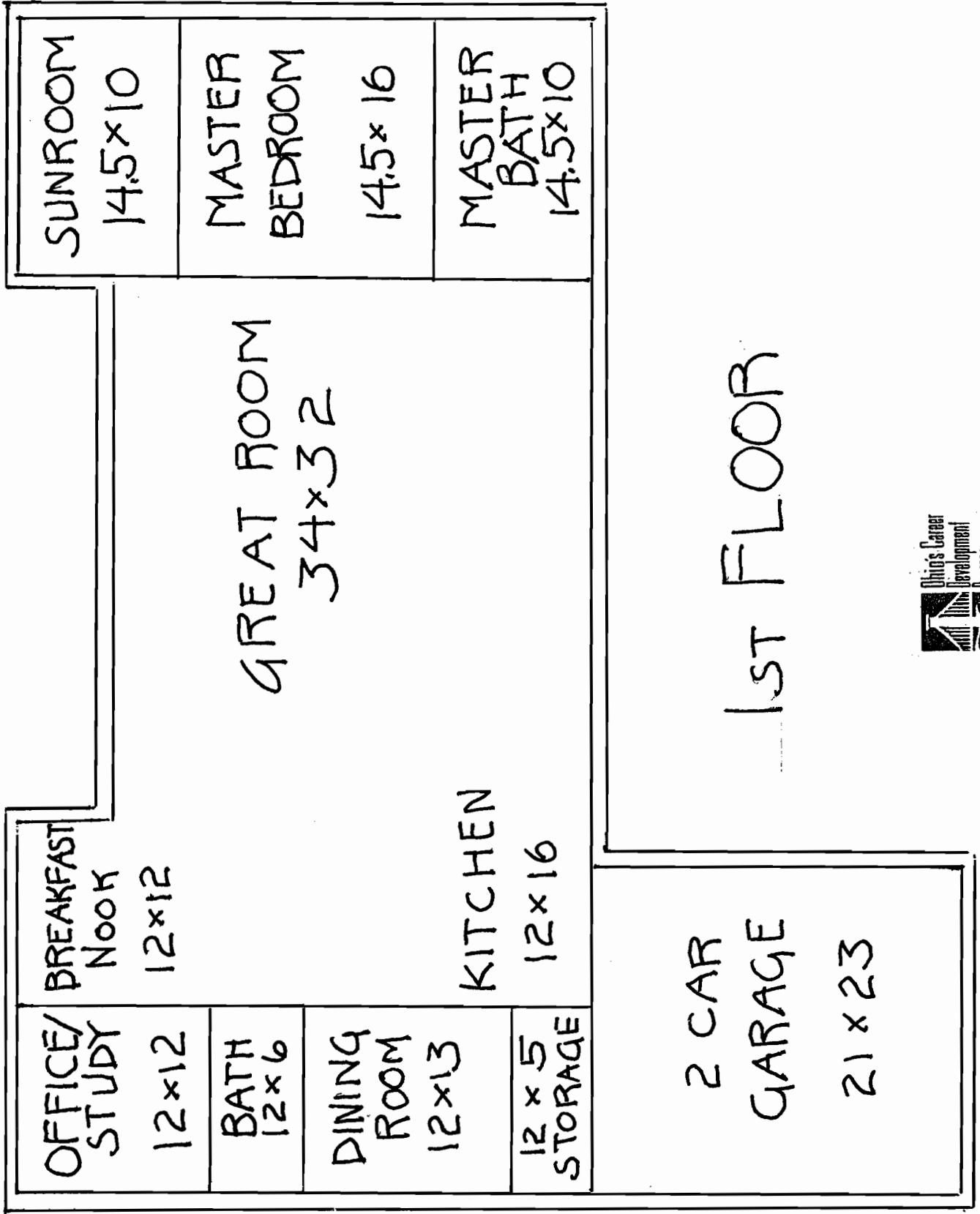
Garage Door: Dimensions \_\_\_\_\_ Area \_\_\_\_\_

Take your *Total Surface Area* and subtract the area of all of your doors and windows to show the total amount of siding needed.

= \_\_\_\_\_

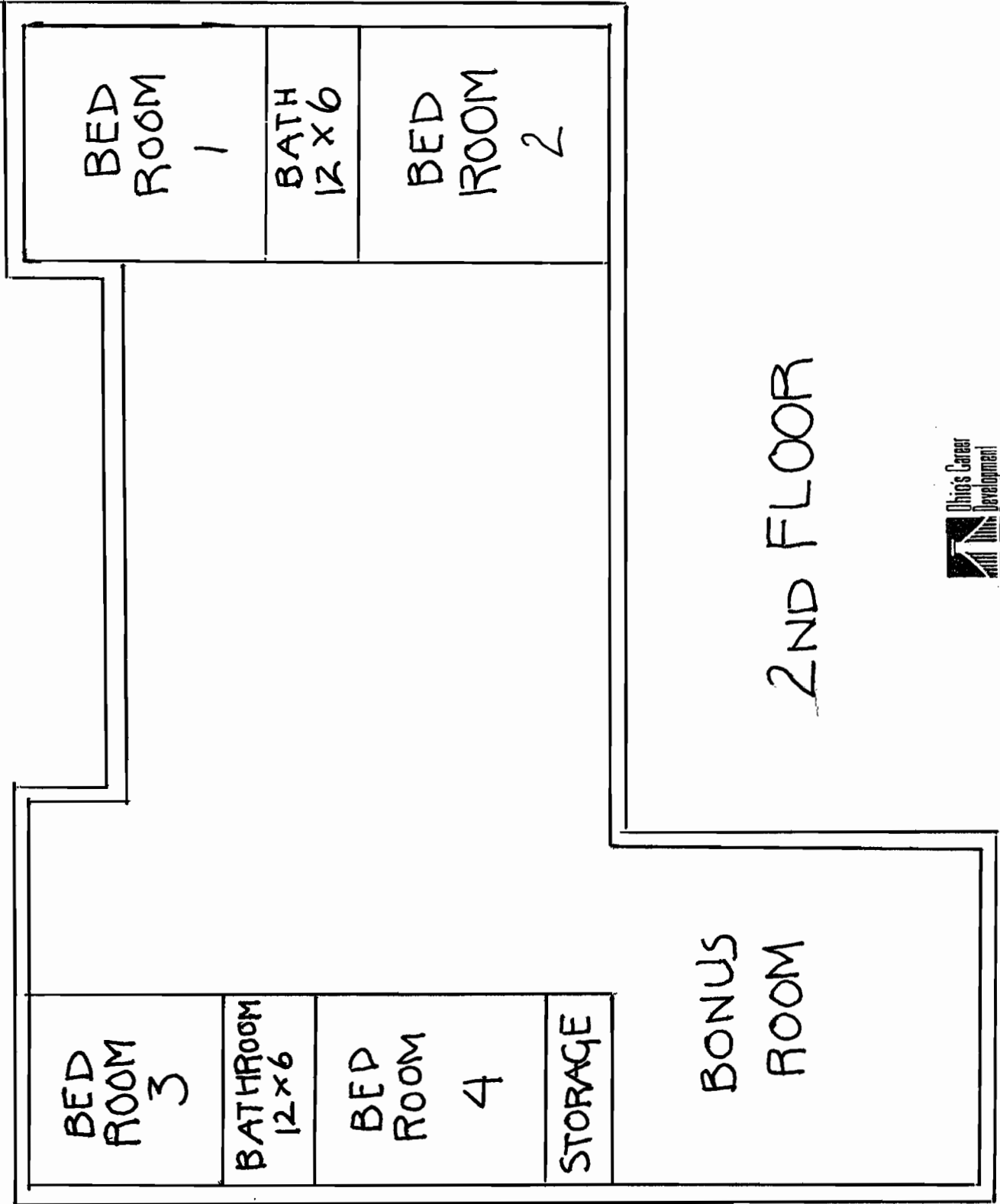


# EXTERIOR VIEW



1ST FLOOR





2ND FLOOR

BONUS ROOM

BED ROOM 3

BATHROOM 12x6

BED ROOM 4

STORAGE

BED ROOM 1

BATH 12x6

BED ROOM 2



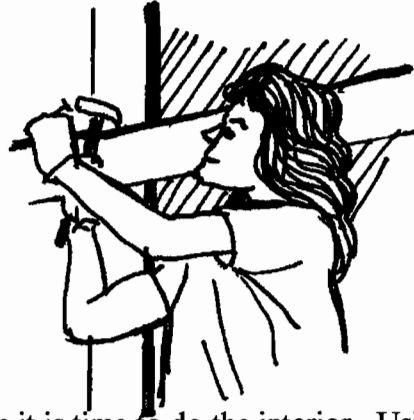
## Roof

Look at the exterior plan of the home to determine the dimensions of the roof.  
Remember there is no bottom to a roof.

Area of Garage Roof = \_\_\_\_\_

Area of House Roof = \_\_\_\_\_

Total Area of Roofs = \_\_\_\_\_



## Interior Floors

Once the outer main structure of the house is complete it is time to do the interior. Using the floor plans answer the following questions.

Using the plans as your guides, calculate the area of the following rooms on the main floor.

Area of Office/Study \_\_\_\_\_

Area of Bath \_\_\_\_\_

Area of Dining Room \_\_\_\_\_

Area of Storage \_\_\_\_\_

Area of Garage \_\_\_\_\_

Area of Breakfast Nook \_\_\_\_\_

Area of Kitchen \_\_\_\_\_

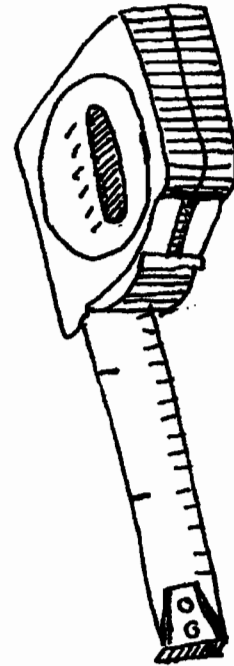
Area of Great Room \_\_\_\_\_

Area of Sunroom \_\_\_\_\_

Area of Master Bedroom \_\_\_\_\_

Area of Master Bath \_\_\_\_\_

TOTAL AREA OF THE MAIN FLOOR \_\_\_\_\_



The McCleary family decides to do the great room, the kitchen and the breakfast nook area in hardwood floors. What is the area of these combined?

\_\_\_\_\_

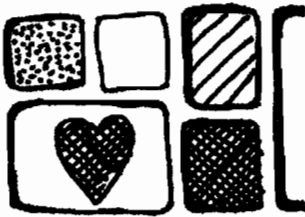
If they are going to pay \$7.00 per square foot for flooring, how much will they pay to have hardwood floors installed?

\$ \_\_\_\_\_

Both bathrooms on the main floor will have tile installed. What is the total area of the baths?

\_\_\_\_\_

If they are going to use 9-inch tiles in the bathrooms, how many tiles will they need? (Remember, you can only buy tiles as a whole and you have the rooms in feet and the tiles in inches.)



What is the area in inches? \_\_\_\_\_

How many tiles would they need? \_\_\_\_\_

The tiles are \$0.67 each. How much will the tiles cost?

\$ \_\_\_\_\_

Finally they choose to do all four bedrooms plus the master bedroom in carpet.

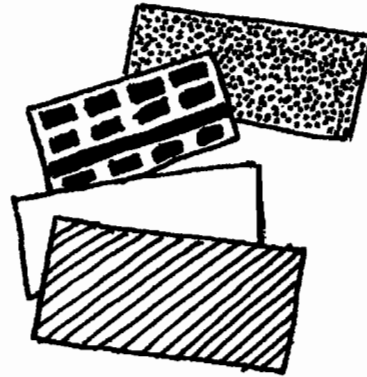
Area of Master \_\_\_\_\_

Area of Bedroom 1 \_\_\_\_\_

Area of Bedroom 2 \_\_\_\_\_

Area of Bedroom 3 \_\_\_\_\_

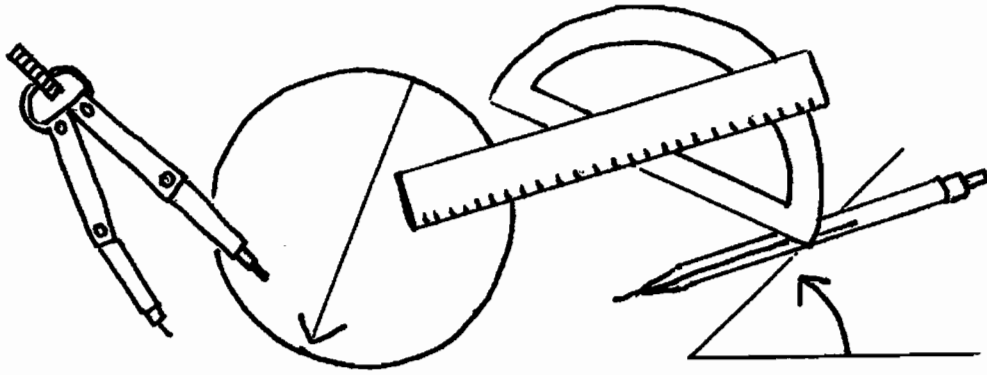
Area of Bedroom 4 \_\_\_\_\_



What is the total area of the bedrooms combined? \_\_\_\_\_

If they choose carpet that is \$12.89 per square foot, how much will they be paying in carpet?

\$ \_\_\_\_\_



Looking at the calculations you have done for the Home Sweet Home activity, how is mathematics used on the job? Why is it important that these calculations be accurate?

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What effects would inaccurate measurements have on the building of the McCleary's home and its cost? Who would be affected? How could it positively or negatively affect the home building company?

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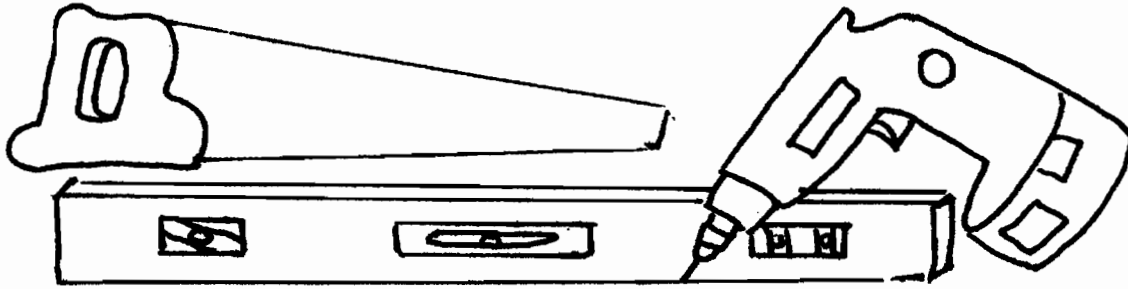




## Home Sweet Home Construction Careers Matching

Match the construction career listed to the knowledge needed to be successful on the job.

Rofer	Knowledge of the entire project including blueprints on hand and directing workers
Carpenter	Knowledge of the exterior of the house and ability to measure, calculate, and install materials. Focus will be on the total surface area of the house
Site Manager	Knowledge of measurement and following a blueprint to make rooms the dimensions specified
Siding	Knowledge of circuits and how they work connecting them throughout the house on both floors
Electrician	Knowledge of the area of the exterior of the house especially triangles and slopes prior to installation
Framer	Knowledge of square footage and area while they are measuring and cutting and installing materials
Building Inspector	Knowledge of codes for building and comparing it to blueprint
Painters	Knowledge of the interior of the house and what the area of each individual room is so product can be purchased



## Extension Ideas:

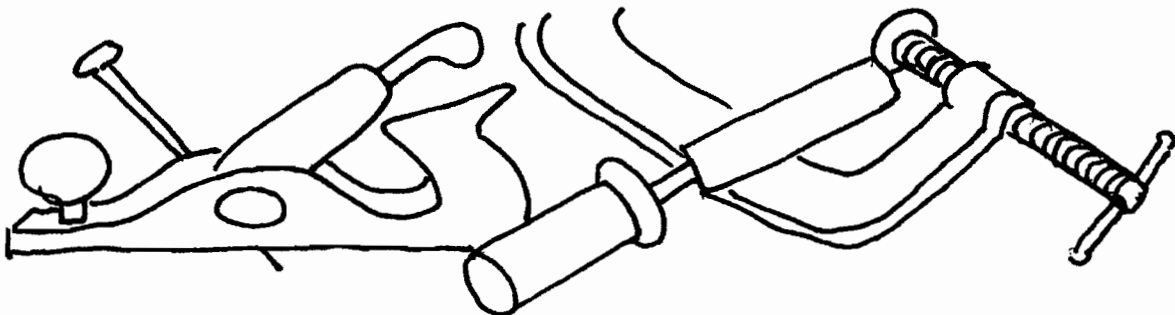
Invite a local homebuilder to talk with your class about the company, pricing structure, decisions homeowners need to make, and careers/jobs involved in the company.

Visit or invite your Career and Technical (including Tech Prep) school's Construction program teacher and/or students to talk about the construction field, skills used, and specific jobs connected to their education and training.

Visit or invite your Career and Technical (including Tech Prep) school's CAD program to learn how to render blueprints and create a three-dimensional image on the computer.

Search on the Internet for real home plans to choose your dream home. Log online to a home store to determine flooring, hardware, wall covers, and other costs.

Research various construction related careers on Ohio's Career Information System (OCIS) or other computer database to learn more.



### ***Ohio's Academic Content Standards***

***Mathematics:*** Measurement. Grades 5-7, C, G  
Geometry and Spatial Sense, Grades 5-7 G  
Mathematical Processes, Grades 5-7 B

Vocational Awareness  
Career Information



# Home Sweet Home!!!

## Answer Key

**Total surface area of the house:**

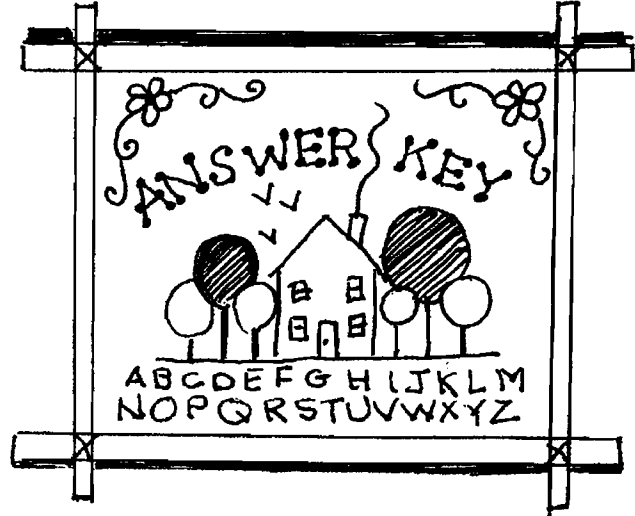
House

51.5x22x2=2266  
 36x22x2=1584  
 51.5x36= 1854  
 Total=5704

Garage

21x23=483  
 21x12x2=504  
 23x12x2=552  
 Total=1539

Total Square Area =7243 ft<sup>2</sup>



**Now you need to calculate the area of the doors and windows since they will not be covered by siding?**

Window A- Dimensions 4x4 Area-16 ft<sup>2</sup>

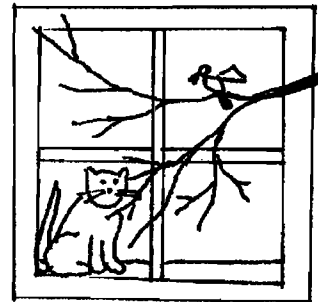
Window B- Dimensions 4x4 Area-16 ft<sup>2</sup>

Window C- Dimensions 4x4 Area- 16 ft<sup>2</sup>

Window D- Dimensions 9x5 Area-45 ft<sup>2</sup>

Front Door- Dimensions 3x7 Area-21 ft<sup>2</sup>

Garage Door- Dimensions 16x8.5 Area-136 ft<sup>2</sup>



**Take your Total Surface Area and subtract out all of your doors and Windows. = 6993 ft<sup>2</sup>**

Area of Garage Roof = 250 ft<sup>2</sup>

Area of House Roof = 1629.25 ft<sup>2</sup>

**Total Area of Roofs Combined =2049.25 ft<sup>2</sup>**

**Main Floor Areas**

Area of Office/Study  $12 \times 12 = 144$

Area of Bath  $12 \times 6 = 72$

Area of Dining Room  $12 \times 13 = 156$

Area of Storage  $12 \times 5 = 60$

Area of Garage  $21 \times 23 = 483$

Area of Breakfast Nook  $12 \times 12 = 144$

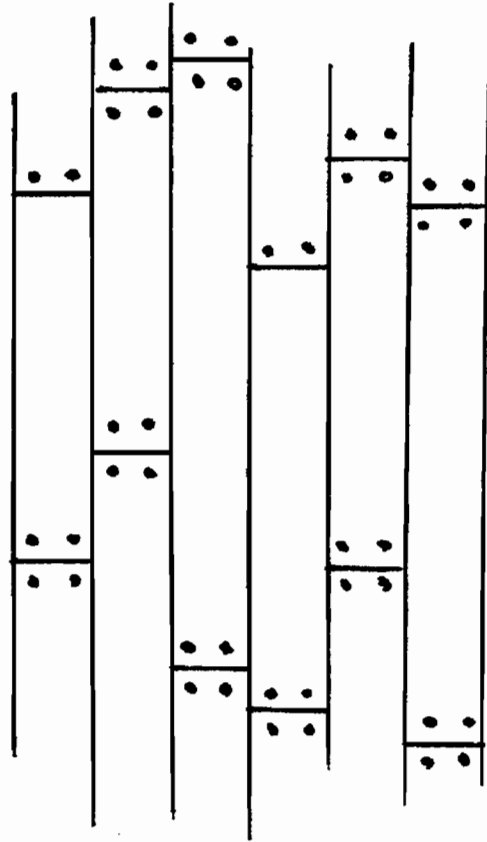
Area of Kitchen  $12 \times 16 = 192$

Area of Great Room  $34 \times 32 = 1088$

Area of Sunroom  $14.5 \times 10 = 145$

Area of Master Bedroom  $14.5 \times 16 = 232$

Area of Master Bath  $14.5 \times 10 = 145$



**What is the area of the main floor?  $2861 \text{ ft}^2$**

**Area of Great Room, the Kitchen and the Breakfast Nook combined =  $1424 \text{ ft}^2$**

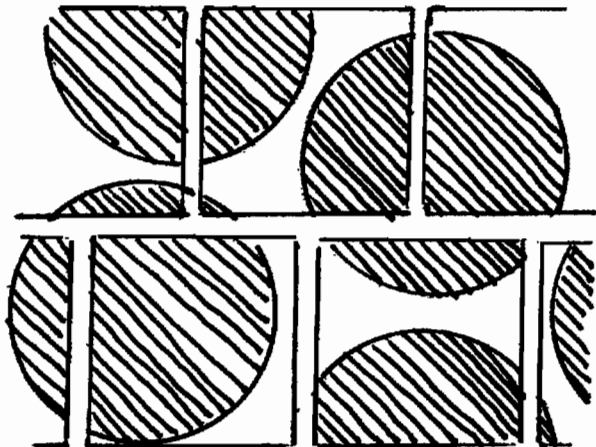
**Cost of hardwood floors =  $\$9968.00$**

Total area of the baths =  $217 \text{ ft}^2$

Area in inches =  $2714 \text{ in}$

Number of tiles needed =  $302 \text{ tiles}$

**Cost of tiles =  $\$202.34$**



**Finally they choose to do all four bedrooms in carpet.**

Area of Master Bedroom 232 ft<sup>2</sup>

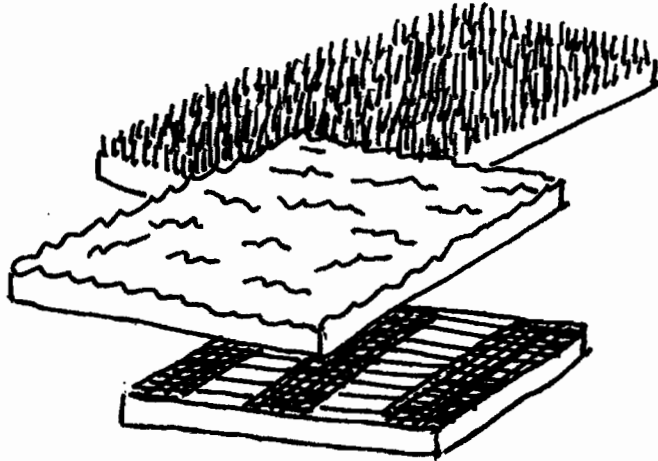
Area of Bedroom 1 238 ft<sup>2</sup>

Area of Bedroom 2 156 ft<sup>2</sup>

Area of Bedroom 3 144 ft<sup>2</sup>

**Total area of the bedrooms =  
770 ft<sup>2</sup>**

**Cost of carpet = \$9925.30**



## MATCHING

Rofer	Knowledge of... Site manager
Carpenter	Knowledge of...Siding
Site Manager	Knowledge of... Framer
Siding	Knowledge of... Electrician
Electrician	Knowledge of...Rofer
Framer	Knowledge of...Carpenter
Building Inspector	Knowledge of...Building inspector
Painters	Knowledge of... Painters