Newark Charter School
Units/Lessons

Mathematics ~ Grade 7

Newark Charter School Instructional Unit

Unit Title: Raise the Roof

Content Area: Mathematics

Grade Level(s): Grade 7

Length of Unit: 3+ Lessons, 14 days total

Unit Summary:
Let's Raise the Roof! Let's get excited! Let's get the kids excited about using math and technology to create the home of their dreams. Students will hone their math skills while they create and construct their very own home. Students will learn to calculate surface area, square footage, estimate cost, and follow a budget. Designing and drawing their vision of the perfect house students will apply area formulas and learn how important it is to measure accurately. Then the fun begins when they start shopping for flooring, paint, and wall covers using the internet and newspaper ads. Using Microsoft Excel, they will create a working budget to calculate their cost. They will literally raise the roof when they construct a scale model of the ideal home. (This is an excellent opportunity for students to understand the concept of STEM programming that is integrating their studies, plus!

Common Core State Standards:
CCSS.Math.Content.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
CCSS.Math.Content.7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
CCSS.Math.Content.7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids
CCSS.Math.Content.7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
CCSS.Math.Content.7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
CCSS.Math.Content.7.RP.A.2c Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.
CCSS.Math.Content.7.RP.A.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
CCSS.Math.Content.7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Big Ideas:
Mathematics is involved in the design process and implementation of a design plan when constructing a building.

Enduring Understandings:
Changes to a dimension or a measured characteristic of a planned construction require new figures to be established; one change impacts the whole.
There are tools we can use to help in designing and implementing a construction project that help with the mathematical requirements.
Thinking, talking and writing about the design process enables one to better understand the process.

Essential Question(s):
What considerations need to be made to accomplish this design project?
What mathematics will one need to use to accomplish the work?
How are the elements of a design project (dimensions, materials, cost, etc.) inter-related?

Knowledge and Skills:

Students will need to know... (the Core Knowledge Sequence)

1. Students should know all information regarding measurement presented in grades 4 and 5.
2. Students should continue to master the use of measuring and drawing instruments, develop their mental arithmetic and their approximating abilities, become familiar with deductive reasoning, and use calculators and computers in a thoughtful way.
3. The student will use math skills previously mastered how fractions and decimals are related to ratios, proportions, and percents, and they can be used to describe real-life probabilities.
4. The student will use math skills previously mastered to use ratios and proportions to interpret map scales and scale drawings.
5. The student will use math skills previously mastered needed to find the area and perimeter of plane figures, or given the area or perimeter find the missing dimension, using all appropriate formulas.

Student will be able to do...

Concept Objectives

1. The student uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.
2. The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.
3. The student constructs, interprets, and uses scale drawing such as those based on number lines and maps to solve real-world problems.
4. The student solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or the customary system.
5. The student solves real world and mathematical problems involving estimates of measurements including length, time, weight/mass, temperature, money, perimeter, area, and volume, in either customary or metric units.
6. The student selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation
7. The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two- and three dimensions.

Content Objectives

1. Measurement

a. Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.

b. Compare weights, capacities, geometric measures, times and temperatures within and between measurement systems (for example, miles per hour and feet per second, cubic inches to cubic centimeters).

c. Use measures expressed as rates (for example, speed, density) and measures expressed products (for example, person-days) to solve problems; check the units of the solutions and use dimensional analysis to check the reasonableness of the answer.

d. Compute the perimeter, area, and volume of common geometric objects and use the results to find measures of lesson common objects.

e. Know how perimeter, area, and volume are affected by changes of scale.

f. Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.

g. Relate the changes in measurement and a change of scale to the units used (for example, square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches of [$1ft^2 = 144\ in^2$], 1 cubic inch is approximately 16.38 cubic centimeters [$1\ in^3$] = [$16.36\ cm^3$]).

Skill Objectives

1. Students will use formulas to calculate area for triangles, squares, rectangles, trapezoids, and parallelograms.
2. Students will accurately measure using standard units.
3. Students will determine cost per square foot for carpet, tile, paint, and wallpaper.
4. Students will plan costs within a budget.
5. Students will show all calculations for computing area and cost/square footage.
6. Students will accurately compute the cost of carpet/tile and wallpaper/paint for four of the differently shaped rooms.
7. Students will use proper units when calculating costs.
8. Students will write a paragraph clearly explaining the reasons of why this is the student's dream house.
9. Students will share a finished product by oral presentation and written explanation.

Assessment Evidence

Performance or Transfer Tasks:

Designing a project using the math skills already learned will enable students to use them in daily living activities.

Students will be able to create other content area design projects using the integrated experiences of this unit's lesson set.

Rubrics:

See appendices

Other Evidence:

See appendices

Student Self-Assessment:

See appendices

Learning Plan

Key Learning Events:

Lesson One: Area and Scale (Six Days)

A. Daily Objectives

1. Concept Objective(s)

a. The student uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.

b. The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.

c. The student constructs, interprets, and uses scale drawing such as those based on number lines and maps to solve real-world problems.

d. The student solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or the customary system.

e. The student solves real world and mathematical problems involving estimates of measurements including length, time, weight/mass, temperature, money, perimeter, area, and volume, in either customary or metric units.

f. The student selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation

g. The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two- and three dimensions.

2. Lesson Content

a. Measurement

1. Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.

2. Compare weights, capacities, geometric measures, times and temperatures within and between measurement systems (for example, miles per hour and feet per second, cubic inches to cubic centimeters).

3. Use measures expressed as rates (for example, speed, density) and measures expressed products (for example, person-days) to solve problems; check the units of the solutions and use dimensional analysis to check the reasonableness of the answer.

4. Compute the perimeter, area, and volume of common geometric objects and use the results to find measures of lesson common objects.

5. Know how perimeter, area, and volume are affected by changes of scale.

6. Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.

7. Relate the changes in measurement and a change of scale to the units used (for example, square inches, cubic feet)and to conversions between units

3. Skill Objective(s)

a. Students will use formulas to calculate area for triangles, squares,rectangles, trapezoids, and parallelograms.

b. Students will accurately measure using standard units.

c. Students will determine cost per square foot for carpet, tile, paint, and wallpaper.

d. Students will plan costs within a budget.

e. Students will show all calculations for computing area and cost/square footage.
f. Students will accurately compute the cost of carpet/tile and wallpaper/paint for four of the differently shaped rooms.
g. Students will use proper units when calculating costs.
h. Students will write a paragraph clearly explaining the reasons of why this is the student's dream house.
i. Students will share a finished product by oral presentation and written explanation.

B. Materials

1. Prepared Area Worksheet –Appendix A
2. Prepared Rubric – Appendix B
3. Prepared Sample Floor Plan Worksheet –Appendix C
4. Pencils
5. Black Pens
6. Grid Paper 11x17 1 square = 1 foot
7. Overhead Projector
8. Overhead of Worksheet
9. Overhead pens

C. Key Vocabulary

1. Polygon – A simple closed figure in a plane formed by three or more line segments.
2. Quadrilateral – A polygon with four sides.
3. Rectangle – A quadrilateral with opposite sides congruent and parallel and all angles are right.
4. Parallelogram – A quadrilateral with both pairs of opposite sides parallel and congruent.
5. Square - A parallelogram with four congruent sides and four right angles.
6. Triangle - A polygon with three sides.
7. Trapezoid - A quadrilateral with exactly one pair of parallel opposite sides.
8. Area – The measure of the inside of a closed figure, expressed in square units.
9. Perimeter – The measure of the distance around the outside of a closed figure.
10. Ratio – A comparison of two numbers by division.
11. Scale – The ratio of a given length on a drawing or model to its corresponding length in reality.
12. Scale Drawing - A drawing that is similar, but either larger or smaller than the actual object.
13. Scale Factor – the ratio of the lengths of two corresponding sides of two similar polygons
14. Scale Model – A replica of an original object that is too large or too small to be built at actual size.

D. Procedures/Activities

1. Draw a square, rectangle, triangle, trapezoid, and parallelogram on the overhead and have students name each figure and describe characteristics of each (e.g., Square - four sides, same lengths, etc.). Discuss the meaning of area.
2. Explain the overall activity that the students will be working on and pass out the rubrics to the students. Go over the expectations and explain the rubrics.
3. Handout Area Practice Worksheet. Demonstrate with examples how to complete the worksheet correctly. Check for understanding by circulating room. Worksheets should be completed by end of class period.
4. Handout Sample Floor Plan Worksheet – Appendix C
5. Explain to students that this is a sample of possible floor plan. Give students window and door dimensions. Windows are 4 ft. x 4 ft. Doors are 6 ft. x 3 ft. All walls will be 8ft. height
6. Illustrate the process to the students by choosing one room. Explain that the window and

door areas are subtracted from total area when figuring square footage for walls.
7. Working in pairs the students will calculate costs of carpet/tile and wallpaper/paint for two different rooms.
8. Hand out two sheets of graph paper to each student.
9. Explain that they going to be designing the floor plans of their single story house.
10. Explain that the scale is one square = one square foot
11. The students must use at least four different shapes and each room must be labeled with the name, dimensions, and area of each room.
12. Tell the student that they must indicate where all windows and doors will be.
13. Students should have the rough draft of their design completed by day four – rough draft is completed using pencil.
14. Final Copy to be completed by day six – final design will be completed using pen.

E. Assessment/Evaluation

1. Students will find the area and perimeter of the geometric figures found on Area Worksheet - Appendix A.
2. Students rough draft and final drawing will be graded for accuracy in drawing and following the Rubric – Appendix B

Lesson Two: Creating a Budget/Calculating Cost (Four Day)

A. Daily Objectives

1. Concept Objective(s)
   a. The student uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.
   b. The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.
   c. The student constructs, interprets, and uses scale drawing such as those based on number lines and maps to solve real-world problems.
   d. The student solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or the customary system.
   e. The student solves real world and mathematical problems involving estimates of measurements including length, time, weight/mass, temperature, money, perimeter, area, and volume, in either customary or metric units.
   f. The student selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.
   g. The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two- and three dimensions.
2. Lesson Content
   a. Measurement
      1. Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.
      2. Compare weights, capacities, geometric measures, times and temperatures within and between measurement systems (for example, miles per hour and feet per second, cubic inches to cubic centimeters).
      3. Use measures expressed as rates (for example, speed, density) and measures expressed products (for example, person-days) to solve problems; check the units of the solutions and use dimensional analysis to check the reasonableness of the answer.

4. Compute the perimeter, area, and volume of common geometric objects and use the results to find measures of lesson common objects.
5. Know how perimeter, area, and volume are affected by changes of scale.
6. Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.
7. Relate the changes in measurement and a change of scale to the units used (for example, square inches, cubic feet)and to conversions between units

3. Skill Objective(s)
   a. Students will use formulas to calculate area for triangles, squares,rectangles, trapezoids, and parallelograms.
   b. Students will accurately measure using standard units.
   c. Students will determine cost per square foot for carpet, tile, paint, and wallpaper.
   d. Students will plan costs within a budget.
   e. Students will show all calculations for computing area and cost/square footage.
   f. Students will accurately compute the cost of carpet/tile and wallpaper/paint for four of the differently shaped rooms.
   g. Students will use proper units when calculating costs.
   h. Students will write a paragraph clearly explaining the reasons of why this is the student's dream house.
   i. Students will share a finished product by oral presentation and written explanation.

B .Materials
1. Prepared Budget Worksheet – Appendix D
2. Prepared Analysis Worksheet – Appendix E
3. Newspaper with ads for floor coverings, paint, and wall coverings.
4. Computers
5. Internet Access
6. Microsoft Excel Software
7. Printer

C. Key Vocabulary
1. Square Feet- The area enclosed by a square with sides each one-foot long.
2. Rough Draft – This drawing is the not as neat or precise as a final drawing and is generally completed in pencil.
3. Budget – A list of all planned expenses.
4. Spreadsheet – A sheet of paper that shows accounting or other data in rows and columns; a spreadsheet is also a computer application program that simulates a physical spreadsheet by capturing, displaying, and manipulating data arranged in rows and columns.
5. Columns –Contain an item of data within a row.
6. Rows – Go across the spreadsheet like rows in a theater. These are labeled with numbers.
7. Formulas – A mathematical expression that refers to cells in other parts of the spreadsheet. Use to add, subtract, multiply, or divide the values in a spreadsheet.
8. Analysis – a Type of evaluation in which both the disadvantages (cost) and advantages (benefits) of a product are weighed.

D. Procedures/Activities
1. Explain to the students the possible types of floor coverings, paint, and wallpaper.
2. Explain that one can of paint covers 400 square feet and one roll of wallpaper covers 55 square feet.
3. Students will be given a pre-determined budget for their flooring and wall covering.
4. Students will use newspaper ads and internet resources to find information and costs for

flooring, paint, and wall coverings.
5. Students will prepare a rough draft of their calculations using Budget Worksheet Appendix D.
6. Students will calculate the square footage for all floors and walls and determine if their selections are within their allotted budget.
7. Introduce the use of Microsoft Excel spreadsheets to students.
8. Demonstrate how label columns and rows.
9. Demonstrate how to create formulas in Microsoft Excel.
10. Have students create a simple spreadsheet using basic formulas in Microsoft Excel.
11. Students will prepare a final budget sheet using Microsoft Excel.
12. Students will prepare an analysis work sheet explaining their selections and reasoning behind those choices by completing Appendix E.

E. Assessment/Evaluation
1. Review student rough draft budget for accuracy.
2. Review Microsoft Excel spreadsheet for accuracy.
3. Review analysis worksheet.

Lesson Three: Let the Building Begin – (Three – Four Days)

A. Daily Objectives
1. Concept Objective(s)
a. The student uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.
b. The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.
c. The student constructs, interprets, and uses scale drawing such as those based on number lines and maps to solve real-world problems.
d. The student solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or the customary system.
e. The student solves real world and mathematical problems involving estimates of measurements including length, time, weight/mass, temperature, money, perimeter, area, and volume, in either customary or metric units.
f. The student selects and uses appropriate instruments, technology, and techniques to measure quantities in order to achieve specified degrees of accuracy in a problem situation.
g. The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two- and three dimensions.
2. Lesson Content
a. Measurement
1. Choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.
2. Compare weights, capacities, geometric measures, times and temperatures within and between measurement systems (for example, miles per hour and feet per second, cubic inches to cubic centimeters).
3. Use measures expressed as rates (for example, speed, density) and measures expressed products (for example, person-days) to solve problems; check the units of the solutions and use dimensional analysis to check the reasonableness of the answer.
4. Compute the perimeter, area, and volume of common geometric objects and

use the results to find measures of lesson common objects.
5. Know how perimeter, area, and volume are affected by changes of scale.
6. Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.
7. Relate the changes in measurement and a change of scale to the units used (for example, square inches, cubic feet)and to conversions between units

3. Skill Objective(s)
   a. Students will use formulas to calculate area for triangles, squares, rectangles, trapezoids, and parallelograms.
   b. Students will accurately measure using standard units.
   c. Students will determine cost per square foot for carpet, tile, paint, and wallpaper.
   d. Students will plan costs within a budget.
   e. Students will show all calculations for computing area and cost/square footage.
   f. Students will accurately compute the cost of carpet/tile and wallpaper/paint for four of the differently shaped rooms.
   g. Students will use proper units when calculating costs.
   h. Students will write a paragraph clearly explaining the reasons of why this is the student's dream house.
   i. Students will share a finished product by oral presentation and written explanation.

B. Materials
   1. Safety Guidelines – Appendix F
   2. Foam Core Board
   3. Exacto Knives
   4. Safety Glasses
   5. Glue
   6. Straight Pins

C. Key Vocabulary
   1. Mitered Corners

D. Procedures/Activities
   1. Review safety procedures for using the cutting utensils, using straight pins, and wearing safety glasses.
   2. Students will be required to pass a Safety Quiz before they are allowed to begin construction. Teacher made test.
   3. Students will use their final floor plan as the base for their construction project.
   4. Students will calculate the surface area of their exterior and interior walls to determine the amount of foam core board needed to construct their home design.
   5. Students will use foam core board to cut exterior and interior walls.
   6. Students will cut out all windows and doors in the exterior and interior walls.
   7. Students will attach the foam core board to their floor plan using glue.
   8. Students will present their completed final project to the class.

E. Assessment/Evaluation
   1. Review Safety Quizzes to ensure students have a thorough understanding of the safety procedures.
   2. Evaluate completed project for accuracy and neatness of construction.

CULMINATING ACTIVITY (Optional)
A. If available students will transfer their hand drawn floor plans to a CAD program. They can then do

a 3-D computer animation of their design.
B. If available have students use the internet and go to the website: http://sketchup.google.com/ an easy-to-learn 3D modeling program that enables the students to explore the world in 3D. With just a few simple tools, they can create 3D models of houses, sheds, decks, home additions, and woodworking projects - even space ships. And once they've built their models, you can place them in Google Earth; post them to the 3D Warehouse, or print hard copies.

HANDOUTS/WORKSHEETS

1. Appendix A: Raise the Roof Area/Perimeter
2. Appendix B: Raise the Roof Rubric
3. Appendix C: Raise the Roof Sample Floor Plan Worksheet
4. Appendix D: Raise the Roof Budget
5. Appendix E: Raise the Roof Analysis worksheet
6. Appendix F: Raise the Roof Safety Guidelines

Resources:

A. Glencoe Mathematics Applications and Concepts Course, McGraw-Hill, New York
ISBN 0-07-860139-8
B. Glencoe Practice Worksheets from the Glencoe Mathematics Applications Series
C. Core Knowledge Sequence Content Guidelines for Grades K-8. 1999, Core Knowledge Foundation
ISBN 1-890517-20-8, Page 172-173
D. Mathematics Applications and Concepts: Course 3,
http://www.glencoe.com/sec/math/msmath/mac04/course3/webquest/unit3.php/ ,10/10/06
E. Technology Education Learning By Design, Burghardt, David and Hacker, Michael. Prentice Hall,
ISBN 0-13-036353-7
F. Sketch Up Google Model Your World, http://sketchup.google.com/ , 10/14/06

Bibliography:

A. Glencoe Mathematics Applications and Concepts Course, McGraw-Hill, New York
ISBN 0-07-860139-8
B. Glencoe Practice Worksheets from the Glencoe Mathematics Applications Series
C. Core Knowledge Sequence Content Guidelines for Grades K-8. 1999, Core Knowledge Foundation
ISBN 1-890517-20-8, Page 172-173
D. Mathematics Applications and Concepts: Course 3.
http://www.glencoe.com/sec/math/msmath/mac04/course3/webquest/unit3.php/ ,10/10/06
E. Technology Education Learning By Design, Burghardt, David and Hacker, Michael. Prentice Hall,
ISBN 0-13-036353-7
F. Sketch Up Google Model Your World. http://sketchup.google.com/ ,10/14/06

Differentiation:

Partnering students who are struggling to do the work independently with others who are not struggling may be a useful strategy.
Enlisting the help of parents who work in design fields to come to specific classes during this unit would be helpful. They can circulate along with you and give more students attention, and allow you to target students who need extra teaching or support.

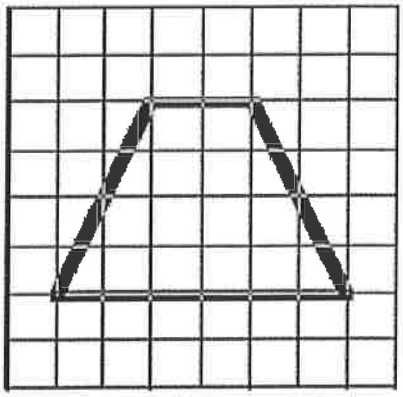
Technology Integrations:

Smart lessons could be prepared from these plans (illustrating how to complete the forms, worksheets, and find info online), if the Smart Board technology is available.

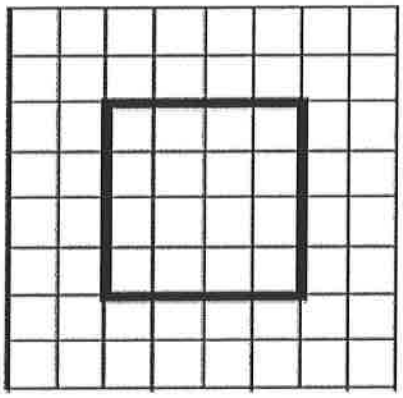
Appendix A: Raise the Roof
Area/Perimeter

Directions: Calculate area and perimeter for each of the following geometric figures. Show all work

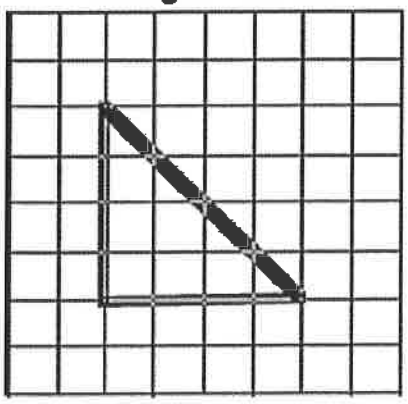
Trapezoid: $A = 1/2 (b_1 + b_2)h$



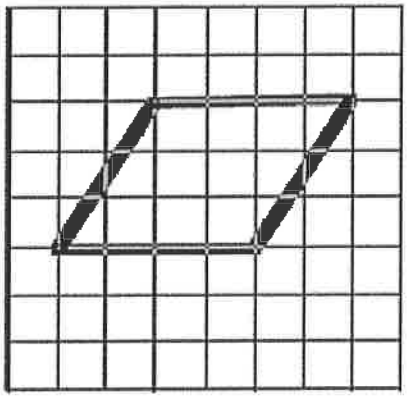
Square: A = l x w



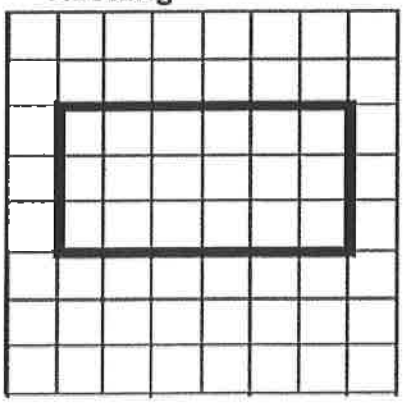
Triangle: 1/2 bh



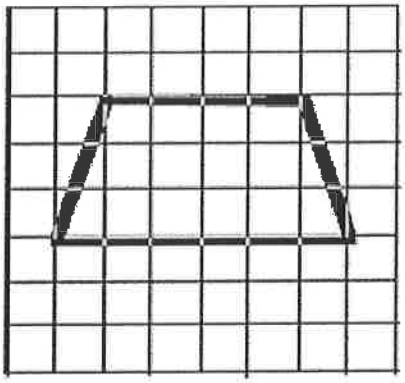
Parallelogram: A = bh

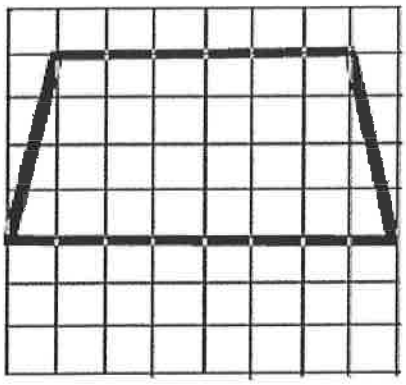


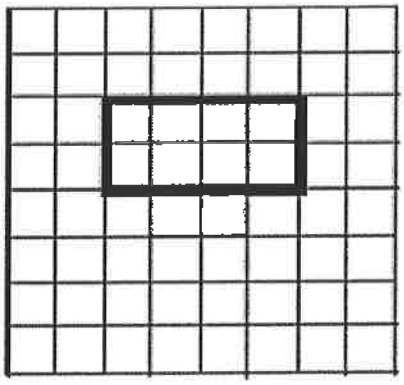
Rectangle: A = l x w

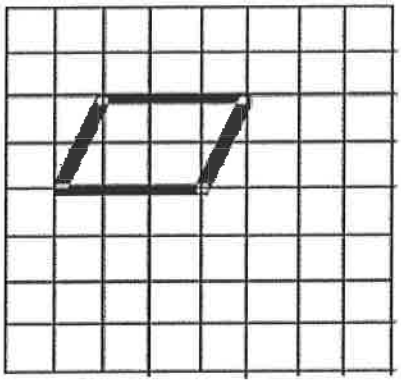


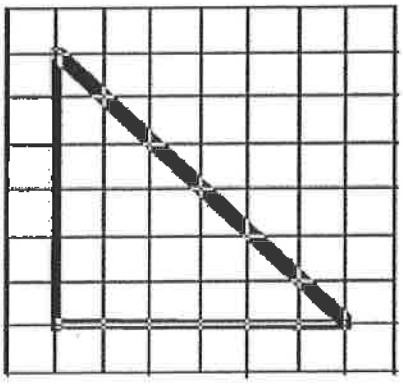
Appendix A: Raise the Roof
Area/Perimeter











Appendix B: Raise the Roof
Drawing Rubric

You will use grid paper to make a scale drawing of your house. The drawing must have a scale of 1 square = 5 ft. You must stay within the given total square footage for the house and the square footage of each room must be listed. There must be a kitchen and at least one bathroom. You must use a ruler to ensure the precision and accuracy of your drawing.

Grading Rubric:

A	90-100	- Drawing is accurate and each measurement matches the scale provided. - Square footage is provided for each area. - Drawing is neat, with all lines (measured with a ruler). - Rooms/Areas are labeled. - At least one bathroom. - Scale is included. - Total square footage is provided and is accurate.
B	80-89	-Drawing is fairly accurate and measurements match scale -Square footage is provided for most areas -Drawing is neat -Most Rooms/Areas are labeled -At least one bathroom -Scale is included -Total square footage is provided and is close to accurate
C	70-79	-Drawing is accurate and some measurements match scale -Square footage is provided for a few areas -Drawing has obvious flaws. -Many Rooms/Areas not labeled. -At least one bathroom. -Scale is included. -Total square footage is provided but not accurate.
D	60-69	-Drawing lacks accuracy. -Square footage is not provided for any areas. -Drawing has obvious flaws, not measured. -Rooms not labeled. -One bathroom. -Scale included, but wrong. -Square footage isn't provided.
F		-Not turned in.

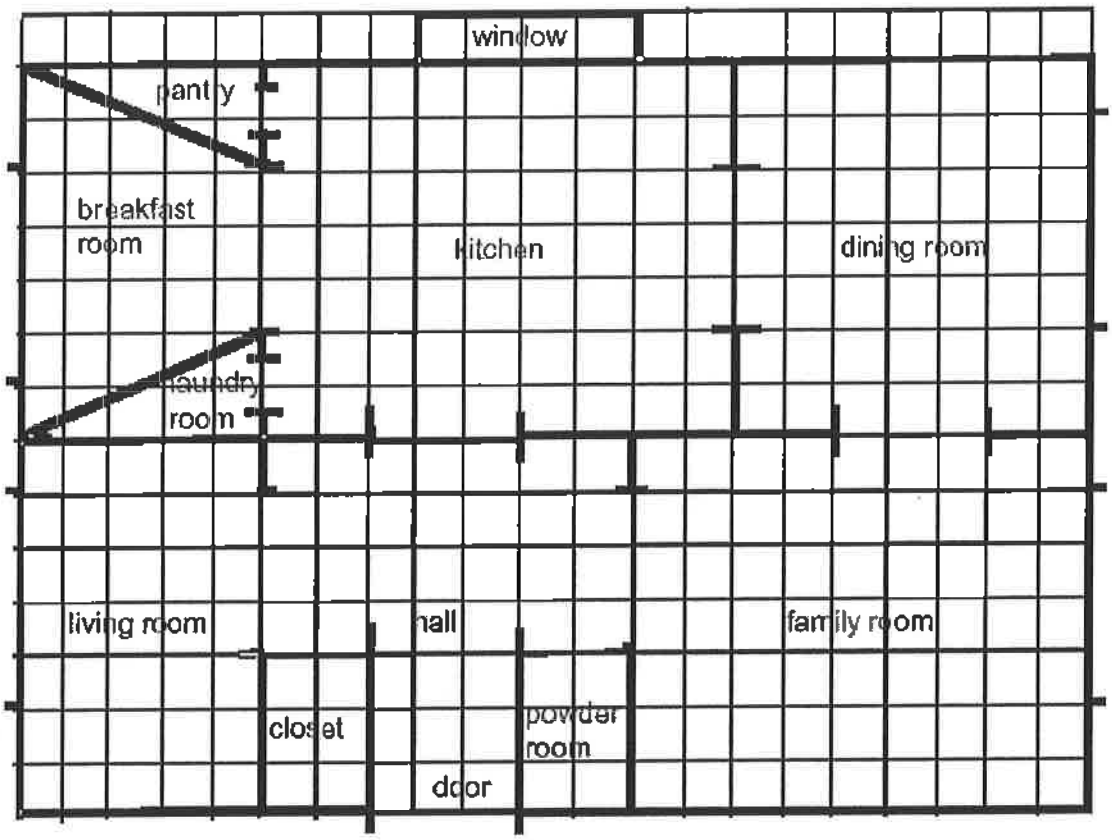
Appendix B: Raise the Roof
Construction Rubric

Once your final drawing has been approved you will use foam core board to construct your house. You must follow your drawing. When you are building you must be neat, precise and accurate when making your cuts and gluing the joints together. Do not allow excessive amounts of glue to extend beyond the joints or to get on the surface of the structure. *Drawing must be turned in with completed project for grading.*

Grading Rubric:

A	90-100	- The structure is nearly identical to the drawing. - The structure was constructed with precision and accuracy. - The structure is neat no excessive glue beyond the joints or on the structure itself.
B	80-89	- The structure is close to the original design with some minor changes. - Construction is good but there are flaws in the precision and accuracy. - The structure has some glue on the surface areas but the construction is neat.
C	70-79	- Major adjustments were made but the drawing was not modified. - Construction is somewhat uniform but not precise. - The structure has glue on the surface areas and is somewhat neat.
D	60-69	- Did not follow drawing at all. - Construction is sloppy and inaccurate. - There is an excessive amount of glue extending beyond the joints and glue everywhere on the surface of the structure.
F		-Not turned in.

Appendix C: Raise the Roof
Sample Floor Plan Worksheet



Budget- $5,000

Tile

Room size	Kind of Tile	Price $2/sq.ft.

Carpet

Room Size	Carpet Style	Price $3/sq.ft.

Wallpaper

Wall sizes	# of Rolls	Price $7/roll

1 roll covers 55 sq. ft.

Paint

Wall size	# of Cans	Price $20/can

1 can covers 400 sq. ft.

Appendix D: Raise the Roof
Budget

Budget: $8,000

Tile

Room & Size	Kind of Tile	Price per square foot	Sq. ft. x Price

Carpet

Room & Size	Kind of Tile	Price per square foot	Sq. ft. x Price

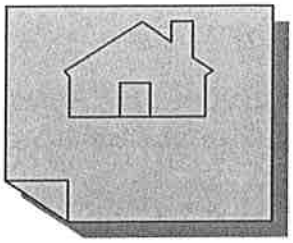
Wallpaper: (1 roll covers 55 sq. ft.)

Room & Size	Kind of Tile	Price per square foot	Sq. ft. x Price

Paint: (1 can covers 400 sq. ft.)

Room & Size	Kind of Tile	Price per square foot	Sq. ft. x Price

Appendix E: Raise the Roof
Analysis Worksheet



Raise the Roof Analysis

1. What did you learn from completing the dream house project?

2. Describe your favorite part(s) of your dream house.

3. If you were the teacher, what would you change about the project? Explain:

4. Name several examples of scale drawings you might see in everyday life?

Appendix F: Raise the Roof
Safety Guidelines

General Safety Guidelines

- Always conduct yourself in a responsible manner.
- Follow all written and verb and instructions carefully. If you do not understand something, ask the instructor before proceeding.
- Never work alone. No student may work in the classroom without an instructor present.
- When first entering the classroom do not touch any equipment or materials until you are instructed to do so.
- Be prepared for your classroom. Read procedures thoroughly before entering the classroom.
- Never fool around in the classroom. Practical jokes and pranks are dangerous and prohibited.
- Clean up after yourself. Work area should be kept clean and tidy at all times.
- All materials not needed for The classroom should be kept in the classroom area.
- Be alert and proceed with caution at all times in the classroom. Notify the instructor immediately of any unsafe conditions you observe.
- You will be assigned a classroom station at which to work. Do not wander around the room, distract other student, or interfere with the classroom experiments of others.
- When using knives and other sharp instruments, always carry with tips and points pointing down and away.
- Always cut away from your body.
- Never try to catch falling sharp instrument.
- Grasp sharp instruments only by the handles.
- Never hold an object while someone else is cutting the object.
- Always wear safety glass to protect your eyes.

Accidents and Injuries

- Report any accident (spill, breakage, etc) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.
- If you or your lab partner is hurt, immediately get the attention of the instructor.