

Make a Splash in Backyard Design!

WebQuest Description: In this WebQuest, students will design a backyard with an inground pool and a fence. They apply knowledge about perimeter, area, and volume. Students also practice unit conversions, drawing blueprints, working in a group, and making a presentation.

Grade Level: 6-8

Curriculum: Life Skills / Careers

Keywords: Geometry, Math, Middle School, Junior High, Perimeter, Area, Volume, Pool, Fence, Backyard, Design, PowerPoint

Published On: 2009-05-28 11:19:58

Last Modified: 2009-06-24 12:37:26

WebQuest URL: <http://zunal.com/webquest.php?w=30280>

Introduction

The Smith Family wants to hire you! You are the owners of Make a Splash Pool and Fencing Company and they would like to have a pool designed for their backyard. The Smiths are excited to hear your ideas about how their new pool and fence should look so they can begin construction.

Tasks

The Smiths have hired your company to design their new pool! In their city, you must also put up a fence around a pool. Unfortunately, they aren't sure what they want their new backyard to look like, so they want to hear your ideas! By the end of the week, your company needs to create a PowerPoint presentation for the Smith Family that includes:

1. A colorful blueprint of the new backyard
2. How many gallons of water the pool holds
3. Type and cost of fence
4. Dimensions of the pool with a cost estimate

Be creative! Include pictures and make the presentation look professional. Good luck!

Process

In order to complete the design, you will be assigned to groups of three students. Once you are in your groups, you will need to quickly choose jobs. This task requires a Project Manager, a Finance Manager, and a Landscape Architect. The Project Manager's job is to make sure that all the information required for the presentation is complete. The Finance Manager is responsible for verifying all of the costs that will be presented to the customer and checking all numbers. The Landscape Architect will be responsible making sure all elements are in the blueprint/sketch. All group members will contribute to design and calculations! Before you begin, print out the Process Worksheet found in the links at the bottom of this page. Fill this worksheet out as you go through the process and show all of your work.

1. Before you can begin designing the backyard, you must find out exactly how big it is. Unfortunately, the Smith's home is several hours away so you have not been able to visit the site to take measurements. The customer gave you the following information:
The backyard they would like fenced is exactly $\frac{1}{3}$ of an acre. The property extends 100 feet from the back of the house. See the Homeowner's Sketch link at the bottom of this page for the drawing they sent with the measurements. As you can see, they sent the width of the yard but not the length. In order to calculate the length, you need to know how many square feet are in $\frac{1}{3}$ of an acre. Follow this link to find out:
Square Feet to Acre
2. To review finding the area and perimeter of a rectangle, go to the following sites. Each member of your group should read the fact sheet and take the quiz in each link:
Area of Rectangle
Perimeter of Rectangle
Now that you are experts on Area and Perimeter, find the missing length and calculate the perimeter of the backyard.
3. Next, you need to decide what type of fence you would like to suggest for the Smith Family how much they will need to purchase. Make sure that you do not quote fence for the entire perimeter of the backyard - the section where the house sits does not need fencing. You can find different types of fencing and prices at the following links:
Your Fence Store
Lowe's
At the Lowe's site, use the zip code 63010 to see prices.
4. Now that you know exactly how much area you have, you need to decide how big to make the pool. You may choose any length, width, and depths. The Smith's want an inground, rectangular pool with both a shallow and a deep end. To find how much water the pool will hold, you need to practice finding the volume of prisms. Go to these sites to become experts at finding volume:
Volume of Rectangles
Volume of Prisms
There must be a slope between the shallow and deep sections of the pool. If you still aren't sure how to find the volume of the pool your group has designed, see the Pool Cross Section attachment below for a hint. There must be a slope between the shallow and deep ends.
5. Now that you know the volume of the pool in cubic feet, you need to find out how many gallons of water it will hold. Go to this site to find out:
Converting Cubic Feet to Gallons
6. Now you can complete your estimate and sketch for the Smith Family. At the cost estimator site, enter the dimensions of your pool. the decking is the area around the pool that will be concrete. The estimator will prompt you if your decking is too small. Make a list for the Smiths showing all of the options that you have included in their estimate. Go to this site and decide what extras you should include in your presentation:
Pool Cost Estimator
7. You have all of the information that you need to put your presentation together! Each group member should contribute to the presentation. It must include a detailed blueprint (on a poster, or incorporated into your PowerPoint presentation), the dimensions of the pool, how many gallons of water the pool will hold, the type and cost of fencing, and an estimate slide showing all of the options. Remember, this presentation will sell your idea to the customer, so be creative and make it exciting!
8. After your presentation, turn in your Process Worksheet and email your presentation to the teacher.

Evaluation

Category and Score	90 - 100%	80 - 89%	70 - 79%	69% or below	Score
Accuracy	90% or more of computations are accurate. All work is shown.	80 - 89% or computations are accurate. Most work is shown.	70 - 79% of computations are accurate. Most work is shown.	69% or less of computations are accurate. Work is not shown.	/100
Completion	Every item on the process sheet is completed and all work is shown.	Team is missing 1 item from the process sheet.	Team is missing 2 items from the process sheet.	Team is missing 3 or more items from the process sheet.	/100
Blueprint	Blueprint is neat, detailed, and easy to understand. It shows the pool, fence, and home.	Blueprint is fairly easy to understand. It is missing one element.	Blueprint is unclear and is missing one element.	Blueprint is difficult to understand and is missing two or more elements.	/100
Presentation and Teamwork	All group members contributed. Presentation included all required elements.	2-3 group members contributed. Presentation included all except one required element.	1-2 group members contributed. Presentation was missing 2 required elements.	Only one group member contributed to presentation. More than 2 required elements were missing.	/100
				Total Score	/400

Conclusion

Congratulations! You have successfully designed a new backyard pool for the Smith Family! Along the way, you have become experts on perimeter, area, volume of prisms, and unit conversions. You now have the tools to help your family with landscaping projects or even design your own backyard pool and fence! If you think your skills are good enough, you can try this WebQuest to design a house!

Teacher Page

Focus: This WebQuest focuses on area and perimeter of rectangles, volume of prisms (rectangular and triangular), and unit conversions. Students will practice problem solving skills to apply these concepts to a real-world problem.

Time and Resources Required: This unit should take 4-5 class periods. Students should be assigned groups prior to the first class period. Each group must have access to a computer with PowerPoint, and a printer. A projector will be required for the PowerPoint presentations. They may need graph paper and/or a poster board for the blueprint. Colored pencils, markers, and rulers are also necessary for groups who choose to make a poster rather than incorporate their blueprint into the PowerPoint.

Show-Me Standards addressed:

Math Knowledge: 1. addition, subtraction, multiplication and division; other number sense, including numeration and estimation; and the application of these operations and concepts in the workplace and other situations 2. geometric and spatial sense involving measurement (including length, area, volume), trigonometry, and similarity and transformations of shapes 4. patterns and relationships within and among functions and algebraic, geometric and trigonometric concepts 5. mathematical systems (including real numbers, whole numbers, integers, fractions), geometry, and number theory (including primes, factors, multiples)

Performance Goals: 1, 2, & 3 Students in Missouri public schools will acquire the knowledge and skills to gather, analyze and apply information and ideas.

1. Students will demonstrate within and integrate across all content areas the ability to

- develop questions and ideas to initiate and refine research
- conduct research to answer questions and evaluate information and ideas
- use technological tools and other resources to locate, select and organize information
- organize data, information and ideas into useful forms (including charts, graphs, outlines) for analysis or presentation
- apply acquired information, ideas and skills to different contexts as students, workers, citizens and consumers

2. Students will demonstrate within and integrate across all content areas the ability to

- plan and make written, oral and visual presentations for a variety of purposes and audiences
- review and revise communications to improve accuracy and clarity
- exchange information, questions and ideas while recognizing the perspectives of others
- apply communication techniques to the job search and to the workplace
- use technological tools to exchange information and ideas

3. Students will demonstrate within and integrate across all content areas the ability to

- identify problems and define their scope and elements
- develop and apply strategies based on ways others have prevented or solved problems
- develop and apply strategies based on one's own experience in preventing or solving problems
- evaluate the processes used in recognizing and solving problems
- reason inductively from a set of specific facts and deductively from general premises
- assess costs, benefits and other consequences of proposed solutions

Technology Standards addressed (see Student Standards): Creativity and Innovation Communication and collaboration Research and Information Fluency Critical thinking, problem solving, and decision making Technology Operations and Concepts Photo Credits: Flickr

Standards

Credits

Other

