



Why?

Why aren't manhole covers square?

Figure This! Why are manhole covers round?

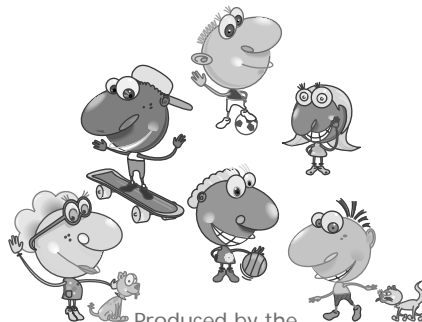
Hint: Investigate different shaped covers to see if they can fall through their corresponding holes.

The shapes of many objects relate directly to their uses. Tools are designed with shapes that are easy to hold, furniture is designed with shapes that are comfortable, and race cars are designed to reduce wind resistance.



Answer: Square manhole covers can be tipped diagonally and fall through the hole.

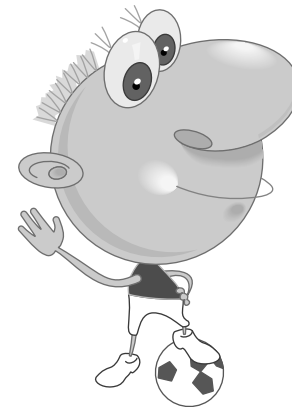
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FigureThis!
Math Challenges for Families



How come the math
my child brings home
doesn't look like the
math I remember?

If you don't recognize the math in your child's homework, think about how the world has changed since you were in school. The math looks different because the world is different.

Advances in science, technology, information processing and communication, combined with the changing workplace, make it necessary for all students to learn more math.



The basics are changing. Arithmetic skills, although important, are no longer enough.

To succeed in tomorrow's world, students must understand algebra, geometry, statistics, and probability. Business and industry demand workers who can—

- solve real world problems,
- explain their thinking to others,
- identify and analyze trends from data, and
- use modern technology.



The mathematics students do in middle school should prepare them for the new basic skills necessary for their futures.

Instead of worksheets, your child may bring home problems to investigate that are related to real life—investigating salaries, life expectancy, and fair decisions, for example.

Giving students opportunities to learn real math maximizes their future options.

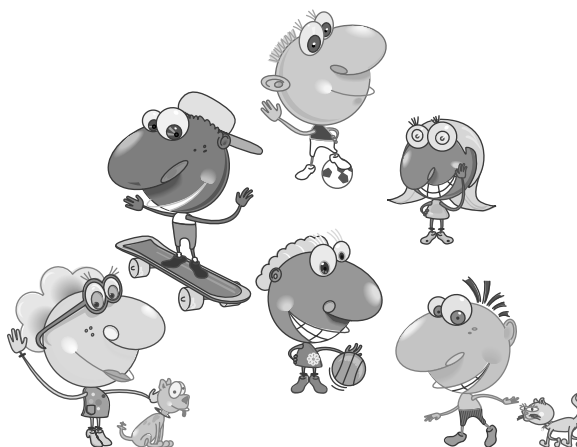
Check with your school to make sure the math your child is learning today is the math they need for tomorrow's world. After all, the future is closer than it may appear.

You might want to ask ...

The teacher, counselor, or both about tutoring, support, and enrichment for math:

- When and how will I know if my child's having trouble? What should I do then?
- Is there any tutoring available before, during, or after school? On weekends?
- Do you offer help on a one-to-one basis or in a group setting? When?
- Is peer-tutoring available? If so, how does it work?
- Can you recommend any tutors outside of school?
- Where can we find more problems to use for practice?
- Are there resources listed in the text-book or anywhere else that would help?
- Is there a Homework Hotline we can use?
- Do you know any math Web sites we can visit?
- Does our school offer programs for catching-up or enrichment?
- Does our school participate in any math competitions or contests?
- Do nearby colleges or universities offer any enrichment programs?

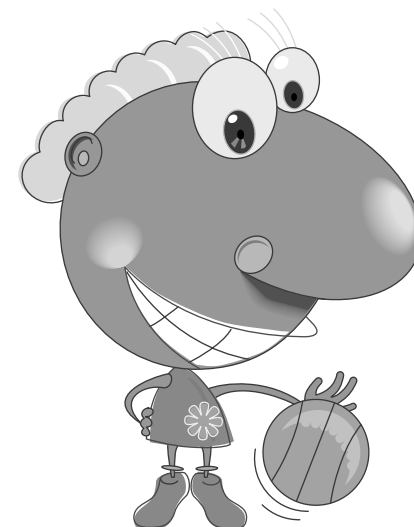
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**How can I work with
the school to make
sure my child gets the
most out of math?**

Just like your child, schools need your support—especially in the middle school years. Since choices made in middle school determine high school courses that either increase or limit future education and career opportunities, your participation is critical.

Two people you should get to know are your child's math teacher and the school counselor. Working with you and your child, they can help you decide the math your child will take in the future. Talk with them often. Let them know that you want to participate in making decisions.

How do you begin? Ask questions. After all, you have a right to know.

Find out if your child is getting the same opportunities in math as everyone else. Ask if a plan is already in place for your child's future math classes. If so, ask to see it. State that you have high expectations. Make it clear that you want your child to take challenging math classes each year through high school.

You'll find that teachers and counselors will be happy to answer your questions. After all, you're in this together.

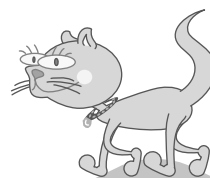
You might want to ask...

The teacher about the class:

- What math will be taught in this class?
- What textbook and other materials will you use this year?
- Will my child need a calculator, ruler, compass, or any other tools?
- How much homework can we expect?
- Is it okay if my child works with other students on homework?
- How should my child make up work after an absence?
- How do you determine grades?
- What graded work will be sent home?
- How often and when will you send home a formal report about my child?
- How do I schedule a parent-teacher conference?
- What, if any, standardized tests in math will my child take this year?
- What can I do to help you?

The teacher, counselor, or both about the math program:

- What math classes are available?
- Do all students take the same math classes? If not, how are students placed in different classes?
- What's the next math class my child will take?
- Will the class prepare my child to take challenging math each year in high school?
- What math classes are offered in high school?
- What math classes will my child be ready to take in high school?
- How many students are in each math class?
- When are schedules made for the next year? How are families involved?
- What technology is available for students in math classes?
- What is the background and experience of the math teachers at our school?
- Does our school have a math club?



Respect the way your child learns

Don't start "twenty questions" the minute your kid walks in the door. Think how you feel when you first get home. Just like you, he probably needs to take a break.

Recognize that she has her own work habits, and they're probably different from yours. You can give her a tidy desk in a quiet setting, but she may prefer her headphones and an unmade bed.

For my child, doing well in math means doing his very best, not necessarily getting an "A." I love to see his excitement when he cracks a problem and knows it's right.

You've got to be ready when they are. Most teenagers won't set a time to do math. So relax. Help them on their terms, not yours.

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**What can I do to help
my child get the most
out of math?**

Helping your child succeed in math is not much different from helping your child with anything else. Here's what parents and other family members say about helping their children with math.

Be positive about math

My daughter is growing up with a "can do" attitude towards math. Her skills are more advanced than mine, and I let her know I'm proud of her.

Maybe you weren't good at math, but your kid doesn't have to know that. Have a good attitude and he will, too.

I enjoy sitting down with my teenager and struggling through a problem together. Sometimes it's hard work, but every chance I get, I tell her how important it is.

When I was young, I thought only nerds could do math. Man, was I wrong. Now I realize that anyone can do math, and everyone needs it. It's where the jobs are.

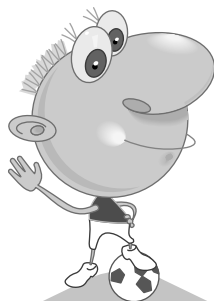
Communicate with your child

It may be only a few minutes a day, but I'll sit down with my grandson and ask him what math he's working on. Sometimes by explaining it to me, it becomes clearer to him.

I've learned to listen more than I talk. Listening to my niece talk about her math problems is a challenge, but it's another way to show I care.

I try to work math into our everyday conversation at home. Since I work in industry, I know how important it is for kids to know math in today's world.

From talking with my daughter, I've begun to see math in an entirely new way. She likes taking the lead, and I'm sure that teaching me helps reinforce what she's learned.



Have high expectations

My kid's teacher says "more math, more opportunity." She's telling us to push to get our children into the challenging math courses they need.

My daughter's only in the sixth grade now, but I've already talked with her counselor. We're going to plan her schedule so she can take math every year through high school.

I quit taking math after algebra. What a mistake! I'll urge my stepson to take all the math he can get.

I guess I'm pretty tough. From day one, I tell my son that not passing math is not an option. But I also let him know I'm there for him every step of the way.





Oh! mirror, mirror

**"Mirror, mirror, what do I see?
Does backing up show more of me?"**

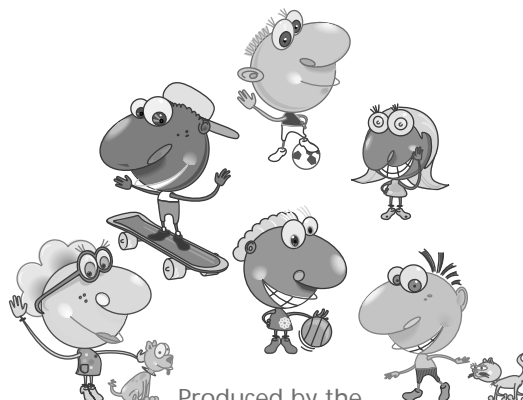
Figure This! How much of yourself
do you see in a small mirror?

Hint: Begin by measuring the height of the mirror and
the amount of yourself that you can see.

Looking in mirrors involves angles, reflections, lines
of sight, and triangles. Understanding how these are
related is important in the design of sound stages,
theaters, and security systems. Such knowledge can
also come in handy when playing billiards, racquet-
ball, tennis, and some
video games.



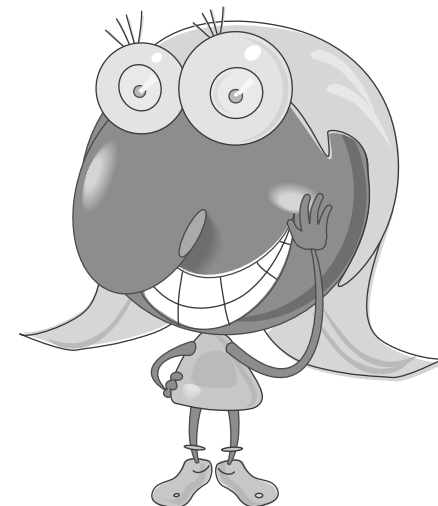
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**Math homework
due tomorrow.
How can I help?**

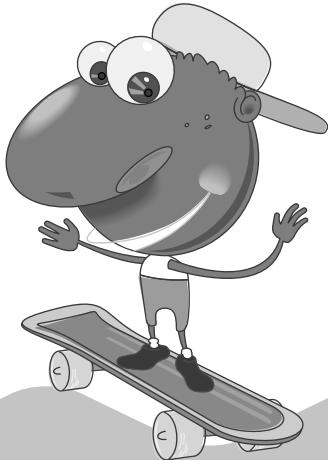
Answer: When you look in the mirror and then back up, you see
exactly the same amount of yourself.

We know the importance of giving our children chances to connect with us. You should feel good if your child comes to you for help with math homework.

If you're unsure about math, don't panic. There are still ways to help. Just keep reading.

If you're good at math, don't take over. You'll help most as a guide.

No matter what your own experiences are with math, there are questions you can ask that will help your child.



Although this isn't a script, you might try these comments. The responses you get can help you and your child tackle the challenges of math homework.

- What is the problem you're working on?
- Let's look at it.
- What do the directions say?
- What words or directions don't you understand?
- Where do you think you should begin?
- What do you already know that can help you work through the problem?
- Show me what you've done so far.
- Where can we find help in your textbook or notes?
- Are there similar problems to look at?
- Let's try drawing a picture or making a diagram.
- What did the teacher ask you to do?
- What problems like this one have you had before?
- Tell me where you're stuck.
- Who can you call to get help?
- Let's try it using a calculator.
- Let's skip this problem and go on to another.
- What is the number for the Homework Hotline?
- Why don't we look for some help on the Internet?
- What type of partial work does your teacher accept?
- Can you go in before or after school for help from your teacher?
- Should we tackle this another time?

Holes by Louis Sachar
Frances Foster Books, New York, 1998

"Instead of twenty-six letters. There are really fifty-two."

Stanley looked at him surprised. "I guess that's right. How'd you figure that out?" he asked.

Zero said nothing.

"Did you add?"

Zero said nothing.

"Did you multiply?"

"That's just how many there are."

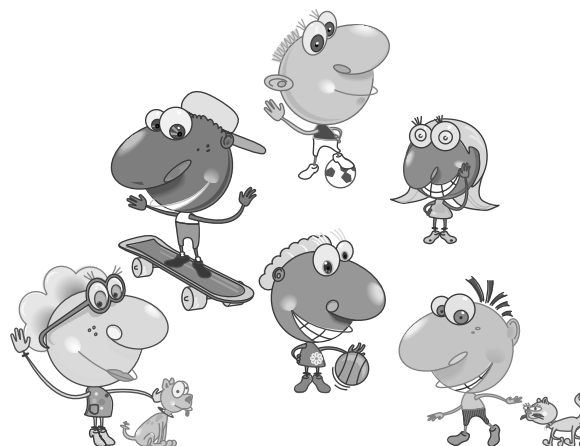
"It's good math," said Stanley.

"I'm not stupid," Zero said. "I know everybody thinks I am. I just don't like answering their questions."

Questions:

- How many letters of the English alphabet are there?
- Why did Zero say there are 52?
- What type of reasoning is being used?

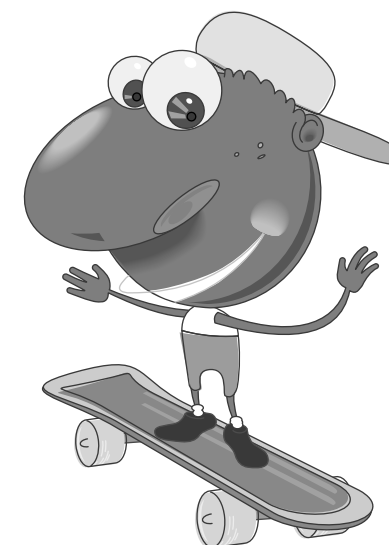
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**Our family likes to read.
 Are there any good
 books that make math
 part of the story?**

Find math where you least expect it—in your child's books and reading materials.

Math turns up in the most unexpected places! You'll find it somewhere between the covers of almost any book—novels, mysteries, biographies, legends, and adventures.

For ideas on how you and your child might talk about the math you discover in books you read, look over the selections in this brochure and the questions that follow below them. But they're only starters.

You'll soon start finding the math in everything you read. Talking about it is one more way to bring your family together. Enjoy!



Doing mathematics as you read literature is a real possibility if you choose the right books. The following passages from contemporary literature, and the accompanying questions, can give you some ideas on how to mix math and your reading.

***The Phantom Tollbooth* by Norton Jester Bullseye Books, New York, 1961**

"Oh, we're just the average family," he said thoughtfully; "mother, father, and 2.58 children—and, as I explained, I'm the .58."

"It must be rather odd being only part of a person," Milo remarked.

"Not at all," said the child. "Every average family has 2.58 children, so I always have someone to play with. Besides, each family also has an average of 1.3 automobiles, and since I'm the only one who can drive three tenths of a car, I get to use it all the time."

Questions:

- What are averages? When are they useful? Are they "real" numbers?
- Every middle school child should be able to discuss averages. What does average mean to you?

***Hatchet* by Gary Paulsen Penguin Books, New York, 1987**

[Brian] looked at the dashboard of the plane, studied the dials and hoped to get some help, hoped to find a compass, but it was all so confusing, a jumble of numbers and lights.

He tried to figure out the dials.... He thought he might know which was speed—it was a lighted number that read 160—but he didn't know if that was actual miles an hour, or kilometers, or if it just meant how fast the plane was moving through the air and not over the ground.

When the pilot had jerked he had moved the plane, but Brian could not remember how much or if it had come back to its original course. Since he did not know the original course anyway and could only guess at which display might be the compass—the one reading 342—he did not know where he had been or where he was going....

Questions:

- How are 160 miles an hour and 160 kilometers an hour different?
- What markings are on a compass? Can a compass have a reading of 342°?