Ten everyday math activities for parents and kids

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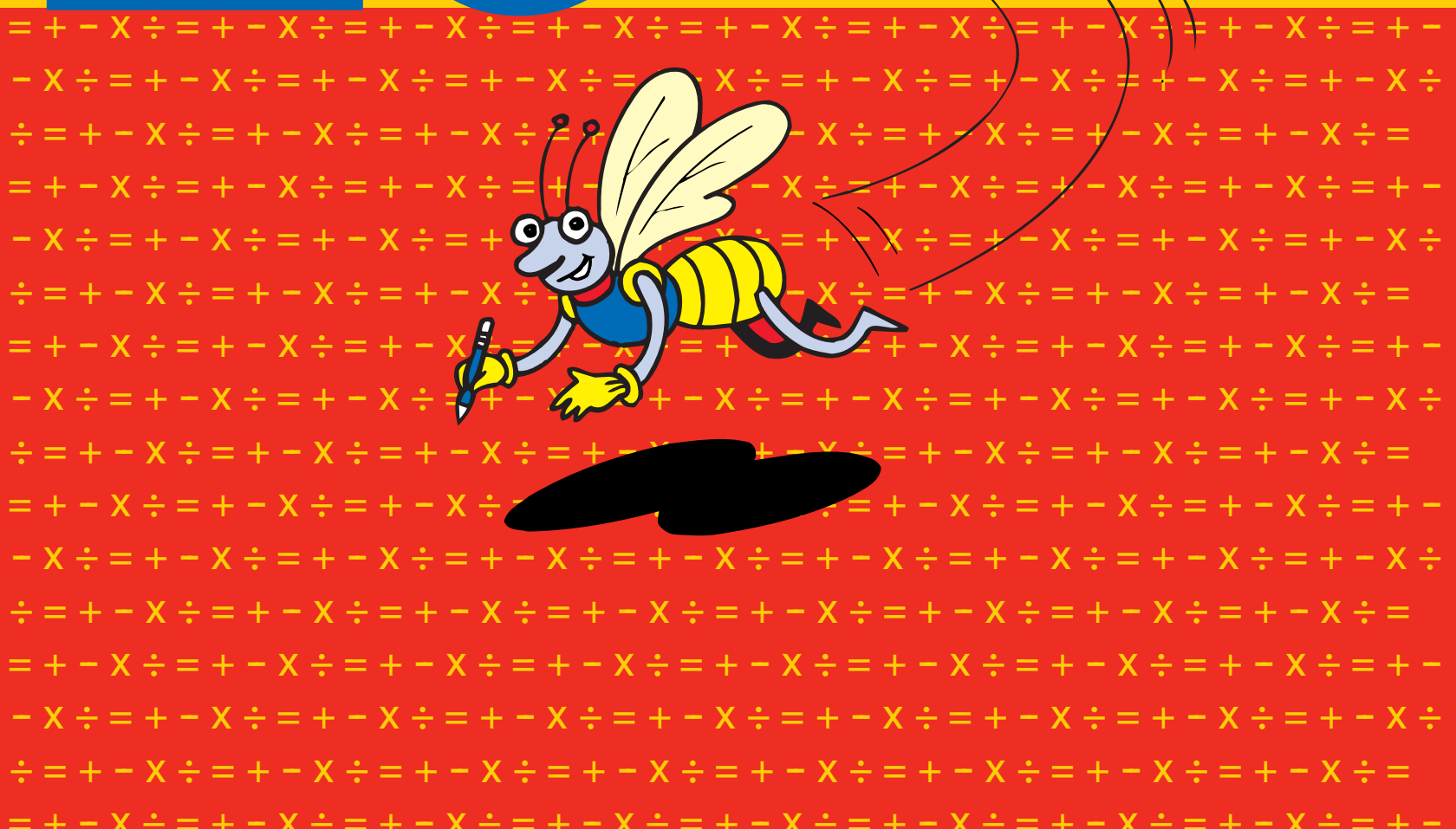

At Home with Math was developed by Marlene Kliman, Jan Mokros, and Alana Parkes at TERC, Inc., Cambridge, Massachusetts, in collaboration with Ceridian Corporation.

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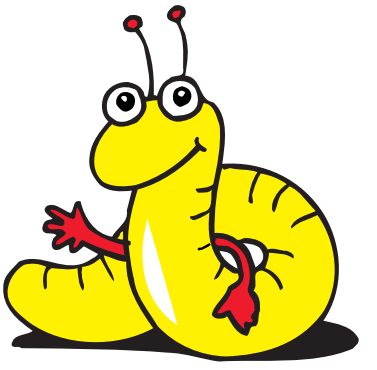


Everyday math activities

A word to parents

As parents, we use math all the time—as we shop, figure out how much time to allot for errands, and schedule time for cooking, eating, and cleaning. Often, our children are with us during these tasks. Perhaps they are even helping out. Why not involve them in the math?

The ten everyday math activities in this kit build math into the things most families already do—ordinary routines such as figuring out ways to save money, to share fairly, or to get somewhere on time. With these activities, children practice adding, subtracting, multiplying, dividing, and using other important math skills while doing tasks that are a regular part of life.

As you look through the activities, think about which ones you'd like to try with your children. Choose those that fit best with the way you manage your household and family routines. Think also about what your children like to do. If they hate cleaning their rooms, you might put off the activity that involves room cleaning. Then again, if you need that room cleaned up fast, this might be an excellent place to start!

Each activity is suitable for children of various ages. Parents often need to deal with two or more children at once, and these versatile math activities can be adjusted to challenge older children as well as meet the needs of younger ones. The variations at the end of each activity suggest ways you might adapt the ideas to fit your family. Once you start, you'll find yourself making your own adjustments automatically.

Making these activities work for you

Each family's use of these activities and games will differ. As you begin to work them into your life, you will draw upon your own knowledge of your children, relying on familiar techniques for handling family situations. While you experiment to find what works for you, keep in mind the following general principles:

- Try to find one time each day when you can do a little math with your child—maybe during chores, while driving in the car or riding the bus, at bed time or bath time, or at the laundromat. The activities take only a few minutes, and you can repeat them on many occasions.

- Use your judgment in choosing things to do from the books. Most of the activities and games can be done in any order. Read them through before deciding what you would like to try first.

- Let your children lead the way. Honor their interests and their attention spans, and always stop before boredom or frustration set in. The goal is to spark your children's interest in math and keep the flame going.

- Beyond these activities and games, let your children see and hear you doing math throughout the day. If you clip coupons, talk about what you are using them for and how much you hope to save. As you look forward to a special event, count aloud the remaining days on the calendar. By giving your children examples of how you use math, you'll be conveying the message that math is important and useful in daily life.

A final word

Children need lots of practice in order to become strong mathematical thinkers. The ideas in this booklet offer many good starting points. We hope you'll make math a regular part of your life. The more you do, the more your children will grow to enjoy math.

1

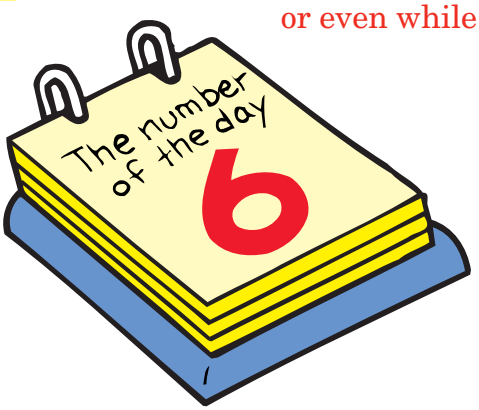
Number of the day

Materials

Paper and pencil (optional)

"The number of the day was 6. Sarita made 1 + 2 + 3. I did 24 ÷ 4. Dad's was 20 – 15 + 1, and Grandma said 4 x 25 – 80 – 14. She had to explain that one!"

You can use this activity to give your children lots of computation practice. Try it just about anywhere—on the bus, in the kitchen, or even while folding laundry.



Before you begin

Choose a number that you will call the "number of the day." The first time you do this activity, choose a number under 15.

1. Find one way to make the number of the day

Ask your children to think up different ways to make the number of the day, using equations.

"Let's all try to come up with different ways to make 11. Here's one way: 8 + 2 + 1 = 11. Can you find a different way?"

2. Collect everyone's equations

- If your children know how to write equations, they list their ideas and take turns reading them.
- When you're in the car, or if younger children need help, appoint one person "record keeper." As people give their ideas, the record keeper writes them down in equation form.
- When everyone's hands are busy making dinner, folding laundry, or pulling weeds, just take turns telling each other how you made the number—no writing is needed.

3. Find more ways to make the number

See how many different ways everyone can find to make the number of the day. You can offer specific challenges to give children practice with something they're doing in school, or just for variety.

For ages 5–7, try using ...

Addition with three numbers
1 + 3 + 7 = 11
Subtraction
13 - 2 = 11
Addition and subtraction
6 + 6 - 1 = 11
Coin values
2 nickels and 1 penny is 11 cents

For ages 7–9, try using ...

Pairs of the same number
2 + 2 + 3 + 3 + 1 = 11
Multiplication
4 x 5 - 9 = 11
Multiples of 5 and 10
25 + 15 - 30 + 1 = 11
The number 100
100 - (3 x 25) - 14 = 11

For ages 9–11, try using ...

A fraction or decimal

22 x .5 = 11

All four operations in one equation

(150 ÷ 10) x 3 - 40 + 6 = 11

Only one numeral

(33 - 3) ÷ 3 + (3 ÷ 3) = 11

The year you were born

1991 - 1900 - 80 = 11

Note: When an equation has parentheses, do the parts in parentheses first. To solve 100 - (3 x 25), first do 3 x 25, then subtract the result from 100.

When you repeat this activity

Family members can take turns choosing the number of the day. If you have young children, keep the number under 15. Otherwise, try a variety of numbers, including large ones (such as 312 and 50,429) and small ones (such as the day of the month, a child's age, or a fraction or decimal less than 1). Small numbers can be just as challenging as large ones.

Every now and then, ask children to explain their thinking: "How did you come up with 27 - 18 = 9? What was going through your head?" Be sure to explain your own thinking sometimes, too.

Talking about thinking is also a good way to handle mistakes. Children may notice and correct a mistake as they talk about how they arrived at the answer. If not, try to use their explanations as a basis for helping. For example, suppose a child says, "7 + 3 = 9 because 7, 8, 9—that's 3." You might respond, "Counting is a good way to do it. What's 1 more than 7? … OK, 8. What's 2 more?"

Variations

Use a starting number (ages 7–11)

Everyone's equations must start with the same number. For example, suppose the number of the day is 57 and you pick 10 as the starting number. Here are two possible equations:

10 + 40 + 7 = 57

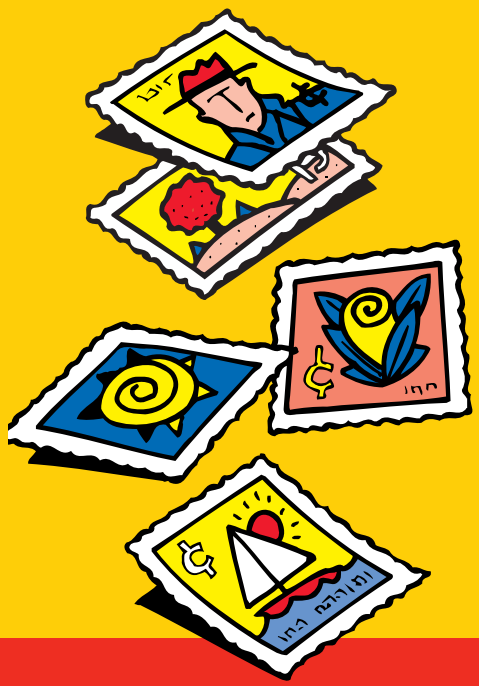
10 x 5 + 7 = 57

Stories about the number of the day (ages 5–11)

Make up story problems with the number of the day for the answer. For example, for the number 27:

"When we went for a walk yesterday, Ebony found 12 pretty stones. Bryce found 9, and I found 6. How many stones did we find in all?"

"I bought 4 books of postage stamps. Each one had 10 stamps. I used 13 stamps to mail party invitations. How many stamps did I have left?"



2

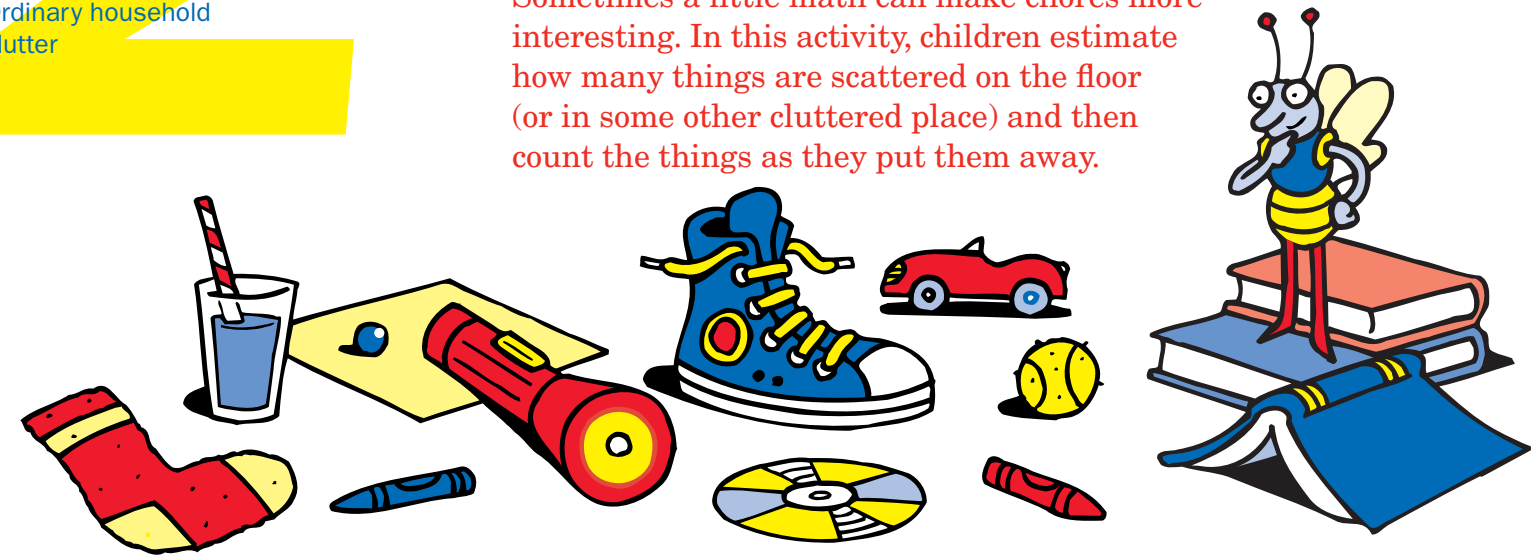
How much is on the floor?

Materials

Ordinary household clutter

"Oh, Mom! Do I really have to clean up everything?"

Sometimes a little math can make chores more interesting. In this activity, children estimate how many things are scattered on the floor (or in some other cluttered place) and then count the things as they put them away.



Before you begin

Choose something your child can count and put away, such as crayons scattered on a table or toys on the floor. When you can't be available to help your younger children count, choose an area with limited clutter so that they'll be able to do the counting themselves. (Many 5- and 6-year-olds can count only 10 to 20 items accurately, even if they can recite the "counting numbers" much higher.)

1. Estimate how many things there are to put away

Ask your child to make an estimate—or to guess the number of items to be picked up.

"About how many things are we looking at here—about 10? About 50? Closer to 100 or 1000?"

Some children's estimates will be on the high side. They might say there are a thousand or even a million things on a messy floor. Over time, as they practice counting and estimating, their ability to judge amounts will improve.

2. Count the things as they are put away

Suggest that your children count each item that they put away. If you are supervising, you can help younger ones count as the numbers get larger.

3. Compare the actual count with the estimate

Part way through cleanup, give your child a chance to revise the original estimate.

"You predicted that there were about 1000 books on the floor. So far, you put away 29, and there are just a few left. Do you still think there are about 1000? Do you want to change your prediction?"

When the chore is done, compare the actual count to the latest estimate. If the estimate was "way off," assure your child that an estimate is just a guess, and that learning to make close estimates can take a long time.

When you repeat this activity

To give children lots of practice judging amounts, try this activity in different situations: when there are small things like beads or buttons to put away, larger items like clothing or shoes, or items of all different sizes. If you've been helping young children count, see if they can do more of the counting themselves.

Variations

Would that be enough? (ages 5–9)

Decide on a particular number of things for your children to put away. Before they begin, ask them to predict whether that amount is "enough" to clear all the clutter. Vary the task for children of different ages.

For ages 5–7: Give the children a total number of items. *"Look at all these toys on the floor! If we put away 15 toys, do you think we'd get the floor clean? Or would there still be some left on the floor?"*

For ages 7–9: Specify an amount for each of several people to pick up. *"There are three of us here to unload the dishwasher. What if we each put away 14 things? Would that be enough to empty the dishwasher? Let's try it and see."*

What's the most? (ages 5–9)

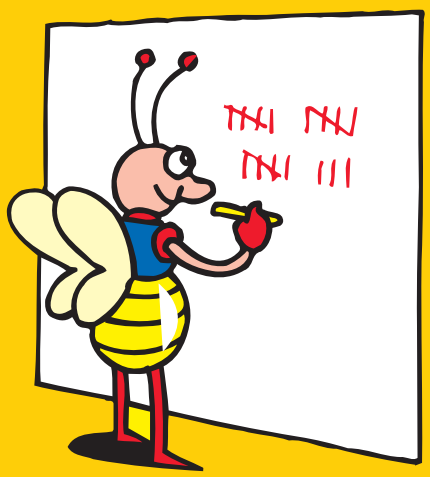
Try this when there are different kinds of things to put away—for instance, when you're sorting clean laundry that includes different kinds of clothes, or when there are different types of art supplies (markers, crayons, sheets of paper) on the table. First, make an estimate. Then count as you sort and put away.

"Let's take everything out of the clothes dryer. Do you think there are more socks, shirts, or towels in this load of laundry?"

"Who do you think has the most clothes in this load of clean laundry—you, Tony, Marco, me, or Mom? Let's sort the laundry to see!"

How many can you put away in a minute? (ages 5–9)

This works well when there are lots of little things scattered around. First, everyone estimates how much they can put away in exactly one minute (or some other amount of time). Then an older child or adult is the timer while everyone else picks up and counts. When the time is up, compare your estimates with your actual counts.



3

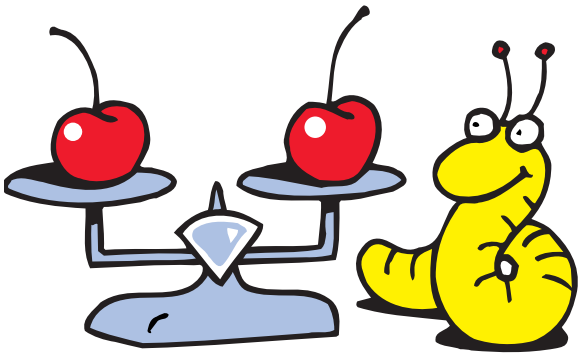
What's fair?

Materials

Between about 5 and 50 "countable" foods, like pancakes, crackers, or strawberries

"Cherries—yum! I want the exact same amount as Tulani!"

When it comes to favorite foods, everyone wants a "fair share." When your children ask you to "make it fair," ask them to figure out how to divide up the food so everyone gets the same amount. This involves using division, as well as counting, adding, subtracting, and multiplying—and sometimes even working with fractions.



1. Count to find how much food

Put the food to be shared on a plate so everyone can see it. If there are more than a few items, ask your children to make an estimate first:

"About how many cherries do you think we have? Let's count and see."

If necessary, help young children with the counting as the numbers get large.

2. Divide the total into equal parts

Remind your children of the number of items and the number of people to share them.

"So, there are 17 cherries and 3 of us. How many cherries should we give each person?"

For ages 5–7

Young children learn about division by working with actual things. Try asking them to deal out the food and count how many each person gets.

For ages 7–11

If your children need help, work with them in one of these ways.

Add up. "What if we gave everyone 2 cherries? How many would that be? … What if we gave everyone 3 cherries? … 5 cherries? How many would be left over?"

Subtract. "If everyone gets 1 cherry, how many are left? … What if everyone gets 2 cherries? … 5 cherries? Can we give out 6 cherries to everyone?"

Use multiplication or division facts. "What if there were 15 cherries, how could you divide them into 3 equal shares? What's $15 \div 3$? … Yes, everyone would get 5. That takes care of 15 of the cherries. How many are left over?"

3. Decide what to do with the extras (optional)

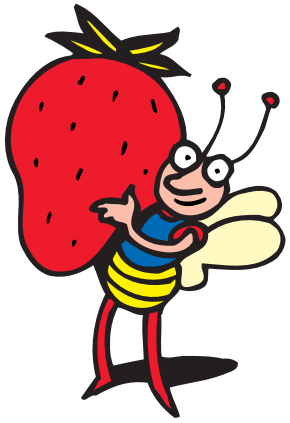
If there are any extras, discuss what to do with them: leave them for someone else? Break them into pieces and share the pieces?

If it makes sense to divide the extras into equal parts, you can do this as a way to bring up fractions. No one wants to divide that extra cherry into three equal parts, but you could easily divide other kinds of foods.

"How can we divide these two brownies up among the three of us?"

"There are seven pancakes left. How can we divide them up among the five of us?"

If your children aren't sure how to start, suggest dividing each extra item into equal parts for everyone. For example, to share two brownies among three people, cut each brownie into three equal parts, or thirds. How many of these thirds are there? How can they be shared?



Variations

Working together (ages 5–11)
If there are two or more children, you can divide up this activity so each child is doing a different part: counting the items to be shared; checking the count; figuring out how many each person gets; and then counting out the equal shares.

Equal shares for some (ages 5-11)
Sometimes, people don't want the exact same amount. A younger child might not eat quite as much, or someone might not be very hungry.

Tell your children how much one or two people get, and ask them to figure out how to share the rest fairly among everyone else.

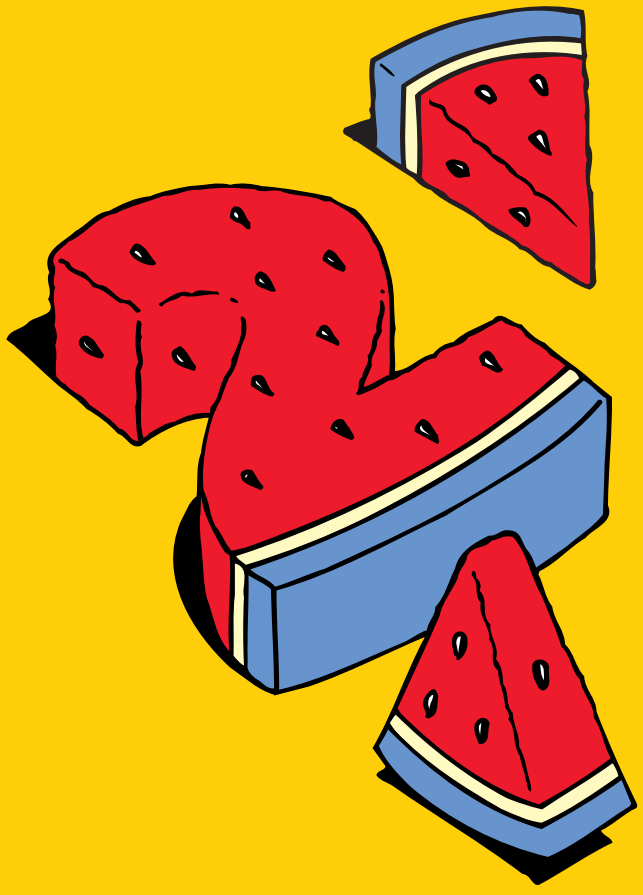
"There are 12 pancakes and 5 of us. Malia eats just one and Dad only wants two. How many will each of the rest of us get?"

Challenge older children with clues about uneven sharing.

"We have 10 crackers. Let's share them so that I get 2 less than you do. How many does each of us get?"

"There are 6 strawberries left. What if I get half as many as you do? How many will we each get?"

These problems can be difficult. Try one when there are just a small number of things to share.



4. Distribute the food

(This step won't be necessary if children dealt out the food as part of step 2.)

Ask your children to count out the actual items for each person. This is an ideal job for a young child if the numbers are small. If it's necessary, help them cut or break up the extras into equal parts. Before everyone eats, make sure there's agreement that the distribution of food is fair. If there's any disagreement, talk with them about what they think would be fair and why.

When you repeat this activity

Try different numbers of food items, and different numbers of people sharing. For more challenge, use larger amounts, and amounts that give you "extras." Encourage children to explain how they got their answers, and to check their work by finding the solution in a different way.

4

Taking turns

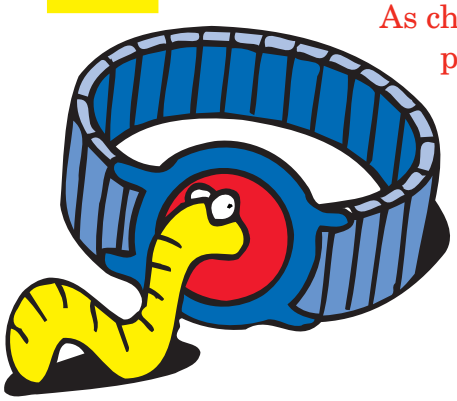
Materials

Clock or watch that displays minutes

"When will it be my turn to see that magazine? You said we could each take 10-minute turns!"

Taking turns is a big part of family life. Even if there's only one child in the family, adults sometimes need to take turns, too.

As children figure out when their turn begins, they get lots of practice with addition and time sense. They also have something to do when it's not their turn. You can do this activity just about anywhere—in the kitchen, waiting at the doctor's office, or on the bus.



Before you begin

Decide how long turns will be. Here are some ideas for children of different ages.

For ages 5–7

- take 1- to 3-minute turns, or
- take 10-minute turns and start turns on a multiple of 10 minutes (10:10 or 7:30).

For ages 7–9

- take turns of any number up to 10 minutes, or
- take turns of any multiple of 5 minutes (15, 20, 35).

For ages 9–11

- take turns that are not multiples of 5 or 10 minutes. Try turns of 13 minutes, 19 minutes, or 37 minutes.

1. Talk through the turn taking

Make sure your children know

- how long each turn is,
- what order they'll take turns in, and
- what time turn taking begins

"You all want to use stencils to make your pictures, but we can only find one stencil. So, each of you gets a 5-minute turn with it. Let's go around the table—Malique, you start. Tania's next, then Camille. Tania, keep an eye on the clock. It's 2:19 now—let us know when it's time for your turn!"

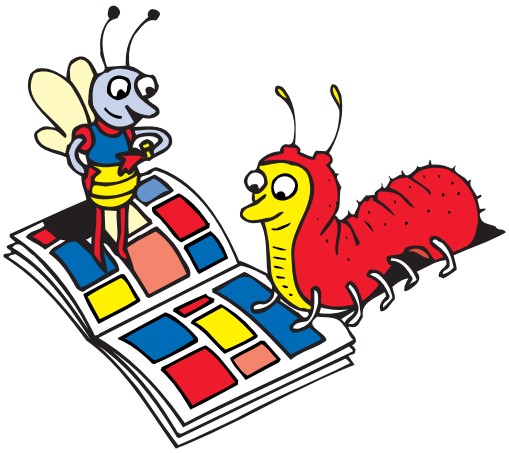
2. Figure out when the next turn begins

If your children need help, work with them in one of these ways:

Count up the minutes. One minute after 2:19 is 2:20, 2 minutes after is 2:21, … 5 minutes after is 2:24.

Round to a "familiar" time, then adjust. The last turn began at 2:19, so you can round up to 2:20. The next turn would begin 5 minutes later, at 2:25. Since the turn really began 1 minute earlier—at 2:19, the next turn begins 1 minute earlier, too—at 2:24.

Talk through your own solution. Children who aren't sure what to do, but know their turns are approaching fast, may not be eager to work out the math themselves. Explain how you know when the next turn begins. Even if your children can't



understand everything, they'll appreciate that you're doing math to find out something important to them. Next time, try a turn length that you think will be easier. You can even make it "too easy," to give a feeling of success so children will be ready to try more challenge another time.

When you repeat this activity

Vary the turn length and starting time. Try turns of a few minutes and turns of a half hour or more. Try starting the first turn on the hour, at half-past, and at any old time. As you learn what your children can figure out easily, choose times that offer just a little challenge.

Variations

How long until our turn? (ages 7–11)

Waiting in line can be unpredictable. When we're in a check-out line, at the bank, or at the post office, we don't know how long each person's turn with the cashier or clerk will be. Try this to pass the time when you're waiting.

If you have a watch, time the turns of three or four people ahead of you and find an average. Or, just estimate the length of an average turn. Then, use this average to predict how long until your turn.

Exploring patterns (ages 5–11)

Write down when each person's turn will start, continuing for at least 12 or 15 turns. (It's OK if no one really gets that many turns.) Then, look for patterns in the numbers.

For example, suppose the starting time is 4:12 and you have 5-minute turns.

4:12	4:37	5:02
4:17	4:42	5:07
4:22	4:47	5:12
4:27	4:52	5:17
4:32	4:57	

Some patterns: the "ones" digits in the minutes are all 2 and 7; the "tens" digits appear twice and then increase by 1.

Here's another example: the starting time is 1:00, with 3-minute turns.

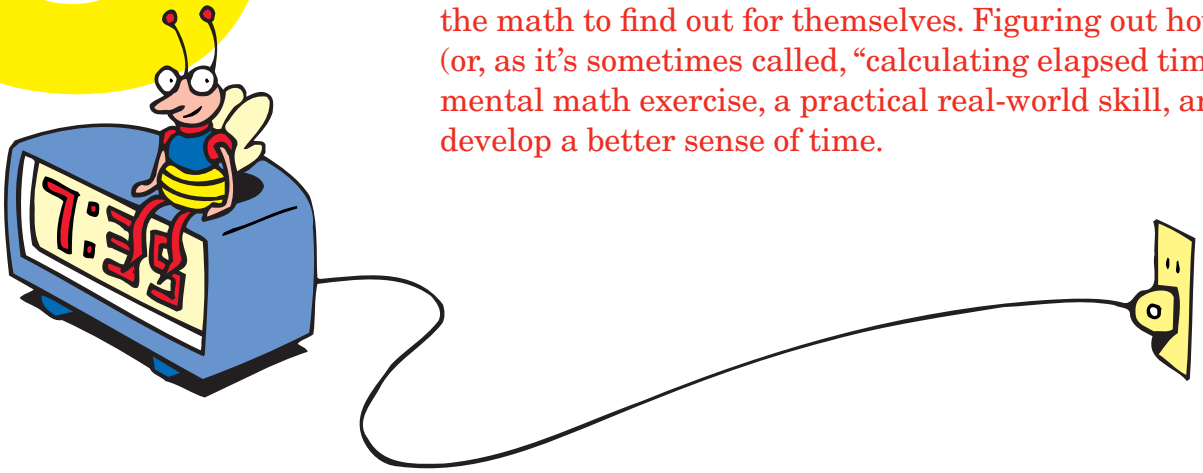
1:00	1:15	1:30
1:03	1:18	1:33
1:06	1:21	1:36
1:09	1:24	1:39
1:12	1:27	

Some patterns: the minutes are multiples of 3; they alternate even and odd; the "ones" digit repeats every 10th number.

How much longer?

Materials

Clock or watch that displays minutes



"How much longer until the soccer game begins? … How long until we eat? … How much longer before the movie starts?"

Next time your children ask you "How much longer?" ask them to do the math to find out for themselves. Figuring out how much longer (or, as it's sometimes called, "calculating elapsed time") is a great mental math exercise, a practical real-world skill, and a way to develop a better sense of time.

1. Talk through the problem

Make sure your children know what time it is now and the time of the event they're waiting for.

Child: "How long until we eat?"

Parent: "It's 5:18. Dinner's at 6. How many minutes until 6?"

For ages 5–7, simplify the problem by rounding times to the nearest half hour (5:30 in this example), quarter hour (5:15), or 10 minutes (5:20).

2. Figure out how much longer

If your children need help, work with them to solve the problem in one of these ways:

Break the problem into parts. For instance, from 5:18 to 5:20 is 2 minutes, then it's 10 more minutes to 5:30, and another 30 to 6:00—42 minutes in all.

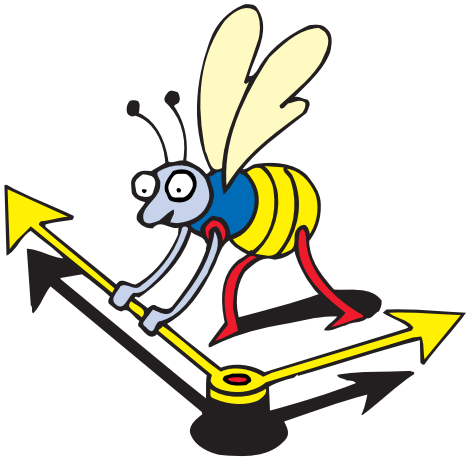
Round to a time that's easier to work with and then adjust. It's 45 minutes from 5:15 to 6:00, so it's 3 less than that—42 minutes—from 5:18 to 6:00.

Count up by ten-minute intervals. From 5:18 to 5:28 is 10 minutes. From 5:18 to 5:38 is 20 minutes, to 5:48 is 30, to 5:58 is 40, plus 2 minutes takes us to 6:00. So it's 42 minutes in all.

3. Explain solutions

If your children solved the problem without help, ask how they got their answers.

If you notice any incorrect calculations, encourage your children to explain their thinking further. They may fix their mistakes as they talk about how they got the answer. If they don't, try to help them correct their solution methods, rather than showing a new way to solve the problem.



4. What could you do in the remaining time? (optional)

To help develop a "real-life" understanding of time, ask about what could be done in the time that's left.

"So, you have about 40 minutes left until dinner. Is that enough time to clean your desk? Your whole room? Your whole room and still have some time left to play?"

When you repeat this activity

Try this when "How much longer?" is a few minutes, close to an hour, or several hours. Ask your children to explain their thinking from time to time—both when they make mistakes and when they arrive at the right answer. Otherwise, they will come to think that "How did you get your answer?" really means, "You're wrong."

Variations

Predict how much longer (ages 5–11)

Sometimes we don't have an answer for "How much longer?" We're not sure when the waitress will take our order, or when the food will arrive. We don't know how long we'll be in the check-out line, or when we'll get home if we're stuck in traffic. In situations like these, ask everyone to predict how much longer, and to explain why they think their predictions are reasonable. Write down (or remember) your predictions, and assign someone to keep track of the time. Which prediction comes closest?

For more challenge, after children make their predictions, suggest they calculate what time that will be.

"It's 3:32, and you guess it will take 45 minutes to get home. What time will it be then?"

When the wait is prolonged, ask if anyone wants to revise their predictions.

"We predicted we'd be through the check-out line in 5 minutes, but 3 minutes have passed and the person ahead of us hasn't unloaded everything from her cart yet. Do you still think we'll be through in 5 minutes, or do you want to change your predictions?"

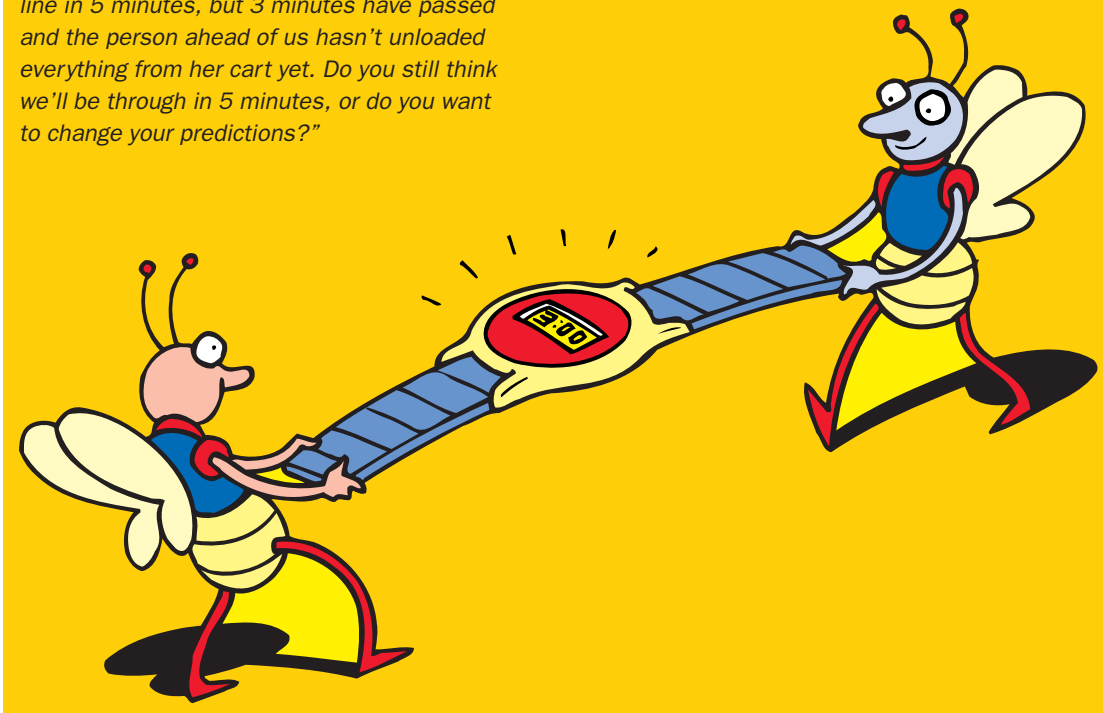
When it seems like forever (ages 5–11)

When there's an exciting event coming up soon, ask your children to find out "how much longer" in weeks, days, or hours. Younger children can use a calendar to count how many days (or weeks). Older children can calculate how many hours until the event, and then explore questions like these:

What is the halfway point? *"When will it be halfway between now and your birthday? What will you be doing then?"*

How many minutes? *"So, you figured out that it's 63 hours until your school play. Do you think that's more than 1000 minutes from now? More than 10,000? How can you find out?"*

How long ago? *"The big soccer game is in 32 hours, and it seems like you have to wait forever! What were you doing 32 hours ago? Does it seem like that long ago?"*



6

When should we leave?

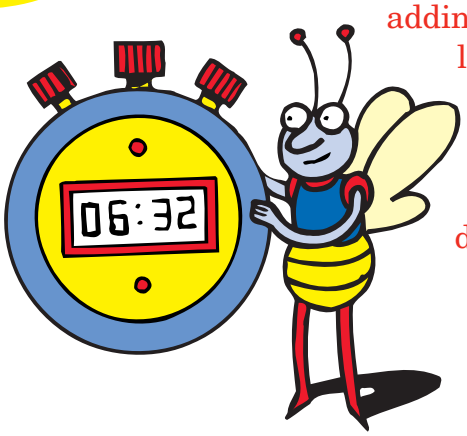
Materials

- Clock or watch that displays minutes
- Pencil and paper (optional)

"Oh no, it's almost 12:35! We'll never get to the soccer field by 1:00!"

Some days it seems that everyone is rushing off somewhere—to school, to work, to appointments. As we plan the day, we need to decide when to leave in order to get places on time—even if we don't always quite make it. Deciding when to leave requires lots of math: adding and subtracting times, using time sense to estimate how long it takes to go places, and using timetables.

In this activity, as children figure out when to leave, they learn about the role math plays in scheduling the day. Finding when to leave also gives them something to do while they're waiting around to go!



1. Talk through the trip

Make sure your children know

- the time you need to arrive at your destination.
- the parts of the trip—will you walk directly there? Walk to the bus stop, wait, ride the bus, and then walk the rest of the way?
- how long each part of the trip takes. It's OK to round times to the nearest 10 or 15 minutes.

"We're driving Ana to school. It's a 15-minute ride to Ana's house, and then it takes about 20 minutes to get to school. We need to be there for the 8:10 bell. When should we leave?"

For ages 5–7

Ask about trips with just one part.

"It takes half an hour to walk to Grandma's house. We need to be there at 3:00. When should we leave?"

Or, combine parts of the trip, so children have fewer things to keep track of.

"It will take about 35 minutes to get to school. When should we leave?"

2. Figure out when to leave

If your children get stuck, work with them in one of these ways:

Calculate how long the trip is, then subtract the travel time from your intended arrival time. The trip takes 15 + 20, or 35 minutes. Thirty-five minutes before 8:10 is 7:35.

Work backwards, one step at a time. To get to school at 8:10, we need to leave Ana's house 20 minutes earlier. That's 7:50. So, we should leave home 15 minutes before then—at 7:35.

Pick a time when you might start, and then adjust. Some children find it easier to work with a specific starting time.

"What if we left at 7:45—when would we get there? … Should we leave earlier or later than that? … How much earlier (or later)?"

Keep the focus on the goal. Sometimes when we get bogged down in calculations, we lose sight of what we're trying to figure out. Remind children of the basic question as needed.

"So you figured out that it will take us about 35 minutes in all. When should we leave so that we get there at 8:10?"

Take off the pressure if it's getting to be time to go. You can spend a bit of travel time explaining how you figured out when to leave. Next time, ask your children to figure out, "When should we leave?" when the trip is simpler.

When you repeat this activity

Try this with a variety of trips—trips under half an hour, and trips of 2 hours or longer; trips involving several stops, bus changes, or errands; and trips involving different methods of transportation. For more challenge, involve your children in planning ahead for possible traffic or other delays.

"We have to take two buses. Each ride could take anywhere from 15 to 30 minutes, depending on traffic, and we could wait up to 10 minutes when we change buses. How much time should we allow, in case there's a lot of traffic and a long wait? What's the earliest we could get there? If we're early, will there be enough time to get ice cream on the way?"

Variations

Use timetables (ages 7–11)

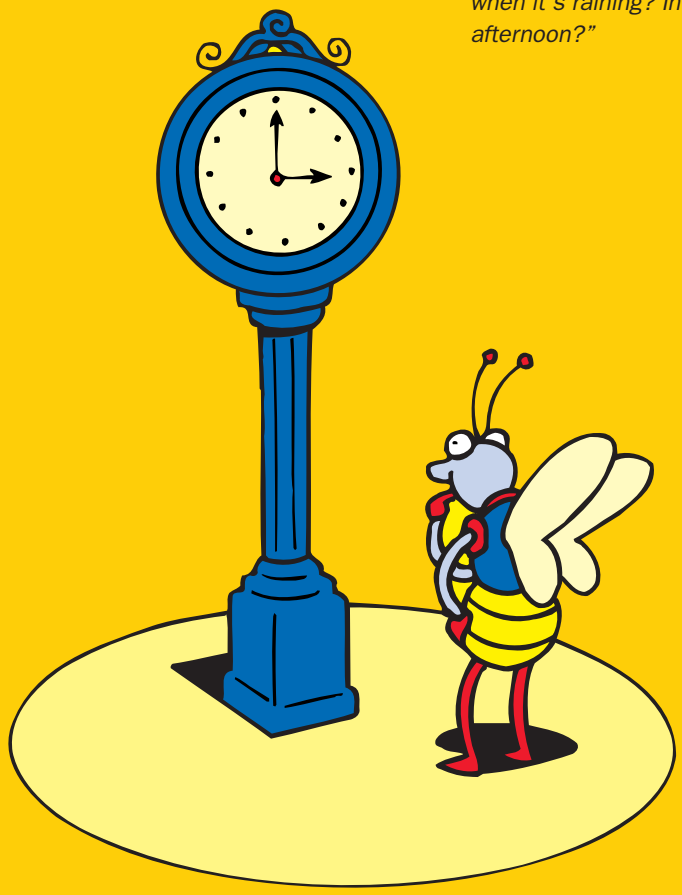
Sometimes, figuring out when to leave involves choosing which bus (or train, or ferry) to take. Work with your child to use a timetable to plan your trip.

"We have to be at the doctor's at 4:00. The bus stops at North Square just around the corner from the doctor's office. Let's look at the schedule to find a bus that gets there by 3:50. OK, the 3:02 from the Oak Street stop should get us in by 3:43. What time do we need to leave home to catch the 3:02 bus at Oak Street?"

How long did it take? (ages 7–11)

Find a trip that your children take on a regular basis—perhaps a drive to the grocery store, a bus to the library, or a trip by foot and subway to Grandma's house. Each time they take this same trip (for at least a few trips), ask them to use a watch or timer to find how long it takes. Provide a notebook or special paper where they can record how long the trip took, along with the date and day of the week, the time of day, the weather, and any circumstances they think affected the length of the trip (such as delays for road construction). They can use these data to help make decisions about when to leave on future trips.

"How much time should we allow for the trip when it's raining? In rush hour? On Sunday afternoon?"



7

How much do we save?

Materials

- Grocery advertisements with coupons
- Scissors
- Pencil and paper (optional)

"Look—here's a coupon for $1.00 off on juice bars, and here's one for 60¢ off my favorite brand of chunky peanut butter! There's a bunch of others we can use, too. I wonder how much we'll save."

Everyone wants to save money! With coupons, children can learn about math and about saving. In this activity, as children figure out coupon savings, they practice adding, multiplying, and estimating with dollars and cents. You can do this activity even if you don't use coupons when you shop.

Before you begin

Alone or with your child, go through grocery advertisements and cut out about 20 coupons. If you use coupons, pick ones you think you'll use on your next trip to the store.

1. Talk about grocery coupons and store savings

If your children are unfamiliar with coupons, explain how people use them. Point out the important information on several coupons—the product, how many you have to buy, the amount of savings, and when the offer expires.

Ask your children to make a quick prediction about how much your family generally spends on groceries each week, and how much you could save with coupons. Some children will have no idea of these amounts. As you repeat this activity, they'll develop a better understanding.

2. Find out the savings

Ask your children to find the total value of all the coupons in the set.

If they need help getting started, ask them to begin by sorting coupons worth the same amount into separate piles—a pile of 25¢ coupons, a pile of 50¢ coupons, and so on. Here are some other things you can suggest:

Combine coupons to make dollars. Suggest finding and grouping coupons that add up to $1.00, such as 40¢ + 60¢, or 25¢ + 25¢ + 50¢. Your children can also make groups that total $2.00, other whole-dollar amounts, or amounts like 50¢ that are easy to work with.

Count up to add coupons worth the same amount. For example, your children could count a group of 25¢ coupons this way: 25¢, 50¢, 75¢…. If your children need help after the first few coupons, you can count along.

Keep track of the coupons already added and those still left to add. Your children can make a special place to set aside coupons after figuring them into the total.

If your children need help finding the total of all the coupons, talk through how you would do it yourself.

3. Explain solutions

Listen to your children as they explain how they added the coupon amounts. Encourage them to check the total by adding the coupons in a different way—for example, by regrouping them into different "dollar" combinations, or adding them up in a different order.

Age range 7–11 (for ages 5–7, see Variations)

When you repeat this activity

Try this with coupons for the pharmacy or hardware store, or with coupons your children choose for their own "pretend" grocery shopping lists. If you use coupons, you can make this activity a regular part of your grocery shopping routine.

For more challenge, if your market doubles or triples the value of any coupons, explain how this works. Children can find the total value of the coupons with this information in mind.

Variations

Use a calculator (ages 7–11)

After your children do this activity with a calculator, ask them to check their results with a mental estimate. For example, they can round coupon values to the nearest 25¢ (round 45¢ to 50¢ or 99¢ to $1.00) and then figure the approximate total. Ask children to talk about times when it makes sense to use a calculator and times when it's just as easy or easier to find the total using common sense.

Do we have enough to save $5.00? (ages 5–7)

Provide about 10 coupons worth different amounts. Choose coupons worth 25¢, 50¢, or whole-dollar amounts. This is the challenge: Find out if there are enough coupons to save your family at least $5.00. (If you have a lot of coupons worth whole-dollar amounts, choose a larger total.) Ask your children to explain how they found the answer.

How can you sort the coupons? (ages 5–7)

This activity can help children work on sorting, logical thinking, and numbers. Provide 20 or more coupons for your children to sort into groups. They can decide what the groups will be. They might form categories like junk food, healthy food, things you can eat, things only pets can eat, or things you use to clean with. When they have finished sorting, ask number questions about their coupon groups:

"Which group has the most coupons? Which group has the fewest? Which coupon lets us save the most? The least?"

8 Wish list

Materials

- A mail-order catalog or advertising supplement likely to contain items of interest to your child. If your child's school sends home book club order forms, you can use those.
- Pencil and paper
- Stick-on notes (optional)

"There are so many great things in this catalog. If I had $50 to spend, what would I buy?"

Mail-order catalogs and advertising supplements can be a temptation, a convenience, and an annoyance. They can also be an opportunity for lots of math! In this activity, children pretend they have a certain amount of money to spend. They use a catalog or an advertising supplement to make a "wish list" of items they can buy for their spending limit. As they make their choices, they practice addition, subtraction, and estimation with dollars and cents. They also learn about working within a budget.

This activity can be a great way to keep children occupied—and doing math—on long trips, at the kitchen table while you're making dinner, or on rainy days.

Before you begin

Pick a spending limit for your child's wish list. The limit need not be realistic, since this is just a wish list.

For children ages 7–9 try a limit between about $25 and $50 the first time you do the activity.

1. What would you get?

Provide a catalog or advertising supplement for your child to look through and suggest making a wish list.

"That easel and paint set would be fun to have. They're not in our price range, but let's pretend we could get some things from this catalog. What would you get if you had $100 to spend?"

Explain that your child can't go over the spending limit, although it's OK to spend a little less.

2. Make a wish list

Your child can record items and prices, or use stick-on notes to mark pages that have items of interest.

If your child needs ideas for getting started, suggest one of these first steps:

Start with one item. Subtract the cost of that item from the spending limit. How much is left to spend?

Start with two items and find out how much they cost together. Are you past the spending limit yet? If so, exchange at least one item for a cheaper one. If not, choose another item.

Round any "dollars and cents" prices to the nearest dollar. If an item is $5.95, call it $6. If it's $5.25, call it $5. Use the whole-dollar prices to do some quick calculations or estimates. Once you get close to your spending limit, figure out the exact amounts to make sure you're not over.

Some children will try several (or many) combinations of items before they settle on a list that is within the spending limit.

If some of the calculations are too challenging, talk through how you would do them yourself. Next time, choose a lower spending limit.

3. Discuss everyone's choices

Listen to your children tell how they made their choices. If they don't mention any calculations, encourage them to tell you about this, too.

"You chose some great things! How did you keep track of all the prices to make sure you stayed under your limit? … Did you come up with any combinations of things you wanted that were over your limit? … So, then what did you do?"

If you notice errors in calculating, encourage your children to explain their thinking further.

"So, you added 18 and 14, and got 31. How did you get that?"

Children may notice and correct mistakes as they talk about how they got their answers. If not, help them work through their own approach again. For example, suppose your child says, "First I added 10 to 18, that's 28. Then I added 4 more—28, 29, 30, 31." Let your child know what was successful, then talk through the trouble spot.

"That's a good way to do it—tens first, then ones. So you have 28 and you want to add 4. What's 28 and 1 more? … OK, 29. What's 28 and 2 more? … 3 more? … 4 more?"

When you repeat this activity

Use different catalogs and advertising supplements, and vary the spending limits. Ask your children to explain some of the calculations they are doing as they make their wish lists, and encourage them to check their work by doing the calculations in a different way.

Variations

Use a calculator (ages 7–11)

Many adults use calculators when doing routine calculations at home and at work, so it's important that children have a chance to learn what calculators can do. As children are making their choices and checking to see if they've reached the limit, ask them to tell you how they're using the calculator.

"So, what did you enter? … Did you add or subtract? … That number on the calculator display—what's that the total of?"

Let children know that when they use calculators, it's important to make sure they've entered correct calculations. Encourage them to check their results with a mental estimate.

"So the total for the bicycle, helmet, and sneakers comes out to $304. Is that about right? Let's see—it's almost $200 for the bike, about $40 for the helmet, and just over $50 for the sneakers. Does that come out close to $300?"

What do we save? (ages 7–11)

Sometimes mail-order companies put out "sale" catalogs in which some or all of the items are reduced in price. Usually, both the original price and the sale price are given. Ask your children to decide what they would buy for a given spending limit, and also to calculate how much they would save from the original prices.

9

Which holds the most?

Materials

- A variety of plastic containers and bottles (see "Before you begin")
- Large waterproof container or mat for catching any spills when you pour water (optional)
- Funnel or pitcher for pouring (optional)

"I thought this tall container would hold everything, but it doesn't! I'll try this other one—it's shorter, but much wider."

Estimating how much can fit in a container, box, or suitcase is a practical skill that involves the math of geometry and measurement. In this activity, children work on this important math as they look for the container that holds the most water. They learn about length, width, and height—the three "dimensions" of three-dimensional shapes. They also learn that it's important to consider all three dimensions when you're trying to figure out what's the biggest.

Try this activity when you have a few extra minutes and are near a water source (the kitchen tap, the bathtub, an outdoor hose, or the beach).

Before you begin

Gather a few empty plastic containers in different sizes and shapes. You can use storage containers, toy bottles or pails, or containers that once held safe household products such as dish soap, syrup, or juice. (Clean them, and if possible, take the labels off.) Try to include some containers that hold about the same amount but look very different.

1. Predict which can hold the most

Ask your children to predict which container would hold the most if all the containers were full.

"What if we filled these empty containers all the way up with water—which one do you think would hold the most water?"

Some children may look at measures on container labels (such as "16 fl. oz." or "295 ml") to find which container holds the most. If this happens, suggest that just for fun, everyone should try predicting without looking at the labels.

2. Explain the predictions

Ask your children to give reasons for their predictions.

"Why do you think this one will hold the most?"

If they say, "It just looks bigger," encourage them to think about size and shape.

"Is the one you think will hold the most the tallest? Widest? Roundest?"

3. Test the predictions

Start with a container that someone thinks will hold the most. Fill it with water. If it's really the largest, there should be some extra when you pour the water into any of the other containers.

Choose another container and pour the water into it. (A funnel or pitcher can make the pouring easier.) Is there any water left over?

Keep trying this with different containers until you're sure which one holds the most.

4. Discuss whether the predictions matched the results

If your children were surprised about which held the most, encourage them to consider size and shape:

"We both predicted that this tall, thin shaving lotion bottle would hold the most, but this round shampoo bottle held the most. I wonder why. Do you think it's something about how wide it is?"

When you repeat this activity

Try some different containers—larger or smaller ones, a variety of sizes and shapes. Encourage younger children to use more "size and shape" words (such as wide, long, tall) as they talk about the containers. Challenge older children to find containers in the house that hold about the same amount but are shaped very differently.

Variations

How many times larger? (ages 7–11)

Gather a variety of empty containers. Include a small one (such as a spice jar) to "measure" the others with. Then, make some predictions:

"Let's say we want to fill up this big syrup bottle with water. We're going to do it by filling this little jar with water. Then, we'll pour the water from the little jar into the syrup bottle. How many times do you think we'd need to do that in order to fill the syrup bottle all the way up?"

Check predictions by filling the containers with the small one you are using to measure with. Keep track of how many times you pour. If the containers are marked with how much they hold, challenge older children to verify their predictions with calculations based on these capacity measurements, too.

Check with measurements (ages 7–11)

Try this when you're unpacking groceries, organizing shelves, cleaning out the refrigerator, or searching for a container to store leftovers. The containers you use can be empty, full, or partly full.

Choose containers that are marked with how much they hold. Look for this measure on the labels of liquid products (such as honey, liquid detergents, and juice). Some plastic storage containers have this measure on the bottom. This measure is often given in both fluid ounces (fl. oz.) and milliliters (ml). You may also see liters (L), cups (c.), pints (pt.), quarts (qt.), or gallons (gal.). For this activity, use containers marked with the same units.

Ask your children to predict which would hold the most if they were all full. After children make their predictions, show them where one container is marked with how much it holds. Help them find a similar marking on each container, and then ask which number is largest.

10

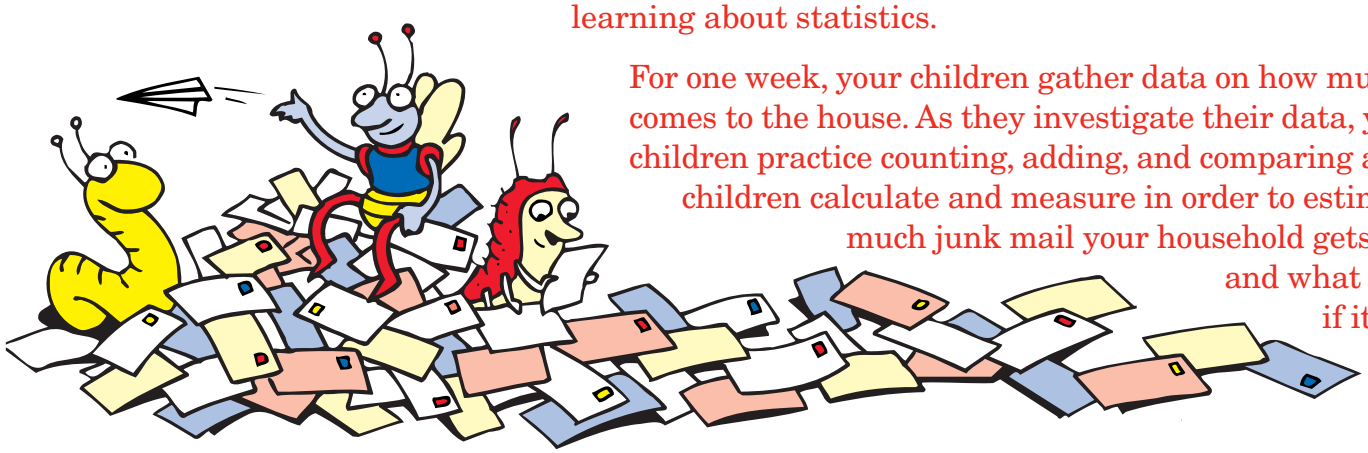
Junk mail (a mini project)

Materials

Your daily mail

"Lots of ads in the mail again—what a waste of paper! I wonder how much of this junk mail we get in a week? How much do we get in a whole year?"

Many children are interested in recycling and saving resources. In this activity, children investigate paper use (and paper waste) while learning about statistics.



For one week, your children gather data on how much junk mail comes to the house. As they investigate their data, younger children practice counting, adding, and comparing amounts. Older children calculate and measure in order to estimate just how much junk mail your household gets in a year—and what would happen if it all piled up!

Before you begin

Set the stage for the project by sorting today's mail and talking about junk mail.

"Let's sort today's mail. We'll put regular mail in one pile, junk mail in another. How much mail do you think we throw out every week without even reading it?"

Encourage your children to make some predictions.

Decide with your children what will count as junk mail: Will you count catalogs? Sweepstakes announcements? Coupons? Other advertisements? You may not be able to make all your decisions in advance, but it's important that everyone generally agrees what to count as "junk."

1. Count and keep track

Every day for a week, your children help sort the mail into two piles: junk mail and regular mail. After counting the number of pieces in each pile, they record the date, how much regular mail, how much junk mail, and the day's total. When they're done, they add the junk mail to the junk mail pile for the week.

Your children can record their data with a chart, graph, tally, or some other way. They can use something they learned in school, or they can come up with their own ways. With young children, it's fine for you to help with recording.

2. Investigate the data

Throughout the week, ask questions about the data your children are collecting. As the week goes on and the totals get larger, younger children may need help finding some of their answers.

"Is there more junk mail or regular mail today? How much more?"

"How much junk mail did we get so far this week? Did we get more junk mail or regular mail so far?"

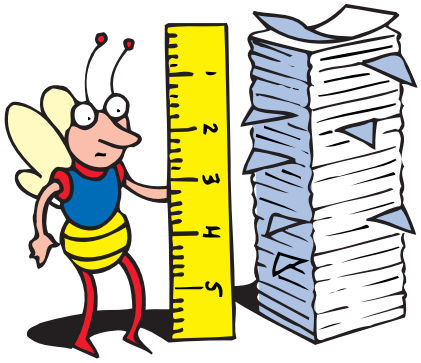
"How many pieces of mail did we get in all today? How many so far this week?"

Additional challenges for ages 7–11

"If we get the same amount of junk mail each week, how much will we have in a month? A year?"

"What fraction of the mail is junk mail? Is it more than half?"

Age range 5–11



"Measure the height of the pile of junk mail at the end of the week. If we let it stack up, how high would our pile of junk mail be in a month? In a year? Would the pile be taller than you are? Up to the ceiling? Taller than the building we live in?"

"If every house on our block (or every apartment in our building) got the same amount of junk mail as we did this week, how high would the pile of junk mail be?"

When you repeat this activity

Save the data you collected this week, then repeat the activity, perhaps at a different time of year. Compare your data.

"Do we get more junk mail during holiday seasons? At the start of the school year? Do we get more on certain days of the week? Why do you think so?"

Variations

More kinds of mail (ages 5–11)

Each day, sort the mail into several categories. You could try one of these ways:

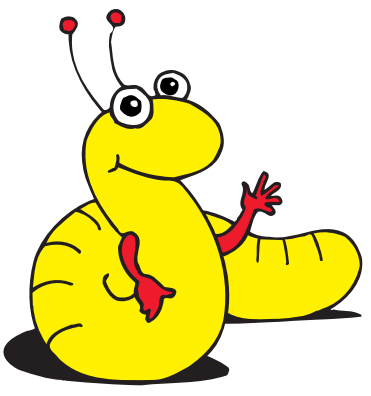
- Name it's addressed to (family member, "occupant" or "resident," former residents of your home)
- Where it's from (country, state, or region of the U.S.)
- Type of mail (bills, letters, magazines, junk mail)

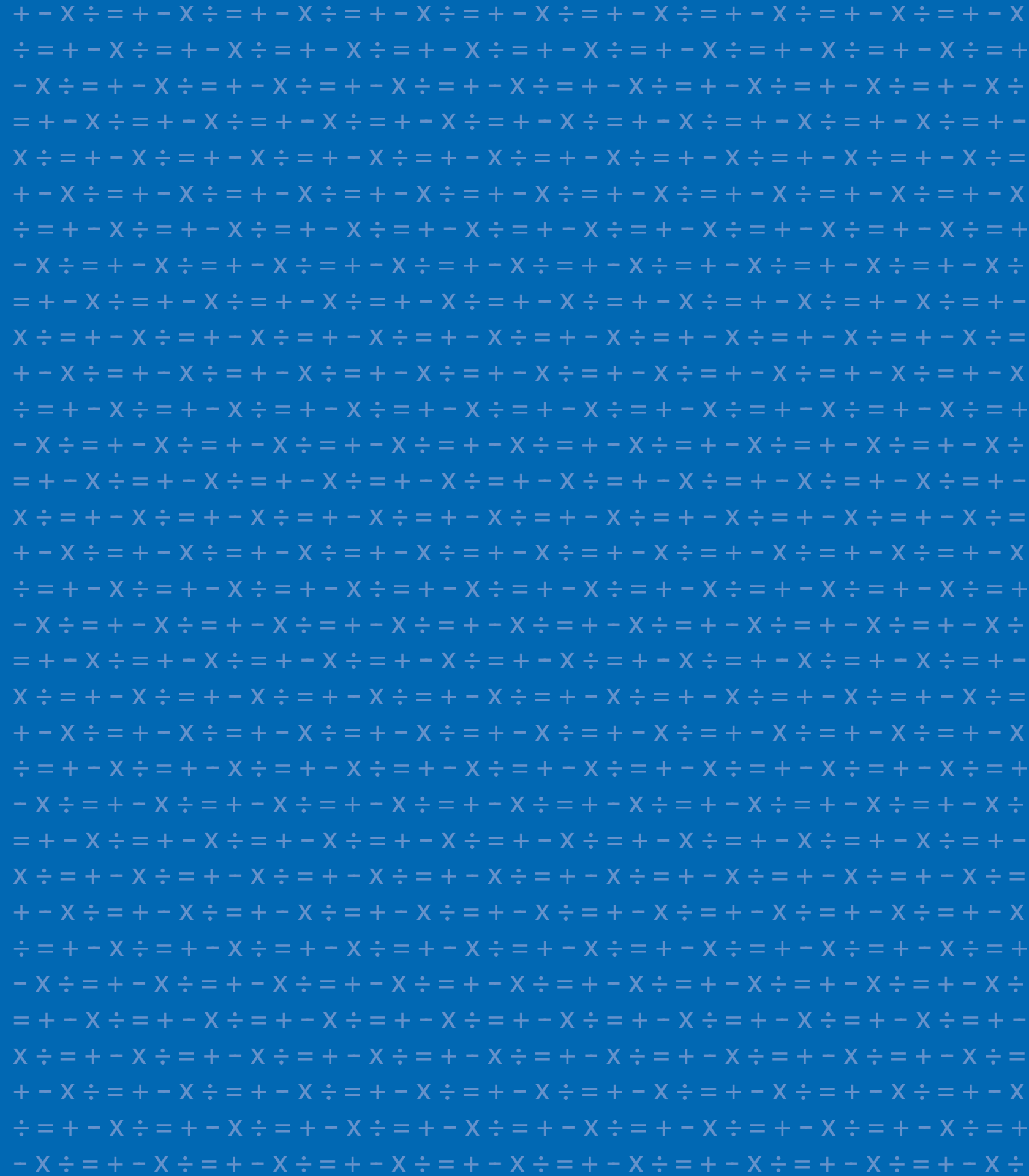
Keep track of how many pieces you get in each category for a week. Then investigate your data.

"Who gets the most mail in the house?"

"About how far away does most of our mail come from—less than 50 miles away? Between 50 and 100? Between 100 and 1000? Over 1000 miles away?"

"Besides junk mail, what's the most common kind of mail we get? What percent of the total mail is this?"

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