

A Manual on Task-Switching or Set-Shifting

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Task-Switching: What and Why?

1. This manual is about an activity called task-switching (also known as set-shifting). In task-switching, you have two or more different sets of directions that you can use with the same sorts of situations or problems. You switch back and forth between the different directions. Here's an example of how you can use different directions with the same problem. Look at this math problem:

1. $3+4$

One task might be simply to say the answer to the addition question. You'd look at the above stimulus and say "7." But a different task is to say the question and the answer. If this were the task, you'd look at the stimulus above and say, " $3+4=7$." A third task might be to say the problem number and the answer, in which you'd say "1, 7." So with the same problem, you can follow different directions, or do different tasks.

What is the purpose of this first section?

A. to define and give some examples of set-shifting or task-switching,

or

B. to explain why task-switching is a good thing to practice?

2. Another word for the problem or the information you respond to, by following some directions, is a *stimulus*. A math problem was the stimulus in the first example. Here's another example of a stimulus that you can respond to with different tasks. Suppose someone shows you the word *blue*, but it is printed in a different color, such as green (please see the words on the cover of this book). If the task is "read the word," you would say "blue." If the task is "Say what color the word is," you would say "green." So you would respond differently, depending on what the task is. There have been many variations on this activity, which has been called the Stroop task.

The main point of this section is that

A. the Stroop task, another task-switching activity, asks you to either read a word or say what color it is,

or
B. the Stroop test is something that is very difficult for some people with concentration problems?

3. Here's another stimulus:

1. fern

It's just a number, followed by a word. One possible set of directions is, "Ignore the number and just read the

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word.” A second possible task is, “Say the sounds of the word separately and then say the word: like “fuh-er-nuh, fern.” Saying each of the sounds and then the word is called “sounding and blending.” A third possible task is to say the number and then read the word: “1, fern.” A fourth task is to say the separate sounds only, without blending, like this: “fuh er nuh.” This direction is called “sounds only.” With different directions like these, we can use numbered lists of words to practice task-switching at the same time that we are practicing reading.

The purpose of this section was to show how

- A. we can practice task-switching with lists of words that we practice reading, as well as with lists of math fact problems,
- or
- B. saying the sounds of words separately develops a skill called phonemic awareness, that helps people read better?

4. Some research suggests that people with concentration problems find task-switching especially difficult. Some research shows that giving people the medicine that is often given for concentration problems, tends to improve task-switching ability. But research also suggests that lots of practice in task-switching also improves task-switching ability.

Could it be that lots of practice in task-switching would stimulate the growth of the part of the brain that gives us good concentration, impulse control, and decision-making abilities? It’s too early to say that this is proved. But practice does tend to improve most skills, and skill improvement happens by the brain’s changing in some way.

This section brings up the possibility that

- A. people can inherit a certain amount of task-switching ability,
- or
- B. lots of practice in task-switching could improve concentration, impulse control, and decision-making?

5. How do you do task-switching well? Let’s imagine that you can hold in your mind only so much information at any one time, and let’s call the amount of information you can hold, your “working memory.” To do tasks such as addition facts takes a certain amount of working memory. But to do task switching, you have to devote some of your working memory to remembering what you are supposed to be doing – what the directions are. Thus dividing your working memory between doing something and remembering what you are supposed to do is part of the art of task switching.

The point of this section is that

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A. no one knows how much practice in task switching is enough to have positive effects,
or
B. good task switching requires using some of your working memory to do something, and some of it to remember what you're supposed to do?

6. Do we ever need to do task-switching in real life? In school work, task switching is very frequently useful. Here's a stimulus you might get in grammar class:

I don't got any fruit.

The sentence should read, I don't have any fruit. But what is the task? It could be lots of different things. The teacher's directions could be, "Draw a circle around the error." Or they could be, "Draw one line through the error and write the correct word right over it." Or they could be, "Rewrite the sentence correctly, on this paper, just below the sentence." Or they could be, "Write the sentence correctly on you own paper." It happens very frequently that kids look at their schoolwork and don't follow the directions. And this particularly is a problem for students that people say have "attention problems," or "attention deficit disorder."

This section

A. promises that by task-switching you can solve attention problems,
or
B. gives an example of a real-life situation in school where good task-switching is an important ability to have?

7. Here's another example. The stimulus is that a bunch of your classmates are near you. If the situation is that you're outside sitting in a park having lunch, the task might be to talk and joke around and have as much fun as you can. If you're sitting in the classroom working on an in-class assignment or test, the task might be to ignore your classmates and say nothing to them. Again, the two stimuli are similar, but the tasks are very different. Kids with "attention deficit disorder" tend to have problems task-switching in this way, but almost all other kids also are challenged by it too.

This section made the point that

A. knowing when the talk and joke with classmates and when to ignore them is a task-switching activity,
or
B. it's not just for the teacher, but for the student's benefit, to be quiet in a classroom during a test?

8. Here's another example. This time, imagine that the stimulus for a student is the student's room, which contains various things including school books

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and electronic toys. At certain times, the “directions” the student gives himself or herself are, “Ignore the electronic toys, and do the homework.” At other times, the “directions” are, “ignore the schoolbooks and enjoy the electronic toys.” Again, the job is to respond to the same stimulus in different ways, depending on what the directions are at a certain time. There’s a need to hold in memory, “Here’s what I’m supposed to be doing now,” while using the rest of your working memory to do it.

This section makes the point that

- A. people with attention deficit disorder often find it hard to ignore the temptation of electronic toys,
- or
- B. following the “directions” one gives oneself to work or play while in one’s room is a task-switching activity?

9. Here’s another example. Someone plays a bunch of videogames where the best strategy is to react as quickly as possible as soon as a new situation comes up. Then the person plays a chess game on the computer, where the best strategy is to take the time to make very careful plans before reacting to any new situation. The stimuli in the two situations are similar (both appear on screens) but not exactly the same. It’s necessary to do task-switching to move from the directions of “react as quickly as you can” to the directions of “react only after making very careful plans.”

This section made the point that

- A. chess is better than most other videogames,
- or
- B. switching between “react fast” and “react with careful planning” strategies is another type of task-switching?

10. Switching between “react fast” and “react after taking your time to decide carefully” of course goes on not just with videogames and computer games, but in countless life situations. If I’m driving and a kid on a bike rides out in front of me, I’m definitely in the “react fast” situation. If I’m thinking of getting married to someone, I’m definitely in the “react only after taking time to decide carefully” situation.

Both of the “stimuli” we’ve just mentioned are somewhat similar, in that they are “choice points” – situations where I have to decide what to do. But the directions one should give oneself on how fast to make the decision are drastically different.

This section makes the point that

- A. in life, it’s necessary to do a lot of task-switching to decide when to use the “react fast” strategy and when to use the “take your time to decide carefully” strategy,
- or

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B. whom you get married to is a decision that will affect the rest of your life?

11. Here's another example of how there are two types of "directions" to follow, in situations that are somewhat similar. The situation is that of "a choice point involving danger"; the two types of directions are "be brave and take a big risk," or "take care of yourself and don't take a risk."

Suppose that the danger is that there's a burning house, and a child trapped inside. A firefighter decides to take a risk and go inside to rescue the child. The firefighter is successful, and people greatly admire the firefighter for courage.

Now suppose the firefighter gets invited by a friend to go rock-climbing. The idea this friend has is that you climb straight up a cliff, without using a rope to catch yourself if you should fall. The firefighter looks at the situation and tells the friend, "No way."

The firefighter has done some task-switching here. In both situations, the stimulus is a choice point; in the first, the task was to overcome fear and be brave; in the second, the task was to listen to realistic fear and be cautious.

The story described in this section involved task-switching because

A. the firefighter had to have lots of courage to rescue the child,
or

B. the firefighter responded to the situation of "a choice point involving danger" using two different sets of directions?

12. I could give you lots of other examples where task-switching is very important in real life. Does doing lots of task switching practice with things like lists of math fact problems or reading words increase your ability to do task-switching in real life? It's too soon to answer that question for sure, but this is our hope. Even if this hope doesn't come true, doing lots of task-switching practice with math facts and reading words will at the very least probably get you lots better at doing math facts and reading words! And these are very important skills for success at school. So even if the task-switching skill you practice doesn't carry over, or generalize, to real life, you will not have wasted your time by practicing.

This section makes the point that

A. we know for sure that practicing task-switching with math facts will help you in all other types of task-switching,
or

B. practicing task-switching with math facts will at the very least help you with math facts, and this is a great skill for success in school?

13. There's some evidence that task-switching activities of many different types all call for the activity of a certain

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part of the brain, near the front of the head, called the prefrontal cortex. There's also some evidence that when we do lots of activities that use a certain part of the brain, that part gets better and better at what it does, as if it is strengthened. Probably something like this happens each time we get better and better at any skill by practicing it. It's probably too simple to say that practicing a lot of task-switching grows or strengthens your prefrontal cortex. But it wouldn't be at all unusual to find that practicing concentration and intense mental activity helped people to get better at similar mental activities. There's some evidence in the research that practicing certain task-switching activities makes improvements in the brain so that other task-switching activities also become easier.

The author in this section states that some evidence leads us to believe that

- A. practicing math facts will help you even in advanced math,
- or
- B. practicing task-switching activities will help you in other task-switching activities?

14. How do you practice task-switching? Some people are trying to make up video games that will be entertaining, and at the same time will give practice in task-switching. It could be that this strategy will be successful.

But this book uses a different strategy. It's our prediction that you have to practice task-switching for many, many hours before your brain grows more competent at task-switching. One of the big ideas of this book is the following: why not practice task-switching at the same time that you are teaching yourself other things that are useful to know?

Two of the main things people need to spend a long time working at, while in school, are learning math facts and learning to read words. This book gives you lists of math facts and reading words, and asks you to task switch back and forth between two different sets of directions on how to practice them.

The main point of this section is that

- A. it's possible to practice task-switching with physical activities,
- or
- B. this book gives you task-switching activities that also give you practice in math facts and reading words?

15. Suppose you see the following stimulus:

1. $2+6$

We'll use four different ways that you can respond. If the directions are "Answer only," or "A only," then you just respond by saying, "8." If the directions are "Question and Answer," or "Q and A," then you respond by

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saying “ $2+6=8$.” If the directions are “Number and answer,” or “Num and A,” then you respond by saying “1, 8.” If the directions are “Sum-1st=2nd,” then you would say “ $8-2=6$.” In other words, for Sum-1st=2nd, you first add the numbers, and then say that the sum minus the first number equals the second number.

If you see the following stimulus,

4. 3×7

Then for “A only” you’d say 21, for Q+A you’d say “3 times 7 = 21,” for Num and A you’d say “4, 21.” For “Product divided by first = second,” which we’ll abbreviate “P/1st=2nd,” you’d say “21 divided by 3=7.”

With these four sets of directions, you can practice a lot of task switching as you are practicing math facts.

The purpose of this section was

- A. to explain the different types of directions used when you task-switch while practicing math facts,
- or
- B. to explain why lots of skill with math facts will come in handy?

16. Now suppose you see a numbered list of reading words, like this:

- 1. ban
- 2. cat

3. fax

If the directions are “sound and blend,” or S and B, you say “buh-aah-nnuh ban, cuh aah tuh cat, fuh aah ks fax.” If the directions are “blend only,” or B only, you just say “ban, cat, fax.” If the directions are “Number and blend,” or “Num and B,” you would say “1, ban; 2, cat; 3, fax.” If the directions are “sound only,” or “S only,” you would say “buh aah nnuh, cuh aah tuh, fuh aah ks.”

When you get to longer words, you will sound and blend by syllable. For example, suppose you see

1. en ter tain ing entertaining

If the directions are “sound and blend,” (S and B) you would say “en ter tain ing entertaining.” If the directions are “blend only” (B only), you would say “entertaining.” If the directions are “number and blend” (Num and B), you would say “1, entertaining.” If the directions are “sound only” (S only) you would say “en ter tain ing.”

We are repeating ourselves sometimes in summarizing these directions; that’s because they are important to understand if this book is to be useful.

The main purpose of this section was to

- A. explain why sounding and blending by syllables is better for longer words,

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or

B. explain the different types of directions used with reading words?

17. We also have some math word problems for you to practice with. We'll use two types of directions for these. Suppose the stimulus is:

1. Jay types 2 pages, and then 3 more. How many has he typed in all?

If the directions are "A only," you say the answer to the problem – you'd just say "5." If the directions are "Which operation," which we'll abbreviate "Which Op," you say whether you add, subtract, multiply, or divide to get the answer. So for the word problem above, you'd say "Add."

For the word problems you'll see later on, are there

A. 4 types of directions,
or
B. 2 types of directions?

18. If you can learn to do math facts quickly and automatically, without having to think about them, you're going to find that the rest of your math career is lots easier than it would otherwise be. Even on tests of advanced math, it's great to be able to do the four basic operations quickly and easily. Some people think, "I'll just do calculations on a calculator." But having to pull out a calculator every

time you want to combine two numbers slows you way down. Learning to do the math facts really quickly is a great thing to do.

Likewise, learning to be able to call out just about any word, with a reasonable guess at how it's pronounced, is a great skill also. You'll be much more able to figure out new words from reading them, if you can pronounce them to yourself. Learning to read words fluently is one of the most important skills for anyone's education. If you already can read very fluently, learning to "sound and blend" will help you greatly if you teach someone else to read!

This section is

A. a sales pitch on why skills in math facts and word-reading are very useful for you,
or
B. a sales pitch on why task-switching is important for you?

19. As you practice task-switching with math facts or reading or anything else, it's important to use what we call good "hierarchy-ology." This means arranging it so that the tasks you do are at the right point on the "hierarchy of difficulty." The hierarchy of difficulty is a usually imaginary list of challenges, starting from very easy ones and going up to very hard ones. If you are trying things that are too easy, you'll usually feel bored. If you are trying things that

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are too hard, you'll usually feel frustrated. If you're at just the right level of challenge, you'll find the activity much more pleasant.

The main point of this section is that

A. you want your task-switching practice sessions to be not too hard, not too easy, but just at the right level of difficulty,

or

B. you need lots of self-discipline to keep practicing task-switching?

20. When you are doing math facts, task-switching adds more difficulty to a task that can be already difficult. So here's a very important recommendation. For any page of math facts, first practice just looking at the questions and saying the answers, without worrying about the directions. When you get familiar enough with the math facts that you can do them all correctly, fairly rapidly (about 30 per minute) then add the task-switching and keep practicing. Keep going until you can do the facts with the task-switching, about as fast as you can get the words out of your mouth.

The author recommends

A. doing task-switching from the very start with any given page of math facts, or

B. first practicing the math facts without task-switching, then adding the task-switching?

21. The same goes for reading words. If you are finding it very difficult just to read the words, adding task switching can make the whole task too frustrating. Work on the list of words until you can comfortably read them correctly, then go back and work on task switching.

The additional work that you do, after you have already learned to do the page fairly comfortably, is where you really get tremendous benefit. Most people don't realize this, and stop drilling when they are "fairly OK" at doing something rather than keeping on until they are "totally proficient" in it.

The author feels that

A. when you can do a page with all items correct, it's time to go on,

or

B. when you can do a page with all items correct, that's when your additional work will yield you the most benefit?

22. We recommend the following procedure once you start task-switching: for any given page of problems or words, there are two types of directions. For example, "Q and A" or "A only." First, go through the entire page using the first way of answering the questions, and time yourself. Then go through the page again, using the

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second way of answering the questions, and time yourself. One of these ways will almost always be slower. For example, you have a lot more to say when you do “Q and A” than when you do “A only.” But the average of the two speeds gives you an estimate of how fast you could go doing half one way and half the other way. Then you time yourself again, this time doing the task-switching. The difference between the average that you computed and the time for task-switching is the “cost” for task-switching. The closer you can get this difference to zero, the more you are doing the task-switching quickly and automatically.

The “cost” of task-switching represents

- A. how difficult the math facts are, or
- B. how much longer it takes you to do the challenge with switching than without?

23. Task-switching is an important skill because it’s a member of a very important set of skills called *executive functions*. These are the skills involved in thinking about what you want in the future, working for future gain and not just short-term pleasure, planning, making good decisions, and keeping on track with what you’re supposed to be doing. Someone who is very skilled in executive functions is much more likely to be successful in all areas of life. Task-switching may be a great way to

build up the “mental muscles” that are involved in executive functioning, particularly the part having to do with “keeping on track with what you’re supposed to be doing.”

The point of this section is that

- A. task-switching is one of a set of important skills called executive functioning skills, that involve making good plans and carrying them out, or
- B. task-switching requires lots of mental effort?

24. There’s another benefit of doing the exercises in this book: an increase in “work capacity.” It takes a lot of mental effort just to practice math facts and read lists of words. It takes even more concentration and mental effort when you add task-switching to the challenge! Some people get tired of putting out mental effort very quickly – they have lower “work capacity” than the people who can keep on doing mental work for a long time. Having lots of work capacity lets you finish more of the things you need to do to accomplish your goals. It’s a very important skill to have.

You increase your physical work capacity by doing lots of exercise. People who train and push their bodies to improve can do enormously much more physical work than those who do not train. Part of the idea of this book is that you can increase your mental work

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capacity by lots of training and practice, very much like physical work capacity.

The main idea of this section is that

- A. by training and doing mental workouts, you can increase your ability to tolerate lots of mental work,
- or
- B. it does little good to have high work capacity if you're doing the wrong task?

25. If you are either the tutor or the student who is getting ready to lead or do the exercises in this book, it will help you very much if you can convince yourself that

- 1. task-switching
- 2. work capacity
- 3. math facts (and word problems)
- 4. and word-reading

are all very important skills, and that they are worth a great deal of work to improve.

The main point of this section is that

- A. the lists to follow will task-switch between two different directions,
- or
- B. it will be easier to do the exercises that follow if you're convinced that the skills they exercise are important ones for you?

26. You'll probably also be more successful if you expect, and are not

scared of, some fatigue. When people work out physically, they get very tired. But they don't mind getting tired, because they know they are increasing their strength and endurance. If you can have the same attitude toward mental fatigue, that will help you greatly. It will help if you can think, "I'm tired, but that's good! That means I'm probably improving my work capacity!" The more you can think this instead of "I'm tired – that means I must stop!" the better you'll do.

This section is promoting

- A. an attitude toward mental fatigue that says, "This means I'm improving," rather than "This means I need to stop,"
- or
- B. the idea that you should do lots of physical exercise as well as mental exercise?

27. Just as when you are getting into good physical shape, you want to take it gradually. Someone who wants to someday run a marathon does not try to run 26 miles on the first day of training. It's best to start with a challenge that will make you push yourself some, but not one that will be very painful for you. You give yourself time to build up your endurance. The same thing goes for mental work. When starting out, 5 minutes of work per day on task-switching may be plenty. After training, one can work up to a good deal more than that.

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The main idea is that

A. people are different from the very start in how much work capacity they have,
or

B. it's good to start out with a little task-switching and gradually build up your "mental muscles" to the point where you're doing lots more?

28. This sort of training is like training for a race in another way, too. You don't just do the exercises. You do them and time yourself, and you get yourself very motivated to improve your speed. You compare your speeds to your previous speeds. You don't do any given page just once. If it's worth doing, it's worth doing several times, to see if you can get faster and faster. If you do get much faster by practicing, you try to really celebrate that, and to feel just great about it.

A summary of this section is that

A. you have lots of work to do if you want to get really good at the skills this book helps you practice,
or

B. you don't just do the work, but measure how fast you can do it, and greatly celebrate when you improve your speed?

29. Especially when you're starting out, it's good to do task-switching in some

ways that don't get you quite as tired as doing math facts or reading word lists. So before we go into practicing task-switching while doing math and reading, let's mention, in the next chapter, some games and activities that also let you practice task-switching.

The next chapter will describe

A. games and activities for task switching,
or

B. math and reading activities?

Some Task-Switching Games

Beach Ball Throwing

30. There are several ways to throw a beach ball with two hands, but two of them are “overhand” and “underhand.” When you throw it overhand, your fingers point up; when you throw it underhand, your fingers point down. The first activity is called “Same.” This means that when the tutor throws the ball overhand, the student throws it back overhand; when the tutor throws the ball underhand, the student throws it back underhand.

Then at some point, the tutor calls out, “other.” From now until when the tutor says “Same” again, the student throws the ball back in the other way from the way the tutor threw it. That is, when the tutor throws it overhand, the student throws it back underhand, and vice versa.

The tutor and the student can switch roles, so that the student gets to call whether the directions are “same” or “other.”

The better summary of this task-switching activity is that

A. the directions alternate between “throw it back the same way I throw it” and “throw it back the other way,”

or

B. the tutor and student throw the ball back and forth a lot?

Jumping Jacks, and other varieties of Two Motions

31. The exercise called “jumping jacks” has two parts. In one, you move your hands from down at your sides, out, up to over your head. In the second, you jump your feet from a “together” position to a “spread apart” position.

In this activity, you’ll be doing one of those parts at a time. When the directions are “same,” the tutor does either the hands part or the legs part, and the student does the same thing. When the tutor says “other,” the student works the legs whenever the tutor works the arms, and the student works the arms whenever the tutor works the legs.

The better summary of this activity is that

A. it’s good to do some jumping when you’re restless,

or

B. you alternate between two conditions, one where the student does the same exercise as the tutor, and one where the student does the other one?

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32. You can make up an unlimited number of variations on this, all of which can be called “Two Motions.” You define any two ways of exercising, moving, or wiggling. One variation is “runs and squats,” where the two tasks are running in place and doing knee bends. Another is “curls and presses,” where both tutor and student have some dumbbells in hand, and the two tasks are doing curls (using your biceps to lift the weight from waist to shoulder) and doing presses (using your shoulder muscles to lift the weight from shoulder to fully extended overhead).

To make this activity more fun, invent a new type of funny wiggle every time you do it. Get the student involved in making up the two movements to do. Let the student be the “caller” of “same” or “other,” some of the time. Do it to music if you want.

This is a good way to practice task-switching when the student has been sitting down reading and doing math for long enough to get restless!

The author seems to hope that the “two motions” activity can be done

- A. in a gleeful way,
- or
- B. in a very serious way?

Tick Tock

33. As in the first two activities, there is a “same” direction and an “other”

direction. You decide on two words – tick and tock, for this example, but they could be “Bye” and “Hi,” or “Up” and “Down,” or “Snake” and “Grape,” or whatever you want. If the directions are “same,” then the student says whatever word the tutor said, right after the tutor says it. If the directions are “other,” the student says the other word. So a round could start like this:

Tutor: Same! tick
Student: tick
Tutor: tick
Student: tick
Tutor: tock
Student: tock
Tutor: Other! tock
Student: tick
Tutor: tick
Student: tock

One of the advantages of this activity is that you can do it over the phone.

The two different tasks that make this a task switching activity are

- A. saying tick or saying tock,
or
- B. saying the same word the tutor said,
or the other word?

Regular Simon Says and Reverse Simon Says

34. The regular version of the game Simon Says goes like this: the leader

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says to do a bunch of things. If the leader says “Simon says jump up and down,” you’re supposed to jump up and down. If the leader says “Jump up and down,” you’re *not* supposed to jump up and down. That is, you only obey Simon, not just generic commands.

In Reverse Simon Says, the directions are the opposite. If the leader says “Say *house*,” you say *house*; if the leader says “Simon says say *frog*,” you don’t say *frog*.

So in this activity, the tutor calls out “regular!” and “reverse” to signal which set of directions applies. Or if you want, the directions can be “Obey Simon” and “Disobey Simon.”

If you stuck to commands like saying words, humming, whistling, yawning loudly, sneezing, coughing, and other things that you can hear, would it be possible to do this game over the phone?

- A. yes,
- or
- B. no?

Alternate Reading

35. A major activity we have used in psychoeducational tutoring is alternate reading – the tutor and the student take turns reading aloud to each other. In a book like this, we have usually taken turns by the numbered section: for example, if the tutor reads section 24, the student would read section 25.

To make alternate reading a task-switching activity, you can switch among different ways of alternating. You can take turns every sentence or every paragraph, and switch back and forth between these two.

Switching between alternating by sentence and alternating by paragraph is a task-switching activity because

- A. you have to hold in mind the directions of when to give the other person a turn, as well as holding in mind whatever you are reading,
- or
- B. taking turns reading makes a social activity out of something that would otherwise be done alone?

Typing Lessons

36. The student puts fingers on the home keys, in the standard position for touch typing. That is: left little finger on a, left ring on s, left middle on d, left index on f. Right index on j, right middle on k, right ring on l, and right little on semicolon. The right thumb depresses the space bar.

The first task, “letter only,” is that when the tutor calls out a letter on the home row, the student types the letter (with the correct finger!) These letters can include g and h, which are typed with the left index and right index respectively. After typing them, the student returns the fingers to the home keys. If the tutor calls out “space,” the

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student presses the space bar with the right thumb.

The second task, “diagonal,” is that when the tutor calls out a letter, the student types the “diagonal” that is typed with the same finger that is used to type that letter. Thus when the tutor calls out “a,” the student types “aqaz” followed by a space. When the tutor calls out “s,” the response is swsx, and so on, for dedc, frfv, gtgb, hyhn, ujjm, kik, lol., and ;p;/.

The tutor switches back and forth between these two tasks by calling out “letter only” and “diagonal.”

If the student practices task-switching with these two activities enough, the student is well on the way to learning touch typing.

The alternation just described in this activity is

A. between typing a letter on the home row and typing the diagonal that goes with that letter,

or

B. typing a space after the letter or not typing a space after the letter?

37. Here’s another similar typing activity. This one takes the student up the hierarchy of typing skill after mastering the previous activity.

The tutor calls out any letter of the alphabet, or semicolon, slash, comma, or period. In the first task, called “diagonal,” the job of the student is to type (with the correct finger!) the

diagonal that contains that letter or punctuation mark. For example, if the tutor calls out “c,” the student types dedc followed by a space. If the tutor calls out “comma,” the student types kik, followed by a space.

The second task is “letter only.” Now if the tutor calls out “c,” the student types the letter c, using the left middle finger. The tutor alternates between “letter only” and “diagonal,” as before.

In this activity, the tutor can call out letter sequences that make words. If the sequences make words even during the “diagonal” part of the activity, the resulting diagonals make a secret code of sorts.

The words the tutor uses to switch tasks in this exercise are

A. the same as in the previous typing exercise,

or

B. are different from in the previous typing exercise?

Stroop Number

38. This activity is a way to do a version of a Stroop test. There are two sets of directions: Repeat the Number and Count the Numbers.

The tutor says the number one, two, three, or four, and says it either one, two, three, or four times. If the directions are “Repeat the number,” or just “Repeat!” you just repeat whatever

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number the tutor said. If the directions are “Count the numbers,” or just “Count!” you count how many times the tutor said the number and say the number you get from counting.

So here’s an example:

Tutor: Repeat! 3, 3.

Student: 3.

Tutor: 1, 1, 1, 1.

Student: 1.

Tutor: Count! 1, 1.

Student: 2

Tutor: 3, 3, 3, 3.

Student: 4.

Should it be possible to do this activity over the phone?

A. yes,

or

B. no?

Subset and Superset

39. The tutor says a word like “dog.” If the directions are “subset,” then you say a subset of dogs – like “collie” or “beagle.” If the directions are “superset,” then you say a class of which dogs are a subset – for example, “animals” or “mammals.” The directions alternate, as in the other activities.

Here’s an example:

Tutor: Subset! Clothing.

Student: Shirt.

Tutor: Machine.

Student: Computer.

Tutor: Silverware.

Student: Fork.

Tutor: Superset! Pencil.

Student: School supplies.

Tutor: Nickel.

Student: Coins.

Tutor: Guitar.

Student: Musical instruments.

Which of the following is correct?

A. vegetables is a subset of foods,
or

B. vegetables is a superset of foods?

Singing in Harmony and Unison

40. As long as we’ll be working on math facts, here’s a way to work on them that will appeal to those who are musically inclined. I’ve written some skip-counting songs to help people learn multiplication. For example, the lyrics to one of these songs is

3, 6, 9, 12, 15, 18
21, 24, 27, 30.

There is a regular melody for this, and a harmony part. You can sing the two parts in harmony, and it sounds good. I hope that you can find these melodies on the internet, by the time you read this.

Singing harmony is sort of a task-switching activity in itself, because

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you have to alternate in your mind between listening to the other person's note and listening to your own note.

What makes this an even greater task switching activity is this. One person just sings the melody. The other person, the task-switcher, shifts back and forth between singing the harmony part and singing in unison with the other singer. This is hard enough that the task switcher should be able to decide upon his or her own time to switch.

Of course, any other song with two part harmony is also one you can use for this activity.

A task-switching part of this activity is

- A. following the different directions of "sing in unison" or "sing in harmony,"
- or
- B. remembering the skip counting numbers, if you are using a skip-counting song?

Practicing Task-Switching with Math Facts

Our philosophy with this book is that task-switching may turn out to be a great way of “building up” extremely useful portions of the prefrontal cortex or other brain regions that help with “executive functioning,” or delaying gratification, planning, and decision-making. But at this point, no one knows how many hours of task-switching practice are sufficient to produce maximum benefit. But if you can practice task-switching at the same time that you practice academic skills that are crucial to your success in school, you are practicing two very important things at once. If task-switching practice turns out to be less useful than we predict, you still will not have wasted your time, because you will have practiced academic skills.

The two skills that take up most of the pages that follow are math facts and word-reading. The student who can not only do these “well enough,” but who can do them totally fluently and automatically, has a major advantage in all future school work.

Let’s talk first about the math facts pages.

The first task with any of these pages is to get to the point where you can say the answers correctly. Once you can do that, then you go for greater and greater speed. Any time trial can be done in either of two ways: you time how long it takes to do all 100

problems, or you time and see how many problems you can do in one minute.

Let’s review the way to calculate the “cost” of task-switching. You ignore the written directions and have a time trial with one of the directions. Then you have another time trial, using the other directions. You average those two times. Then, you do a time trial with the switching in effect. (If you make an error, including the error of following the wrong directions, the tutor corrects the error and the student goes back and says the item correctly. Thus making errors adds to the time for the time trial.)

You find the difference between speed with switching and speed without switching. The answer is the cost of switching. As you get better and better at task-switching, that cost will go down and down.

Periodically, you can ignore the directions and just say the answers to the math facts. You should shoot for over 60 answers per minute, all correct.

The addition facts go through a certain sequence. We start with the plus 0’s, plus 1’s, and plus 2’s, which are easy to do by counting up. Then we do the plus 10’s, which are easy to do by adding a one before the number to be added to 10. Then we do the doubles, such as 6+6, which are easy for most people to remember. Next comes the

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“one aparts,” such as $6+7$. You can figure these out from knowing the doubles – if $6+6$ is 12, then $6+7$ is one more than 12, or 13. Next come the “two aparts,” which also can be figured out from the doubles. In figuring out $6+8$, for example, you can take one off the 8 and put it on the 6, and realize that the answer is the same as $7+7$, or 14. Then we do the plus 9’s, which are one less than the corresponding plus 10. Finally, there are 6 more facts that don’t yield to any of the tricks above, that can be figured out in any of several other ways.

Please don’t hesitate to do any given page of facts several times. Keep a record of the speed with which the task was done, and see how much the speed can increase. It is a very good idea to graph, or at least put into a table, the speed for any page, over repeated trials. If at all possible, the student should become very involved in recording and graphing the speeds and in celebrating new speed records. If the student finds the task so hard as to be very frustrating, practice it more without task-switching or go back to an easier page.

Addition Facts

Plus 0's, Plus 1's, and Plus 2's.

For "A only," (that is, "Answer only") When you see $2+7$, say 9. For "Q and A," (or "Question and Answer") when you see $2+7$, say " $2+7=9$."

Q and A	29. $9+1$	58. $1+4$	87. $1+5$
1. $0+9$	30. $0+10$	59. $10+0$	88. $0+6$
2. $2+4$	31. $0+9$	60. $3+1$	89. $0+9$
3. $1+5$	32. $9+2$	61. $6+2$	90. $6+1$
4. $1+7$	33. $0+0$	62. $3+1$	91. $10+2$
5. $3+2$	34. $2+3$	63. $3+2$	92. $0+5$
6. $10+1$	35. $1+5$	64. $2+2$	93. $0+2$
7. $9+2$	36. $1+7$	65. $6+2$	94. $1+8$
8. $8+0$	37. $1+9$	A only	95. $1+4$
9. $1+6$	Q and A	66. $8+2$	96. $4+1$
10. $2+7$	38. $6+0$	67. $2+8$	97. $0+6$
A only	39. $5+0$	68. $2+8$	98. $5+2$
11. $1+8$	40. $3+1$	69. $9+1$	99. $1+1$
12. $2+7$	41. $3+2$	70. $0+5$	Q and A
13. $8+1$	42. $6+2$	71. $6+0$	100. $2+7$
14. $10+1$	43. $3+0$	72. $2+0$	
15. $8+0$	44. $10+1$	73. $4+1$	
16. $3+0$	45. $0+6$	74. $3+1$	
17. $2+9$	A only	Q and A	
18. $8+1$	46. $0+10$	75. $10+2$	
Q and A	47. $4+1$	76. $2+0$	
19. $5+1$	48. $1+8$	77. $1+6$	
20. $7+1$	49. $6+0$	78. $3+2$	
21. $1+10$	50. $10+1$	79. $2+8$	
22. $3+0$	51. $10+1$	80. $10+2$	
23. $2+8$	52. $0+0$	81. $1+9$	
24. $4+0$	53. $9+1$	82. $1+3$	
25. $1+0$	54. $9+1$	83. $10+2$	
26. $1+10$	Q and A	84. $0+3$	
27. $5+2$	55. $0+2$	85. $5+1$	
A only	56. $7+1$	A only	
28. $1+1$	57. $7+1$	86. $2+4$	

Plus 0's, Plus 1's, and Plus 2's, Set 2

For “Num and A,” (or “Number and Answer”) when you see 1. $2+7$, say “1, 9.”

A only	31. $6+2$	62. $1+3$	92. $5+0$
1. $2+7$	32. $0+7$	Num and A	93. $4+2$
2. $10+0$	33. $0+0$	63. $0+0$	94. $10+1$
3. $0+8$	34. $1+9$	64. $1+9$	95. $5+0$
4. $1+7$	35. $9+1$	65. $1+1$	96. $10+2$
5. $2+2$	36. $0+5$	66. $0+6$	Num and A
6. $8+0$	A only	67. $7+2$	97. $2+2$
7. $5+1$	37. $3+0$	68. $9+1$	98. $0+4$
8. $6+0$	38. $3+0$	69. $1+9$	99. $8+0$
9. $1+1$	39. $0+6$	70. $7+2$	100. $0+2$
10. $2+7$	40. $9+0$	A only	
11. $2+8$	41. $2+7$	71. $10+1$	
Num and A	42. $1+9$	72. $1+2$	
12. $1+8$	43. $9+0$	73. $0+3$	
13. $4+1$	Num and A	74. $5+1$	
14. $1+9$	44. $1+0$	75. $1+3$	
15. $6+1$	45. $1+7$	76. $4+2$	
16. $2+7$	46. $7+2$	77. $2+9$	
17. $0+8$	47. $0+6$	78. $0+8$	
18. $5+2$	48. $5+1$	79. $2+3$	
19. $1+9$	49. $0+8$	80. $1+9$	
20. $0+0$	50. $1+6$	Num and A	
21. $0+6$	51. $0+1$	81. $2+5$	
A only	52. $5+2$	82. $0+8$	
22. $1+4$	53. $1+5$	83. $7+1$	
23. $1+10$	A only	84. $2+3$	
24. $2+7$	54. $10+2$	85. $1+4$	
25. $0+9$	55. $4+2$	86. $8+0$	
26. $2+1$	56. $8+2$	87. $1+4$	
27. $5+2$	57. $2+0$	88. $9+0$	
Num and A	58. $2+5$	89. $5+2$	
28. $4+0$	59. $7+1$	90. $0+4$	
29. $0+4$	60. $4+1$	A only	
30. $5+2$	61. $3+1$	91. $1+6$	

Plus 10's, Set 1

Q and A	33. 9+10	66. 8+10	97. 9+10
1. 10+9	34. 8+10	A only	98. 10+6
2. 10+8	35. 1+10	67. 9+10	99. 10+2
3. 10+6	36. 7+10	68. 2+10	100. 10+0
4. 10+4	37. 5+10	69. 10+3	
5. 3+10	Q and A	70. 4+10	
6. 10+3	38. 5+10	71. 3+10	
7. 10+8	39. 5+10	72. 1+10	
8. 0+10	40. 8+10	73. 1+10	
A only	41. 1+10	74. 10+8	
9. 10+0	42. 2+10	75. 8+10	
10. 7+10	43. 10+3	76. 10+9	
11. 7+10	44. 4+10	Q and A	
12. 6+10	45. 10+9	77. 10+1	
13. 6+10	46. 10+1	78. 0+10	
14. 1+10	47. 2+10	79. 10+10	
15. 9+10	A only	80. 2+10	
16. 4+10	48. 10+4	81. 10+5	
17. 7+10	49. 10+5	82. 10+1	
Q and A	50. 10+1	83. 7+10	
18. 9+10	51. 3+10	84. 10+8	
19. 10+6	52. 6+10	85. 10+6	
20. 0+10	53. 4+10	86. 1+10	
21. 10+10	54. 10+1	87. 2+10	
22. 10+2	55. 10+6	A only	
23. 10+3	56. 8+10	88. 10+4	
24. 10+5	Q and A	89. 2+10	
25. 6+10	57. 9+10	90. 8+10	
26. 10+5	58. 10+5	91. 10+3	
27. 6+10	59. 2+10	92. 2+10	
A only	60. 10+6	Q and A	
28. 10+9	61. 10+8	93. 7+10	
29. 8+10	62. 10+3	A only	
30. 4+10	63. 2+10	94. 10+5	
31. 10+2	64. 10+10	95. 10+6	
32. 2+10	65. 2+10	96. 7+10	

Plus 10's, Set 2

Num and A

1. $0+10$

2. $2+10$

3. $10+5$

4. $6+10$

5. $6+10$

6. $9+10$

7. $4+10$

8. $10+4$

9. $8+10$

10. $8+10$

A only

11. $10+7$

12. $1+10$

13. $4+10$

14. $2+10$

15. $10+10$

16. $10+2$

17. $10+6$

18. $2+10$

19. $10+5$

20. $10+4$

Num and A

21. $10+1$

22. $10+9$

23. $10+0$

24. $10+3$

25. $3+10$

26. $6+10$

27. $6+10$

28. $10+1$

A only

29. $7+10$

30. $8+10$

31. $8+10$

32. $3+10$

33. $10+7$

34. $10+5$

35. $4+10$

36. $10+0$

37. $10+8$

38. $10+0$

39. $10+8$

40. $1+10$

Num and A

41. $5+10$

42. $10+10$

43. $10+10$

44. $10+1$

45. $10+8$

46. $10+4$

47. $10+9$

48. $10+1$

49. $10+3$

50. $6+10$

A only

51. $10+8$

52. $0+10$

53. $0+10$

54. $10+10$

55. $10+4$

56. $5+10$

57. $1+10$

58. $10+7$

59. $10+7$

60. $1+10$

Num and A

61. $5+10$

62. $5+10$

63. $1+10$

64. $10+1$

65. $10+8$

66. $10+6$

67. $10+8$

68. $4+10$

69. $10+1$

70. $9+10$

A only

71. $10+6$

72. $10+2$

73. $10+4$

74. $2+10$

75. $4+10$

76. $10+9$

77. $1+10$

78. $3+10$

79. $10+2$

80. $5+10$

81. $3+10$

82. $10+1$

83. $10+3$

84. $10+9$

Num and A

85. $10+6$

86. $10+2$

87. $10+0$

88. $10+4$

A only

89. $6+10$

90. $5+10$

91. $8+10$

92. $8+10$

93. $10+8$

94. $10+9$

95. $10+10$

96. $10+3$

97. $10+2$

Num and A

98. $10+10$

99. $10+8$

100. $3+10$

Doubles, Set 1

Q and A	33. 3+3	65. 1+1	97. 8+8
1. 3+3	34. 2+2	66. 0+0	98. 3+3
2. 10+10	35. 2+2	67. 0+0	99. 9+9
3. 9+9	Q and A	68. 4+4	100. 7+7
4. 3+3	36. 1+1	69. 7+7	
5. 8+8	37. 7+7	70. 7+7	
6. 5+5	38. 0+0	71. 5+5	
7. 5+5	39. 10+10	72. 4+4	
8. 6+6	40. 2+2	Q and A	
A only	41. 9+9	73. 6+6	
9. 8+8	42. 4+4	74. 2+2	
10. 6+6	43. 9+9	75. 9+9	
11. 6+6	44. 0+0	76. 4+4	
12. 10+10	45. 8+8	77. 6+6	
13. 3+3	46. 8+8	78. 8+8	
14. 4+4	A only	79. 5+5	
15. 0+0	47. 4+4	80. 9+9	
16. 2+2	48. 3+3	81. 3+3	
17. 1+1	49. 6+6	82. 4+4	
18. 3+3	50. 2+2	A only	
Q and A	51. 1+1	83. 9+9	
19. 0+0	52. 10+10	84. 4+4	
20. 5+5	53. 3+3	85. 5+5	
21. 5+5	Q and A	86. 9+9	
22. 4+4	54. 5+5	87. 0+0	
23. 9+9	55. 9+9	88. 2+2	
24. 2+2	56. 7+7	89. 8+8	
25. 1+1	57. 0+0	90. 6+6	
26. 7+7	58. 5+5	91. 1+1	
27. 8+8	59. 4+4	92. 1+1	
A only	60. 9+9	Q and A	
28. 6+6	61. 3+3	93. 9+9	
29. 3+3	62. 8+8	94. 9+9	
30. 9+9	A only	95. 4+4	
31. 0+0	63. 7+7	A only	
32. 6+6	64. 5+5	96. 0+0	

Doubles, Set 2

Num and A	33. 7+7	66. 1+1	99. 7+7
1. 3+3	34. 4+4	67. 4+4	100. 7+7
2. 6+6	35. 1+1	68. 2+2	
3. 8+8	36. 3+3	69. 8+8	
4. 2+2	37. 5+5	70. 2+2	
5. 2+2	38. 5+5	71. 10+10	
6. 7+7	39. 10+10	A only	
7. 6+6	40. 10+10	72. 6+6	
8. 5+5	41. 3+3	73. 3+3	
9. 8+8	42. 9+9	74. 6+6	
10. 5+5	Num and A	75. 3+3	
A only	43. 8+8	76. 7+7	
11. 2+2	44. 4+4	77. 5+5	
12. 2+2	45. 10+10	78. 2+2	
13. 10+10	46. 7+7	79. 10+10	
14. 2+2	47. 6+6	80. 5+5	
15. 1+1	48. 0+0	81. 4+4	
16. 2+2	49. 0+0	Num and A	
Num and A	50. 0+0	82. 4+4	
17. 5+5	51. 6+6	83. 6+6	
18. 2+2	52. 7+7	84. 10+10	
19. 10+10	A only	85. 6+6	
20. 5+5	53. 9+9	86. 1+1	
21. 7+7	54. 10+10	87. 0+0	
22. 4+4	55. 9+9	88. 1+1	
23. 2+2	56. 1+1	89. 5+5	
24. 3+3	57. 7+7	A only	
25. 9+9	58. 6+6	90. 8+8	
26. 3+3	59. 3+3	91. 3+3	
27. 1+1	60. 6+6	92. 3+3	
28. 6+6	61. 0+0	93. 9+9	
A only	Num and A	94. 2+2	
29. 7+7	62. 0+0	95. 2+2	
30. 6+6	63. 1+1	96. 8+8	
31. 10+10	64. 10+10	97. 2+2	
32. 0+0	65. 5+5	98. 8+8	

One aparts

A only	33. 3+2	Q and A	99. 10+9
1. 3+2	34. 3+2	66. 4+3	A only
2. 6+5	35. 5+6	67. 1+2	100. 6+7
3. 7+8	36. 10+9	68. 6+5	
4. 1+2	37. 9+8	69. 4+5	
5. 5+6	A only	70. 5+4	
6. 7+8	38. 7+8	71. 4+3	
7. 10+9	39. 9+10	72. 3+2	
8. 3+2	40. 9+8	73. 9+10	
9. 5+4	41. 2+1	74. 7+6	
10. 9+8	42. 7+8	A only	
Q and A	43. 3+4	75. 7+8	
11. 8+7	44. 10+9	76. 5+4	
12. 9+8	45. 2+1	77. 4+5	
13. 9+10	Q and A	78. 9+10	
14. 8+7	46. 2+1	79. 8+9	
15. 7+6	47. 2+1	80. 7+6	
16. 7+8	48. 3+4	81. 10+9	
17. 3+2	49. 6+7	82. 3+4	
18. 9+10	50. 8+7	83. 7+8	
A only	51. 7+6	84. 5+6	
19. 4+5	52. 4+5	85. 2+3	
20. 7+8	53. 8+7	Q and A	
21. 5+6	54. 6+7	86. 7+8	
22. 5+4	A only	87. 5+4	
23. 9+10	55. 3+2	88. 8+9	
24. 9+8	56. 10+9	89. 10+9	
25. 3+4	57. 7+8	90. 7+8	
26. 4+5	58. 9+10	91. 6+7	
27. 5+4	59. 2+1	92. 10+9	
Q and A	60. 2+3	93. 8+9	
28. 3+4	61. 4+3	94. 9+8	
29. 8+9	62. 3+2	95. 10+9	
30. 1+2	63. 3+2	96. 2+1	
31. 4+5	64. 7+8	97. 6+5	
32. 3+2	65. 9+10	98. 3+2	

Two Aparts

Num and A

1. $8+10$
2. $3+5$
3. $3+1$
4. $9+7$
5. $4+2$
6. $1+3$
7. $3+1$
8. $2+4$
9. $4+2$
10. $3+1$
11. $2+0$

A only

12. $5+3$
13. $8+10$
14. $2+0$
15. $8+6$
16. $5+3$
17. $4+2$
18. $2+0$
19. $2+4$
20. $9+7$
21. $1+3$

Num and A

22. $2+4$
 23. $5+7$
 24. $7+9$
 25. $4+6$
 26. $2+0$
 27. $3+1$
- A only
28. $3+1$
 29. $1+3$
 30. $3+5$
 31. $4+6$
 32. $6+4$

33. $0+2$

34. $9+7$

35. $5+3$

36. $7+9$

Num and A

37. $3+1$

38. $2+0$

39. $6+4$

40. $8+10$

41. $2+4$

42. $3+1$

43. $4+6$

A only

44. $3+5$

45. $0+2$

46. $8+10$

47. $3+1$

48. $1+3$

49. $3+1$

50. $4+6$

51. $7+5$

52. $3+5$

53. $3+5$

Num and A

54. $6+8$

55. $8+10$

56. $5+3$

57. $7+5$

58. $5+3$

59. $6+8$

60. $8+10$

61. $2+4$

62. $0+2$

A only

63. $5+7$

64. $9+7$

65. $5+7$

66. $3+5$

67. $4+6$

68. $6+4$

69. $2+0$

70. $2+0$

Num and A

71. $4+2$

72. $3+5$

73. $10+8$

74. $7+5$

75. $7+5$

76. $10+8$

77. $10+8$

78. $9+7$

79. $4+2$

80. $1+3$

A only

81. $8+10$

82. $6+4$

83. $2+0$

84. $10+8$

85. $4+6$

86. $3+5$

87. $3+5$

88. $2+4$

89. $5+7$

90. $3+5$

Num and A

91. $4+6$

92. $7+5$

93. $10+8$

94. $3+1$

95. $8+6$

96. $6+8$

A only

97. $7+5$

98. $2+4$

99. $4+6$

100. $6+8$

Plus 9's

A only	33. 9+7	66. 9+10	99. 7+9
1. 9+0	34. 1+9	67. 4+9	100. 9+7
2. 9+6	35. 8+9	68. 7+9	
3. 9+9	A only	69. 8+9	
4. 9+3	36. 4+9	70. 8+9	
5. 9+9	37. 9+0	71. 9+2	
6. 1+9	38. 6+9	Q and A	
7. 9+8	39. 6+9	72. 1+9	
8. 9+8	40. 9+1	73. 1+9	
Q and A	41. 4+9	74. 0+9	
9. 9+6	42. 9+1	75. 9+9	
10. 7+9	43. 6+9	76. 9+9	
11. 9+7	44. 9+10	77. 9+0	
12. 9+7	45. 3+9	78. 7+9	
13. 1+9	46. 9+5	79. 9+5	
A only	47. 9+6	A only	
14. 9+2	48. 9+0	80. 4+9	
15. 9+7	Q and A	81. 9+6	
16. 9+2	49. 4+9	82. 9+9	
17. 0+9	50. 1+9	83. 2+9	
18. 9+5	51. 9+9	84. 9+3	
19. 9+9	52. 1+9	85. 9+10	
20. 4+9	53. 6+9	86. 9+0	
Q and A	54. 10+9	87. 6+9	
21. 9+1	55. 5+9	88. 8+9	
22. 4+9	56. 0+9	89. 9+4	
23. 9+6	57. 3+9	90. 9+6	
24. 9+9	58. 5+9	Q and A	
25. 8+9	59. 8+9	91. 8+9	
26. 5+9	60. 9+4	92. 5+9	
27. 0+9	A only	93. 1+9	
28. 6+9	61. 4+9	94. 9+8	
29. 8+9	62. 8+9	95. 8+9	
30. 9+4	63. 9+0	96. 8+9	
31. 9+10	64. 9+8	97. 9+1	
32. 9+4	65. 9+5	98. 9+4	

The Remaining Six

Num and A	33. 4+7	66. 5+8	99. 8+5
1. 8+3	34. 5+8	67. 8+5	100. 8+3
2. 5+8	35. 3+7	68. 8+4	
3. 4+7	36. 7+3	69. 7+4	
4. 3+8	37. 8+5	70. 4+7	
5. 7+4	38. 4+8	71. 8+5	
6. 3+6	39. 6+3	72. 4+7	
7. 8+3	40. 7+3	A only	
8. 7+3	Num and A	73. 8+3	
9. 4+7	41. 4+7	74. 6+3	
10. 4+7	42. 6+3	75. 3+7	
11. 4+8	43. 8+5	76. 8+3	
A only	44. 6+3	77. 5+8	
12. 6+3	45. 5+8	78. 3+7	
13. 8+5	46. 4+8	79. 8+5	
14. 5+8	47. 3+8	80. 6+3	
15. 3+6	48. 7+3	81. 3+8	
16. 8+3	49. 5+8	82. 3+8	
17. 8+3	50. 4+7	83. 8+5	
18. 4+7	51. 8+4	84. 8+5	
19. 4+7	52. 4+8	85. 8+3	
20. 5+8	53. 3+8	86. 7+4	
21. 8+5	A only	87. 3+6	
Num and A	54. 8+3	Num and A	
22. 4+7	55. 8+5	88. 4+8	
23. 3+7	56. 5+8	89. 6+3	
24. 3+8	57. 7+4	90. 8+4	
25. 3+7	58. 5+8	91. 8+4	
26. 3+8	59. 8+3	92. 8+5	
27. 3+6	60. 4+7	93. 7+4	
28. 3+7	61. 6+3	94. 7+4	
29. 7+3	62. 4+7	95. 5+8	
30. 3+6	63. 8+4	A only	
31. 8+5	64. 4+8	96. 6+3	
32. 5+8	65. 3+8	97. 4+8	
A only	Num and A	98. 4+8	

All Addition Facts, Set 1

Q and A	33. 1+10	66. 2+6	99. 2+6
1. 2+7	34. 6+6	67. 1+3	100. 4+10
2. 2+6	35. 2+3	68. 6+10	
3. 9+10	36. 5+7	69. 8+10	
4. 6+9	37. 4+5	70. 2+10	
5. 8+10	38. 2+3	71. 1+4	
6. 3+3	39. 3+4	72. 3+5	
7. 8+9	40. 1+7	A only	
8. 7+10	41. 3+5	73. 4+9	
9. 8+8	42. 2+7	74. 4+6	
10. 5+7	Q and A	75. 0+2	
11. 9+10	43. 1+5	76. 2+10	
12. 0+0	44. 8+9	77. 2+9	
13. 0+8	45. 1+3	78. 0+8	
A only	46. 8+8	79. 1+1	
14. 5+7	47. 6+8	80. 1+9	
15. 4+9	48. 10+10	81. 6+6	
16. 7+10	49. 2+10	82. 2+8	
17. 1+10	50. 1+1	83. 7+8	
18. 3+8	51. 3+6	84. 4+8	
19. 6+10	52. 2+7	85. 1+9	
20. 1+10	53. 1+9	86. 4+7	
21. 9+9	A only	87. 0+8	
22. 5+10	54. 3+10	Q and A	
23. 2+2	55. 1+9	88. 3+3	
Q and A	56. 1+1	89. 1+7	
24. 8+9	57. 8+9	90. 2+2	
25. 5+8	58. 4+5	91. 8+10	
26. 4+10	59. 4+8	92. 6+10	
27. 6+8	60. 5+5	93. 4+4	
28. 0+7	61. 2+9	94. 3+7	
29. 0+9	Q and A	95. 0+0	
30. 3+8	62. 9+10	A only	
A only	63. 4+9	96. 2+10	
31. 8+10	64. 5+7	97. 4+5	
32. 2+10	65. 1+1	98. 4+4	

All Addition Facts, Set 2

A only	33. 7+2	66. 4+10	99. 9+9
1. 8+7	34. 10+1	67. 10+3	100. 3+7
2. 5+0	35. 8+8	68. 4+5	
3. 6+7	A only	Num and A	
4. 3+9	36. 8+4	69. 8+10	
5. 2+1	37. 7+8	70. 9+1	
Num and A	38. 9+2	71. 1+3	
6. 0+7	39. 10+10	72. 1+1	
7. 2+9	40. 2+4	73. 1+5	
8. 0+9	41. 3+5	74. 4+2	
9. 3+1	42. 0+2	75. 9+4	
10. 10+2	43. 3+10	76. 1+7	
11. 4+6	44. 4+8	77. 4+9	
12. 5+7	45. 8+5	78. 10+6	
13. 5+5	46. 9+10	79. 6+6	
A only	47. 3+6	A only	
14. 7+7	Num and A	80. 3+2	
15. 10+7	48. 8+9	81. 10+9	
16. 5+9	49. 3+4	82. 9+0	
17. 10+5	50. 6+1	83. 7+6	
18. 4+3	51. 0+5	84. 8+6	
19. 8+2	52. 0+1	85. 0+6	
20. 6+8	53. 9+6	86. 9+5	
21. 8+3	54. 5+8	87. 4+4	
22. 8+0	55. 0+0	88. 0+3	
23. 8+1	56. 9+8	89. 2+3	
24. 5+3	57. 1+9	Num and A	
25. 1+6	58. 1+8	90. 5+1	
26. 2+5	59. 2+6	91. 10+4	
27. 5+6	60. 3+8	92. 2+7	
28. 7+9	A only	93. 3+3	
Num and A	61. 6+4	94. 7+4	
29. 0+8	62. 1+10	95. 6+3	
30. 4+1	63. 6+0	96. 6+5	
31. 2+10	64. 4+7	97. 7+1	
32. 9+3	65. 6+2	98. 4+0	

All Addition Facts, Set 3

For “Sum-1st=2nd,” when you see 2+7, say “9 minus 2 equals 7.”

Sum-1st=2nd	32. 4+1	64. 4+6	94. 7+3
1. 9+7	33. 4+8	A only	95. 4+7
2. 8+6	34. 6+0	65. 5+4	96. 8+5
3. 6+3	35. 7+9	66. 9+1	97. 5+5
4. 6+1	36. 3+5	67. 10+5	98. 7+7
5. 1+10	Sum-1st=2nd	68. 8+8	99. 5+9
6. 0+2	37. 0+7	69. 2+9	100. 1+0
7. 7+0	38. 9+5	70. 3+3	
A only	39. 9+3	71. 3+10	
8. 6+8	40. 2+5	72. 10+7	
9. 7+10	41. 0+1	73. 9+0	
10. 1+4	42. 0+3	74. 2+1	
11. 8+7	43. 9+2	Sum-1st=2nd	
12. 3+9	44. 0+5	75. 3+4	
13. 3+1	45. 2+2	76. 6+10	
14. 5+6	46. 0+9	77. 9+10	
15. 8+0	A only	78. 4+9	
Sum-1st=2nd	47. 6+9	79. 8+4	
16. 6+2	48. 2+6	A only	
17. 10+6	49. 10+2	80. 0+4	
18. 9+4	50. 7+1	81. 1+6	
19. 3+2	51. 1+9	82. 4+2	
20. 10+10	52. 8+10	83. 1+5	
21. 2+10	Sum-1st=2nd	84. 1+7	
22. 7+5	53. 1+2	85. 8+2	
23. 6+6	54. 3+8	86. 4+3	
24. 2+0	55. 10+0	Sum-1st=2nd	
A only	56. 9+8	87. 1+3	
25. 7+6	57. 9+9	88. 2+3	
26. 7+4	58. 6+5	89. 4+4	
27. 10+8	59. 1+1	90. 8+9	
28. 8+3	60. 3+0	91. 0+6	
29. 5+1	61. 2+8	92. 4+5	
30. 9+6	62. 7+2	93. 5+7	
31. 4+10	63. 1+8	A only	

All Addition Facts, Set 4

A only	34. 5+0	66. 8+5	98. 3+3
1. 2+4	35. 4+8	67. 8+1	99. 10+10
2. 0+9	36. 6+4	68. 0+1	100. 9+4
3. 2+7	Sum-1st=2nd	69. 4+1	
4. 6+3	37. 4+4	70. 10+3	
5. 8+8	38. 9+0	71. 0+8	
6. 9+5	39. 6+6	72. 5+6	
7. 5+10	40. 9+10	73. 5+5	
8. 2+1	41. 8+2	Sum-1st=2nd	
9. 9+7	42. 1+7	74. 2+2	
10. 10+2	43. 5+2	75. 3+10	
11. 3+8	44. 2+5	76. 6+10	
12. 8+9	45. 9+9	77. 2+8	
Sum-1st=2nd	46. 0+0	78. 9+8	
13. 7+1	47. 8+0	79. 7+3	
14. 2+10	A only	80. 1+1	
15. 5+9	48. 1+8	81. 0+7	
16. 0+3	49. 7+2	82. 2+0	
17. 9+1	50. 8+6	83. 7+0	
18. 3+0	51. 0+4	84. 1+5	
19. 10+6	52. 7+9	85. 8+4	
20. 9+2	Sum-1st=2nd	A only	
21. 4+5	53. 10+4	86. 0+2	
22. 7+4	54. 6+1	87. 1+0	
A only	55. 10+9	88. 10+7	
23. 8+10	56. 4+9	89. 5+7	
24. 10+8	57. 1+10	90. 0+5	
25. 4+7	58. 6+7	Sum-1st=2nd	
26. 7+8	59. 7+7	91. 2+9	
27. 9+3	60. 7+10	92. 3+4	
28. 6+2	61. 0+6	93. 3+5	
29. 6+0	62. 1+6	94. 7+5	
30. 2+3	63. 5+8	95. 10+5	
31. 5+4	A only	96. 1+3	
32. 3+9	64. 8+7	A only	
33. 1+2	65. 7+6	97. 4+0	

Subtraction Facts

All Subtraction Facts, Set 1

A only	31. 7-3	62. 14-4	93. 13-5
1. 6-6	32. 3-1	63. 17-10	94. 11-4
2. 5-5	33. 8-3	64. 12-8	95. 9-4
3. 10-4	34. 6-5	65. 7-6	96. 12-7
4. 9-6	35. 13-9	66. 16-9	97. 7-7
5. 18-8	A only	67. 7-0	98. 2-2
Q and A	36. 18-10	68. 11-5	99. 1-1
6. 9-5	37. 15-6	Q and A	100. 16-10
7. 17-7	38. 11-6	69. 13-6	
8. 5-2	39. 13-4	70. 8-0	
9. 6-4	40. 7-2	71. 10-2	
10. 10-5	41. 9-8	72. 2-1	
11. 5-1	42. 14-5	73. 19-10	
12. 12-6	43. 7-5	74. 16-8	
13. 16-7	44. 11-7	75. 10-8	
A only	45. 6-3	76. 7-4	
14. 6-2	46. 15-9	77. 6-0	
15. 3-0	47. 12-10	78. 8-7	
16. 10-7	Q and A	79. 15-10	
17. 9-0	48. 12-4	A only	
18. 9-3	49. 8-4	80. 0-0	
19. 9-9	50. 15-5	81. 5-0	
20. 14-7	51. 14-9	82. 13-10	
21. 9-2	52. 11-2	83. 17-8	
22. 4-3	53. 9-7	84. 14-6	
23. 6-1	54. 10-9	85. 4-2	
24. 10-10	55. 14-10	86. 12-2	
25. 11-9	56. 15-7	87. 8-6	
26. 19-9	57. 2-0	88. 15-8	
27. 3-3	58. 13-7	89. 1-0	
28. 20-10	59. 4-4	Q and A	
Q and A	60. 5-4	90. 5-3	
29. 11-10	A only	91. 12-9	
30. 11-3	61. 10-1	92. 11-1	

All Subtraction Facts, Set 2

Q and A	33. 11-3	66. 15-8	99. 0-0
1. 11-4	34. 10-7	67. 13-7	100. 13-6
2. 15-6	35. 9-5	68. 14-7	
3. 16-9	36. 5-0	69. 12-8	
4. 7-6	37. 17-7	70. 6-1	
5. 18-9	38. 10-9	71. 9-7	
6. 11-8	39. 11-10	72. 6-4	
7. 9-8	40. 16-8	73. 8-2	
8. 6-2	Q and A	74. 14-5	
9. 7-1	41. 18-10	75. 10-1	
10. 5-2	42. 6-5	76. 10-0	
A only	43. 12-2	77. 8-0	
11. 4-1	44. 5-1	78. 5-3	
12. 11-2	45. 7-4	79. 9-3	
13. 9-0	46. 5-4	80. 9-1	
14. 7-3	47. 17-8	A only	
15. 10-6	48. 13-3	81. 1-1	
16. 14-10	49. 8-4	82. 10-8	
17. 3-0	50. 6-0	83. 4-4	
18. 2-0	51. 19-10	84. 18-8	
19. 11-5	52. 10-5	85. 8-7	
20. 6-3	A only	86. 9-2	
21. 7-5	53. 10-3	87. 16-7	
Q and A	54. 15-7	Q and A	
22. 12-3	55. 7-7	88. 1-0	
23. 10-4	56. 14-9	89. 12-9	
24. 3-2	57. 13-4	90. 14-4	
25. 10-2	58. 7-0	91. 12-10	
26. 11-7	59. 9-9	92. 4-0	
27. 3-1	60. 4-3	A only	
28. 12-7	61. 8-1	93. 14-6	
29. 2-2	62. 13-10	94. 15-9	
A only	63. 11-6	95. 13-9	
30. 3-3	64. 4-2	96. 5-5	
31. 12-5	65. 11-1	97. 6-6	
32. 10-10	Q and A	98. 9-4	

All Subtraction Facts, Set 3

Num and A	33. 7-0	66. 18-8	99. 14-5
1. 15-5	34. 8-1	67. 3-2	100. 10-8
2. 8-8	35. 13-9	68. 13-8	
3. 19-9	Num and A	A only	
4. 16-7	36. 3-1	69. 1-0	
5. 12-6	37. 3-3	70. 11-9	
A only	38. 16-9	71. 6-4	
6. 14-7	39. 16-6	72. 19-10	
7. 12-2	40. 10-7	73. 7-2	
8. 5-0	41. 4-4	74. 12-10	
9. 8-5	42. 12-7	75. 11-4	
10. 2-1	43. 9-6	76. 8-3	
11. 13-5	44. 2-0	77. 11-10	
12. 2-2	45. 18-10	78. 15-6	
13. 7-1	46. 0-0	79. 17-10	
Num and A	47. 6-6	Num and A	
14. 7-5	A only	80. 14-6	
15. 9-4	48. 9-8	81. 10-5	
16. 13-6	49. 10-0	82. 7-3	
17. 9-7	50. 10-3	83. 4-2	
18. 12-5	51. 8-0	84. 8-4	
19. 11-2	52. 9-0	85. 10-2	
20. 12-9	53. 16-10	86. 14-9	
21. 18-9	54. 11-1	87. 6-2	
22. 5-2	55. 16-8	88. 8-6	
23. 11-8	56. 1-1	89. 12-8	
24. 20-10	57. 10-4	A only	
25. 10-6	58. 12-4	90. 15-8	
26. 11-7	59. 9-9	91. 17-8	
27. 15-9	60. 6-1	92. 13-4	
28. 8-2	Num and A	93. 17-7	
A only	61. 5-4	94. 6-0	
29. 14-10	62. 10-9	95. 5-5	
30. 3-0	63. 12-3	96. 9-1	
31. 10-10	64. 11-5	97. 14-4	
32. 6-3	65. 5-3	98. 13-10	

All Subtraction Facts, Set 4

A only

1. 9-2
2. 12-8
3. 6-5
4. 13-8
5. 5-5
6. 12-6
7. 9-8
8. 11-7

Q and A

9. 11-6
10. 17-10
11. 10-10
12. 14-8
13. 7-6
14. 13-9
15. 0-0
16. 15-8
17. 10-4
18. 12-3
19. 6-4
20. 5-1

A only

21. 10-0
22. 1-1
23. 15-9
24. 6-6
25. 17-7
26. 16-7
27. 10-3
28. 4-1
29. 2-0
30. 8-8
31. 9-3
32. 5-2
33. 8-7

Q and A

34. 5-4
35. 13-4
36. 13-3
37. 7-7
38. 18-9
39. 14-5
40. 3-3
41. 4-0
42. 9-7
43. 6-1
44. 12-2
45. 14-9
46. 10-8
47. 8-4
48. 10-6

A only

49. 7-4
 50. 16-10
 51. 3-2
 52. 7-2
 53. 4-2
 54. 6-3
 55. 9-6
 56. 11-3
 57. 4-4
 58. 13-7
 59. 12-7
- Q and A
60. 11-5
 61. 6-2
 62. 11-2
 63. 3-0
 64. 16-6
 65. 4-3
 66. 14-6

67. 6-0

A only

68. 12-9
69. 14-10
70. 8-5
71. 11-8
72. 19-10
73. 11-10
74. 1-0

Q and A

75. 9-1
76. 15-5
77. 17-9
78. 7-1
79. 18-8

A only

80. 16-8
81. 14-4
82. 13-10
83. 15-10
84. 2-2
85. 10-5
86. 17-8
87. 9-0
88. 12-4
89. 7-3
90. 7-0

Q and A

91. 12-5
92. 10-7
93. 9-5
94. 5-3
95. 10-9
96. 8-3
97. 15-6
98. 9-9

99. 14-7

100. 2-1

All Subtraction Facts, Set 5

A only	33. 17-8	66. 5-2	99. 6-4
1. 3-0	34. 19-9	67. 6-1	100. 6-6
2. 16-8	35. 12-9	68. 18-10	
3. 17-7	36. 10-6	69. 14-8	
4. 10-0	37. 15-9	70. 13-4	
5. 9-9	38. 8-1	71. 11-3	
6. 13-5	39. 13-6	72. 11-9	
7. 10-3	40. 9-3	Q and A	
8. 7-5	A only	73. 5-0	
9. 8-7	41. 10-10	74. 7-7	
10. 7-1	42. 18-8	75. 17-9	
11. 5-4	43. 2-1	76. 17-10	
Num and A	44. 20-10	77. 4-3	
12. 9-0	45. 10-1	78. 8-8	
13. 11-1	46. 15-10	79. 9-8	
14. 5-1	47. 1-1	80. 13-7	
15. 6-2	48. 18-9	81. 10-2	
16. 0-0	49. 12-4	82. 9-7	
17. 9-1	50. 3-3	83. 11-8	
18. 4-1	51. 10-4	84. 8-5	
19. 13-3	52. 14-10	85. 8-3	
20. 11-5	53. 13-10	86. 19-10	
21. 11-7	Q and A	87. 10-5	
A only	54. 10-9	A only	
22. 12-5	55. 7-2	88. 12-6	
23. 3-2	56. 9-4	89. 12-3	
24. 7-0	57. 12-10	90. 4-0	
25. 12-8	58. 6-3	91. 7-4	
26. 11-2	59. 5-5	92. 10-7	
27. 14-4	60. 11-6	93. 7-3	
28. 8-0	61. 13-9	94. 6-5	
29. 8-2	62. 1-0	95. 3-1	
30. 8-6	63. 2-0	Q and A	
31. 13-8	64. 16-9	96. 10-8	
32. 15-6	65. 16-6	97. 14-9	
Q and A	A only	98. 12-7	

Multiplication Facts

Times 0's, 1's, and 2's

Num and A

1. 8×0

2. 7×2

3. 2×0

4. 6×0

5. 0×5

6. 0×9

7. 2×6

8. 2×4

9. 1×6

10. 2×9

A only

11. 0×3

12. 7×1

13. 2×4

14. 0×1

15. 2×7

16. 8×0

17. 7×0

18. 4×1

Num and A

19. 7×1

20. 9×0

21. 0×5

22. 7×2

23. 2×4

24. 2×4

25. 1×3

26. 2×2

27. 7×2

A only

28. 9×0

29. 1×4

30. 10×1

31. 4×0

32. 6×1

33. 2×2

34. 8×1

35. 5×1

36. 2×0

37. 1×2

Num and A

38. 1×10

39. 0×9

40. 10×0

41. 1×5

42. 0×6

43. 2×2

44. 1×0

45. 2×7

A only

46. 9×1

47. 6×1

48. 8×0

49. 1×3

50. 2×1

51. 3×2

52. 10×0

53. 9×1

54. 0×2

Num and A

55. 1×7

56. 0×6

57. 8×2

58. 0×4

59. 7×0

60. 2×0

61. 1×4

62. 1×1

63. 2×2

64. 2×2

65. 0×10

A only

66. 5×0

67. 0×9

68. 1×0

69. 0×8

70. 1×1

71. 0×8

72. 1×2

73. 9×1

74. 3×2

Num and A

75. 7×0

76. 6×2

77. 2×9

78. 10×0

79. 0×6

80. 2×7

81. 1×6

82. 4×1

83. 2×1

84. 1×3

85. 5×1

A only

86. 1×8

87. 3×1

88. 1×8

89. 7×0

90. 4×0

91. 1×5

92. 2×9

93. 0×2

94. 1×10

95. 0×5

96. 0×5

97. 2×9

98. 1×4

99. 9×0

Num and A

100. 8×0

Times 10's

Q and A	33. 5×10	65. 8×10	97. 10×6
1. 3×10	34. 2×10	66. 10×0	98. 10×4
2. 10×9	35. 4×10	67. 5×10	99. 8×10
3. 10×7	36. 10×6	68. 8×10	100. 10×2
4. 10×6	Q and A	69. 10×7	
5. 10×3	37. 9×10	70. 10×0	
6. 10×7	38. 8×10	Q and A	
7. 9×10	39. 2×10	71. 3×10	
8. 8×10	40. 3×10	72. 10×0	
9. 10×5	41. 10×3	73. 0×10	
10. 10×3	42. 10×7	74. 7×10	
11. 5×10	43. 6×10	75. 9×10	
A only	A only	76. 3×10	
12. 10×3	44. 5×10	77. 10×1	
13. 4×10	45. 10×3	78. 2×10	
14. 5×10	46. 8×10	79. 10×2	
15. 6×10	47. 5×10	80. 10×2	
16. 4×10	48. 10×3	A only	
17. 10×9	49. 7×10	81. 8×10	
18. 10×9	50. 10×5	82. 10×7	
19. 10×10	51. 3×10	83. 3×10	
20. 2×10	52. 10×2	84. 10×1	
21. 10×7	53. 10×0	85. 5×10	
Q and A	Q and A	86. 10×3	
22. 10×0	54. 6×10	87. 10×2	
23. 10×0	55. 10×4	88. 8×10	
24. 6×10	56. 10×5	89. 10×10	
25. 8×10	57. 10×5	90. 0×10	
26. 6×10	58. 2×10	Q and A	
27. 0×10	59. 9×10	91. 10×0	
A only	60. 1×10	92. 10×2	
28. 5×10	61. 10×5	93. 10×7	
29. 10×4	62. 5×10	94. 8×10	
30. 0×10	A only	95. 6×10	
31. 10×3	63. 10×9	96. 10×5	
32. 2×10	64. 10×10	A only	

Times 3's

A only	33. 7×3	66. 9×3	99. 1×3
1. 2×3	34. 3×4	67. 3×6	100. 3×0
2. 0×3	35. 9×3	68. 3×6	
3. 8×3	A only	69. 8×3	
4. 3×10	36. 3×2	70. 3×10	
5. 7×3	37. 5×3	71. 3×4	
6. 1×3	38. 3×8	Num and A	
7. 4×3	39. 9×3	72. 3×7	
8. 3×3	40. 3×4	73. 3×7	
Num and A	41. 2×3	74. 2×3	
9. 3×8	42. 3×8	75. 9×3	
10. 6×3	43. 8×3	76. 3×3	
11. 3×1	44. 10×3	77. 3×1	
12. 1×3	45. 3×6	78. 9×3	
13. 3×10	46. 6×3	79. 6×3	
A only	47. 6×3	A only	
14. 3×0	48. 0×3	80. 3×10	
15. 4×3	Num and A	81. 1×3	
16. 6×3	49. 1×3	82. 4×3	
17. 8×3	50. 0×3	83. 3×4	
18. 6×3	51. 3×2	84. 3×8	
19. 1×3	52. 1×3	85. 9×3	
20. 3×2	53. 3×8	86. 3×0	
Num and A	54. 3×7	87. 0×3	
21. 3×7	55. 10×3	88. 3×8	
22. 3×3	56. 5×3	89. 3×8	
23. 7×3	57. 3×5	90. 2×3	
24. 1×3	58. 10×3	Num and A	
25. 7×3	59. 3×2	91. 4×3	
26. 7×3	60. 4×3	92. 4×3	
27. 6×3	A only	93. 3×2	
28. 3×5	61. 2×3	94. 3×4	
29. 0×3	62. 3×1	95. 1×3	
30. 8×3	63. 0×3	96. 3×3	
31. 3×8	64. 8×3	97. 5×3	
32. 10×3	65. 3×2	98. 8×3	

Times 4's

A only	33. 4×7	66. 2×4	99. 0×4
1. 5×4	34. 4×9	67. 0×4	100. 7×4
2. 10×4	35. 10×4	68. 1×4	
3. 5×4	36. 7×4	69. 4×4	
4. 4×7	37. 0×4	70. 4×10	
5. 4×10	38. 4×0	71. 4×8	
6. 2×4	39. 4×0	72. 3×4	
7. 3×4	40. 4×5	Q and A	
8. 4×10	A only	73. 4×4	
9. 8×4	41. 4×2	74. 2×4	
10. 4×9	42. 6×4	75. 4×3	
11. 3×4	43. 0×4	76. 3×4	
Q and A	44. 4×7	77. 1×4	
12. 7×4	45. 4×8	78. 2×4	
13. 4×10	46. 3×4	79. 4×3	
14. 4×0	47. 4×2	80. 4×4	
15. 4×0	48. 1×4	81. 7×4	
16. 5×4	49. 4×2	82. 8×4	
17. 2×4	50. 6×4	83. 9×4	
18. 4×8	51. 4×9	84. 4×5	
19. 4×2	52. 1×4	85. 7×4	
20. 4×9	53. 4×5	86. 8×4	
21. 8×4	Q and A	87. 5×4	
A only	54. 6×4	A only	
22. 4×5	55. 0×4	88. 4×4	
23. 5×4	56. 4×6	89. 0×4	
24. 4×3	57. 4×0	90. 4×1	
25. 4×6	58. 4×3	91. 4×9	
26. 4×10	59. 1×4	92. 4×9	
27. 10×4	60. 4×1	93. 9×4	
28. 4×1	61. 7×4	94. 9×4	
29. 4×6	62. 4×9	95. 4×1	
30. 4×5	63. 10×4	Q and A	
31. 0×4	64. 4×8	96. 4×3	
32. 4×2	65. 4×0	97. 0×4	
Q and A	A only	98. 10×4	

Times 5's

Num and A	33. 5×7	66. 5×8	99. 5×2
1. 5×9	34. 9×5	67. 9×5	100. 4×5
2. 5×9	35. 5×7	68. 5×8	
3. 5×7	36. 7×5	69. 5×5	
4. 8×5	37. 3×5	70. 5×8	
5. 8×5	38. 5×5	71. 5×8	
6. 5×8	39. 5×10	72. 5×7	
7. 2×5	40. 7×5	A only	
8. 5×0	41. 2×5	73. 5×10	
9. 10×5	42. 5×6	74. 5×4	
10. 8×5	Num and A	75. 3×5	
11. 5×1	43. 4×5	76. 7×5	
12. 5×9	44. 7×5	77. 6×5	
13. 7×5	45. 5×6	78. 5×7	
A only	46. 5×8	79. 5×6	
14. 5×7	47. 5×0	80. 5×4	
15. 5×10	48. 5×6	81. 5×3	
16. 4×5	49. 2×5	82. 5×0	
17. 7×5	50. 5×8	83. 5×6	
18. 5×10	51. 3×5	84. 8×5	
19. 5×6	52. 3×5	85. 7×5	
20. 5×7	53. 8×5	86. 5×1	
21. 6×5	A only	87. 4×5	
22. 5×7	54. 5×2	Num and A	
23. 6×5	55. 5×3	88. 5×5	
Num and A	56. 4×5	89. 3×5	
24. 5×0	57. 7×5	90. 5×0	
25. 5×3	58. 5×3	91. 6×5	
26. 5×6	59. 5×6	92. 0×5	
27. 8×5	60. 2×5	93. 4×5	
28. 5×4	61. 10×5	94. 7×5	
29. 0×5	Num and A	95. 5×10	
30. 5×5	62. 7×5	A only	
A only	63. 5×3	96. 5×6	
31. 0×5	64. 1×5	97. 10×5	
32. 5×2	65. 0×5	98. 4×5	

Times 6's

A only	33. 6×10	66. 8×6	99. 6×7
1. 6×6	34. 0×6	67. 10×6	100. 6×9
2. 6×10	35. 3×6	68. 6×0	
3. 6×10	A only	Q and A	
4. 6×6	36. 6×10	69. 10×6	
5. 9×6	37. 2×6	70. 0×6	
Q and A	38. 6×2	71. 1×6	
6. 3×6	39. 6×10	72. 6×9	
7. 6×9	40. 10×6	73. 4×6	
8. 6×1	41. 2×6	74. 5×6	
9. 0×6	42. 6×2	75. 7×6	
10. 6×10	43. 3×6	76. 6×8	
11. 6×7	44. 6×8	77. 7×6	
12. 8×6	45. 6×6	78. 6×6	
13. 3×6	46. 6×3	79. 6×9	
A only	47. 5×6	A only	
14. 6×9	Q and A	80. 7×6	
15. 1×6	48. 2×6	81. 2×6	
16. 6×4	49. 6×6	82. 6×4	
17. 4×6	50. 6×2	83. 7×6	
18. 9×6	51. 2×6	84. 7×6	
19. 6×0	52. 6×1	85. 6×6	
20. 4×6	53. 6×4	86. 4×6	
21. 2×6	54. 6×1	87. 10×6	
22. 6×9	55. 0×6	88. 6×9	
23. 6×6	56. 7×6	89. 1×6	
24. 6×2	57. 6×0	Q and A	
25. 6×3	58. 4×6	90. 6×8	
26. 6×4	59. 6×5	91. 3×6	
27. 9×6	60. 4×6	92. 3×6	
28. 6×0	A only	93. 6×7	
Q and A	61. 2×6	94. 6×3	
29. 6×3	62. 5×6	95. 6×1	
30. 7×6	63. 6×4	96. 1×6	
31. 6×4	64. 6×4	97. 2×6	
32. 10×6	65. 5×6	98. 4×6	

Times 7's

A only	33. 7×3	66. 10×7	99. 7×3
1. 9×7	34. 0×7	67. 8×7	100. 7×6
2. 7×5	35. 6×7	68. 7×0	
3. 7×7	36. 7×1	69. 7×0	
4. 8×7	37. 7×0	70. 7×7	
5. 7×0	38. 6×7	71. 2×7	
6. 7×2	39. 7×1	72. 8×7	
7. 7×6	40. 4×7	73. 7×0	
8. 10×7	A only	74. 4×7	
9. 4×7	41. 7×2	75. 6×7	
10. 1×7	42. 7×0	76. 7×6	
Num and A	43. 6×7	77. 8×7	
11. 0×7	44. 3×7	78. 0×7	
12. 4×7	45. 7×2	79. 10×7	
13. 7×5	46. 7×0	80. 7×1	
14. 3×7	47. 7×10	Num and A	
15. 7×9	48. 7×8	81. 10×7	
16. 7×8	49. 0×7	82. 1×7	
17. 7×7	50. 7×9	83. 2×7	
18. 5×7	51. 6×7	84. 7×3	
19. 7×6	52. 7×8	85. 6×7	
20. 7×6	Num and A	86. 7×5	
21. 3×7	53. 3×7	87. 10×7	
A only	54. 7×6	A only	
22. 4×7	55. 7×6	88. 7×4	
23. 9×7	56. 7×9	89. 7×7	
24. 7×4	57. 6×7	90. 7×8	
25. 7×9	58. 6×7	91. 3×7	
26. 7×8	59. 7×4	92. 7×1	
27. 7×5	60. 6×7	Num and A	
28. 7×4	61. 7×6	93. 10×7	
29. 7×7	62. 7×5	94. 7×3	
Num and A	63. 7×6	95. 7×2	
30. 1×7	64. 2×7	96. 7×7	
31. 5×7	65. 2×7	97. 7×3	
32. 10×7	A only	98. 7×4	

Times 8's

Q and A

1. 0×8
2. 8×9
3. 8×3
4. 10×8
5. 8×4
6. 8×2
7. 8×10
8. 4×8
9. 5×8
10. 8×7
11. 0×8

A only

12. 1×8
13. 8×8
14. 8×3
15. 8×0
16. 7×8
17. 7×8
18. 8×8
19. 8×0
20. 1×8
21. 5×8
22. 8×8
23. 0×8

Q and A

24. 5×8
25. 8×5
26. 6×8
27. 8×9
28. 0×8
29. 8×1
30. 8×3
31. 2×8
32. 8×8
33. 7×8

34. 8×6

A only

35. 8×8
36. 8×7
37. 8×10
38. 2×8
39. 3×8
40. 8×5
41. 7×8
42. 8×5
43. 8×6
44. 8×7

Q and A

45. 8×7
46. 8×4
47. 8×8
48. 4×8
49. 8×4
50. 8×1
51. 9×8
52. 6×8
53. 10×8
54. 9×8
55. 8×6
56. 8×5
57. 4×8
58. 8×6
59. 8×1
60. 8×9
61. 0×8
62. 8×9
63. 8×4
64. 8×10
65. 8×0
66. 3×8

Q and A

67. 8×8
68. 8×8
69. 5×8
70. 8×5
71. 6×8
72. 1×8
73. 3×8
74. 8×10
75. 8×2
76. 3×8
77. 7×8
78. 8×8
79. 8×9
80. 2×8
81. 8×5
82. 8×5
83. 5×8
84. 8×2
85. 2×8
86. 8×10
87. 6×8
88. 4×8
89. 8×3
90. 8×4
91. 1×8
92. 8×2
93. 3×8
94. 7×8
95. 6×8
96. 8×9
97. 6×8
98. 8×5

99. 8×1

100. 7×8

Times 9's

A only	33. 9×8	67. 5×9	99. 7×9
1. 9×7	34. 2×9	A only	100. 9×8
2. 8×9	35. 9×8	68. 6×9	
3. 9×2	36. 9×4	69. 9×6	
4. 9×4	37. 2×9	70. 7×9	
5. 9×7	38. 1×9	71. 9×1	
6. 9×9	39. 9×8	72. 9×0	
7. 2×9	40. 5×9	73. 9×1	
8. 3×9	41. 8×9	74. 9×6	
Num and A	42. 10×9	75. 8×9	
9. 0×9	43. 9×5	76. 0×9	
10. 9×10	44. 9×0	77. 2×9	
11. 9×0	A only	Num and A	
12. 9×8	45. 9×7	78. 9×5	
13. 5×9	46. 8×9	79. 9×10	
14. 4×9	47. 8×9	80. 9×8	
15. 4×9	48. 9×7	81. 10×9	
16. 10×9	49. 5×9	82. 7×9	
17. 9×0	50. 2×9	83. 9×9	
18. 9×9	51. 9×5	84. 9×0	
19. 4×9	52. 9×10	85. 9×9	
A only	53. 9×2	86. 5×9	
20. 9×3	54. 1×9	87. 9×8	
21. 9×8	55. 9×2	88. 10×9	
22. 9×1	56. 9×2	A only	
23. 9×1	57. 9×4	89. 6×9	
24. 9×10	58. 10×9	90. 10×9	
25. 9×0	59. 2×9	91. 2×9	
26. 9×1	Num and A	92. 8×9	
27. 9×3	60. 9×8	93. 9×1	
28. 9×4	61. 4×9	94. 9×1	
29. 2×9	62. 9×0	95. 9×7	
30. 9×1	63. 1×9	Num and A	
31. 9×8	64. 9×8	96. 9×1	
Num and A	65. 9×9	97. 9×0	
32. 3×9	66. 0×9	98. 9×3	

All Multiplication Facts, Set 1

A only

1. 10×1
2. 6×3
3. 2×10
4. 9×1
5. 9×4
6. 5×4
7. 8×9
8. 7×5
9. 0×0
10. 8×1

Q and A

11. 4×2
12. 7×7
13. 2×5
14. 4×10
15. 2×7
16. 1×1
17. 8×6
18. 7×2

A only

19. 3×2
20. 5×1
21. 4×7
22. 5×3
23. 4×4
24. 8×10
25. 8×5
26. 8×8
27. 2×0

Q and A

28. 2×4
29. 9×7
30. 10×3
31. 0×5
32. 3×5

33. 10×5

34. 6×8

35. 1×2

36. 1×6

37. 10×9

A only

38. 5×7

39. 0×4

40. 1×3

41. 2×6

42. 9×8

43. 5×8

44. 7×0

45. 0×8

Q and A

46. 8×2

47. 6×5

48. 7×10

49. 7×1

50. 2×2

51. 0×7

52. 9×9

53. 3×9

54. 6×2

A only

55. 6×0

56. 4×0

57. 10×2

58. 4×9

59. 3×10

60. 2×9

61. 10×10

62. 3×4

63. 9×2

64. 0×9

65. 1×4

Q and A

66. 10×7

67. 6×10

68. 5×0

69. 10×4

70. 2×1

71. 1×10

72. 6×9

73. 7×3

74. 10×0

A only

75. 0×3

76. 6×6

77. 5×10

78. 4×6

79. 4×5

80. 9×0

81. 4×8

82. 4×3

83. 8×7

84. 3×1

85. 7×8

Q and A

86. 2×3

87. 8×4

88. 1×7

89. 5×5

90. 7×4

91. 5×6

92. 6×4

93. 9×5

94. 7×6

95. 3×0

96. 1×9

97. 8×3

98. 0×6

99. 9×3

A only

100. 1×8

All Multiplication Facts, Set 2

A only	33. 2×3	65. 5×1	97. 4×8
1. 7×5	34. 0×9	66. 0×4	98. 3×10
2. 6×7	35. 2×6	67. 0×6	99. 9×0
3. 7×7	36. 8×0	68. 9×6	100. 0×10
4. 0×0	A only	69. 7×1	
5. 5×10	37. 10×9	70. 0×8	
6. 7×4	38. 7×10	A only	
7. 1×2	39. 4×1	71. 5×8	
8. 3×8	40. 10×4	72. 3×3	
9. 0×3	41. 4×9	73. 10×3	
10. 3×4	42. 10×8	74. 7×9	
11. 9×2	43. 6×0	75. 4×0	
Num and A	Num and A	76. 1×5	
12. 4×6	44. 5×2	77. 3×2	
13. 7×2	45. 0×1	78. 1×8	
14. 9×10	46. 1×7	79. 3×5	
15. 2×5	47. 9×1	80. 7×0	
16. 3×0	48. 6×2	Num and A	
17. 3×9	49. 9×4	81. 5×3	
18. 9×8	50. 9×9	82. 6×1	
19. 5×9	51. 8×7	83. 6×3	
20. 3×7	52. 1×9	84. 9×3	
21. 6×6	53. 1×10	85. 6×9	
A only	A only	86. 4×2	
22. 8×3	54. 7×6	87. 9×7	
23. 6×10	55. 0×5	88. 10×2	
24. 1×1	56. 7×3	89. 0×7	
25. 4×3	57. 2×2	90. 6×5	
26. 10×6	58. 2×1	A only	
27. 1×6	59. 10×1	91. 8×10	
Num and A	60. 8×5	92. 2×0	
28. 1×4	61. 10×0	93. 6×8	
29. 2×8	62. 5×7	94. 4×10	
30. 9×5	Num and A	95. 8×2	
31. 7×8	63. 4×7	96. 5×6	
32. 2×10	64. 1×3	Num and A	

All Multiplication Facts, Set 3

Q and A	33. 4×0	66. 0×4	99. 6×1
1. 7×4	34. 1×7	67. 5×7	100. 0×9
2. 6×6	35. 1×8	68. 1×5	
3. 7×6	Q and A	69. 1×1	
4. 10×6	36. 8×4	70. 5×3	
5. 3×5	37. 4×4	71. 10×5	
6. 2×10	38. 0×0	A only	
7. 1×4	39. 1×9	72. 5×9	
8. 3×8	40. 0×3	73. 0×6	
A only	41. 3×7	74. 8×5	
9. 8×9	42. 7×3	75. 0×2	
10. 3×2	43. 3×1	76. 8×6	
11. 10×9	44. 9×10	77. 2×1	
12. 2×9	45. 9×2	78. 1×3	
13. 0×10	46. 2×3	79. 2×2	
Q and A	47. 6×5	Q and A	
14. 10×2	48. 1×2	80. 9×4	
15. 6×10	A only	81. 9×6	
16. 10×1	49. 10×4	82. 7×1	
17. 10×10	50. 9×7	83. 6×4	
18. 8×8	51. 4×5	84. 8×10	
19. 2×6	52. 1×10	85. 5×1	
20. 9×5	53. 7×7	86. 9×9	
A only	54. 5×10	87. 2×8	
21. 10×3	55. 3×10	88. 4×7	
22. 3×3	56. 3×4	89. 4×6	
23. 3×0	57. 5×5	90. 5×8	
24. 6×7	58. 3×9	A only	
25. 10×7	59. 4×1	91. 4×2	
26. 8×2	60. 8×1	92. 6×9	
27. 0×7	Q and A	93. 9×3	
28. 3×6	61. 7×8	94. 2×5	
29. 5×6	62. 10×0	95. 1×6	
30. 6×8	63. 0×8	96. 5×2	
31. 4×10	64. 2×4	97. 2×7	
32. 1×0	65. 7×5	98. 2×0	

All Multiplication Facts, Set 4

Num and A	33. 8×8	66. 1×0	99. 1×5
1. 1×6	34. 10×3	67. 0×9	100. 9×2
2. 2×3	35. 9×9	68. 5×2	
3. 8×0	36. 2×7	69. 1×9	
4. 0×2	37. 6×6	70. 6×7	
5. 1×10	38. 0×4	71. 10×10	
6. 7×6	39. 1×8	72. 6×5	
7. 7×4	40. 2×6	A only	
8. 7×10	Num and A	73. 2×9	
9. 4×6	41. 2×8	74. 4×9	
10. 0×5	42. 4×0	75. 8×10	
11. 6×10	43. 7×0	76. 9×8	
A only	44. 10×6	77. 9×10	
12. 5×7	45. 0×3	78. 7×2	
13. 3×7	46. 2×4	79. 2×0	
14. 6×4	47. 7×7	80. 1×2	
15. 7×5	48. 5×8	81. 6×3	
16. 5×3	49. 10×8	82. 9×7	
17. 3×9	50. 0×7	83. 2×2	
18. 1×1	51. 3×2	84. 4×1	
19. 3×10	52. 3×0	85. 5×10	
20. 0×8	53. 8×4	86. 5×1	
21. 8×9	A only	87. 5×6	
Num and A	54. 7×3	Num and A	
22. 0×1	55. 6×2	88. 3×3	
23. 4×7	56. 10×4	89. 4×3	
24. 4×2	57. 2×10	90. 7×8	
25. 7×9	58. 9×1	91. 0×0	
26. 0×10	59. 4×8	92. 7×1	
27. 10×2	60. 6×1	93. 3×5	
28. 4×4	61. 10×7	94. 4×10	
29. 5×5	62. 2×5	95. 5×9	
30. 8×7	63. 9×4	A only	
31. 9×6	64. 10×1	96. 9×0	
32. 8×5	65. 10×0	97. 4×5	
A only	Num and A	98. 3×6	

All Multiplication Facts, Set 5

For “P/1st=2nd,” when you see 3x4, say “12 divided by 3 equals 4.”

P/1 st =2 nd	32. 3x9	64. 4x10	96. 6x7
1. 7x2	33. 10x0	65. 1x5	97. 9x5
2. 4x9	34. 4x3	66. 2x5	98. 3x3
3. 8x8	35. 7x8	67. 5x1	99. 2x10
4. 9x5	36. 5x0	68. 6x2	100. 2x8
5. 2x3	37. 7x3	69. 3x9	
6. 3x10	38. 9x2	70. 5x9	
7. 8x4	39. 10x10	71. 6x7	
8. 9x7	40. 8x9	72. 8x5	
9. 6x5	41. 1x2	A only	
10. 6x1	42. 3x8	73. 2x9	
11. 1x3	P/1 st =2 nd	74. 1x8	
12. 1x7	43. 10x8	75. 7x0	
13. 3x0	44. 6x4	76. 2x4	
A only	45. 9x3	77. 9x0	
14. 5x2	46. 9x9	78. 9x1	
15. 10x6	47. 5x8	79. 3x2	
16. 8x3	48. 9x8	80. 7x1	
17. 4x0	49. 10x9	81. 6x8	
18. 7x6	50. 10x4	82. 3x4	
19. 4x2	51. 1x4	83. 10x0	
20. 6x0	52. 2x1	84. 8x1	
21. 1x5	53. 9x6	85. 3x1	
22. 7x10	A only	86. 5x3	
23. 3x0	54. 10x7	87. 8x0	
P/1 st =2 nd	55. 7x5	P/1 st =2 nd	
24. 10x3	56. 1x1	88. 9x4	
25. 9x10	57. 2x0	89. 4x8	
26. 6x10	58. 6x9	90. 2x2	
27. 2x6	59. 3x5	91. 7x4	
28. 6x3	60. 10x1	92. 8x8	
29. 8x10	61. 4x5	93. 5x4	
30. 6x6	P/1 st =2 nd	94. 4x6	
A only	62. 10x2	95. 3x7	
31. 8x2	63. 5x10	A only	

All Multiplication Facts, Set 6

A only	33. 6×2	66. 10×7	99. 1×5
1. 7×7	34. 6×9	67. 3×10	100. 2×7
2. 8×5	35. 3×3	68. 6×0	
3. 6×5	A only	P/1 st =2 nd	
4. 4×0	36. 5×6	69. 10×0	
5. 4×7	37. 8×0	70. 5×4	
P/1 st =2 nd	38. 5×5	71. 1×1	
6. 4×3	39. 5×1	72. 7×8	
7. 8×1	40. 10×9	73. 6×3	
8. 3×4	41. 3×7	74. 6×7	
9. 5×9	42. 7×10	75. 1×9	
10. 7×1	43. 8×4	76. 3×8	
11. 2×1	44. 10×5	77. 2×3	
12. 2×4	45. 2×8	78. 9×5	
13. 2×10	46. 9×6	79. 9×4	
A only	47. 3×1	A only	
14. 10×1	P/1 st =2 nd	80. 5×3	
15. 1×8	48. 4×1	81. 7×4	
16. 4×10	49. 7×2	82. 8×6	
17. 7×9	50. 8×10	83. 9×10	
18. 9×7	51. 6×4	84. 2×0	
19. 10×3	52. 8×7	85. 1×7	
20. 2×9	53. 8×2	86. 6×8	
21. 3×9	54. 1×6	87. 3×5	
22. 6×1	55. 7×6	88. 9×3	
23. 2×5	56. 4×4	89. 4×5	
24. 4×6	57. 9×0	P/1 st =2 nd	
25. 10×8	58. 10×6	90. 5×8	
26. 3×2	59. 5×2	91. 6×6	
27. 1×3	60. 3×0	92. 1×0	
28. 6×10	A only	93. 10×10	
P/1 st =2 nd	61. 5×0	94. 7×5	
29. 9×8	62. 8×3	95. 8×9	
30. 1×4	63. 7×3	96. 8×8	
31. 3×6	64. 9×9	97. 9×1	
32. 10×2	65. 9×2	98. 5×7	

All Multiplication Facts, Set 7

P/1 st =2 nd	33. 2x0	66. 2x4	99. 4x3
1. 9x4	34. 2x3	67. 9x2	100. 9x7
2. 4x0	35. 6x7	68. 9x6	
3. 5x2	36. 9x1	69. 3x4	
4. 5x7	37. 7x3	70. 6x6	
5. 2x6	38. 10x4	71. 5x1	
6. 6x10	39. 10x7	72. 4x7	
7. 8x1	40. 8x2	73. 4x8	
8. 3x6	P/1 st =2 nd	74. 7x10	
9. 7x8	41. 8x9	75. 7x0	
10. 3x1	42. 3x10	76. 9x3	
A only	43. 4x9	77. 10x2	
11. 10x6	44. 8x10	78. 2x8	
12. 10x10	45. 5x0	79. 1x3	
13. 5x8	46. 7x4	80. 10x5	
14. 5x3	47. 7x6	A only	
15. 3x3	48. 7x5	81. 8x0	
16. 1x2	49. 7x1	82. 1x4	
17. 7x9	50. 4x2	83. 10x1	
18. 6x2	51. 4x6	84. 3x7	
19. 1x0	52. 1x10	85. 8x6	
20. 3x9	A only	86. 1x7	
21. 6x4	53. 7x7	87. 5x9	
P/1 st =2 nd	54. 6x5	P/1 st =2 nd	
22. 1x5	55. 10x8	88. 5x5	
23. 3x2	56. 2x9	89. 10x0	
24. 9x0	57. 6x9	90. 6x0	
25. 8x8	58. 1x1	91. 8x3	
26. 2x2	59. 2x7	92. 1x6	
27. 9x5	60. 2x5	A only	
28. 3x5	61. 9x10	93. 2x10	
29. 5x6	62. 5x4	94. 9x9	
A only	63. 3x8	95. 1x8	
30. 8x4	64. 6x8	96. 10x3	
31. 5x10	65. 4x5	97. 4x10	
32. 6x1	P/1 st =2 nd	98. 8x5	

All Multiplication Facts, Set 8

Num and A

1. 7×3
2. 8×10
3. 9×0
4. 3×1
5. 7×1
6. 1×2
7. 4×4
8. 2×2
9. 8×8
10. 10×0
11. 4×3

$P/1^{\text{st}}=2^{\text{nd}}$

12. 4×2
13. 9×5
14. 1×4
15. 6×2
16. 3×9
17. 5×3
18. 2×0
19. 8×3
20. 5×7
21. 9×10
22. 5×10
23. 10×9

Num and A

24. 4×1
25. 1×3
26. 6×8
27. 1×9
28. 1×7
29. 3×0
30. 5×8
31. 7×0
32. 2×6
33. 6×0

34. 4×8

$P/1^{\text{st}}=2^{\text{nd}}$

35. 10×2
36. 3×2
37. 2×8
38. 3×10
39. 6×6
40. 4×9
41. 10×10
42. 10×6
43. 2×10
44. 4×6

Num and A

45. 4×0
46. 3×5
47. 8×9
48. 9×2
49. 10×7
50. 7×9
51. 3×7

$P/1^{\text{st}}=2^{\text{nd}}$

52. 9×4
53. 4×5
54. 8×4
55. 7×7
56. 6×3
57. 8×1
58. 10×4
59. 7×8
60. 7×4
61. 2×3
62. 6×7
63. 2×7
64. 9×1
65. 8×0
66. 10×3

Num and A

67. 5×5
68. 10×5
69. 6×10
70. 8×2
71. 3×4
72. 1×0
73. 6×1
74. 9×9
75. 8×5
76. 4×10
77. 6×4
78. 7×10

$P/1^{\text{st}}=2^{\text{nd}}$

80. 7×6
81. 6×9
82. 3×3
83. 3×6
84. 9×7

Num and A

85. 2×4
86. 9×6
87. 9×8
88. 7×2
89. 5×9
90. 5×6
91. 2×9
92. 5×2

$P/1^{\text{st}}=2^{\text{nd}}$

93. 10×1
94. 5×4
95. 10×8
96. 8×6
97. 2×1
98. 7×5

99. 9×3

100. 1×1

Division Facts

All Division Facts, Set 1

A only	Num and A	63. 70/7	94. 60/10
1. 28/7	32. 24/4	64. 64/8	95. 18/6
2. 4/4	33. 35/5	65. 0/1	Num and A
3. 36/6	34. 20/2	66. 12/3	96. 4/1
4. 5/1	35. 0/6	67. 32/4	97. 3/3
5. 15/3	36. 40/10	A only	98. 20/5
6. 20/4	37. 80/8	68. 6/2	99. 9/9
7. 56/7	38. 16/2	69. 27/9	100. 10/5
8. 0/2	39. 30/6	70. 30/5	
Num and A	40. 0/7	71. 50/5	
9. 42/7	41. 42/6	72. 49/7	
10. 63/7	42. 70/10	73. 48/8	
11. 6/1	43. 5/5	74. 14/7	
12. 45/9	44. 54/6	75. 18/3	
13. 8/8	A only	76. 2/1	
14. 50/10	45. 9/3	77. 15/5	
15. 90/9	46. 72/8	Num and A	
16. 45/5	47. 12/4	78. 8/2	
17. 0/3	48. 32/8	79. 0/5	
18. 63/9	49. 24/3	80. 7/1	
19. 30/10	50. 28/4	81. 12/2	
A only	51. 4/2	82. 35/7	
20. 6/6	52. 36/9	83. 40/4	
21. 18/9	53. 90/10	84. 18/2	
22. 72/9	54. 40/8	85. 8/1	
23. 6/3	55. 24/8	86. 56/8	
24. 16/4	56. 80/10	87. 25/5	
25. 16/8	57. 100/10	88. 10/10	
26. 60/6	58. 3/1	A only	
27. 30/3	59. 81/9	89. 0/9	
28. 24/6	Num and A	90. 0/8	
29. 14/2	60. 21/7	91. 9/1	
30. 0/4	61. 20/10	92. 1/1	
31. 36/4	62. 2/2	93. 48/6	

All Division Facts, Set 2

Q and A	34. 12/4	66. 4/1	99. 30/3
1. 7/1	A only	67. 60/10	100. 0/3
2. 5/5	35. 36/9	68. 20/10	
3. 36/4	36. 70/10	69. 12/2	
4. 80/8	37. 0/10	70. 0/9	
5. 0/7	38. 49/7	71. 2/1	
6. 21/7	39. 3/1	72. 6/3	
7. 1/1	40. 0/5	73. 42/7	
8. 2/2	41. 40/4	74. 7/7	
9. 8/2	42. 28/4	75. 63/9	
10. 35/5	43. 70/7	A only	
11. 45/5	44. 4/4	76. 8/4	
A only	45. 36/6	77. 10/10	
12. 40/5	46. 90/9	78. 27/3	
13. 18/9	Q and A	79. 10/5	
14. 27/9	47. 48/6	80. 63/7	
15. 50/5	48. 8/8	81. 30/5	
16. 100/10	49. 24/8	82. 14/2	
17. 15/3	50. 4/2	83. 18/2	
18. 9/9	51. 9/3	84. 0/4	
19. 9/1	52. 0/1	85. 15/5	
20. 16/8	53. 20/5	Q and A	
21. 12/6	54. 6/1	86. 60/6	
22. 28/7	55. 40/10	87. 24/3	
23. 0/6	56. 72/9	88. 16/2	
24. 54/6	57. 50/10	89. 12/3	
25. 72/8	A only	90. 25/5	
26. 20/4	58. 21/3	91. 45/9	
Q and A	59. 90/10	92. 24/4	
27. 18/3	60. 10/1	A only	
28. 35/7	61. 54/9	93. 30/10	
29. 32/8	62. 42/6	94. 3/3	
30. 10/2	Q and A	95. 64/8	
31. 0/2	63. 8/1	96. 56/8	
32. 14/7	64. 24/6	97. 40/8	
33. 30/6	65. 56/7	98. 48/8	

All Division Facts, Set 3

A only	33. 45/5	66. 32/4	99. 18/2
1. 50/10	34. 48/6	67. 20/2	100. 21/3
2. 72/8	35. 9/9	68. 64/8	
3. 8/1	36. 12/6	69. 54/9	
4. 40/4	37. 36/4	70. 12/3	
5. 6/6	38. 12/2	71. 72/9	
6. 15/3	39. 40/10	72. 56/7	
7. 40/8	40. 36/9	73. 35/7	
8. 10/5	41. 42/6	Num and A	
9. 6/3	A only	74. 70/7	
10. 81/9	42. 0/5	75. 14/7	
11. 0/4	43. 8/4	76. 45/9	
12. 60/10	44. 18/6	77. 10/2	
Num and A	45. 24/6	78. 20/10	
13. 8/2	46. 90/10	79. 18/3	
14. 2/2	47. 80/8	80. 6/2	
15. 3/1	48. 42/7	81. 9/1	
16. 0/10	49. 30/10	82. 10/1	
17. 7/7	50. 48/8	83. 0/8	
18. 9/3	51. 20/5	84. 60/6	
19. 63/7	Num and A	A only	
20. 40/5	52. 24/8	85. 27/3	
21. 80/10	53. 16/4	86. 15/5	
22. 90/9	54. 4/2	87. 8/8	
23. 70/10	55. 21/7	88. 10/10	
A only	56. 3/3	89. 100/10	
24. 30/5	57. 12/4	90. 0/9	
25. 0/7	58. 50/5	91. 0/2	
26. 28/7	A only	92. 16/2	
27. 30/6	59. 35/5	Num and A	
28. 20/4	60. 0/1	93. 30/3	
Num and A	61. 16/8	94. 28/4	
29. 5/1	62. 49/7	95. 32/8	
30. 25/5	63. 36/6	96. 4/4	
31. 5/5	64. 27/9	97. 4/1	
32. 6/1	65. 1/1	98. 7/1	

All Division Facts, Set 4

Q and A	34. 90/10	66. 50/5	99. 0/4
1. 20/5	A only	67. 30/5	100. 45/9
2. 25/5	35. 30/3	A only	
3. 6/6	36. 6/1	68. 24/6	
4. 4/1	37. 0/9	69. 18/2	
5. 2/1	38. 18/9	70. 70/7	
6. 20/2	39. 14/2	71. 5/5	
7. 60/10	40. 54/6	72. 9/9	
8. 45/5	41. 16/8	73. 12/3	
9. 24/4	Q and A	74. 10/1	
10. 30/10	42. 8/8	75. 9/3	
11. 2/2	43. 35/7	76. 40/4	
12. 0/1	44. 36/6	77. 27/9	
13. 60/6	45. 0/3	78. 63/7	
14. 14/7	46. 27/3	79. 0/8	
15. 5/1	47. 10/2	80. 80/8	
A only	48. 40/5	Q and A	
16. 36/4	49. 30/6	81. 7/1	
17. 28/4	50. 42/6	82. 10/10	
18. 18/6	51. 64/8	83. 8/4	
19. 16/2	A only	84. 1/1	
20. 28/7	52. 48/6	85. 12/6	
21. 0/6	53. 36/9	86. 4/4	
22. 56/8	54. 21/3	87. 12/4	
23. 0/10	55. 40/10	88. 72/9	
24. 100/10	56. 0/2	89. 7/7	
25. 72/8	57. 56/7	90. 9/1	
26. 10/5	58. 24/3	91. 12/2	
Q and A	59. 15/3	92. 81/9	
27. 24/8	60. 80/10	A only	
28. 70/10	61. 6/3	93. 35/5	
29. 8/2	62. 40/8	94. 42/7	
30. 4/2	Q and A	95. 48/8	
31. 18/3	63. 90/9	96. 16/4	
32. 20/4	64. 50/10	97. 21/7	
33. 3/3	65. 6/2	98. 8/1	

All Division Facts, Set 5

Num and A	A only	67. 0/4	99. 72/8
1. 14/7	34. 81/9	Num and A	100. 4/1
2. 18/9	35. 50/5	68. 20/4	
3. 18/3	36. 6/1	69. 0/3	
4. 42/6	37. 12/4	70. 6/6	
5. 40/10	38. 10/2	71. 8/8	
6. 6/2	39. 30/10	72. 12/3	
7. 24/4	40. 16/8	73. 5/5	
8. 24/3	41. 70/10	74. 18/2	
A only	42. 1/1	A only	
9. 7/7	43. 40/5	75. 21/7	
10. 9/3	44. 63/7	76. 3/3	
11. 54/9	45. 48/8	77. 40/4	
12. 32/4	46. 14/2	78. 2/2	
13. 8/4	47. 5/1	79. 100/10	
14. 54/6	48. 24/6	Num and A	
15. 10/10	Num and A	80. 20/2	
16. 18/6	49. 35/7	81. 40/8	
17. 63/9	50. 7/1	82. 70/7	
18. 8/1	51. 3/1	83. 36/9	
19. 24/8	52. 27/3	84. 36/4	
20. 56/8	53. 80/10	85. 90/10	
Num and A	54. 45/5	86. 42/7	
21. 30/6	55. 30/5	87. 0/10	
22. 0/1	56. 36/6	88. 12/6	
23. 15/3	57. 48/6	89. 16/2	
24. 2/1	58. 4/4	90. 72/9	
25. 80/8	59. 20/10	A only	
26. 28/7	A only	91. 28/4	
27. 25/5	60. 60/6	92. 0/7	
28. 10/1	61. 30/3	93. 12/2	
29. 4/2	62. 16/4	94. 32/8	
30. 45/9	63. 27/9	95. 8/2	
31. 50/10	64. 60/10	96. 0/9	
32. 9/9	65. 56/7	97. 90/9	
33. 0/8	66. 49/7	98. 10/5	

Task-Switching with All 4 Operations

All 4 Operations, Set 1

Q and A	31. 6×0	62. 0×8	92. 8×7
1. $6/1$	Q and A	A only	A only
2. $56/8$	32. $9/3$	63. $4-2$	93. $8+3$
3. $24/6$	33. $9+7$	64. $4+3$	94. $6+9$
4. $2/1$	34. $2+7$	65. $2+10$	Q and A
5. $13-6$	35. $6+6$	66. $11-9$	95. 7×9
6. $5+2$	36. $49/7$	67. $14-10$	96. 9×4
7. 1×9	37. $3+10$	68. $4/1$	97. $3/3$
A only	38. 8×8	69. $18/3$	98. 10×0
8. $7+4$	39. $45/5$	70. $16-10$	99. $56/7$
9. $3-1$	40. $2+5$	71. $4/4$	100. 6×5
10. $10+0$	41. $7+3$	Q and A	
11. $6-0$	A only	72. $14-4$	
12. $28/7$	42. $3+0$	73. $9+0$	
13. $8+9$	43. $6-1$	74. 0×10	
14. $3+9$	44. 4×10	75. 9×10	
15. $12-4$	45. $17-9$	76. $3+3$	
16. $1/1$	46. 5×2	A only	
Q and A	47. $0+1$	77. $27/3$	
17. $35/5$	48. $2+2$	78. $1+4$	
18. $9-7$	49. $8+4$	79. $8-0$	
19. 5×3	50. $0/8$	80. 2×10	
20. 7×0	51. $0+8$	81. $10-6$	
21. 7×3	Q and A	82. $3+2$	
A only	52. 4×1	83. 3×4	
22. 7×7	53. $4-0$	84. $7-1$	
23. 8×1	54. $4+5$	85. $18/2$	
24. $45/9$	55. $16-6$	86. $40/5$	
25. $8+10$	56. $8/1$	Q and A	
26. 4×2	57. $10-5$	87. 5×9	
27. $5/1$	58. $2+3$	88. $50/5$	
28. 8×5	59. $30/5$	89. 7×5	
29. $80/8$	60. $72/8$	90. 5×6	
30. $54/6$	61. $15/5$	91. 5×10	

All 4 Operations, Set 2

Num and A	33. $3+1$	65. 8×10	96. $14-6$
1. $24/3$	Num and A	66. $9+1$	97. $9-2$
2. 2×8	34. $18-9$	Num and A	A only
3. $13-3$	35. $6-4$	67. $13-8$	98. $9/1$
4. 8×6	36. $7+5$	68. $6+1$	99. $5+3$
5. $17-8$	37. $4/2$	69. 1×7	100. $12-2$
6. $25/5$	A only	70. 4×5	
7. $15-6$	38. $8/4$	71. $5-0$	
8. 3×10	39. $2-0$	72. 10×10	
A only	40. $10-3$	73. 5×1	
9. $8-7$	41. $15-9$	74. 9×5	
10. $1+6$	42. $3+4$	75. $32/8$	
11. $0+2$	43. $7+6$	A only	
12. $8-5$	44. $8-1$	76. $5+6$	
13. $11-4$	45. 0×9	77. 6×8	
Num and A	46. $6/6$	78. $7-0$	
14. $16/4$	47. 3×6	79. $12/4$	
15. $7+9$	Num and A	80. 6×4	
16. $5-2$	48. $7-2$	81. $12-9$	
17. $20/5$	49. $3-2$	Num and A	
18. 7×4	50. 4×3	82. $8-8$	
19. $48/6$	51. $11-5$	83. $12/6$	
20. $5/5$	52. $9+3$	84. $9+2$	
21. $17-10$	53. $32/4$	85. $0+6$	
22. 10×5	54. 4×9	86. $7-7$	
A only	55. $0/10$	A only	
23. $9-6$	56. $18/6$	87. 10×3	
24. $7+7$	57. $20/2$	88. 7×8	
25. 0×2	58. $10+10$	89. $8+7$	
26. $2+4$	A only	90. $17-7$	
27. $6-2$	59. $15-10$	91. $8+5$	
28. $0/5$	60. $4-1$	92. $2/2$	
29. $6+4$	61. $0/9$	93. $30/6$	
30. $12-5$	62. $10/5$	Num and A	
31. $12-10$	63. $18/9$	94. 5×4	
32. $11-7$	64. $6+2$	95. $14-7$	

All 4 Operations, Set 3

A only	33. 3-3	Q and A	97. 1-1
1. 9×0	34. $1+2$	66. $27/9$	98. $10+9$
2. 10×4	35. $9/9$	67. $5-1$	99. $4+9$
3. $7-3$	36. $5+10$	68. 9×9	100. $6/2$
4. 6×2	37. 6×1	69. $18-8$	
5. $48/8$	38. 2×9	70. $0+7$	
6. $14-5$	39. $9+10$	71. $15/3$	
7. $1+5$	A only	72. $10-1$	
8. $6+7$	40. $10+1$	73. $10-8$	
9. $2+0$	41. $14-8$	74. $72/9$	
10. $36/4$	42. 3×0	75. 6×10	
11. 0×7	43. $7/1$	76. $1-0$	
Q and A	44. 2×1	77. $10-7$	
12. 1×6	45. $10+3$	78. $11-3$	
13. $4+10$	46. $11-1$	79. $36/6$	
14. $15-7$	47. 1×1	A only	
15. $14-9$	48. $10+5$	80. $7-6$	
16. $15-5$	49. 1×0	81. 7×1	
17. $13-4$	Q and A	82. $24/4$	
18. 5×5	50. $11-6$	83. 5×7	
19. 4×6	51. $5+1$	84. 9×8	
20. $3+5$	52. $13-9$	Q and A	
A only	53. 0×0	85. 3×2	
21. $9+9$	54. 5×8	86. 3×3	
22. 7×6	55. $28/4$	87. $9-0$	
23. $54/9$	A only	88. 9×6	
24. $9-1$	56. $12-3$	89. 6×9	
25. $2+6$	57. 6×6	90. $16/8$	
26. 2×6	58. $8+2$	A only	
27. $13-5$	59. $6/3$	91. $9-9$	
28. 4×8	60. $4+4$	92. $13-10$	
29. $5-3$	61. 2×5	93. $9+5$	
Q and A	62. $8-6$	94. $8+8$	
30. $10-9$	63. $0/4$	95. $8-3$	
31. $3+6$	64. 0×1	Q and A	
32. $0/6$	65. 8×4	96. $7-4$	

All 4 Operations, Set 4

A only	33. 5×0	65. 4×0	96. $9 + 4$
1. $6 - 6$	A only	66. $8 - 4$	97. $0/2$
2. 10×7	34. $10 - 4$	67. 3×8	98. 7×10
3. 2×3	35. $0 + 9$	68. 7×2	Num and A
4. $10 + 7$	36. $10 - 2$	69. 10×9	99. $20/4$
Num and A	37. $12/2$	A only	100. $8/8$
5. $8/2$	38. $16/2$	70. $10 + 4$	
6. 2×7	39. $60/6$	71. $19 - 9$	
7. $6 + 0$	40. $7 + 8$	72. 3×5	
8. 1×2	41. $4 - 4$	73. $6 + 3$	
9. $0/1$	42. $21/3$	74. $0 - 0$	
10. $1 + 8$	43. $19 - 10$	75. $42/6$	
11. $0 + 5$	44. 8×2	76. $3/1$	
12. $5 + 8$	45. $4 + 2$	77. $8 - 2$	
13. $0 + 0$	46. $1 + 10$	Num and A	
14. 9×1	47. $1 + 3$	78. $6 + 10$	
A only	Num and A	79. $9 - 3$	
15. 8×3	48. $2 + 9$	80. $7 + 2$	
16. 9×7	49. 2×2	81. 3×7	
17. $9 - 4$	50. $11 - 8$	82. $7/7$	
18. $6 - 3$	51. $0/7$	A only	
19. $2 - 1$	52. $9 + 6$	83. $63/7$	
20. $16 - 8$	53. $9 - 8$	84. $0/3$	
21. $10 + 8$	54. $4 + 0$	Num and A	
22. $5 + 0$	A only	85. $8 + 0$	
23. 6×3	55. $9 - 5$	86. $11 - 10$	
24. $12 - 7$	56. $1 + 7$	87. $12 - 8$	
25. $10 + 2$	57. 2×0	88. 9×2	
26. $16 - 7$	58. $11 - 2$	89. $8 + 1$	
Num and A	59. $5 + 4$	90. 0×6	
27. $40/4$	Num and A	91. 3×9	
28. $6 + 5$	60. $2 - 2$	92. $36/9$	
29. $4 + 8$	61. $4 + 7$	93. $7 + 1$	
30. $6 + 8$	62. $5 + 9$	A only	
31. $2 + 1$	63. $5 + 7$	94. $4 + 1$	
32. 6×7	64. $10 + 6$	95. $10/2$	

All 4 Operations, Set 5

Q and A

1. $70/7$

2. $3+8$

3. $5+5$

4. $40/8$

5. $1+9$

6. 0×5

A only

7. $7-5$

8. 8×9

9. $0+3$

10. $10-10$

11. 1×4

12. 4×7

13. $0+4$

14. 1×3

Q and A

15. $18-10$

16. $14/7$

17. $12/3$

18. $16-9$

19. $4-3$

20. $42/7$

21. 1×5

22. 4×4

23. 1×8

24. $35/7$

A only

25. 10×6

26. $7+10$

27. $5-5$

28. $24/8$

29. $6-5$

30. $81/9$

31. $15-8$

32. 0×4

33. $20-10$

Q and A

34. $30/3$

35. $12-6$

36. $3+7$

37. $9+8$

38. $3-0$

39. 10×2

40. 3×1

41. $10/1$

42. 10×8

43. 0×3

44. 9×3

A only

45. $1+0$

46. $13-7$

47. $5-4$

48. $8+6$

Q and A

49. $63/9$

50. $1+1$

51. $14/2$

52. $21/7$

53. 2×4

54. $10-0$

55. $2+8$

A only

56. 8×0

57. $64/8$

58. $4+6$

59. $7+0$

60. $90/9$

61. 4×2

62. 5×9

63. 7×3

64. $10-5$

65. 5×1

66. $7/7$

Q and A

67. $19-10$

68. $5+5$

69. $12-10$

70. $10+5$

71. 7×10

72. $9+3$

73. 0×4

74. $49/7$

A only

75. $10+9$

76. $6+9$

77. $0/3$

78. $56/7$

79. $16-8$

80. 7×5

Q and A

81. $9+1$

82. 2×3

83. 9×7

84. $1-0$

A only

85. $9+2$

86. 2×0

87. $20/5$

88. $2+9$

89. $3+7$

90. $12-7$

91. 4×9

92. $11-10$

93. $5/1$

94. $3+6$

95. $0+6$

96. $11-6$

Q and A

97. $4+4$

98. $7-6$

99. $2+5$

100. $13-10$

Math Word Problems

Word Problems Involving Addition and Subtraction

First, go through these problems until you understand them all. Then you can do task-switching between “A only” (where you say the number that is the solution to the problem) and “Which Op” (where you say which operation is necessary to find the answer – is it addition or subtraction?)

For example, suppose the stimulus is, “There are three crows on a fence. Two fly away. How many are left?” The response using “A only” is “1.” The response using “Which Op” is “subtract.”

A only:

1. Jim has 3 books, and buys 2 more. How many does he own after buying?
2. Fran has 7 books, and sells 4. How many does she own after selling?
3. A puppy is 9 inches long, and grows 2 inches. How many inches tall is he after growing?

4. A plant is 10 centimeters tall, and grows 4 centimeters. How tall is it after growing?
5. Jim has 8 dollars, and earns 2 dollars more. How much does he have after earning?

Which op

6. Fran has 9 dollars, and spends 3 dollars. How much does she have after spending?
7. There are 8 windows. 3 get broken. How many windows remain unbroken?
8. There are 5 bugs in the room. 2 more fly in. How many are in the room now?
9. There are 8 sacks of sand. We get 3 more. How many do we have after getting those?

A only

10. We have 11 pencils. Two get used up. How many do we have left?

Word Problems Involving Addition and Subtraction

11. It's 10 kilometers to town from where we are. We go 6 kilometers toward town. How many kilometers from town are we now?
12. John owes \$14 to Tim. John pays \$9 back. How much does he owe Tim after that repaying?
13. Jim is 10 kilometers north of town. He goes 3 kilometers farther north. How far north of town is he now?
14. Jan is 8 kilometers north of town. She goes 2 kilometers south (towards town). How far north of town is she now?
15. Al has read 10 pages of a book. He reads 7 more pages. How many has he read altogether?
16. Min has 9 pages to read. She reads 4 pages. How many pages are left to read?
17. There are 6 bugs in the room. 3 fly out. How many are left?
18. Sal wants to save \$10. She saves \$3. How many dollars are left for her to save?
19. Ralph goes 5 miles east from his home. Then he goes 5 more miles east. How many miles east of home is he now?
20. A rope is 10 meters long. 2 meters are cut off. How many meters are left?
21. A chain is 4 meters long. It's joined end to end with another chain 7 meters long. How long is the resulting chain?
- Which op
22. Ralph is 10 years old. Sue is 7 years old. How much older is Ralph than Sue?
23. Jim has \$8. Tina has \$9. How much do they have altogether?
24. Sarah's lunch bill is \$10. Sarah leaves a tip of \$2. How much does Sarah spend on lunch altogether?
25. A book costs 30 dollars before tax. The tax is 2 dollars. How much does the book cost in all?
26. The original price of a book is 10 dollars. Because of a sale, the price is reduced 2 dollars. What's the new price of the book?
27. John owes Tim \$3. Then John borrows \$4 more. Now how much does John owe Tim?

Manual on Task-Switching

28. Paul owes his mom \$10. Then he pays back \$4. How much does he owe her now?

A only

29. Jay is 5 feet tall. Lisa is 3 feet tall. How much taller is Jay than Lisa?
30. A hole is 2 meters deep. We dig down 2 more meters. How deep is the hole now?
31. A jug holds 6 liters of water. We drink 4 liters. How much water is left?
32. Alex weighs 100 pounds. He gains 10 pounds. How much does he weigh after gaining?
33. John types 9 pages on Monday, and 7 pages on Tuesday. How many pages did he type over the two days?

Which op

34. A pancake is 100 calories, and the syrup on it is 100 more calories. How many calories altogether are in the pancake and syrup?
35. I have \$13, and I spend \$6. How much do I have left?

36. I go 10 meters north of my starting point, and then come back 8 meters straight south. How far am I from my starting point?

37. Jed can run 12 kilometers per hour, and Rod can run 8 kilometers per hour. How much faster than Rod can Jed run?

38. Tom weighs 50 pounds and his little brother weighs 20 pounds. When Tom holds his little brother and they both get on the scale, what's their combined weight?

39. Gina weighs 100 pounds. She loses 10 pounds. How much does she weigh after losing?

A only

40. Jacob has 10 friends. He makes 3 more friends. How many friends does he have after making the new ones?

41. Bert gets on the scale, and it reads 100 pounds. He takes 1 pound of stuff out of his pocket, and puts it on a table. What's the scale reading now?

42. Jean has 10 friends who live in her town. 3 of them move away. Now how many friends does she have in her town?

Word Problems Involving Addition and Subtraction

43. A shirt originally costs 17 dollars. There is a discount of 8 dollars. How much does the shirt cost after the discount?
44. A merchant buys a shirt for 10 dollars. He marks the shirt up by 5 dollars. How much does he sell the shirt for?
45. The runner who finishes a race first, finishes in 9 minutes. The second place runner has a time of 11 minutes. How many minutes went by between the winner's finish and the second placer's finish?
46. A mixture has 8 kilograms of water and 5 kilograms of alcohol (and none of anything else). How many kilograms in the mixture altogether?
- Which op
47. There are 9 pounds of salt water. 1 pound of the mixture is salt. How much of the mixture is water?
48. Ted sleeps 7 hours at night, and later takes a 2 hour nap. How many hours has he slept altogether?
49. One pill has 10 milligrams of medicine, and another has 5 milligrams. How many milligrams does someone get by taking both pills together?
50. Someone wants to take 20 milligrams of medicine. The person has already taken 10 milligrams. How many milligrams more should the person take?
51. There are 10 questions on a test, all of which Jane gets either right or wrong. She gets 9 right. How many did she miss?
52. On a test, Frank answered all the questions and got 9 right and 3 wrong. How many questions were on the test?
53. The contents of John's suitcase weigh 10 pounds and the suitcase itself weighs 2 pounds. How much does the suitcase weigh with the contents in it?
54. A suitcase with a bunch of stuff in it weighs 10 pounds. The stuff by itself weighs 7 pounds. How much does the suitcase weigh?
55. Three weights, altogether, weigh 8 pounds. The first two, together, weigh 6 pounds. How much does the third one weigh?
56. Three weights, together, weigh 9 pounds. A fourth weight weighs

Manual on Task-Switching

7 pounds. How much do all four of them weigh altogether?

behind a tree.” How many baby pigs were really there?

A only

57. Three people have, altogether, \$8. A fourth person has \$4. How much do all four people have?

58. Five people have, altogether, \$7. When a sixth person pools her money with the first five, the six people altogether have \$15. How much money did the sixth person have?

59. Sunny can do 25 math facts per minute. She increases her speed by 10 facts per minute. How fast can she go after increasing her speed?

60. Harold knows how to play 14 songs. He forgets how to play 8 of them. How many does he know how to play after forgetting?

61. Gina counts some baby pigs. She gets a total of 10. Gina’s mom correctly says, “There were two pigs that you counted twice.” How many baby pigs were really there?

62. Tommy counts some baby pigs. He gets a total of 6. Tommy’s dad correctly says, “There was one you missed who was hiding

63. Rick wants to buy something for \$12. He has \$7. How many more dollars does he need to get?

64. Tonya gets paid \$17 per hour. Lisa gets paid \$10 per hour. How much more, per hour, does Tonya get paid than Lisa?

65. Tonya gets paid \$17 per hour, and Lisa gets paid \$10 per hour. If they pool their money, how much do they make each hour, altogether?

66. All 10 members of a group study Spanish. 2 of them study both Spanish and French. How many of them study Spanish and not French?

Which op

67. Kristy has to wait 10 minutes for a play to start. After she waits 6 minutes, how much longer does she have to wait?

68. Larry thinks a play will start in 10 minutes after he sits down. But after he waits that long, the play doesn’t start for 7 more minutes. How long did Larry sit waiting altogether?

Word Problems Involving Addition and Subtraction

69. A person spends 5 dollars on food and 8 dollars on presents. How much did the person spend altogether?
70. A person spends 15 dollars altogether. 10 dollars of that were spent on food. How much was spent on something other than food?
71. 3 people ride in one car, and 6 people ride in a van. How many people travel altogether, in the two vehicles?
72. 14 people go from one building to another. 6 of them rode bicycles. How many of them went by some means other than bicycle?
73. A snake is 18 inches long after growing 8 inches. How long was the snake before she grew the 8 inches?
74. Gina's first name has 4 letters, and her last name has 9 letters. How many letters total are in her first and last name?
75. Gina's first name has 4 letters, and her last name has 9 letters. How many more letters are in her last name than in her first?
76. Sara is 10 years old, and Tim is 6 years old. How many years older than Tim is Sara?
77. An old broken computer is on sale for 17 dollars. Another one is on sale for 9 dollars. How much more does the first cost than the second?
78. Lottie started high school when she was 14 years old. She started college 4 years later. How old was she when she started college?

A only

Which op

79. Everyone in a certain high school studies either Spanish or French, but not both. In a group of 15 students, 9 of them study Spanish. How many study French?
80. A group of 17 students has 9 males. How many females are in the group?
81. There are 7 males and 9 females in a group. How many people are in the group in all?
82. A window sill is 2 feet higher than the floor. The top of the window is 4 feet higher than the window sill. How far above the floor is the top of the window?

Manual on Task-Switching

83. A window sill is 2 feet higher than the floor. The top of a window is 7 feet higher than the floor. How far is it from the windowsill to the top of the window?
84. A room is 9 feet from floor to ceiling. A cabinet is 6 feet tall. How many feet are there from the top of the cabinet to the ceiling?
85. There are 9 boxes of stuff to move from the bedroom, and 8 boxes to move from the office. How many boxes are there to move, from the two rooms combined?
86. The temperature was 40 degrees at 2 pm, and 30 degrees at 9 pm. By how many degrees did the temperature drop?
87. One appliance uses 100 watts of power, and another uses 200 watts. How much power do they use when both are turned on?
88. John wants to take 16 credits of college courses. He is signed up for 9 credits already. How many more credits does he need to sign up for?
89. Tom buys a 3 acre lot, right next to his 4 acre property. How big is his property altogether after the purchase?
90. Richard owns 15 acres of land, but he sells a lot that is 8 acres. How much land does he own after the sale?
- A only
91. A merchant buys a computer for 200 dollars and sells it for 300 dollars. What is the merchant's profit?
92. A merchant buys a computer for 300 dollars. He wants to make 200 dollars profit when selling it. For how much should he list the price of it?
93. A merchant lists the price of a computer as 600 dollars. He advertises a sale with a 100 dollar discount taken off the list price. What is the sale price?
94. Someone has a 10 page paper to write. The person has written 2 pages. How many more pages are there to write?
- Which op
95. Someone is writing a paper. The person writes 5 pages in the morning, and 3 in the afternoon. How many pages has the person

Word Problems Involving Addition and Subtraction

written in both morning and
afternoon?

96. A person runs 100 meters in 18 seconds. He wants to improve his speed by 4 seconds. If he succeeds, what will be his new time for the 100 meter run?
97. A person runs 100 meters in 20 seconds. He doesn't exercise, gets more out of shape, and gets slower by 4 seconds. What is his time after getting out of shape?
98. A person can lift 100 pounds. He gets stronger, so that he can lift 10 pounds more. How much can he lift after getting stronger?
99. A person can lift 100 pounds. He gets weaker by 10 pounds. How much can he lift after getting weaker?
100. A person leases an office for 2 years. After a few months, he decides he likes the office so much that he wants to extend the original lease by 3 more years. How long is the period of the lease after he extends it?

Word Problems Involving All 4 Operations

A only:

1. There are 3 rooms, and 4 people in each room. How many people in all?
2. There are 18 peanuts, distributed equally among 3 bags. How many in each bag?
3. 15 cards are dealt equally to 5 people. How many cards does each get?
4. A rectangle is 7 centimeters long and 5 centimeters wide. What is its area, in square centimeters?
5. Someone has 18 dollars and spends 9 dollars. How much is left?
6. Someone walks 3 km east of a starting point, and then goes 7 km further east. Now how far east of the starting point is the person?
7. Someone has 20 dollars. How many things can he buy, if each thing costs 5 dollars?
8. Each of 4 spiders has 8 legs. How many legs are there in all?

9. Someone has 8 nickels, each of which is worth 5 cents. How much are the coins worth in all?
10. In the year 2008, someone was 8 years old. What year was the person born in?
11. The area of a rectangle is 36 square centimeters. The length is 9 centimeters. What is the width?

Which op

12. Someone goes 7 miles each hour, for 3 hours. How many miles does the person go in all?
13. Someone wants to go 24 kilometers. The person walks at 4 km per hour. How long does it take the person?
14. Each of 4 people has 7 dollars. How many dollars do they have in all?
15. 6 people are each pushing against a car with a force of 50 pounds. How much force are they pushing with altogether?
16. Someone wants to eat no more than 50 calories from cherries. Each cherry is 5 calories. How

Word Problems Involving All 4 Operations

- many cherries can the person eat?
17. Someone eats two grapes which together provide 4 calories, and a bite of tomato which is 3 calories. How many has the person eaten in all?
18. Someone eats 6 cherries, which are 5 calories apiece. How many calories has the person taken in, in all?
19. Someone wants to eat a maximum of 3000 calories in a day. The person has eaten 2000 calories. How many more calories can the person eat?
20. 6 weights each weigh 4 pounds. How much do they weigh if you put them all on a scale at once?
21. Marvin earns 10 dollars an hour. How much does he earn in 7 hours?
22. Marvin earns 10 dollars an hour. How long will it take for him to earn 40 dollars?
23. Sally is working a shift that is 10 hours long. She has worked 6 hours. How many hours does she have before she gets off work?
24. Each of 9 mother rabbits has 6 baby rabbits. How many baby rabbits were born?
25. Each of 8 insects has 6 legs. How many legs are there in all?
26. A bunch of insects, each of which has 6 legs, has 36 legs altogether. How many insects are there?
- A only
27. Each of 7 boxes has mass of 4 kilograms. How much mass do the boxes have altogether?
28. 8 identical boxes have a total mass of 56 kilograms. How much mass is there in each box?
29. Each person in a group has 10 fingers. There are 90 fingers in all. How many people are there?
30. John buys a lunch for 9 people at 7 dollars apiece. How much does he spend in all?
31. Sally pays 72 dollars for lunches for 8 people. How much did each lunch cost?
32. 10 identical computers, when put on a scale, weigh 100 pounds. How much does each computer weigh?

Manual on Task-Switching

33. It takes Maria 20 minutes to give a dog a haircut. How many minutes will it take her to give haircuts to 4 dogs?
34. Each trip across the college is 2 kilometers. How far does someone go in 8 trips across the college?

Which op

35. A truck goes 10 miles for each gallon of gas. How far can the truck go on 8 gallons of gas?
36. A truck goes 10 miles for each gallon of gas. How many gallons will it take for the truck to go 50 miles?
37. Joe gets a haircut 10 times a year. Each one costs \$5. How much does he spend in all on haircuts in a year?
38. Fran bought 8 cans of vegetables, at the same price. The vegetables cost her 8 dollars altogether. How much did each can of vegetables cost?
39. One can of vegetables cost 40 cents and another cost 30 cents. How much did they cost in all?
40. Tina has an assignment to read 17 pages. She has read 7 pages.

How many more does she have to read?

41. It is now 6 minutes after 8. A concert begins at 10 minutes after 8. How many minutes is it until the concert begins?
42. Mack waits 2 minutes each time he turns his computer on, once each day. How many minutes, total, does he wait for the computer to come on in a month which is 30 days long?
43. There are 7 days in a week. Rhonda is getting married in exactly 6 weeks. How many days will it be before she gets married?
44. People have allotted 56 total minutes for speeches. Each speaker gets the same amount of time. There are 7 speakers. How long does each get to speak?
45. There are 80 pounds of books to be moved. Each of 8 people gets an equal amount of the weight. How much weight does each person carry?
46. Tom sleeps two hours a night more than Gary does. In 7 days, how much more sleep, total, does Tom get than Gary?

A only

Word Problems Involving All 4 Operations

47. In one night, Jean sleeps 9 hours and Tonya sleeps 6 hours. How many more hours sleep did Jean get than Tonya?
48. The temperature is 8 degrees Celsius, and then the temperature rises 7 degrees. What's the temperature after the increase?
49. John has 3 nephews graduating from school, and he gives each of them a 50 dollar present. How much does John give in all?
50. Terry has 20 dollars to spend on books. Each book costs 4 dollars. How many books can she buy?
51. There are 63 pounds of beans, to be divided equally among 7 families. How much does each family get?
52. Tina has 8 friends, and she spends 9 minutes per friend sending a message. How many minutes does she spend sending messages?
53. 28 cards are dealt out equally to 4 people. How many cards does each person get?
54. 4 vans carry 6 people each. How many people do the vans carry in all?
55. Each of 5 people owns 2 pairs of shoes. How many pairs of shoes do they own in all?
56. A recipe uses 4 ounces of ketchup. Someone wants to make 3 times as much as the recipe makes. How many ounces of ketchup should be in the new recipe?
57. There are 9 members of a club. Each pays dues of 7 dollars apiece. How much in all does the club collect in dues?
- Which op
58. A club wants to collect 72 dollars in dues. There are 9 members. How much should each member be charged?
59. Someone wants to write an 81 page story. The person can write 9 pages each day. How many days will it take for the person to write the story?
60. I have 14 bags of grapes that I want to give out equally among my two children. How much does each child get?

Manual on Task-Switching

61. I have 35 minutes left to talk to customers, and 7 of them are in line. If I want to give each of them the same amount of time, how much time can I spend with each?

62. Cynthia wants to practice her dance routine 10 times tonight. She has practiced it 7 times. How many more does she have to go?

A only

63. Cynthia practices her dance 10 times each night. How many times does she practice it in 9 days?

64. 48 cards are dealt out evenly to some people; each person got 8 cards. How many people were there?

65. 49 cards are dealt out evenly to 7 people. How many cards does each person get?

66. I want to go 21 miles; I can travel 7 miles per hour. How long will the trip take me?

67. I go 36 miles in 4 hours. How many miles per hour do I go, on the average?

68. It takes 2 lemons for Sam to make a liter of lemonade. How

many lemons will it take to make 5 liters of lemonade?

69. A dog is supposed to get 2 milligrams of medicine for every kilogram of the dog's mass. If the dog weighs 8 kilograms, how many milligrams of medicine should the dog get?

70. If each person makes an average of 5 doctor visits a year, how many total doctor visits were made by 7 people in the year?

71. There are 15 kids in a group. They get into groups of 3 for an activity. How many groups do they form?

72. Molly spends 30 dollars for each of her textbooks. If she buys five textbooks, how much does she spend total?

73. Sven gets 9 dollars an hour. How long does he have to work to earn 72 dollars?

74. Someone runs 5 meters per second for 10 seconds. How many meters does the person go?

75. Each person in a family has 3 suitcases. They have 18 suitcases in all. How many people are in the family?

Word Problems Involving All 4 Operations

Which op

A only

76. A plant grows 5 inches each month. How much does it grow in 6 months?
77. In a bunch of ducks, with two legs each, there are a total of 18 legs. How many ducks are there?
78. Alice's car goes 30 miles per gallon of gas. How far does the car go on 10 gallons?
79. John can type 100 characters per minute. How long will it take him to type 500 characters?
80. Linda gets paid 3 dollars for each page she types. How many pages does she have to type to earn 21 dollars?
81. Linda gets paid 3 dollars for each page she types. How much does she earn from typing 5 pages?
82. Each glass of orange juice has 100 calories. How many calories are in 5 glasses of orange juice?
83. Jack has 3 flash drives. Each holds 2 gigabytes of information. How many gigabytes can his drives hold altogether?
84. Rashad wants to store 12 gigabytes of information on flash drives, each of which holds 4 gigabytes. How many flash drives does Rashad need?
85. Tom wants to copy 15 gigabytes of information. He has already copied 7 gigabytes. How many does he have left to copy?
86. Julie has two flash drives, one holding 8 gigabytes and another holding 4 gigabytes. How much information can the two flash drives hold in all?
87. A person has 20 files in his file cabinet. Each one weighs two newtons. How many newtons do the 20 files weigh altogether?
88. A nut has a mass of 5 grams. How many nuts does it take to have a mass of 30 grams?
89. A cup is 8 ounces. How many cups does it take to make 64 ounces?
90. There are two pints in a quart. How many pints are in 8 quarts?

Which op

Manual on Task-Switching

91. A computer battery will stay charged for 3 hours. If the person wants to use the computer for 15 hours, how many times must the battery be charged (counting the first charge before the computer is used)?
92. Someone makes a flag with 5 rows of stars, and 4 stars in each row (that is, 4 columns). How many stars are there altogether?
93. 30 people are going somewhere, and 5 people can fit in each car. How many cars are needed to take the 30 people?
94. It's 6 miles from town A to town B, and then 5 more miles from town B to town C. If someone goes from A to B to C, how far have they gone?
95. If someone walks 10 meters north, and then comes back 3 meters south, how far is the person from the starting point?
96. It takes someone 10 minutes to type a page. How long does it take to type 3 pages?
97. Someone takes a total of 15 milligrams of a chemical, and puts an equal amount into each of three beakers. How much goes into each beaker?
98. A phone weighs 2 newtons. A second phone weighs 10 newtons. The second phone weighs how many times as much as the first?
99. A phone weighs 3 newtons. A second phone weighs 3 times as much. How much does the second phone weigh?
100. A book weighs 12 newtons. It weighs 4 times as much as a smaller book. How much does the smaller book weigh?

Practicing Task-Switching with Reading Words

If there's a skill that's even more important for school success than math facts, it's the ability to read. Most students will benefit from lots of practice in reading individual words. The skill of "phonemic awareness" is that of hearing the individual sounds in words, and blending those sounds together. This is a very important skill for fluent reading. To develop this skill, as well as to practice recognizing lots of words, it's good to do "sounding and blending": this means, for example, upon seeing the word "fit," saying, "fuh ih tuh fit." Seeing a word and saying the "sounds only," for example seeing the word "get" and saying "guh eh tuh," also give practice in phonemic awareness. It's also good reading practice, of course, just to look at a word and just read it, or to "blend only." If the word is in a numbered list, you can do "blend only" with and without saying the item number first.

So we have four conditions: "S and B" (sound and blend), "S only" (sounds only), "B only" (blend only), and "Num and B" (number and blend). We can do task-switching among those four ways of responding to numbered words, while we're at the same time getting in lots of good reading practice.

The words in the lists that follow start with short vowel consonant-vowel-consonant words, and gradually go up the hierarchy of reading

difficulty. These lists follow the same general order as those in my book, *Manual for Tutors and Teachers of Reading*. In the reading manual, the jumps in difficulty from one list to the next are much smaller. There is much more attention to the prerequisite skills worth shoring up before taking on word lists. But for some students, the words in this task-switching manual may be enough, especially combined with what the student learns at school. The best of all possible worlds may be to use the reading manual and to use task-switching with these lists as a supplementary activity and review.

I recommend ignoring the directions and practicing the lists with one set of directions only – especially sounding and blending – before taking on the task-switching.

As with all of these lists, the real reward comes from doing them repeatedly and setting new speed records as time goes by.

Three Phoneme Short Vowel Words

For “B only,” (that is, “Blend only”) when you see bug, say “bug.” For “S and B,” (or “Sound and Blend”) when you see bug, say “buh uh guh, bug.”

S and B	32. bin	62. gull	93. hum
1. fuss	33. hut	63. rip	94. vet
2. top	B only	64. cob	95. nun
3. tap	34. puff	65. web	B only
4. mat	35. cuff	66. pod	96. sell
5. pat	36. bat	67. gun	97. net
6. pet	37. moss	68. dot	98. job
7. log	38. pan	69. wax	99. rub
8. nap	39. tug	S and B	100. red
B only	40. nut	70. tub	
9. keg	41. fed	71. tag	
10. pop	42. wag	72. tiff	
11. jazz	43. tell	73. toss	
12. kiss	S and B	74. mum	
13. get	44. hag	75. nod	
14. not	45. Kim	76. jam	
15. den	46. sin	B only	
16. run	47. less	77. hot	
17. sum	48. set	78. Ben	
18. ham	49. lid	79. Tim	
19. Nat	50. bag	80. buzz	
20. pad	51. hug	81. bill	
S and B	S and B	82. lip	
21. fit	52. Tom	83. sis	
22. men	53. kit	84. fan	
23. kill	54. rib	S and B	
24. mud	B only	85. fig	
25. nip	55. tip	86. Jim	
26. bed	56. rod	87. hen	
27. miss	57. fog	88. hiss	
28. Gus	58. fill	89. bit	
29. rap	59. led	90. dad	
30. Jill	60. fell	91. tan	
31. tax	61. mug	92. Don	

Short Vowel Words

For “S only,” (that is, “Sound only”) when you see bug, say “buh uh guh.”

S only	32. fund	63. well	95. pack
1. splint	33. swim	64. an	96. pin
2. next	34. rock	65. nut	97. tank
3. bag	35. belt	66. bump	98. stem
4. drill	36. job	B only	99. lip
5. land	37. brim	67. sell	100. pub
6. pest	S only	68. spend	
7. let	38. help	69. toss	
8. stamp	39. fuzz	70. did	
9. lid	40. swept	71. up	
10. dogs	41. if	72. lift	
11. rip	42. tug	73. drink	
B only	43. desk	74. puff	
12. gulp	44. bond	75. till	
13. swell	45. dusk	76. pod	
14. strip	46. mass	77. hops	
15. set	47. wigs	78. luck	
16. cuff	S only	79. guns	
17. God	48. wag	80. lick	
18. dim	49. pan	81. hum	
19. grip	50. damp	S only	
S only	B only	82. bring	
20. slink	51. clamp	83. from	
21. boss	52. prompt	84. pant	
22. crack	53. kill	85. hill	
23. lips	54. pass	86. lock	
24. had	55. mutt	87. Fran	
25. ink	S only	88. fond	
26. jam	56. trip	89. dunk	
B only	57. moss	B only	
27. will	58. mats	90. mix	
28. pigs	59. beg	91. wish	
29. nun	60. drip	92. skip	
30. tell	61. ham	93. silk	
31. span	62. ax	94. strong	

Short Vowel Words, with sh, th, ch, wh, and qu

For “Num and B” (that is, “Number and Blend”) when you see 1. bug, say “One, bug.”

Num and B	32. tag	64. black	96. snap
1. shot	33. sketch	65. link	97. snatch
2. sing	34. nap	S and B	98. run
3. odd	35. slip	66. stuff	99. bet
4. peg	36. bunch	67. back	Num and B
5. shift	37. glint	68. mush	100. moth
6. tan	Num and B	69. brink	
7. hop	38. slack	70. pond	
8. with	39. when	71. sells	
9. dress	40. hog	72. plump	
10. tax	41. rap	73. max	
S and B	42. cuts	74. gun	
11. rips	43. bulk	Num and B	
12. send	44. fan	75. fill	
13. must	45. whack	76. mad	
14. drug	S and B	77. log	
15. fed	46. shut	78. ship	
16. wing	47. rust	79. trap	
17. sob	48. trick	80. web	
18. notch	49. chick	81. wind	
Num and B	50. fact	82. past	
19. cloth	51. him	83. fist	
20. glad	52. wax	84. left	
21. bus	53. hunch	85. Don	
22. trot	54. flip	S and B	
23. cash	Num and B	86. whip	
24. kick	55. crib	87. sis	
25. chop	56. tuck	88. cob	
26. brisk	57. huff	89. cuffs	
27. pick	58. brag	90. mud	
S and B	59. than	91. last	
28. lung	60. quilt	92. bit	
29. tap	61. rim	93. mum	
30. brat	62. fix	94. risk	
31. sad	63. then	95. stuck	

More Short Vowel Words

B only	33. lot	65. den	97. dust
1. fetch	34. hills	66. snip	98. print
2. yank	35. string	67. sips	99. its
3. frog	36. Tim	68. patch	100. bang
4. bench	B only	69. plank	
5. hum	37. ox	70. tin	
6. nip	38. click	B only	
7. flock	39. splash	71. pinch	
8. mug	40. jazz	72. pad	
9. brand	41. beds	73. king	
10. sack	42. gull	74. rank	
11. spell	43. batch	75. brush	
S and B	S and B	76. mask	
12. bluff	44. stretch	77. pen	
13. leg	45. mock	78. pump	
14. less	46. ditch	79. dell	
15. frank	47. mist	80. rib	
16. hums	48. chum	S and B	
17. six	49. kid	81. muff	
18. tent	50. hats	82. plum	
19. this	51. led	83. shop	
20. stub	52. such	84. melt	
21. Nick	53. quill	85. hit	
B only	B only	86. bets	
22. hen	54. gift	87. elf	
23. cats	55. that	88. held	
24. bed	56. nest	89. lamp	
25. Ken	57. slot	90. rash	
26. junk	58. digs	B only	
27. cot	59. flop	91. mess	
S and B	60. hug	92. strap	
28. quick	61. sock	93. dock	
29. went	62. bugs	94. lap	
30. bath	S and B	95. drum	
31. much	63. zip	96. gash	
32. Fred	64. thrift	S and B	

Long Vowel Words, Set 1

B only

1. hold
2. own
3. dry
4. cone
5. street
6. Zeke
7. tail
8. go

S only

9. steam
10. fade
11. dole
12. boat
13. slay

B only

14. flies
15. note
16. maze
17. steer
18. froze
19. taste
20. blaze

S only

21. shine
22. low
23. mine
24. grind
25. hire
26. load
27. Mike
28. cheat
29. seed
30. throne
31. chore
32. sight

33. sale

34. wife
35. stream

B only

36. size
37. made
38. ago
39. heat
40. chime
41. stripe
42. hello
43. woe
44. chain
45. reach
46. dine
47. rate
48. make

S only

49. boast
50. seal
51. tape
52. lean
53. hate
54. green
55. faint
56. mow
57. plain
58. goal
59. shy
60. grope

B only

61. brave
62. height
63. thigh
64. toad
65. fright

66. leap

67. breed
68. male
69. fume
70. doe
71. knight

S only

72. five
73. whine
74. blame
75. spray
76. hue
77. deep
78. sail
79. gripe

B only

80. throw
81. pie
82. cry
83. old
84. pine
85. frail
86. dear
87. cheap
88. tight
89. Poe
90. hive

S only

91. sleep
92. weep
93. pure
94. oak
95. peak
96. wheat
97. hail
98. spade

99. pail

100. he

Long Vowel Words, Set 2

S and B

1. meet
2. goat
3. queer
4. tube
5. most
6. may

7. Luke

8. moan

9. snail

10. oath

11. maid

Num and B

12. hear

13. toll

14. bind

15. peep

16. waste

17. teeth

18. blow

19. ripe

20. claim

21. flow

S and B

22. peach

23. die

24. reap

25. screen

26. train

27. lame

28. shore

29. nine

30. life

31. feel

32. wait

Num and B

33. throat

34. way

35. wore

36. colt

37. roe

38. ear

39. robe

40. try

S and B

41. slope

42. fight

43. growth

44. spite

45. tame

46. ape

47. fate

48. light

49. feet

50. game

51. like

52. creep

53. maybe

Num and B

54. safe

55. pry

56. flake

57. joke

58. aid

59. rake

60. ride

61. fry

62. pain

63. braid

64. blind

65. bright

S and B

66. seen

67. bray

68. cure

69. steel

70. plate

71. crime

72. saint

Num and B

73. bite

74. glide

75. tea

76. coast

77. while

78. foam

79. poll

80. bee

81. more

82. eve

83. rope

84. wire

85. east

86. lute

87. rind

S and B

88. use

89. clear

90. date

91. faith

92. haze

93. teach

94. bean

95. side

Num and B

96. ray

97. dome

98. toe

99. brute

100. sheer

Long Vowel Words, Set 3

S and B	33. crate	66. pane	99. quake
1. beak	34. spy	67. jay	100. meat
2. away	35. foe	68. scroll	
3. moat	36. rail	69. cube	
4. near	37. Crete	70. smile	
5. hoe	38. home	71. don't	
6. trade	39. aim	72. woke	
7. clay	40. glow	B only	
8. rule	41. fire	73. tune	
9. tire	42. dream	74. Pete	
10. might	S and B	75. wide	
11. quaint	43. night	76. roast	
12. spoke	44. lay	77. soap	
13. fly	45. wake	78. told	
B only	46. yeast	79. shave	
14. grain	47. cope	80. she	
15. by	48. tried	81. gear	
16. loaf	49. cream	82. flea	
17. peel	50. strain	83. cold	
18. zeal	51. dive	84. play	
19. bait	52. grate	85. fake	
20. vain	53. bay	86. dune	
21. prune	B only	87. shape	
22. loan	54. bolt	S and B	
23. leaf	55. bore	88. flute	
S and B	56. see	89. bride	
24. sweep	57. cane	90. stole	
25. window	58. heel	91. groan	
26. smoke	59. yellow	92. child	
27. beach	60. lobe	93. fear	
28. bike	61. before	94. wild	
29. eke	S and B	95. fried	
30. store	62. Joe	B only	
B only	63. brain	96. tone	
31. paint	64. Dave	97. heap	
32. speech	65. globe	98. fine	

Words With Vowel Blends, Set 1

B only

1. corn
2. pall
3. food
4. Sue
5. shook

S only

6. girl
7. under
8. stern
9. arch
10. talk
11. grouch
12. marsh
13. claw

B only

14. woo
15. dew
16. hurl
17. bound
18. south
19. torch
20. glue
21. cook
22. moo
23. smooth
24. scar
25. star
26. form
27. part
28. gown

S only

29. flour
30. vowel
31. loop
32. tall

33. too

34. always

35. about

B only

36. cloud

37. art

38. malt

39. dirt

40. chalk

41. stall

42. porch

43. round

44. gaunt

45. never

46. farm

47. lord

S only

48. cord

49. point

50. hound

51. fool

52. burr

53. soon

54. sharp

55. bark

56. howl

57. vow

58. chart

59. shirt

60. mouth

B only

61. yarn

62. scout

63. ever

64. tool

65. sprawl

66. halt

67. drown

68. straw

S only

69. booth

70. burn

71. cool

72. jerk

73. stew

74. powder

75. hoist

76. dark

77. pouch

78. draw

79. worn

B only

80. fowl

81. found

82. law

83. Carl

84. hard

85. far

86. tooth

87. boot

88. port

89. third

S only

90. foot

91. proud

92. flaunt

93. spout

94. dart

95. twirl

96. birch

97. hers

S only

98. shark

99. crown

100. brow

Vowel Blends, Set 2

Num and B

1. news
2. coy
3. crew
4. haunt
5. true
6. drool
7. haul
8. jaunt
9. skirt
10. balk

S and B

11. room
12. surf
13. saw
14. brown
15. car
16. short
17. curb
18. drawn
19. thirst
20. hook
21. mood

Num and B

22. fault
23. our
24. shoot
25. card
26. or
27. birth
28. purr
29. fall

S and B

30. scoop
31. starch
32. jar

33. soy

34. toy

35. north

36. firm

37. church

38. sort

39. good

40. pool

Num and B

41. root

42. how

43. snort

44. cork

45. new

46. daunt

47. horn

48. doom

49. stoop

50. taunt

51. mall

52. thorn

S and B

53. pork

54. crawl

55. thaw

56. fork

57. couch

58. ground

59. flew

60. bird

61. hood

62. moon

63. zoo

64. scorch

65. frown

Num and B

66. trout

67. bow

68. spoil

69. gall

70. squall

71. soot

72. fir

73. hoop

74. launch

75. broil

76. paw

77. stool

78. salt

79. march

80. sworn

S and B

81. shawl

82. shout

83. lard

84. sport

85. bawl

86. for

87. paunch

Num and B

88. spoon

89. bald

90. brew

91. strewn

92. coin

S and B

93. hoof

94. lark

95. loin

96. pound

97. foil

98. flaw

99. brood

100. house

Vowel Blends, Set 3

B only

1. raw
2. Roy
3. dawn
4. jaw
5. clue
6. wall
7. gloom
8. blew
9. Paul
10. whirl
11. scorn

S and B

12. start
13. ball
14. cow
15. broom
16. ouch
17. now
18. call
19. joy

B only

20. all
21. tar
22. owl
23. stir
24. roof
25. burst
26. fraud
27. book
28. around
29. troop
30. crouch
31. harm
32. joint
33. stalk

34. sir

S and B

35. scarf
36. perch
37. darn
38. coo
39. torn
40. due
41. squirm
42. soil
43. out
44. down

B only

45. walk
46. loud
47. herd
48. bloom
49. storm
50. pout
51. stood

S and B

52. arm
53. ploy
54. moist
55. after
56. wood
57. took
58. clown
59. mark
60. Bert
61. wow
62. yawn
63. wool
64. small
65. foul
66. Jew

B only

67. first
68. her
69. look
70. hall
71. grew
72. sour
73. spool
74. sound
75. drew
76. oil
77. town
78. turn
79. furl

S and B

80. yard
81. haunch
82. snout
83. groom
84. growl

B only

85. smart
86. spur
87. chew
88. boy
89. park
90. strew
91. hurt
92. chirp

S and B

93. lawn
94. blue
95. droop
96. clerk
97. Walt
98. bar

99. cart

100. lurch

Words With Other Letter-Sound Correspondences, Set 1

B only	33. fiend	67. helped	99. pounce
1. asked	34. wealth	B only	100. hose
2. sonny	35. pear	68. yield	
3. since	36. trailed	69. puffed	
4. gnome	37. naught	70. glare	
5. bought	38. heads	71. robbed	
6. matched	39. glove	72. breath	
7. knelt	40. enough	73. seethe	
8. treads	41. breathe	74. rise	
S only	42. mice	75. ton	
9. ledge	43. dumb	76. wretch	
10. daughter	44. those	77. taught	
11. money	B only	S only	
12. baked	45. heaven	78. sledge	
13. forced	46. flare	79. scratched	
14. gem	47. hissed	80. knock	
15. tipped	48. push	81. wrist	
16. comb	49. spaced	82. tough	
17. noise	50. break	83. weight	
18. son	51. bull	84. sludge	
19. mare	52. orange	85. is	
B only	53. field	86. pearl	
20. closed	54. feather	87. want	
21. earth	55. slice	88. canned	
22. forge	56. cracked	B only	
23. parked	57. wreath	89. cough	
24. loathe	58. cause	90. month	
25. place	59. fished	91. swan	
26. swamp	S only	92. fuse	
27. hushed	60. smudge	93. snapped	
28. ounce	61. fierce	94. change	
29. sniffed	62. mixed	95. threat	
30. germ	63. kneel	S only	
31. rolled	64. race	96. siege	
S only	65. sailed	97. George	
32. easy	66. bulge	98. glanced	

Words With Other Letter-Sound Correspondences, Set 2

Num and B	34. edge	66. gnaw	99. shrieked
1. jerked	S and B	67. use	100. page
2. wise	35. pause	68. urge	
3. hair	36. kissed	69. ought	
4. eighty	37. ace	70. helped	
5. strange	38. heavy	71. wrong	
6. cent	39. honey	72. wage	
7. rouse	40. raced	73. wheeled	
8. instead	41. budge	74. health	
9. death	42. love	75. brace	
10. chair	43. knob	S and B	
11. written	44. these	76. eight	
S and B	45. shriek	77. rare	
12. brief	46. soothe	78. meant	
13. wiped	Num and B	79. pinched	
14. cell	47. squeezed	80. thumb	
15. dread	48. as	81. breakfast	
16. splashed	49. laugh	82. preached	
17. lair	50. share	83. chance	
18. gym	51. balked	84. smoked	
19. priest	52. please	85. lodge	
20. caught	53. flair	Num and B	
21. brought	54. blare	86. Butch	
22. pledge	55. limb	87. stitched	
23. thieves	56. raise	88. choice	
24. cage	57. growled	89. gnu	
25. lace	S and B	90. wrestle	
26. dead	58. crashed	91. front	
Num and B	59. patched	92. great	
27. called	60. above	S and B	
28. trapped	61. steady	93. sweater	
29. skipped	62. rough	94. monkey	
30. dodge	Num and B	95. crawled	
31. heard	63. excuse	96. monks	
32. bridge	64. air	97. niece	
33. spread	65. sleigh	98. those	

Words With Other Letter-Sound Correspondences, Set 3

B only	33. fought	66. put	99. played
1. nagged	34. learn	67. stopped	100. whole
2. pierce	35. watch	68. voice	
3. wished	36. steak	69. scare	
4. stair	37. chief	70. hitched	
5. because	38. wrote	71. stare	
6. freight	39. charmed	72. fair	
7. filled	40. deaf	73. stage	
8. square	41. fringe	S and B	
9. pull	B only	74. spare	
10. wall	42. neighbor	75. leather	
11. bear	43. bread	76. care	
12. pair	44. search	77. spruce	
S and B	45. sneezed	78. choose	
13. huffed	46. fixed	79. shield	
14. tease	47. weigh	80. age	
15. hare	48. answer	81. gene	
16. thread	49. crumb	82. dance	
17. knife	50. naughty	83. debt	
18. wretched	51. write	84. slammed	
19. bush	S and B	B only	
20. whipped	52. prince	85. wreck	
21. pace	53. jumped	86. sought	
22. hedge	54. fudge	87. wear	
23. snare	55. nudge	88. Bruce	
B only	56. fare	89. face	
24. nose	57. wrap	90. known	
25. close	58. ready	91. water	
26. sweat	B only	92. aware	
27. peace	59. cinch	S and B	
28. pinned	60. cheese	93. stacked	
S and B	61. wash	94. leaped	
29. bathe	62. gnat	95. tripped	
30. knee	63. huge	96. wan	
31. dropped	64. know	97. daisy	
32. thought	65. twice	98. rage	

Polysyllabic Words, Set 1

S only

1. wor ry worry
2. tip ping tipping
3. fit ting fitting
4. bath tub bathtub
5. rid dle riddle
6. hur ries hurries
7. drum mer drummer
8. wel come welcome
9. some one someone
10. butch er butcher
11. com pan ies companies
12. him self/himself
13. anx ious anxious
14. can ning canning
15. class room classroom

B only

16. set tle settle
17. brit tle brittle
18. Pe ter Peter
19. be came became
20. nut ty nutty
21. sin gle single
22. car ries carries
23. in flu ence influence
24. ca per caper
25. frac tion fraction
26. big ger bigger

S only

27. wai ter waiter
28. fun ny funny
29. pos si ble possible
30. mo ment moment
31. ver y very
32. pat ted patted
33. pre tend pretend

34. act ed acted

B only

35. fair ies fairies
36. on ly only
37. hug ging hugging
38. con fi dence confidence
39. nag ging nagging
40. co zy cozy
41. birth day birthday

S only

42. home work homework
43. un cle uncle
44. lath er lather
45. Mon day Monday
46. la cy lacy
47. real ly really
48. jeal ous jealous
49. gra vy gravy
50. driz zle drizzle
51. dan ces dances

B only

52. ba bies babies
53. joy ous joyous
54. or ange orange
55. jost le jostle
56. pur ring purring
57. fer ment ferment
58. fu ture future
59. men tion mention
60. sum mer summer
61. like ly likely
62. bod ies bodies

S only

63. rail road railroad
64. tum bler tumbler
65. co ping coping

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- 66. la zy lazy
- 67. trim ming trimming
- B only
- 68. aw ful awful
- 69. trea sure treasure
- 70. o bey obey
- 71. fair y fairy
- 72. book case bookcase
- 73. flick er flicker
- 74. cau tious cautious
- 75. la dy lady
- 76. ti tle title
- 77. point ed pointed
- 78. ship ping shipping
- 79. grum ble grumble
- 80. gar den garden
- S only
- 81. six teen sixteen
- 82. e nor mous enormous
- 83. plat ter platter
- 84. ho ping hoping
- 85. act or actor
- 86. mail box mailbox
- 87. dig it digit
- 88. hob ble hobble
- 89. plea sant pleasant
- 90. sil li est silliest
- 91. fa ces faces
- 92. dan gle dangle
- B only
- 93. re quire ment requirement
- 94. belt way beltway
- 95. ba by baby
- 96. oft en often
- 97. broth er brother
- B only
- 98. el ev a tor elevator
- 99. ci der cider
- 100. en er gy energy

Polysyllabic Words, Set 2

S and B

1. rath er rather
2. hop ping hopping
3. nee dle needle
4. ug li er uglier
5. com pli ance compliance
6. sa ving saving
7. in side inside
8. cour age courage

Num and B

9. gen er al general
10. fla vor flavor
11. pep per pepper
12. count ed counted
13. ad mit admit
14. wrest le wrestle
15. sad ly sadly
16. son ny sonny
17. mix ture mixture
18. hap pi est happiest
19. ex pect expect
20. mer cy mercy

S and B

21. ad vice advice
22. grand mom grandmom
23. ex cite ment excitement
24. some how somehow
25. wea ver weaver
26. tri umph triumph
27. dam age damage
28. jun gle jungle
29. sai lor sailor
30. rust le rustle
31. let ting letting
32. un til until
33. ber ries berries

Num and B

34. gath er gather
35. pro duc tive productive
36. tack le tackle
37. din ner dinner
38. dip per dipper
39. tur tle turtle
40. hap pi er happier
41. la ter later
42. some bod y somebody
43. ques tion question
44. friend ship friendship
45. po nies ponies
46. won der wonder
47. fam i ly family
48. cow ard coward

S and B

49. a bove above
50. cud dle cuddle
51. crack le crackle
52. a wake awake
53. lick ing licking
54. cu ri ous curious
55. jug gler juggler
56. sus pi cious suspicious
57. Sun day Sunday
58. ev er y every
59. pump kin pumpkin

Num and B

60. up per upper
61. im por tance importance
62. min cing mincing
63. dig ging digging
64. rub ber rubber
65. chil ly chilly
66. na ming naming

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67. ap pear ance appearance

S and B

68. na tive native

69. cig ar cigar

70. cab bage cabbage

71. with er wither

72. en gin eer engineer

73. tow er tower

74. fum ble fumble

Num and B

75. res i dence residence

76. rug ged rugged

77. el e phant elephant

78. cha fing chafing

79. ex plain explain

S and B

80. com fort comfort

81. snap py snappy

82. watch dog watchdog

83. fath er father

84. oun ces ounces

85. sad dle saddle

86. an i mal animal

87. for ti tude fortitude

88. u ni ted united

89. sled ding sledding

90. puz zle puzzle

Num and B

91. trou ble trouble

92. ce ment cement

93. ra ting rating

94. skim ming skimming

95. dan ger danger

96. ad di tion addition

97. Phil ip Philip

98. Peg gy Peggy

99. move ment movement

100. fib bing fibbing

Polysyllabic Words, Set 3

B only

1. oth er other
2. ap ple apple
3. cush ion cushion
4. a mount amount
5. near ly nearly
6. stor y story
7. moth er mother
8. tor ture torture
9. ex am ple example
10. tug boat tugboat

S and B

11. hap py happy
12. gar bage garbage
13. jin gle jingle
14. na vy navy
15. po ny pony
16. fic tion fiction
17. fa ding fading
18. be come become
19. hon ey honey
20. vo ter voter
21. vi sion vision

B only

22. dur ing during
23. fa vor favor
24. hard ly hardly
25. trai tor traitor
26. phras ing phrasing
27. vis i tor visitor
28. sun set sunset
29. na tur al natural
30. gra ting grating
31. pen sion pension
32. at ten tive attentive
33. snug gle snuggle

S and B

34. pam phlet pamphlet
35. man gle mangle
36. can dy candy
37. scur ried scurried
38. be lief belief
39. quit ting quitting
40. sick le sickle
41. ket tle kettle

B only

42. pas sive passive
43. brown ie brownie
44. spe cial special
45. kit ty kitty
46. act ive active
47. skip ping skipping
48. com pare compare
49. fan cy fancy
50. guz zle guzzle
51. la ser laser
52. han dy handy
53. or der order
54. vis it visit
55. brim ming brimming
56. cin der cinder

S and B

57. par ty party
58. tan gle tangle
59. coun try country
60. log jam logjam
61. stin gy stingy
62. tug ging tugging
63. win ner winner
64. per mis sion permission
65. per form ance performance
66. cou ple couple

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67. slip ping slipping
B only
68. set ting setting
69. stud y study
70. care ful careful
71. gro cer ies groceries
72. gin ger ginger
- S and B
73. tro phy trophy
74. pho net ic phonetic
75. hast en hasten
76. de cide decide
77. de li cious delicious
78. re joice rejoice
79. bla ming blaming
80. vi cious vicious
81. in come income
82. en gine engine
83. hyph en hyphen
84. pad ded padded
85. truth ful truthful
- B only
86. bless ed blessed
87. thir ty thirty
88. siz zle sizzle
89. col lect collect
90. lei sure leisure
91. be gan began
92. mat ted matted
93. slo ping sloping
- S and B
94. Bob by Bobby
95. pen cil pencil
96. cen ter center
97. cap tive captive
98. foot ball football
99. au tumn autumn
100. play ground playground

Polysyllabic Words, Set 4

S and B

1. man u al manual
2. ac tiv i ty activity
3. sit u a tion situation
4. di rec tions directions
5. stim u lus stimulus
6. var i a tion variation
7. dif fi cult difficult
8. con cen tra tion concentration
9. pos si ble possible
10. sep ar ate ly separately
11. prac tic ing practicing

B only

12. pho ne mic phonemic
13. a ware ness awareness
14. med i cine medicine
15. im prove improve
16. stim u late stimulate
17. im pulse impulse
18. de ci sion decision
19. pos sib il i ty possibility
20. i mag ine imagine
21. in for ma tion information
22. mem o ry memory
23. re mem ber ing remembering
24. sup posed supposed
25. cor rect ly correctly
26. fre quent ly frequently

S and B

27. par tic u lar ly particularly
28. def ic it deficit
29. sim i lar similar
30. chal lenged challenged
31. dis or der disorder
32. var i ous various
33. e lec tron ic electronic

34. de pend ing depending

B only

35. tempt a tion temptation
36. vid e o games videogames
37. strat e gy strategy
38. re act ing reacting
39. ex act ly exactly
40. ne ces sar y necessary
41. care ful ly carefully
42. com pu ter computer
43. def in ite ly definitely
44. mar ried married
45. dras tic al ly drastically
46. ex am ple example

S and B

47. fire fight er firefighter
48. o ver come overcome
49. real is tic realistic
50. cau tious cautious
51. sec tion section
52. in volved involved
53. re spond ed responded
54. im por tant important
55. a bil i ty ability
56. prob ab ly probably
57. gen er al ize generalize

B only

58. ev i dence evidence
59. pre front al prefrontal
60. cor tex cortex
61. strength ened strengthened
62. in tense intense

S and B

63. ment al mental
64. re search research
65. ad vanced advanced

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66. en ter tain ing entertaining
 67. com pet ent competent
 68. fol low ing following
 69. el e ment ar y elementary
 70. di rec tions directions
 71. phys i cal physical
 72. re spond respond
 73. di vi ded divided
 74. prod uct product
 75. ab brev i ate abbreviate
- B only
76. switch ing switching
 77. syl la ble syllable
 78. sec tion section
 79. op er a tion operation
 80. au to mat i cal ly automatically
 81. ca reer career
 82. ea si er easier
 83. cal cu la tor calculator
- S and B
84. rea son a ble reasonable
 85. pro nounce pronounce
 86. flu ent ly fluently
 87. hi er arch y hierarchy
 88. ar rang ing arranging
 89. frus tra ted frustrated
 90. dis cip line discipline
- B only
91. for tu nate ly fortunately
 92. rap id ly rapidly
 93. com fort ab ly comfortably
 94. tre men dous tremendous
 95. real ize realize
 96. pro fi cient proficient
 97. pro ce dure procedure
 98. ad di tion al additional
 99. av er age average
 100. es tim ate estimate

The Scientific Literature on Task-Switching

Do people with ADHD have trouble with task-switching?

Cepeda et al. (2000) calculated “switch costs” in the same way that we have described in this book. They found that “ADHD children showed substantially larger switch costs than non-ADHD children.” (page 213)

King et al. (2007) compared adults with ADHD to adults without ADHD on two task-switching activities. These authors conclude: “Evidence for ADHD group impaired interference control was obtained from both tasks. Task switching group error rate profiles revealed distinct cognitive flexibility deficiencies in the ADHD group.” (page 12)

Boonstra et al. (2010) studied forty-nine adults with ADHD compared with forty-nine normal control adults, matched for age and gender. The participants were given a large battery of tests, including those that, like task-switching, are thought to be measure of executive functioning as well as other intellectual tasks not thought to involve executive functioning. “After stringent controls for nonexecutive function demands and IQ, adults with ADHD

showed problems in inhibition and set shifting but not in any of the other executive functioning domains tested.” (page 209)

Rhodes et al. (2005) found that a group of children with ADHD showed impairment on an “attentional set-shifting” task on the Cambridge Neuropsychological Test Automated Battery (CANTAB). However, the authors of this study also found deficits in the ADHD sample in other intellectual tasks, such as paired associates learning. Thus this study does not support the specificity of task-switching impairment in ADHD.

In another negative study, Sheres et al. (2004) compared boys with ADHD with normal control boys on various tests of executive functioning, as well as other intellectual tasks. The boys with ADHD demonstrated deficits in “interference control [and] inhibition of an ongoing response,” however, after controlling for age, IQ, and non-executive functioning measures, none of the executive functioning deficits remained significant.

Gualtieri and Johnson (2008) found that on a computerized screening battery including a task-switching test, “significant differences were detected

between normals and untreated ADHD patients.” (p 459)

Goth-Owens et al. (2010) report slower performances of children with ADHD inattentive type on a set-shifting task than those of controls.

Is task-switching related to higher achievement and greater mental development?

St Clair-Thompson and Gathercole (2006) found that children with better “updating abilities” had better working memory, and those with better working memory in turn had higher achievement in English and mathematics.

Davidson et al. (2006) studied the development of task-switching as children grew older from age 4 to age 13 and in young adults. Children in this age range showed better performance as they got older; 13 year-olds were still not at adult levels on task-switching. “Effects seen only in reaction time in adults were seen primarily in accuracy in young children. Adults slowed down on difficult trials to preserve accuracy; but the youngest children were impulsive; their reaction times remained more constant but at an accuracy cost on difficult trials.” (p 2037) Luciana and Nelson (1998) also found a “general age-related progression in ability levels” on “frontal lobe tasks,” of which task-switching is one. Four-year-

olds performed worse than 5- to 7-year-olds on all measures.

Is the severity of ADHD correlated with the degree of difficulty in task-switching?

Oades and Christiansen (2008) reported that “The latency for completion of the trail-making task controlling for psychomotor processing was longer for ADHD cases, and correlated with Conners’ ratings of symptom severity across all subjects.” (p. 21)

Are people with ADHD the only group that seems to be at a disadvantage in task-switching?

Meiran et al. (2010) compared patients suffering from unipolar depression, others suffering from obsessive compulsive disorder, and match control participants. Patients with both unipolar depression and obsessive compulsive disorder “required more trials to adjust to single-task conditions after experiencing task-switching.”

Kapoula et al. (2010) studied dyslexic teenagers and controls. They found results suggesting “that the inhibitory and attention processes required by the Stroop tests are dysfunctioning even in older dyslexics.” Poljac et al. (2010) reported (in a title

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that well summarizes the article), “Impaired task switching performance in children with dyslexia but not in children with autism.”

Wylie et al. (2010) reported that patients with schizophrenia appeared to be more impaired in task-switching than they were in even other executive function tasks.

Roberts et al. (2007) report, using a review and meta-analysis of other studies, that “Problems in set shifting as measured by a variety of neuropsychological tasks are present in people with eating disorders.” (p. 1075)

What portion of the brain seems most responsible for task-switching performance?

Rubia et al. (2010) used functional magnetic resonance imaging (fMRI) to look at brain activation during a task-switching activity. “The fMRI comparison showed that the patients with ADHD compared to both control and patients with conduct disorder showed underactivation in right and left inferior prefrontal cortex.”

Cubillo et al. (2010) in a study also using fMRI found that “adults with childhood ADHD showed reduced activation compared to controls in bilateral inferior prefrontal cortex, caudate and thalamus... as well as in left parietal lobe during the Switch task.”

Robbins (2007) reviewed studies on the neuropsychological basis of task-switching. “Notably, most of the paradigms implicate a locus in the right prefrontal cortex, specifically in the right inferior frontal gyrus.”(p 917).

Smith et al. (2006) reported, using functional MRI, that “Boys with ADHD showed decreased activation in .. the bilateral prefrontal and temporal lobes and right parietal lobe during the switch task.” (p 957) The boys in this study were medication-naive, thus “suggesting that hypoactivation in this patient group is unrelated to long-term stimulant exposure.” (p 957)

Newman et al. (2008) reported that in rats, “Noradrenergic depletion of the medial prefrontal cortex is sufficient to impair attentional set-shifting.” (p 39).

Do the medications used for ADHD improve task-switching?

Cepeda et al. (2000), as mentioned above, found that ADHD children showed larger switch costs than non-ADHD children on a task-switching challenge. “However, when on medication, the ADHD children’s switch performance was equivalent to control children.” (page 213)

Mehta et al. (2004) found that methylphenidate, in a dose of 0.5 mg/kg of body weight, improved “attentional set-shifting” on the CANTAB

neuropsychological battery, as well as a couple of other subtests.

Gualtieri and Johnson (2008), using a neuropsychological battery including a task-switching activity, compared medication treated ADHD patients, untreated ADHD patients, and normal subjects. “Treated patients performed better than untreated patients but remained significantly impaired compared to normal subjects.” (p 459)

Kramer et al. (2001) asked twenty children with ADHD to perform a task-switching challenge while on and off methylphenidate. “The medication selectively enhanced the children’s ability to rapidly and accurately switch between tasks and to focus attention on the currently relevant response set.” (page 1277)

However, Rhodes et al. (2006) in a similar study found that, contrary to their predictions, methylphenidate did not enhance performance in a set shifting task.

Can you get better at task-switching by practice?

White and Shah (2006) found that a sample of ADHD adults showed impaired task-switching when compared with non-ADHD adults. Training improved task-switching in both groups.

Berryhill and Hughes (2009) found that a “novel training regimen” reduced task-switching costs to about 20 milliseconds. These investigators

also found that the learning of better task switching performance was quite durable: “No decrements in fluent task-switching performance were observed after 10 months without practice.”

Buchler et al. (2008) evaluated task-switching performance in young and older adults, and delivered training over 5 days. Training eliminated age effects in task-switching performance.

Newman et al. (2008) found that with rats who had been “noradrenergically lesioned” in the medial prefrontal cortex, “atomoxetine remediated the attentional set-shifting impairments in [lesioned] rats but impaired the [set-shifting] performance of non-lesioned rats. (p. 39). Similarly, Lapid and Morilak (2006) reported that in rats, “elevating noradrenergic activity at alpha-1 receptors in medial prefrontal cortex facilitates cognitive performance of rats in an attentional set-shifting task, which may contribute to the role of norepinephrine in behavioral state changes such as arousal, or to the beneficial cognitive effects of psychotherapeutic drugs that target noradrenergic neurotransmission.” (p. 39)

When you improve at one task-switching challenge, does that generalize to other types of task-switching?

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Karbach and Kray (2009) gave training in task-switching to three age groups of participants: ages eight through ten, eighteen through twenty-six, and sixty-two through seventy-six. The investigators reported: “We found near transfer of task-switching training in all age groups, especially in children and older adults. Near transfer was enhanced in adults and impaired in children when training tasks were variable. We also found substantial far transfer to other executive tasks and fluid intelligence in all age groups, pointing to the transfer of relatively general executive control abilities after training.” (page 978)

Similarly, the White and Shah (2006) study mentioned above found that training effects of task-switching transferred to other types of task-switching that had not been specifically trained.

Minear and Shah (2008) also report improvement with practice in task-switching, transferable to new situations. These authors state, “These results add to a growing number of studies demonstrating generalizable improvement with training on executive processing.” (p 1470)

Does practice on lots of task-switching challenges not only improve task-switching, but also reduce the core symptoms of ADHD?

The core symptoms of ADHD are short attention span (or low work capacity), impulsivity, and hyperactivity. Can one improve these symptoms by enough task-switching practice? This is obviously the most clinically important question, and we have to date not found studies that answer this question.

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