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Foreword

Math Mammoth International Version Grade 2-A and Grade 2-B worktexts comprise a complete maths curriculum for the second grade mathematics studies.

This curriculum is essentially the same as the version of Math Mammoth Grade 2 sold in the United States (US version), only customised for international use. The US version is aligned to the “Common Core” Standards, so it may not be properly aligned to the second grade standards in your country. However, you can probably find material for any missing topics in neighbouring grades. For example, let’s say multiplication tables are studied in grade or year 4 in your country. They are not found in Math Mammoth Grade 4. Instead, you will need to use Math Mammoth Grade 3-A to study them.

The International version of Math Mammoth differs from the US version in these aspects:

- The currency used in the money chapters in grades 1-3 is the Australian dollar. (The download version of this curriculum for grades 1-3 include the chapter on money for European, South African, Canadian, US, and British currencies.)
- The curriculum teaches the metric measurement units. Imperial units, such as inches and pounds, are not used.
- The spelling conforms to British international standards.
- Paper size is A4.

The main areas of study for second grade are:

1. Understanding of the base-ten system within 1000. This includes place value with three-digit numbers, skip-counting in fives, tens, and multiples of hundreds, tens, and ones (within 1000) (chapters 6 and 8);
2. Develop fluency with addition and subtraction, including solving word problems, regrouping in addition, and regrouping in subtraction (chapters 1, 3, 4, and 8);
3. Using standard units of measure (chapter 7);
4. Describing and analysing shapes (chapter 5).

Additional topics we study are time, money, introduction to multiplication, and bar graphs and picture graphs.

This book, 2-A, covers reading the clock (chapter 2), the basic addition and subtraction facts within 18 (chapter 3), regrouping in addition (chapter 4) and geometry (chapter 5). The rest of the topics are covered in the 2-B student worktext.

Some important points to keep in mind when using the curriculum:

- These two books (parts A and B) are like a “framework”, but you still have a lot of liberty in planning your child’s studies. While addition and subtraction topics are best studied in the order they are presented, feel free to go through the sections on shapes, measurement, clock and money in any order you like.

This is especially advisable if your child is either “stuck” or is perhaps getting bored with some topic. Sometimes the concept the child was stuck on can become clear after a break from the topic.

- Math Mammoth is mastery-based, which means it concentrates on a few major topics at a time, in order to study them in depth. However, you can still use it in a *spiral* manner, if you prefer. Simply have your child study in 2-3 chapters simultaneously. This type of flexible use of the curriculum enables you to truly individualise the instruction for your child.
- Don’t automatically assign all the exercises. Use your judgement, trying to assign just enough for your child’s needs. You can use the skipped exercises later for revision. For most children, I recommend to start out by assigning about half of the available exercises. Adjust as necessary.

Sample worksheet from
<https://www.mathmammoth.com>

- For revision, the curriculum includes a worksheet maker (Internet access required), mixed revision lessons, additional cumulative revision lessons, and the word problems continually require usage of past concepts. Please see more information about revision (and other topics) in the FAQ at <https://www.mathmammoth.com/faq-lightblue.php>

I heartily recommend that you view the full user guide for your grade level, available at <https://www.mathmammoth.com/userguides/>

Lastly, you can find free videos matched to the curriculum at <https://www.mathmammoth.com/videos/>

I wish you success in teaching maths!

Maria Miller, the author

User Guide

Note: You can also find the information that follows online, at <https://www.mathmammoth.com/userguides/> .

Basic principles in using Math Mammoth Complete Curriculum

Math Mammoth is mastery-based, which means it concentrates on a few major topics at a time, in order to study them in depth. The two books (parts A and B) are like a “framework”, but you still have a lot of liberty in planning your child’s studies. You can even use it in a *spiral* manner, if you prefer. Simply have your student study in 2-3 chapters simultaneously. In second grade, the addition and subtraction topics are best studied in the order they are presented, but feel free to go through the chapters on geometry, measurement, clock and money in any order you like.

Math Mammoth is not a scripted curriculum. In other words, it is not spelling out in exact detail what the teacher is to do or say. Instead, Math Mammoth gives you, the teacher, various tools for teaching:

- **The two student worktexts** (parts A and B) contain all the lesson material and exercises. They include the explanations of the concepts (the teaching part) in blue boxes. The worktexts also contain some advice for the teacher in the introduction of each chapter.

The teacher can read the teaching part of each lesson before the lesson, or read and study it together with the student in the lesson, or let the student read and study on his own. If you are a classroom teacher, you can copy the examples from the “blue teaching boxes” to the board and go through them on the board.

- There are a lot of **videos** matched to the curriculum available at <https://www.mathmammoth.com/videos/> . There isn’t a video for every lesson, but there are dozens of videos for each grade level. You can simply have the author teach your child or student!
- Don’t automatically assign all the exercises. Use your judgement, trying to assign just enough for your student’s needs. You can use the skipped exercises later for revision. For most students, I recommend to start out by assigning about half of the available exercises. Adjust as necessary.
- For each chapter, there is a **link list to various free online games** and activities. These games can be used to supplement the maths lessons, for learning maths facts, or just for some fun. Each chapter introduction (in the student worktext) contains a link to the list corresponding to that chapter.
- The student books contain some **mixed revision lessons**, and the curriculum also provides you with additional **cumulative revision lessons**.
- There is a **chapter test** for each chapter of the curriculum, and a comprehensive end-of-year test.
- The **worksheet maker** allows you to make additional worksheets for most calculation-type topics in the curriculum. You will need Internet access to be able to use it. In the digital version, the worksheet maker is found in the folder titled “For revision”. In the print version, a link to it is found in the introduction just before the cumulative revisions.
- You can use the free online exercises at <https://www.mathmammoth.com/practice/>
This is an expanding section of the site, so check often to see what new topics we are adding to it!
- Some grade levels have **cut-outs**, such as to make fraction manipulatives or geometric solids.
- And of course there are answer keys to everything.

Sample worksheet from
<https://www.mathmammoth.com>

How to get started

Have ready the first lesson from the student worktext. Go over the first teaching part (within the blue boxes) together with your child. Go through a few of the first exercises together, and then assign some problems for your child to do on their own.

Repeat this if the lesson has other blue teaching boxes. Naturally, you can also use the videos at <https://www.mathmammoth.com/videos/>

Many children can eventually study the lessons completely on their own — the curriculum becomes self-teaching. However, children definitely vary in how much they need someone to be there to actually teach them.

Pacing the curriculum

The lessons in Math Mammoth complete curriculum are NOT intended to be done in a single teaching session or class. Sometimes you might be able to go through a whole lesson in one day, but more often, the lesson itself might span 3-5 pages and take 2-3 days or classes to complete.

Therefore, it is not possible to say exactly how many pages a student needs to do in one day. This will vary. However, it is helpful to calculate a general guideline as to how many pages per week you should cover in the student worktext in order to go through the curriculum in one school year (or whatever span of time you want to allot to it).

The table below lists how many pages there are for the student to finish in this particular grade level, and gives you a guideline for how many pages per day to finish, assuming a 180-day school year.

Example:

Grade level	Lesson pages	Number of school days	Number of days for tests and revisions	Number of days for studying the student book	Pages to study per day	Pages to study per week
2-A	131	89	10	79	1.66	8.3
2-B	136	91	10	81	1.68	8.4
Grade 2 total	267	180	20	160	1.67	8.34

The table below is for you to fill in. First fill in how many days of school you intend to have. Also allow several days for tests and additional revision before the test — at least twice the number of chapters in the curriculum. For example, if the particular grade has 8 chapters, allow at least 16 days for tests & additional revision. Then, to get a count of “pages/day”, divide the number of pages by the number of available days. Then, multiply this number by 5 to get the approximate page count to cover in a week.

Grade level	Lesson pages	Number of school days	Number of days for tests and revisions	Number of days for studying the student book	Pages to study per day	Pages to study per week
2-A	131					
2-B	136					
Grade 2 total	267					

Now, let's assume you determine that you need to study about 1.6 pages a day, 8 pages a week in order to get through the curriculum. As you study each lesson, keep in mind that sometimes most of the page might be filled with blue teaching boxes and very few exercises. You might be able to cover two pages on such a day. Then some other day you might only assign one page of word problems. Also, you might be able to go through the pages quicker in some chapters, for example when studying graphs or telling time, because the large pictures fill the page so that one page does not have many problems.

When you have a page or two filled with lots of similar practice problems ("drill") or large sets of problems, feel free to **only assign 1/2 or 2/3 of those problems**. If your child gets it with less amount of exercises, then that is perfect! If not, you can always assign him/her the rest of the problems some other day. In fact, you could even use these unassigned problems the next week or next month for some additional revision.

In general, 1st-2nd graders might spend 20-40 minutes a day on maths. Third-fourth graders might spend 30-60 minutes a day. Fifth-sixth graders might spend 45-75 minutes a day. If your child finds maths enjoyable, he/she can of course spend more time with it! However, it is not good to drag out the lessons on a regular basis, because that can then affect the child's attitude towards maths.

Working space, the usage of additional paper and mental maths

The curriculum generally includes working space directly on the page for students to work out the problems. However, feel free to let your students to use extra paper when necessary. They can use it, not only for the "long" algorithms (where you line up numbers to add, subtract, multiply, and divide), but also to draw diagrams and pictures to help organise their thoughts. Some students won't need the additional space (and may resist the thought of extra paper), while some will benefit from it. Use your discretion.

Some exercises don't have any working space, but just an empty line for the answer (e.g. $200 + \underline{\quad} = 1000$). Typically, I have intended that such exercises to be done using MENTAL MATHS.

However, there are some students who struggle with mental maths (often this is because of not having studied and used it in the past). As always, the teacher has the final say (not me!) as to how to approach the exercises and how to use the curriculum. We do want to prevent extreme frustration (to the point of tears). The goal is always to provide SOME challenge, but not too much, and to let students experience success enough so that they can continue enjoying learning maths.

Students struggling with mental maths will probably benefit from studying the basic principles of mental calculations from the earlier levels of Math Mammoth curriculum. To do so, look for lessons that list mental maths strategies. They are taught in the chapters about addition, subtraction, place value, multiplication, and division. My article at https://www.mathmammoth.com/lessons/practical_tips_mental_math also gives you a summary of some of those principles.

Using tests

For each chapter, there is a **chapter test**, which can be administered right after studying the chapter. **The tests are optional**. Some families might prefer not to give tests at all. The main reason for the tests is for diagnostic purposes, and for record keeping. These tests are not aligned or matched to any standards.

In the digital version of the curriculum, the tests are provided both as PDF files and as html files. Normally, you would use the PDF files. The html files are included so you can edit them (in a word processor such as Word or LibreOffice), in case you want your student to take the test a second time. Remember to save the edited file under a different file name, or you will lose the original.

The end-of-year test is best administered as a diagnostic or assessment test, which will tell you how well the student remembers and has mastered the mathematics content of the entire grade level.

Sample worksheet from
<https://www.mathmammoth.com>

Using the cumulative revisions and the worksheet maker

The student books contain mixed revision lessons which revise concepts from earlier chapters. The curriculum also comes with additional cumulative revision lessons, which are just like the mixed revisions in the student books, with a mix of problems covering various topics. These are found in their own folder in the digital version, and in the Tests & Cumulative Revisions book in the print version.

The cumulative revisions are optional; use them as needed. They are named indicating which chapters of the main curriculum the problems in the revision come from. For example, “Cumulative Revision, Chapter 4” includes problems that cover topics from chapters 1-4.

Both the mixed and cumulative revisions allow you to spot areas that the student has not grasped well or has forgotten. When you find such a topic or concept, you have several options:

1. Check if the worksheet maker lets you make worksheets for that topic.
2. Check for any online games and resources in the Introduction part of the particular chapter in which this topic or concept was taught.
3. If you have the digital version, you could simply reprint the lesson from the student worktext, and have the student restudy that.
4. Perhaps you only assigned 1/2 or 2/3 of the exercise sets in the student book at first, and can now use the remaining exercises.
5. Check if our online practice area at <https://www.mathmammoth.com/practice/> has something for that topic.
6. Khan Academy has free online exercises, articles, and videos for most any maths topic imaginable.

Concerning challenging word problems and puzzles

While this is not absolutely necessary, I heartily recommend supplementing Math Mammoth with challenging word problems and puzzles. You could do that once a month, for example, or more often if the student enjoys it.

The goal of challenging story problems and puzzles is to **develop the student’s logical and abstract thinking and mental discipline**. I recommend starting these in fourth grade, at the latest. Then, students are able to read the problems on their own and have developed mathematical knowledge in many different areas. Of course I am not discouraging students from doing such in earlier grades, either.

Math Mammoth curriculum does contain a lot of word problems. Even so, the problems I have created are usually tied to a specific concept or concepts. I feel students can benefit from solving problems and puzzles that require them to think “out of the box” or are just different from the ones I have written.

I recommend Math Stars problem-solving newsletters (free) as a main resource for challenging problems: <https://www.homeschoolmath.net/teaching/math-stars.php>

I have also compiled a list of other resources for problem solving practice, which you can access at this link: <https://l.mathmammoth.com/challengingproblems>

Another idea: search online for “brain puzzles for kids,” “logic puzzles for kids” or “brain teasers for kids.”

Frequently asked questions and contacting us

If you have more questions, please first check the FAQ at <https://www.mathmammoth.com/faq-lightblue>

Additionally, you can contact us using the contact form at the Math Mammoth.com website.

Sample worksheet from
<https://www.mathmammoth.com>

Chapter 1: Some Old, Some New

Introduction

This chapter contains both some revision and some new topics, with the aim of giving children a good start in second grade maths.

In the first few lessons, we revise adding and subtracting two-digit numbers, and skip-counting using the 100-chart, from first grade. Next, the lesson *Fact Families* revises the connection between addition and subtraction, and introduces a new strategy for missing subtrahend problems (such as $___ - 5 = 4$). In these problems, the child can *add* to find the missing total. This actually teaches them algebraic thinking.

Then we go on to the “new”, starting with ordinal numbers, which are probably familiar from everyday language. Even and odd numbers are presented in the context of equal sharing: if you can share that many objects evenly (equally), then the number is even. Use manipulatives here if desired.

Then we study doubling and halving. Don’t skip the word problems included in these lessons; they are important. Children need to learn to apply the concepts they have just learned. Also, if a child cannot solve word problems that involve doubling or halving, there is a chance they did not actually learn those concepts.

The last lessons have to do with adding and subtracting whole tens (multiples of ten) *mentally* (e.g. $51 + 30$ or $72 - 40$). Mental maths is very important, because it builds number sense: the ability to manipulate numbers flexibly — to take them apart and put them together in various combinations. And number sense is very important: it actually predicts a student’s success later on in algebra.

In this case, adding or subtracting multiples of ten is actually a concept rooted in place value. As long as the child understands place value (tens and ones), these types of problems are very easy. If your child has trouble, it is a sign they perhaps have not grasped place value with two-digit numbers.

Also, don’t forget the free videos matched to the curriculum at <https://www.mathmammoth.com/videos/>.

Pacing Suggestion for Chapter 1

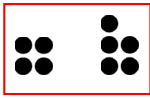
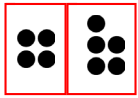
Please add one day to the pacing for the test if you use it. Note that the lessons in the chapter can take several days to finish. As a general guideline, second graders should finish 1.5-2 pages daily or 8-10 pages a week. Please also see the user guide at <https://www.mathmammoth.com/userguides/>.

The Lessons in Chapter 1	page	span	suggested pacing	your pacing
Some Revision	14	2 pages	2 days	
The 100-Chart and More Revision	16	3 pages	2 days	
Fact Families	19	2 pages	1 day	
Ordinal Numbers	21	2 pages	1 day	
Even and Odd Numbers	23	2 pages	1 day	
Doubling	25	3 pages	2 days	
One-Half	28	2 pages	2 days	
Adding with Whole Tens	30	3 pages	2 days	
Subtracting Whole Tens	33	2 pages	1 day	
Revision Chapter 1	35	2 pages	2 days	
Chapter 1 Test (optional)				
TOTALS		23 pages	16 days	

Sample worksheet from
<https://www.mathmammoth.com>

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Fact Families

When two addition and two subtraction facts use the same numbers, it is called a “ <i>fact family</i> .”	 $4 + 5 = 9$ $5 + 4 = 9$ $9 - 5 = 4$ $9 - 4 = 5$	 $4 + 5 = 9$ $5 + 4 = 9$ $9 - 5 = 4$ $9 - 4 = 5$
Remember that a subtraction starts with the <i>total</i> . This is how it looks if the <i>total</i> is missing in a subtraction: $\square - 8 = 20$ To find the total, just add the “parts” 20 and 8. We get $20 + 8 = 28$. So the subtraction was $28 - 8 = 20$.	Notice the TOTAL. The subtraction sentences <u>start</u> with the total.	Notice the PARTS. The two parts make up the total.

1. Write two addition and two subtraction sentences—a fact family!

a.  $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$	b.  $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$	c.  $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$
---	---	---

2. Fill in the missing numbers. The four problems form a fact family.

a. $2 + \square = 8$ $\square + 2 = 8$ $8 - 2 = \square$ $8 - \square = 2$	b. $\underline{\quad} + \underline{\quad} = 10$ $\underline{\quad} + \underline{\quad} = 10$ $10 - 7 = \square$ $10 - \square = 7$	c. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $9 - \square = 6$ $\underline{\quad} - \underline{\quad} = \underline{\quad}$
--	--	--

3. Write a matching addition for the subtraction. There are two possibilities.

a. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $8 - 2 = 6$	b. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $20 - 7 = 13$	c. $\underline{\quad} + \underline{\quad} = \underline{\quad}$ $60 - 20 = 40$
---	---	--

When the first number is missing in a subtraction, it is the TOTAL that is missing. You can find the TOTAL by adding the two numbers (those are the “parts”).	$\square - 6 = 2$ The total is missing. 6 and 2 are the “parts”. So we add them. $2 + 6 = 8$. The missing number is 8!
It is like “adding backwards”:	$\begin{array}{c} \text{Add.} \\ \leftarrow + \\ \boxed{8} - 6 = 2 \end{array}$ $\begin{array}{c} \text{Add.} \\ \leftarrow + \\ \boxed{23} - 3 = 20 \end{array}$

4. The total is missing from the subtraction sentence. Solve.

a. $\square - 5 = 4$	b. $\square - 7 = 2$	c. $\square - 7 = 10$
----------------------	----------------------	-----------------------

5. Find the missing numbers.

a. $\square - 2 = 4$ $\square - 50 = 50$ $\square - 8 = 20$	b. $\square - 7 = 80$ $60 + 4 = \square$ $16 + \square = 20$	c. $9 - \square = 5$ $77 + \square = 78$ $\square - 9 = 60$
---	--	---

Puzzle Corner

Find the missing numbers. This time adding backwards will NOT work!

a. $50 - \square = 10$	b. $100 - \square = 91$	c. $10 - \square - 2 = 1$
$33 - \square = 31$	$76 - \square = 72$	$9 - \square - 5 = 2$

Ordinal Numbers

The numbers 1, 2, 3, 4, and so on are called cardinal numbers.

We also often use **ordinal numbers**. Ordinal numbers are used when talking about the *order* of things.

List of some ordinal numbers:

<u>Ordinal Number</u>	<u>Name</u>
-----------------------	-------------

1st	first
2nd	second
3rd	third
4th	fourth
5th	fifth
6th	sixth
7th	seventh
8th	eighth



The *fourth* tree from the left is circled. It is also the *second* tree from the right.

K A L A H A R I

The *sixth* letter of the word is A.

<u>Ordinal Number</u>	<u>Name</u>
-----------------------	-------------

9th	ninth
10th	tenth
11th	eleventh
12th	twelfth
13th	thirteenth
14th	fourteenth
15th	fifteenth
16th	sixteenth

1. Circle.

a. The second car from the left.

b. The fifth car from the right.



c. The seventh snowflake from the left.

d. The third snowflake from the right.



e. The ninth letter from the left.

f. The twelfth letter from the right.

E X T R A O R D I N A R Y

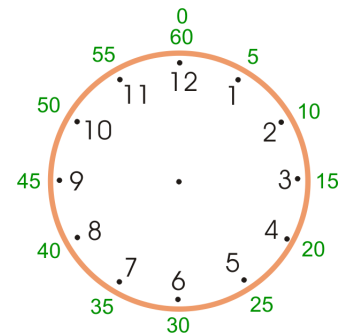
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The Minutes

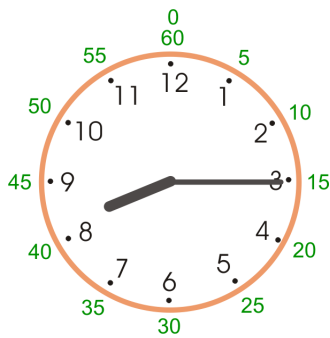
When the hour hand moves from one number to the next (from 1 to 2, or from 6 to 7, etc.), it takes one hour to do so.

In that same one hour of time, the *minute hand* travels **from 0 to 60 minutes**. So one hour is 60 minutes. A half-hour is 30 minutes.

When you read the minute hand, you use the green numbers (marked outside the clock face of the clock on the right). They go by fives, and are not normally marked on clocks. You need to know them. Just skip-count in fives!



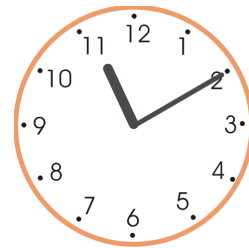
1 hour = 60 minutes.
1/2 hour = 30 minutes.



The hour hand is past 8.
The minute hand is at 15.
The time is 8:15.

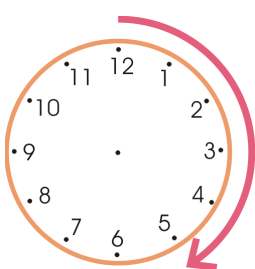


The hour hand is past 2.
The minute hand is at 25.
The time is 2:25.

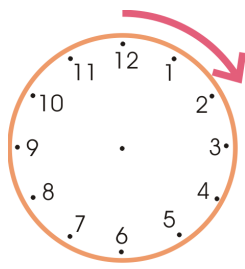


The hour hand is past 11.
The minute hand is at 10.
The time is 11:10.

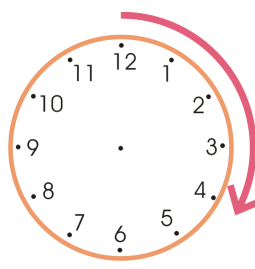
1. The arrow shows how much the minute hand travels. How many minutes pass?



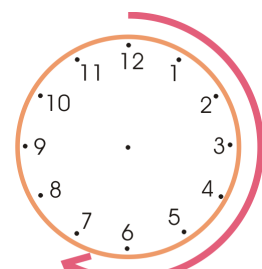
a. _____ minutes



b. _____ minutes



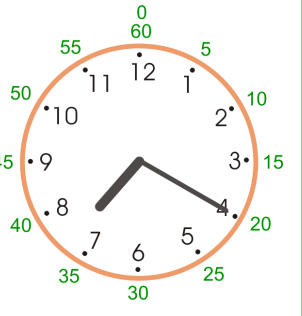
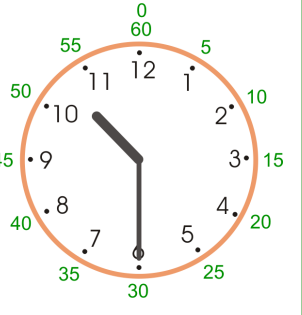
c. _____ minutes



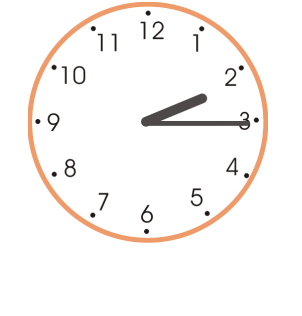
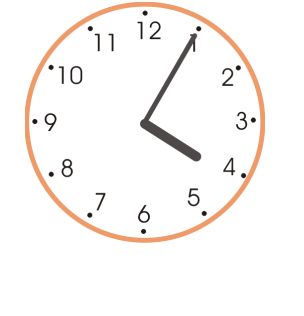
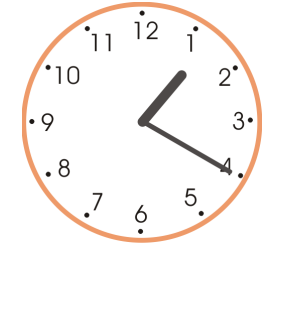
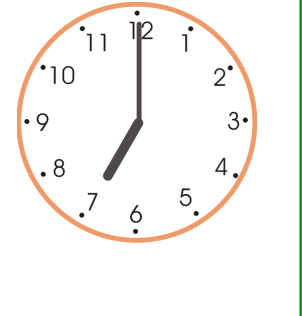
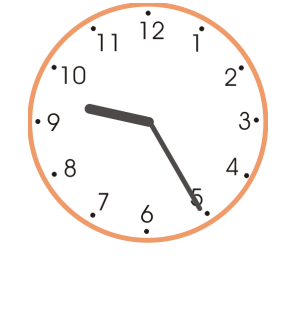
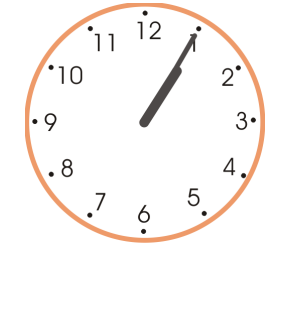
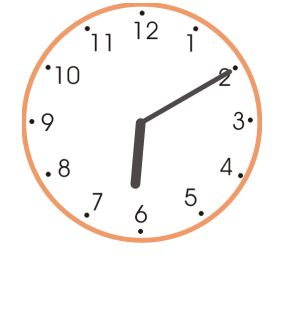
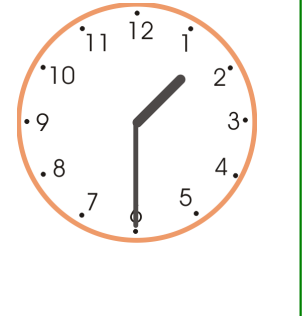
d. _____ minutes

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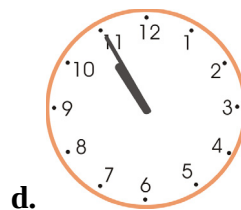
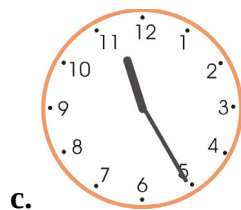
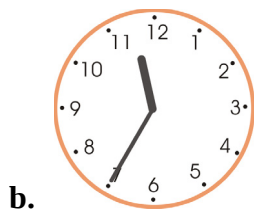
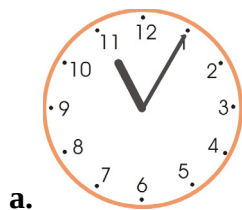
2. Write the time using the special clock that shows the numbers for hours and for minutes.

 a. ____ : ____	 b. ____ : ____	 c. ____ : ____	 d. ____ : ____
 e. ____ : ____	 f. ____ : ____	 g. ____ : ____	 h. ____ : ____

3. Write the time using the normal clock. Remember, the numbers for the minute hand are not shown, and they go by fives!

 a. ____ : ____	 b. ____ : ____	 c. ____ : ____	 d. ____ : ____
 e. ____ : ____	 f. ____ : ____	 g. ____ : ____	 h. ____ : ____

4. Find the clock that shows 11:25 and the clock that shows 11:05.



5. Write the time.

a. _____ : _____	b. _____ : _____	c. _____ : _____	d. _____ : _____

6. Write the time that the clock shows, and the time 5 minutes later. Imagine the minute hand moving one “step” further. You can use your practice clock.

	a. _____ : _____	b. _____ : _____	c. _____ : _____	d. _____ : _____
5 min. later →	_____ : _____	_____ : _____	_____ : _____	_____ : _____
	e. _____ : _____	f. _____ : _____	g. _____ : _____	h. _____ : _____
5 min. later →	_____ : _____	_____ : _____	_____ : _____	_____ : _____

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Adding with 9

Imagine that 9 *really* wants to be a 10!
It takes one from the other number
(from 5). So, 9 becomes 10, and
four dots are left over.

$$9 + 5 = 10 + 4 = 14$$

9 wants to be a 10! So, it takes one
from the other number (from 3).
So, 9 becomes 10, and two dots
are left over.

$$9 + 3 = 10 + 2 = 12$$

Use the list on the right to practise. Don't write the answers there.
Just point to different problems and say the answer aloud.

1. Circle the ten, then add.

 a. $9 + 5$ $10 + 4 = \underline{\quad}$	 b. $9 + 4$ $10 + \underline{\quad} = \underline{\quad}$	 c. $9 + 7$ $10 + \underline{\quad} = \underline{\quad}$
 d. $9 + \underline{\quad}$ $10 + \underline{\quad} = \underline{\quad}$	 e. $9 + \underline{\quad}$ $10 + \underline{\quad} = \underline{\quad}$	 f. $9 + \underline{\quad}$ $10 + \underline{\quad} = \underline{\quad}$

- $9 + 1 = \square$
- $9 + 2 = \square$
- $9 + 3 = \square$
- $9 + 4 = \square$
- $9 + 5 = \square$
- $9 + 6 = \square$
- $9 + 7 = \square$
- $9 + 8 = \square$
- $9 + 9 = \square$

2. It is good to memorise the doubles, also. Fill in.

a. $2 + 2 = \underline{\quad}$	b. $5 + 5 = \underline{\quad}$	c. $8 + 8 = \underline{\quad}$
$3 + 3 = \underline{\quad}$	$6 + 6 = \underline{\quad}$	$9 + 9 = \underline{\quad}$
$4 + 4 = \underline{\quad}$	$7 + 7 = \underline{\quad}$	$10 + 10 = \underline{\quad}$

3. Add to nine. Think how 9 wants to be a ten, and takes 1 from the other number.

a. $9 + 6$ $10 + 5 = \underline{\hspace{2cm}}$	b. $9 + 8$ $10 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$	c. $9 + 5$ $10 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
d. $9 + 7$ $10 + 6 = \underline{\hspace{2cm}}$	e. $9 + 9$ $10 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$	f. $9 + 3$ $10 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

4. Addition facts with nine. Do not write the answers down. Just practise the sums.

$9 + 0 = \square$	$9 + 5 = \square$	$9 + 9 = \square$	$9 + 4 = \square$ $9 + 10 = \square$
$9 + 3 = \square$	$9 + 6 = \square$	$9 + 1 = \square$	
$9 + 7 = \square$	$9 + 8 = \square$	$9 + 2 = \square$	

5. Add. Remember, you can add both ways. For example, $7 + 9$ is the same as $9 + 7$.

a. $9 + 4 = \underline{\hspace{2cm}}$	b. $9 + 7 = \underline{\hspace{2cm}}$	c. $3 + 9 = \underline{\hspace{2cm}}$	d. $5 + 9 = \underline{\hspace{2cm}}$
$8 + 9 = \underline{\hspace{2cm}}$	$4 + 9 = \underline{\hspace{2cm}}$	$9 + 2 = \underline{\hspace{2cm}}$	$8 + 9 = \underline{\hspace{2cm}}$
$9 + 5 = \underline{\hspace{2cm}}$	$9 + 4 = \underline{\hspace{2cm}}$	$9 + 9 = \underline{\hspace{2cm}}$	$9 + 6 = \underline{\hspace{2cm}}$

6. What is missing?

a. $9 + \square = 13$	b. $9 + \square = 16$	c. $\square + 9 = 17$
$9 + \square = 15$	$9 + \square = 14$	$\square + 9 = 11$

You can use this same “trick” with 19, 29, 39, 49, and so on. Imagine that 49 *really* wants to be 50, and so it “takes” 1 from the number you add. Solve.

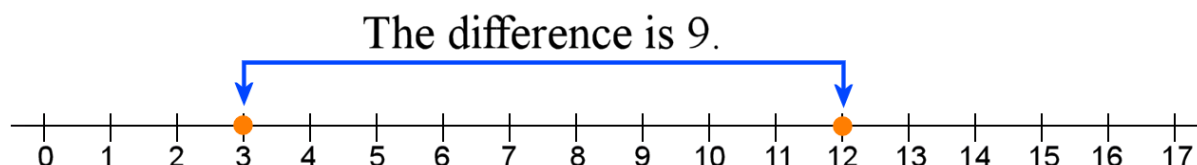
Puzzle Corner

- | | | |
|--|--|--|
| a. $49 + 7 = \underline{\hspace{2cm}}$ | b. $59 + 5 = \underline{\hspace{2cm}}$ | c. $69 + 3 = \underline{\hspace{2cm}}$ |
| $19 + 6 = \underline{\hspace{2cm}}$ | $89 + 9 = \underline{\hspace{2cm}}$ | $29 + 6 = \underline{\hspace{2cm}}$ |

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Difference and How Many More

The difference or distance between two numbers means how far apart they are from each other on the number line. The difference between 3 and 12 is 9, because they are NINE steps apart.



1. Find the differences between these numbers using the number line above.

- a. difference between 10 and 6: _____ b. difference between 12 and 8: _____
 c. difference between 14 and 2: _____ d. difference between 17 and 6: _____

We can solve the difference between two numbers by **subtracting**.

What is the difference between 10 and 4? Subtract $10 - 4 = 6$. The difference is 6.

2. Write a subtraction to find the difference between the numbers.

a. The difference between 10 and 4 _____ - _____ = _____	b. The difference between 2 and 9 _____ - _____ = _____	c. The difference between 8 and 3 _____ - _____ = _____
d. The difference between 20 and 50 _____ - _____ = _____	e. The difference between 10 and 90 _____ - _____ = _____	f. The difference between 19 and 8 _____ - _____ = _____

3. Solve the subtractions by thinking of the distance between the numbers—how far apart they are from each other.

a. $20 - 16 =$ _____	b. $40 - 38 =$ _____	c. $65 - 61 =$ _____	d. $36 - 31 =$ _____
e. $100 - 99 =$ _____	f. $87 - 84 =$ _____	g. $55 - 50 =$ _____	h. $79 - 78 =$ _____

You can also solve the difference between two numbers by thinking of addition: how many more do you need to add to the one number to get the other?

For example, to find the difference between 12 and 7, think: $7 + \underline{\quad} = 12$. (“7 and how many more makes 12?”) The answer is 5.

4. Write a “how many more” addition to find the difference between the numbers.

a. The difference between 10 and 6 $6 + \underline{\quad} = 10$	b. The difference between 6 and 12 $6 + \underline{\quad} = 12$
c. The difference between 15 and 8 $\underline{\quad} + \underline{\quad} = \underline{\quad}$	d. The difference between 4 and 11 $\underline{\quad} + \underline{\quad} = \underline{\quad}$

5. Subtract. Think how far apart the two numbers are from each other.

 a. $15 - 12 = \underline{\quad}$ 12 and how many more makes 15?	 b. $11 - 9 = \underline{\quad}$ 9 and how many more makes 11?	 c. $16 - 11 = \underline{\quad}$ 11 and how many more makes 16?
--	--	--

There are two ways to find a difference between two numbers:

(1) Subtraction

Find the difference between 100 and 2.
It is easier to subtract $100 - 2 = 98$.
The difference is 98.

(2) A “how many more” addition

Find the difference between 100 and 95.
It is easier to think: $95 + \underline{\quad} = 100$.
The difference is 5.

6. Find the differences.

a. The difference between 60 and 56	b. The difference between 22 and 20
c. The difference between 35 and 1	d. The difference between 67 and 3
e. The difference between 50 and 30	f. The difference between 40 and 100

Whenever a word problem asks “*how many more*,” you can solve it in two ways. You can either subtract, or you can write a “*how many more*” addition. Either way, you are finding the difference between the two numbers.

7. Solve the word problems.

- a. Jane is on page 20 and Toby is on page 17 of the same book.
How many more pages has Jane read?

- b. Mum has one dozen eggs plus five in another carton. A dozen means 12.
How many eggs does Mum have?

- c. Becky is reading a 50-page book. She is on page 42.
How many more pages does she have left to read?

- d. Heidi worked in the garden for 2 hours in the morning and 3 hours in the afternoon. Andrew worked for 8 hours in the shop.
Who worked more hours?

How many more?

- e. Tanya has a house full of flies! She killed 28 flies. Her husband killed 5 flies.
How many more did she kill than him?

- f. The next day, Tanya had a house full of flies again. She killed 5 flies in the living room, 12 in the kitchen, and 2 in her room.
How many flies did she kill in total?

- g. Mal had \$12 and Brett had \$6. Then both brothers worked helping Dad in the garden. Mal earned \$5 and Brett earned \$9.
Now, who has more money?

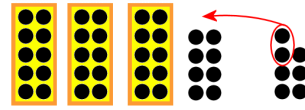
How much more?

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Add a Two-Digit and a Single-Digit Number Mentally

Imagine that 38 wants to be 40, so it “grabs” two from 7. Then, 38 becomes 40, and 7 becomes 5.

The addition problem is changed to $40 + 5 = 45$.



$$38 + 7 = \underline{\quad}$$

1. Circle the eight dots and two more dots to form a complete ten. Add.

a. $18 + 6 = \underline{\quad}$	b. $28 + 7 = \underline{\quad}$	c. $48 + 8 = \underline{\quad}$
d. $38 + 4 = \underline{\quad}$	e. $38 + 6 = \underline{\quad}$	f. $48 + 5 = \underline{\quad}$

2. Add. Think of the trick explained above.

a. $18 + 7 = \underline{\quad}$	b. $38 + 6 = \underline{\quad}$	c. $58 + 5 = \underline{\quad}$
---------------------------------	---------------------------------	---------------------------------

3. Add. Compare the problems. What is similar about the problems in each box?

a. $8 + 3 = \underline{\quad}$ $18 + 3 = \underline{\quad}$	b. $8 + 6 = \underline{\quad}$ $38 + 6 = \underline{\quad}$	c. $8 + 4 = \underline{\quad}$ $78 + 4 = \underline{\quad}$
d. $8 + 2 = \underline{\quad}$ $38 + 2 = \underline{\quad}$ $28 + 2 = \underline{\quad}$	e. $8 + 9 = \underline{\quad}$ $68 + 9 = \underline{\quad}$ $78 + 9 = \underline{\quad}$	f. $8 + 5 = \underline{\quad}$ $18 + 5 = \underline{\quad}$ $58 + 5 = \underline{\quad}$

When you add a two-digit number and a single-digit number, such as $45 + 6$ or $77 + 4$, think of the “helping” problem: the addition with just the ones digits.

Example. $45 + 6$

Think of the helping problem $5 + 6 = 11$.
(Drop the 40 from 45, and you have $5 + 6$.)

$5 + 6$ is ONE more than the next ten (11),
and $45 + 6$ is also ONE more than the next
ten (51).

Example. $67 + 8$

Think of the helping problem $7 + 8 = 15$.
(Drop the 60 from 67, and you have $7 + 8$.)

$7 + 8$ is FIVE more than the next ten (15),
and $67 + 8$ is also FIVE more than the next
ten (75).

4. Add. Compare the problems! The top problem can help you solve the bottom one.

a. $7 + 6 =$ _____ $27 + 6 =$ _____ (three more than the next ten)	b. $6 + 8 =$ _____ $76 + 8 =$ _____ (four more than the next ten)	c. $7 + 7 =$ _____ $87 + 7 =$ _____ (four more than the next ten)
d. $5 + 8 =$ _____ $35 + 8 =$ _____	e. $6 + 9 =$ _____ $26 + 9 =$ _____	f. $8 + 7 =$ _____ $48 + 7 =$ _____

5. Fill in: To add $73 + 8$, I can use the helping problem $___ + ___ = _____$. Since the answer to that is $___$ more than 10, the answer to $73 + 8$ is $_____$ more than $_____$.

6. Add.

a. $34 + 8 =$ _____	b. $47 + 7 =$ _____	c. $59 + 5 =$ _____
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7. Solve the word problems.

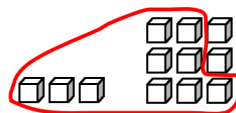
a. Jenny needed 24 eggs to make omelettes for her family.
She already had 10 eggs. How many more does she need?

b. Jenny’s large family eats a lot of potatoes. Dad bought a 25-kilogram bag of potatoes. Now, only 5 kg are left. How many kilograms of potatoes have they eaten?

Regrouping with Tens

When adding $3 + 9$, we can circle ten little ones to form a ten. We write "1" in the tens column.

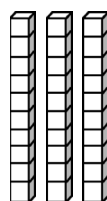
There are two little ones left over, so we write "2" in the ones column.



tens	ones
	3
	9
1	2

With $35 + 8$, we circle ten little ones to make a ten. There already are three tens, so in total we now have four tens. So, we write "4" in the tens column.

There are three little cubes left over, so we write "3" in the ones column.



tens	ones
3	5
	8
4	3

1. **Circle** ten cubes to make a **new ten**. Count the tens, including the new one. Count the ones. Write the tens and ones in their own columns. You can also use manipulatives.

a.

tens	ones
3	3
	9

b.

tens	ones
2	5
	8

c.

tens	ones
3	8
	9

d.

tens	ones
2	7
	7

e.

tens	ones
3	6
1	8

f.

tens	ones
2	5
2	7

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Adding Three or Four Numbers in Columns

Sometimes we get *two or three new tens* from the ones. We need to regroup.

In the ones, we add
 $8 + 7 + 8 = 23$.

We write the two new
 tens in the tens column.
 Complete the problem.

$$\begin{array}{r} 2 \\ 4 \text{ } 8 \\ 2 \text{ } 7 \\ + 1 \text{ } 8 \\ \hline 3 \end{array}$$

In the ones we add $9 + 9 + 7 + 6$
 $= 18 + 13 = 31$. We write three
 new tens in the tens column.

In the tens, we add
 $3 + 3 + 1 + 2 + 2 = 11$. The
 answer is *more than 100*.

$$\begin{array}{r} 3 \\ 3 \text{ } 9 \\ 1 \text{ } 9 \\ 2 \text{ } 7 \\ + 2 \text{ } 6 \\ \hline 1 \text{ } 1 \text{ } 1 \end{array}$$

1. Add mentally. Remember: first try to find if any of the numbers **make 10**.

a.	b.	c.
$8 + 4 + 5 = \underline{\hspace{2cm}}$	$3 + 8 + 7 = \underline{\hspace{2cm}}$	$8 + 5 + 6 + 4 = \underline{\hspace{2cm}}$

2. Add. The answers are “hidden” in the list of numbers below the problems.

a.
$$\begin{array}{r} 5 \text{ } 2 \\ 3 \text{ } 0 \\ + 1 \text{ } 1 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 1 \text{ } 3 \\ 2 \text{ } 5 \\ + 5 \text{ } 4 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 3 \text{ } 3 \\ 3 \text{ } 8 \\ + 2 \text{ } 7 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 3 \text{ } 6 \\ 2 \text{ } 7 \\ + 1 \text{ } 9 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 3 \text{ } 6 \\ 2 \text{ } 7 \\ 1 \text{ } 8 \\ + 1 \text{ } 6 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 4 \text{ } 0 \\ 1 \text{ } 8 \\ 1 \text{ } 6 \\ + 2 \text{ } 2 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 1 \text{ } 5 \\ 1 \text{ } 7 \\ 1 \text{ } 8 \\ + 3 \text{ } 9 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 1 \text{ } 2 \\ 2 \text{ } 9 \\ 2 \text{ } 5 \\ + 1 \text{ } 4 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 1 \text{ } 9 \\ 6 \text{ } 9 \\ + 1 \text{ } 9 \\ \hline \end{array}$$

j.
$$\begin{array}{r} 5 \text{ } 6 \\ 3 \text{ } 2 \\ + 2 \text{ } 9 \\ \hline \end{array}$$

k.
$$\begin{array}{r} 4 \text{ } 5 \\ 5 \text{ } 5 \\ + 1 \text{ } 9 \\ \hline \end{array}$$

l.
$$\begin{array}{r} 5 \text{ } 9 \\ 1 \text{ } 9 \\ + 4 \text{ } 2 \\ \hline \end{array}$$

74 80 82 89 91 92 93 96 97 98 117 107 120 119 122

3. Find the total cost.

a. Two dolls for \$17 each; roller-skates for \$49.

b. Three action figures for \$17 each.

c. Two lamps for \$24 each; two pillows for \$19 each.

d. A purse for \$89, a diary for \$12, and chocolate for \$7.

e. Two pairs of shoes for \$36 each, two sweaters for \$23 each.

f. A toy car for \$19 and three watches for \$29 each.

4. Find the errors in these additions, and correct them.

a.

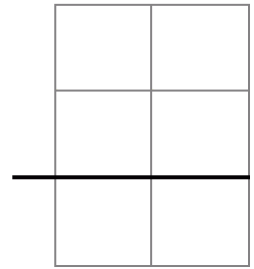
$$\begin{array}{r} 33 \\ + 48 \\ \hline 711 \end{array}$$

b.

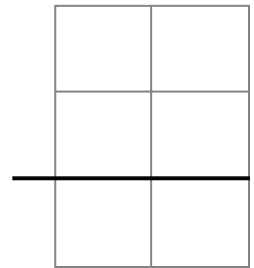
$$\begin{array}{r} 55 \\ + 39 \\ \hline 814 \end{array}$$

5. Solve the problems. You need to add or subtract.

- a. One bus has 35 people on it, and another has 22.
How many more people does the first one have
than the second?



- b. A bus had some people on it. Then, 13 more people
got on. Now there are 19 people on the bus.
How many were on the bus originally?



- c. One bus can seat 40 people. There were already 33 people.
Is there room for nine more people?

Yes/No, because

- d. One bus can seat 40 people.
How many buses do you need for 76 people?

How many buses do you need for 99 people?

- e. A bus was full with 40 people, but then six people got off.
How many people are on the bus now?

- f. A bus was full with 40 people. First it dropped off 3 people.
Then it dropped off seven more people. How many people
were left on the bus?

6. Add.

a.	3 9
	1 5
	1 8
	+ 2 8

b.	3 3
	4 8
	1 6
	+ 1 3

c.	1 7
	3 7
	2 5
	+ 3 4

d.	5 5
	1 8
	1 5
	+ 2 7

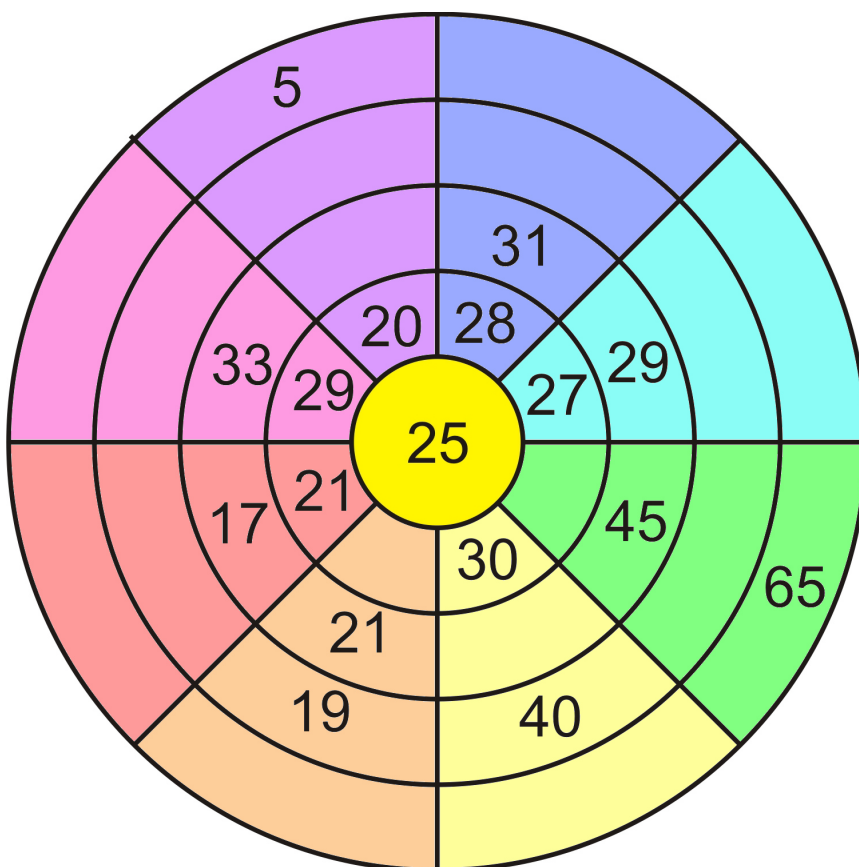
7. Are these numbers even or odd? Mark an “X”. If the number is even, write it as a double of some number.

Number	Even?	Odd?	As a double:
8	X		4 + 4
16			
100			
19			

Number	Even?	Odd?	As a double:
18			
24			
15			
21			

Puzzle Corner

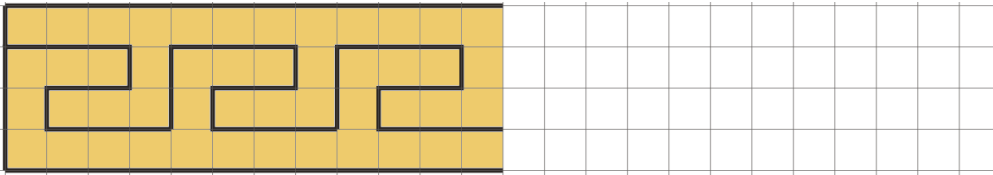
Skip-count from 25 (in the middle) to the outer edge. Each sector has a different skip-counting pattern—either by 2s, by 3s, by 4s, by 5s, or by 10s.



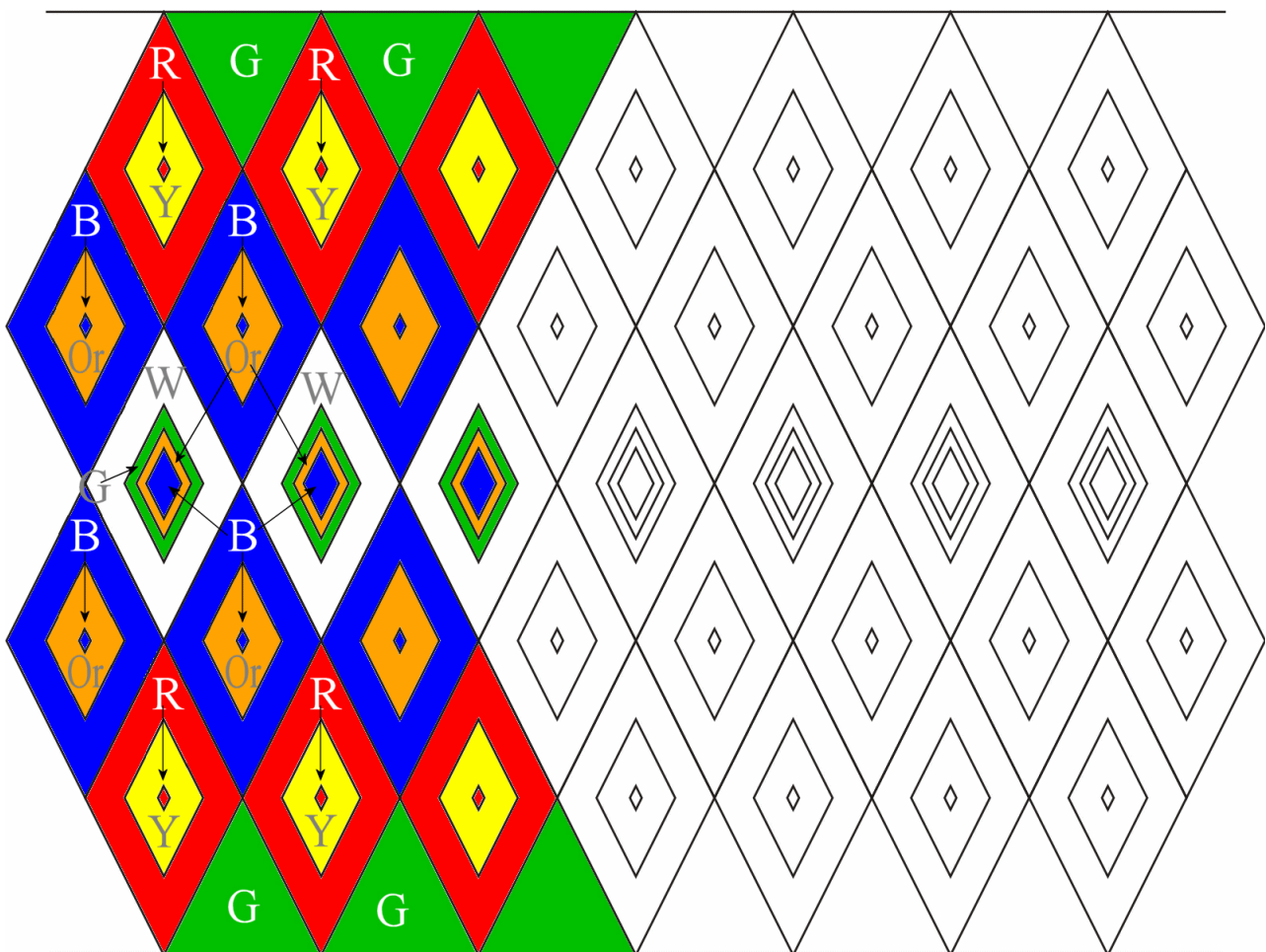
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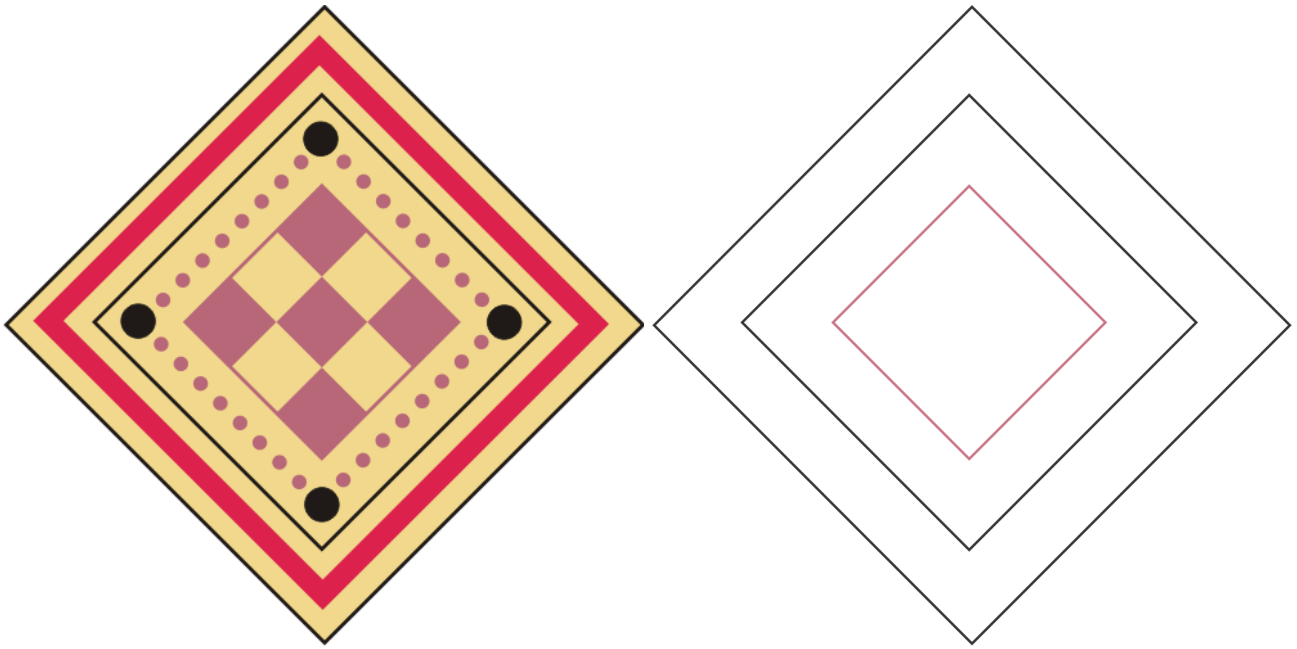
Geometric Patterns

1. The design below is often seen in Greek vases. Continue it.



2. This is a pattern from an apron used by Kirdi people in Cameroon, Africa. Notice it uses PARALLELOGRAMS that are inside each other. Continue the colouring in the pattern.



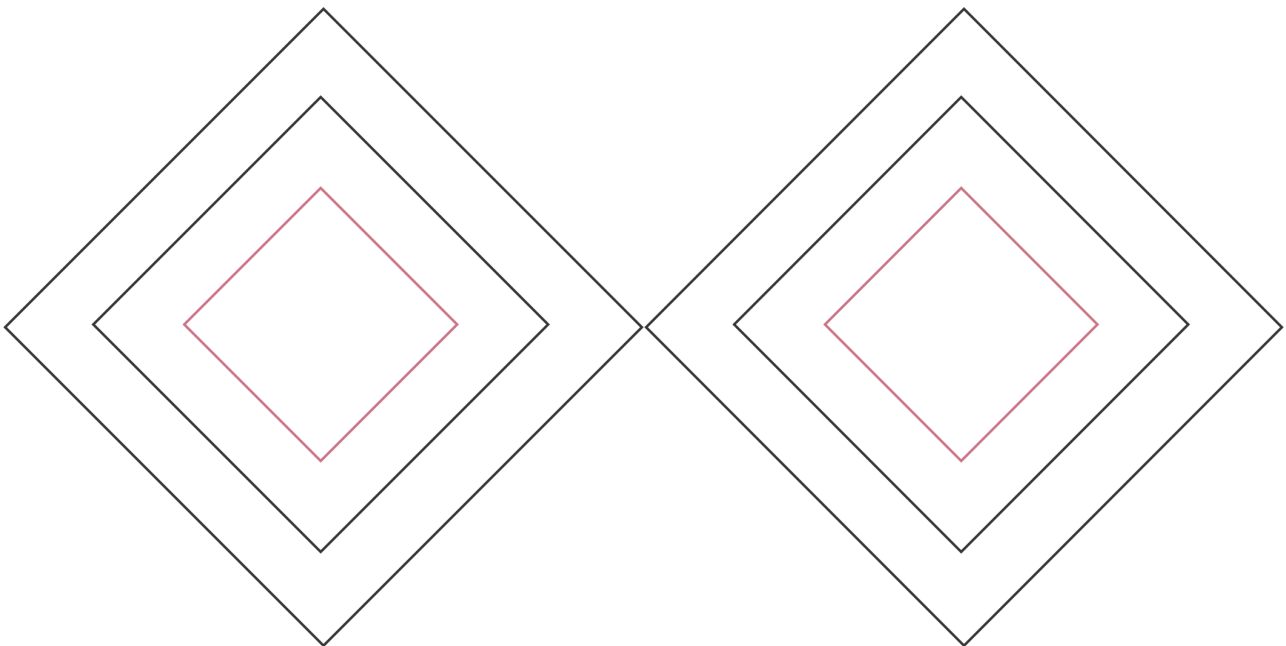


3. This is a geometric design found on a Greek vase.

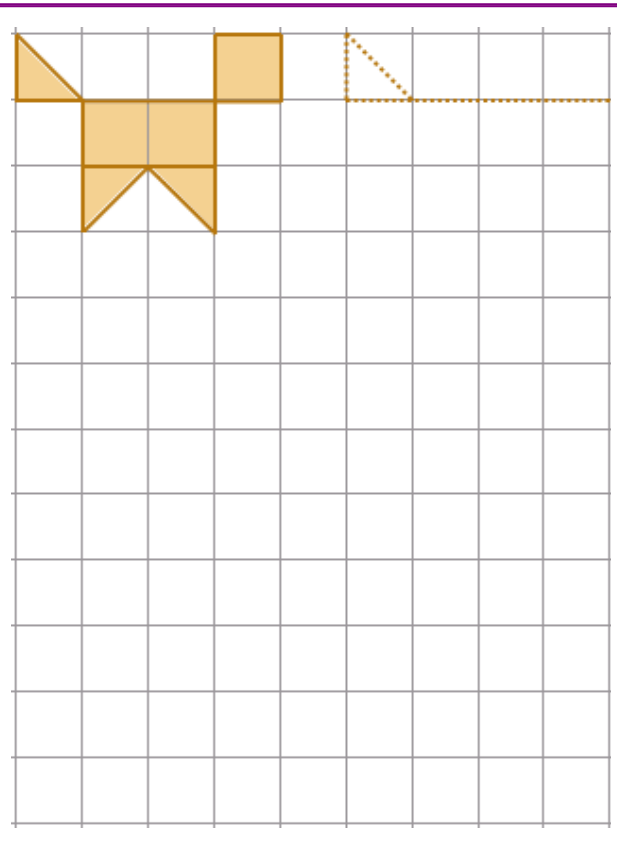
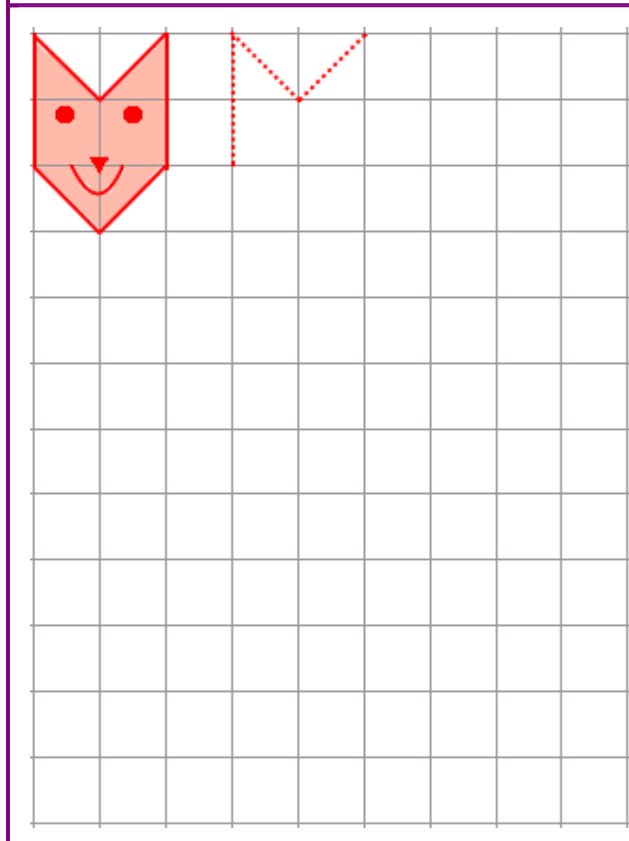
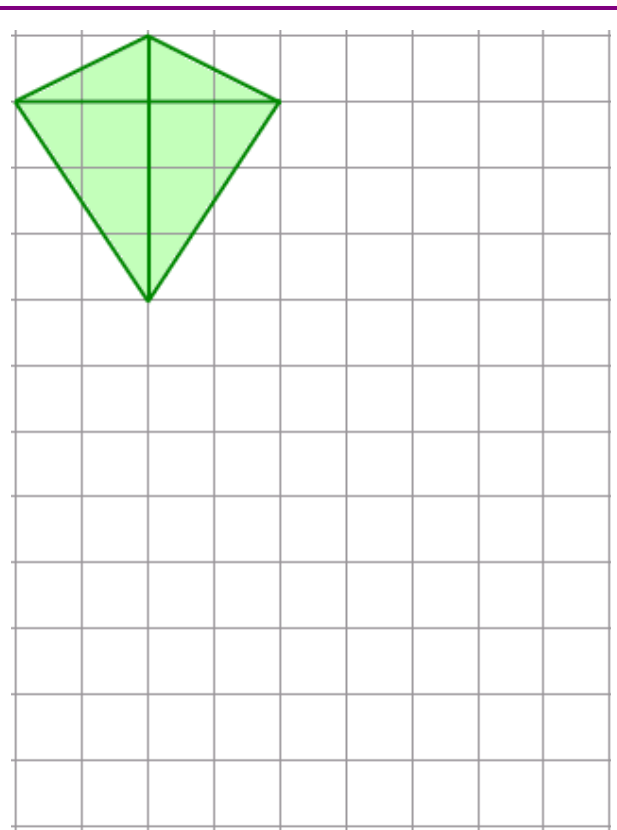
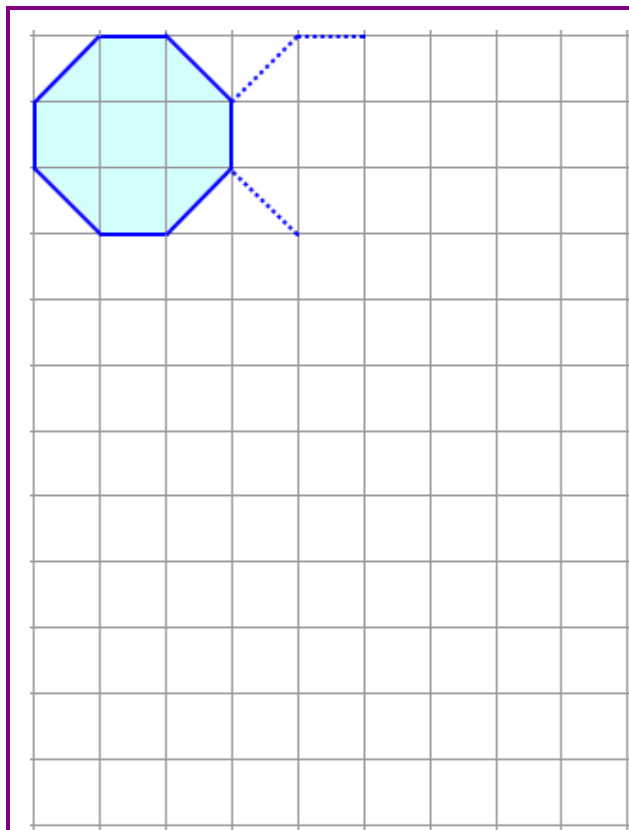
a. What two shapes are used in this design?

_____ and _____

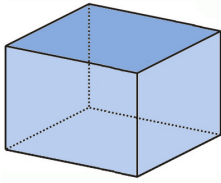
b. Copy the design at least once in the empty shapes.



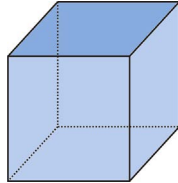
4. Repeat the patterns to fill the grids.



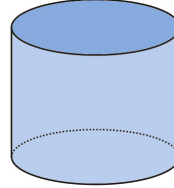
Solids



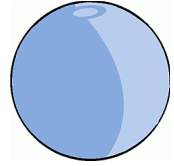
This is a **box**. It is also called a “rectangular prism.”



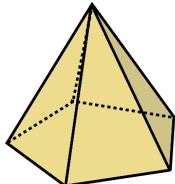
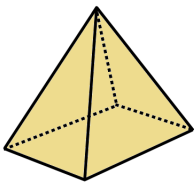
A **cube** is a box, too, but all of its sides are equal in length.



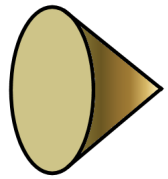
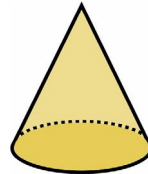
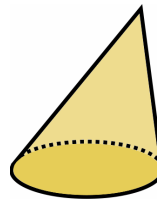
A **cylinder** has a circle on the bottom and at the top.



This is a **sphere**, or just a ball.



A **pyramid** has a pointed top. Its bottom shape can be any many-sided figure, such as a triangle, a rectangle, a square, or a pentagon.



A **cone** has a pointed top, as well, but it has a rounded shape on the bottom.

1. Make a cube, a cylinder, a cone, and a pyramid using the cut-outs provided on the following pages. Your teacher will help you.

2. A *face* is any of the flat sides of a solid.

a. Count how many faces a cube has. _____ faces

What shapes are they?

b. Count how many faces a box has. _____ faces

What shapes are they?

c. Count how many faces this pyramid has.

_____ faces

What shapes are they?

