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Mental maths games

This page lets you practice mental math for free (Want to learn all the tricks? We've broken down everything you need into 14 strategies) Place Value Basketball is a fun, base ten blocks game which helps children aged 5 to 8 to know what each digit in a either a two or three digit number represents. Bead Numbers is a place value investigation involving a tens and ones abacus. The game provides a good context for encouraging learners to think systematically. Sort numbers on these Carroll Diagrams by whether they are odd or even, by place value or by more or less than a given number. Test your knowledge of place value or hundreds, tens and units. Suitable for use on an interactive whiteboard and desktops. Daily 10 has maths questions on a range of maths concepts: addition, subtraction, ordering, partitioning, digit values, rounding, multiplication, division, doubles, halves and fractions. Great starter or plenary activity. Useful for mental maths. Useful place value teaching resources for use on an interactive whiteboard. They cover hundreds, tens and ones and money. With some you will need to drag the Diennes blocks to represent the number you want. Please note the decimals section is faulty. Mathsframe has produced a tablet friendly beadsticks resource which can help with understanding place value, partitioning and modelling addition and subtraction. A hundreds, tens and units maths game. Count carefully otherwise the shark will bite your boat. A useful teaching tool to demonstrate decimals and place value. Find 1000 more or less than a given number. A place value game which will test your knowledge of digit values. There are 3 levels of difficulty which go from two to four decimal places. Note the currency is dollars but this does not mean the game is not useful in other currency areas. Sharpen your mental maths skills on this selection of learning games. You can practise over and over again as the questions change. Many mental maths tests such as Key Stage 2 SATs are time limited so the maths games against the clock can help you to work out answers quickly. Quick fire questions on number bonds, times tables and division facts against the clock. Superb! Daily 10 has maths questions on a range of maths concepts: addition, subtraction, ordering, partitioning, digit values, rounding, multiplication, division, doubles, halves and fractions. Great starter or plenary activity. Useful for mental maths. Mental Maths Train is a maths game which focuses on the essential vocabulary of addition, subtraction, multiplication and division. A multiple choice game which can give children confidence in the four arithmetic operations. Test your knowledge in preparation for SATs. This interactive quiz has the type of questions that appear on Paper 1 - Arithmetic. A quick fire space invader type addition game. It is quite a challenge but will help you learn your number bonds to 20. Great for improving your mental maths skills. Spin from 1 - 4 spinners. With the built in activities you need to find the rule to produce a result using addition, subtraction, multiplication and division. An engaging adventure game for students as they explore the Prodigy Maths Game world. Answer maths questions to complete fantasy quests and earn in-game rewards. It's free too! Fantastic for improving your mental maths. Complete the loop against the clock. All types of calculations. You play the game similar to dominoes. NB The 75% section is faulty. Mental maths games are fun and play a key part of every primary school classroom. When we are focusing on mental maths, games can play an essential part in developing different mental maths strategies as many games reward accuracy and speed. Games, such as multiplication games, can be an excellent way to encourage participation in lessons, as well as improving attitudes towards the subject being taught. This blog gives suggestions for 18 different games that you could play to develop an array of mental maths skills. Mental maths games are a fun, low stakes way to develop childrens' number fluency. These games are easy to organise as they require very few resources, relying on children's ability to make calculations mentally. Mental maths games challenge students to identify number patterns and assess the most efficient methods for problem solving. Fluent in Five Years 1-6 (Weeks 1-6) Download a free resource pack of interactive, fun maths games to build mental maths skills in KS1 and KS2 Download Free Now! There are various mental maths strategies that children should be developing throughout KS1 and KS2 that can be used to facilitate mental calculation, however these often require a level of number fluency and a flexibility with numbers. Mental maths is not simply recalling facts, instead it involves knowing and manipulating facts to answer different questions. Another important skill that is developed when solving questions mentally is the ability to select the most appropriate method to answer a question. After playing some games, you may find it beneficial to ask your students what strategies they used to answer the question.This can help children understand that there are a range of strategies that can be used and can begin a conversation about what method is best in what circumstance. Third Space Learning's online one to one online interventions are tailored to the needs of each student. We aim to fill the gaps in understanding and help children develop confidence and true fluency in maths. Our one to one lessons incorporate mental maths into the learning objectives, encouraging children to attempt questions mentally. Our SATs revision lessons also focus heavily on mental maths, dedicating the first part of each session to a range of arithmetic and mental fluency type questions. In this blog, we provide 18 mental maths games that you could use with your class. We recommend that you pick 3 or 4 games that work well for your class and adapt them for the lesson you are teaching. By doing this, pupils won't have to learn how to play a new game each time and can instead focus on the maths. Where appropriate, we have provided a few suggestions of how the games can be adapted for different topics of year groups. Meet Skye, the voice-based AI tutor making maths success possible for every student. Built by maths experts, Skye uses the same pedagogy, curriculum and lesson structure as our traditional tutoring. But, with more flexibility and a lower cost, schools can scale AI maths tutoring to support every student who needs it. Watch Skye in action There are several different points within a lesson that mental maths games can be used. You can use mental maths games as starters, at the end of a lesson or during a lesson. By starting a lesson with a game, pupils will be engaged in the learning from the outset. Carefully selected games that are played at the start of the lesson can also be used to quickly assess prior knowledge that is necessary for the lesson. This also relies on carefully selected questions. Similarly, games used as a starter can recap essential skills from previous lessons, terms or years. As with maths starters (games used at the start of the lesson), games that are played during or at the end of the lesson can be used to assess the learning from the lesson being taught. When games are played at the end of the lesson, it ends the lesson on an exciting note, which is always enjoyable. As a teacher, sometimes you can feel your class is no longer 'with you' and may need a bit of a break. Playing a game that is relevant to the lessons may re-engage your class and help them understand the content you're covering. It is important that you consider if the games you are playing are competitive or not. Adding competition to the lesson may help some pupils but it may produce anxiety in others. Consider if it is more beneficial to work in groups or partners. This may change depending on the game played and the pupils you are working with. To help you find your way round these mental maths games, we've made suggestions as to the ones most suitable for KS1 or for KS2. However many of these mental maths games epitomise low threshold high ceiling maths activities and you can continue to adapt them at any stage of the school. When young children first start learning, they tend to explore and play. KS1 Mental maths games allow pupils to explore a maths concept in a fun and engaging way. The following games can be adapted so they can be played with pupils throughout the primary phase. This is a great mental maths game that is very simple and can be adapted for a range of topics. You will need: Individual whiteboards or a bingo board. How to play: Pupils draw a bingo board on individual whiteboards. Tell the children to fill in their bingo board with numbers or words that relate to the topic given. (For example, if you are working on the two times tables, pupils can fill their board with multiples of two.) Ask a series of questions that relate to the given topic. The first person to cross off all the numbers on their bingo board and shout 'bingo', wins. As a class you can check the answers by going over the questions and sharing the answers. Tell pupils to write numbers from 0 to 10 in the grid. Then ask the pupils questions, such as 2 add what makes 10. If they have 8 on their board, they can cross it off. Initially, with KS1 children, you could use maths manipulatives (such as Numicon) to complete the board and ask children to work in partners or small groups. This would develop not only maths skills but also develop communication skills. First, select a times table to focus on and ask pupils to individually complete their board with multiples the times table (you could specify a range of multiples). Ask times table questions and related division questions, varying the language you use (such as, 'What are 5 groups of 4.' or '20 shared between 5.') will help to expose pupils to the different vocabulary related to multiplication and division. First, pupils individually write the name of a shape in the bingo grid, you could specify that pupils include specific names of triangles or quadrilaterals, for example. You can then describe the properties of a shape, we would suggest that you clarify with the pupils the shape you are describing before moving on to the next shape (rather than recapping at the end). This will ensure that the pupils all have clarity around the descriptions of different shapes, in case any were unsure before. This game works best with very simple counting but can be adapted to incorporate counting in topics other than place value. You will need: n/a How to play: Pupils need to be in pairs or two groups to play this game (the two groups could also be the whole class as a group and teacher as another group). Tell the pupils how you want them to count and the target number to end the game on. One person will start counting and the other pupil then responds with the next number (e.g. counting in multiples of 2, pupil A says 2 then pupil B says 4). You could also count backwards if pupils are confident to do so. Counting continues until the pupils reach the target number or one pupil makes a mistake. This game can be 'won' in different ways. You could decide the first person to reach the target number wins. You could have it as a team game where they both win by reaching the target number without errors. You could have a point system where an error gives the other person a point. In Key Stage 1, this game works best with skip counting (or multiples). Tell pupils to count in twos from 0 to 24. Initially, this game will be best played as a whole class against the teacher to demonstrate how to play, this will also help reinforce the correct answers. You could use concrete or pictorial representations to support pupils when playing this game. In KS2, children need to know how to count in fractions as well as decimals. In Year 3, pupils could ping pong count in tenths from 0 to 1 (or more). By counting these out loud, rather than writing them down, it may help them to identify that tenths as a fraction and tenths as a decimal are the same but can be written differently (1/10 or 0.1). For older children, you could ask them to count in different fractions/ decimals such as counting in two tenths starting from 1 tenth (1 tenth, 3 tenths etc) to add an extra level of challenge. 21 is very similar to ping pong but is played with the whole class or within a small group rather than pairs. You will need: mini whiteboards (if desired) How to play: Tell the pupils how you want them to count and the end number (in this case it is 21 but this can be changed). Go around the group counting in the stated way. Whoever says or goes over the end number first is out. Repeat this until there is an ultimate champion. There are several ways to add challenges to this game. First, pupils could score points based on accurately predicting who will be the next person to go out. Give them time at the start of each round to write their prediction. With this variation, there will be two overall winners, one who remained in the game the longest and one who accurately predicted who would be the next person out each round. This variation is useful to ensure all children remain engaged in the game. Another variation is to allow the pupils to say between 1 and 3 numbers each time (their choice). This will add an element of strategy that can make it even more fun. Similar to ping pong, this game is most suited to topics that involve counting such as place value, multiplication, fractions and decimals. Don't forget that you can also ask pupils to count backwards to increase the challenge! This is a very active game that requires a little bit of preparation beforehand. It isn't the best game to use to assess pupils' knowledge but it is a fun game that can be used to get children moving. You will need: Large digit cards or large answers How to play: Set up a large space with digit cards/ answer cards spread out around the space. These should be easy to see (avoid putting them on the floor). Pupils start in the middle of the space. Shout a question and pupils run to the correct answer. Together chant the question and the answer (this helps pupils who may have followed the majority of the class to understand why the number they have ended at is the correct answer). On the answer cards, have numbers represented in different ways (e.g. write 'two', show 5 using counters, use the digit 9 etc). Give pupils time to look at the different representations before starting. Then say a number and pupils need to run to the representation of the number. When they have all decided on their answer, reiterate which number is represented. On the answer cards, have a range of different fractions, decimals and percentages. Give pupils time to look at the numbers before starting. Say a fraction, decimal or percentage that is equivalent to one on the answer cards. Pupils then run to the equivalent fraction, decimal or percentage. When they have made their final decision, chant the equivalence together (e.g. 0.5 is equivalent to one half). You could add individual points for the first person to say the missing equivalent (in this example, 50%). This is a similar game to 'Run To The Answer', but far less active. It works best with answers that can be expressed in numbers, although you could swap digit cards/ concrete resources for individual whiteboards to allow for more variation. You will need: Digit cards or concrete resources (one or more set per group/ pair depending on the complexity of the questions you plan to ask) How to play: Put pupils into pairs or small groups. Ask pupils a question. Pupils work with their partner/ group to use their digit cards to create the answer. Tell pupils to show their answers at the same time. Each pair/ group with the correct answer gets a point. You can decide how many points pupils need to win. Ask pupils an addition or subtraction calculation. Depending on the skill you are focusing on, give pupils concrete resources, digit cards or both. Pupils can then work in partners or as a small group to show the answer using concrete resources or digit cards (or both). The option of using concrete resources can prompt interesting discussions around the different ways that pupils may have represented the same answer. For example, if the answer is 20, one set of pupils may have put cubes into two groups of 10 whereas another group may have put cubes into one line of 20. There are many different dice games that can be used to develop mental maths skills. One of our favourites is 'Roll to Win' as it is incredibly easy to adapt for arithmetic questions. You will need: One dice per pupil How to play: First decide on the desired outcome of the game (see examples below for suggestions of how to vary this game for different topics and year groups) Put pupils into pairs. Each pupil will take it in turns to roll a die. When they have rolled the die, they select where to place their number to best meet the criteria. The person who is the closest to the criteria in the end is the winner. Give pupils a target number (for example 50 for Year 2). Pupils then take it in turns to roll their die to make two, two-digit numbers with the target of making a calculation that would have an answer as close to the target number (50 in this example) as possible. You can decide if you want to use one operation or both.Pupil A rolls 3, 2, 1, 4 and makes 34 + 21 = 55 Pupil B rolls 6, 1, 5, 3 and makes 16 + 35 = 51 Pupil B wins a point. You can give the pupils a target number or the challenge of making the largest or smallest product possible. Pupils can then take it in turns to roll their die and make a one 3-digit number and one 2-digit number. Whoever makes the target number or the highest or lowest product (depending on your choice) wins a point. You will need: A pack of cards (jokers and faces removed or assigned values) Similar to dice, cards can have many uses in mental maths games. The easiest card game to play is revealing two cards and adding the numbers together, whoever is the quickest wins the cards. This can be adapted as pupils start to learn their times tables by including multiplying the numbers on the cards together. As pupils get older, they could move on to revealing multiple cards to make 2-digit numbers or more and use any of the four operations to create a calculation. Noughts and crosses is a great game to adapt as so many children know how to play it already. This reduces the time you will need to explain how to play and win and gives pupils more time to focus on the maths questions, while still having fun. You will need: A noughts and crosses board filled with calculations/ images/ representations depending on the aim of the game. How to play: Be the first to make an uninterrupted line of noughts or crosses on the board. To place a nought or cross, first answer the question correctly. If the answer given is incorrect, then the square is left open for anyone else to claim and play passes to the next person. Put images of 2D shapes on the grid. Pupils have to name the 2D shape before they can claim the shape. This would also work for physical 3D shapes. Pupils could then keep the 3D shapes to prove they knew the name. There could also be repeated shapes in the grid to help encourage the use of accurate language for those who are less confident. Example of a 2D shape grid Either fill the grid with division calculations that pupils can answer or fill the grid with numbers. With the second option, pupils would have to say a calculation that would have the given number as the quotient. This game can be played in pairs, small groups or as a whole class. It can be easily adapted for the topic you are teaching and can have lots of ways to win or have praise awarded. You will need: Individual whiteboards or sheets of paper How to play: Give pupils time to think of and write down a set of 3 to 5 clues for a number/ shape/ value that is related to a given topic. Whoever is going first (you may wish to create a set of statements yourself for the first few rounds of this game to demonstrate the type of statements to use) reads out their first clue and asks for guesses for their number/ shape/ value. If no one guesses the correct answer, they then say their second statement. This continues until the number/ shape/ value has been guessed. You could add points for the person who guesses the answer first but also for the person giving clues as a way to encourage good, usable clues. The clues you use can vary in difficulty depending on the year group you play with. In Key Stage 1, you may introduce a clue involving half or a third whereas in Key Stage 2, you may introduce square numbers or equivalent percentages to add challenge. This game can be adapted for topics such as telling the time where you can describe the position of the hands on an analogue clock. We suggest that the following mental maths games are more appropriate for key stage 2 as they are slightly more complex than the previous games. These games incorporate number skills taught in KS2 and aim to help children to develop these skills. Mental maths skills are particularly important as KS2 students prepare for SATs. Being able to quickly make calculations mentally and select the most efficient methods for solving problems is key for success in SATs. Slide from a Third Space Learning online Year 6 lesson, teaching strategies for mental calculations This game can be either a very calm and quiet game or extremely active, depending on how you decide to play it. You will need: A set of loop cards (between 5 and 10 would be more than enough), a room or a space How to play: Set up some loop cards around the room/ space before the lesson (it is important that they are randomly placed). Pupils can work individually, in pairs or in groups for this task. Task pupils to find their way around the room by finding a question then finding it's related answer. You may decide that the first pupil/ group to accurately find each question/ answer is the winner or you may decide not to have a 'winner', instead focusing on enjoying the game. You can very easily adapt this game for any topic. This is a very enjoyable whole class game that works best with arithmetic calculations. You will need: n/a How to play: Pupils stand back to back and take 3 steps away from each other. If they want, they can prepare their fingers as 'lazer guns' ready to stun their opponent with their answer. A question master (this could be yourself or a pupil) asks a question. They must know the answer to the question. The first pupil to turn around and say 'zap' followed by the correct answer is the winner of the round. They stay on while another pupil takes their place. To add whole class competition, you could split the class in half and have the players representing their half of the class. Splat is very similar to zap but involves a few more instructions and all pupils to focus. This is another game that works best with arithmetic questions, which can include fraction, decimals and percentages. You will need: A large space How to play: A question master (this could be yourself or a pupil) stands in the middle. The rest of the class make a circle around the question master. The pupils in the circle can prepare their fingers as 'splat guns'. The question master points at one pupil and says a question. The pupil being pointed at ducks down, the pupils on either side of the ducking person attempt to be the first to answer the question and 'splat' the other pupil. (If the pupil pointed at forgets to duck down, they are out and sit down.) Whoever is first wins the round and the other pupil sits down. The pupil who had ducked can stand again. This game can be played as a quick fire game. When two pupils are left, they can play back to back (similar to zap) to decide who is the overall champion. This game involves all pupils in the class and can cover a range of topics. You will need: n/a How to play: All pupils stand up (or, if you prefer, sit on their desk). The teacher goes around the class asking each pupil an individual question. These questions can be differentiated for each pupil. If the pupil answers the question incorrectly, they sit back in their chair. You can continue to go round the class until there is one pupil left. This game can be played with arithmetic questions but also with other topics. If you are working on telling the time, this game can be played with a teaching clock to display a new time for each pupil. Similarly, if you are teaching a topic such as 2D shapes, you could display different shapes on the whiteboard for each pupil to identify. Hands up offers an alternative to the traditional games where pupils need to provide the correct answer to a question. This game can be used as a quick assessment point but be aware that pupils may not know the answer and instead be copying the rest of the class. Hands up is another example of a game that can be easily adapted for all mathematical topics. You will need: n/a How to play: Write a number, word or general answer where pupils can see. Ask the pupils a series of questions. If the answer to the question is the one you have given, they put their hand up. If it is not they keep their hand down (this could also be standing or sitting). If the answer does not match the given answer, ask pupils to give the correct answer. You can adapt this game by putting pupils into pairs or small groups so they can decide together if they put their hands up or down. This would promote mathematical discussions. Beat the teacher is an excellent way to encourage pupils to work together against the teacher, rather than each other. You will need: n/a There are two ways to play this game. How to play (version 1): A pupil is the question master (or a series of pupils are the question masters). They must know the answer to the question. A pupil is selected to play against the teacher. A question is asked, whoever answers first wins a point (teacher or the class). How to play (version 2): Either the teacher is the question master or a pupil is the question master. A pupil is asked a question, if they answer correctly, the class wins a point. If they answer incorrectly, the teacher wins a point. Both versions of this game are easily adaptable for arithmetic questions and can be adapted for some other topics with relative ease (for example arithmetic involving measures). This game can be played as an individual challenge or as a beat the teacher challenge. Beat the clock can be adapted for all topics but, as the focus is on mental maths, avoid topics that would be best solved using a written method. You will need: A worksheet with questions, a timer How to play: Hand out worksheets upside down (encourage pupils to avoid looking before the timer starts). Set a timer. When all pupils are ready, start the timer. Pupils will have this time to answer as many questions as they can. They can record the amount of time they have left once all the questions are completed. Alternatively, they can attempt to race to answer all the questions before the teacher or before the timer finishes. This is a very simple game that can be played with the whole class. You will need: a beach ball How to play: Write questions on the beach ball (this is another game that works best with arithmetic questions). Throw the beach ball to a pupil. When they catch the ball, they read out loud one of the two questions their thumbs cover (this gives them a choice of questions to answer) then they answer the question. When they have finished, they throw the beach ball to someone else who repeats the process. You could add a timer to see how quickly you can get through the whole class with only correct answers. Although some pupils may be unfamiliar with the television show this game is based on, it is an excellent way to answer questions with reduced pressure. This game can be adapted for all topics. You will need: A set of 15 questions that increase in difficulty as they progress How to play: Pupils can work as a whole class or in groups. In both cases, one pupil should be nominated to answer each question. Explain that each question will have 4 possible answers and that each team (if in teams) will have the option of using phone a friend, ask the audience or 50/50, but they can only use each once. Play through the questions to see how far they get. You could add the incentive of points that build up to a reward if that helps motivate the class. Looking for more resources to strengthen your students' mental maths? Take a look at our KS2 Maths Games, 25 Fun Maths Games , 150 Mental Maths Questions and 24 Fun KS1 Maths Games. Third Space Learning's Maths Hub also provides a wealth of maths resources, including more maths games for KS1 and KS2 including our popular maths holiday resource packs for years 2-6. Read more: Games are a great way to kick off a maths class or conclude a lesson. Hopefully, these mental maths games and teaching ideas can be successfully deployed in the classroom, or serve as inspiration as you develop your own and be a helpful tool to get students engaged. As students progress and get more confident with certain mental maths skills, freely adapt these games with more complex questions to further challenge your students to continuously expand their mental maths abilities. These fun maths games can help children recognise 2d and 3d shapes and understand the properties of shapes. There are maths games where children can practise finding lines of symmetry and recognise symmetrical shapes. Also included are coordinates games which give children hands on practise at identifying locations on grids, angles games and activities on areas and perimeters. An interactive whiteboard resource to help with the teaching and learning of the names and properties of 2D shapes. Sort 2D shapes on Carroll diagrams. There are four levels of difficulty and sorting is by two variable criteria. Squares are classed as rectangles as they are special case rectangles. Symmetry matching game involving mirroring pictures, shapes and patterns along lines of symmetry. Sort the pictures, shapes and letters into symmetrical and not symmetrical sets. Shape Patterns is a sequencing game where children from 3 to 8 years of age need to complete the pattern of different coloured 2D shapes. Three levels of difficulty. A fabulous teaching aid and learning game site on areas, perimeter and fractions of shapes. You can toggle between one or two display areas which is useful if you want to compare different shapes. Create your own shapes with blocks and explore the relationship between perimeter and area. A useful teaching tool for demonstrating irregular shapes. An activity where you use a Venn diagram to sort a variety of 3D shapes according to their properties, including: whether they are pyramids or prisms, the number of faces, edges and vertices and whether they have a curved surface. Use your knowledge of angles in this game where you defend the Earth from aliens. You can either estimate the angles or read them from a protractor. A game which reinforces skills in finding coordinates. There is progression up to a 4 quadrant grid. Find the coordinates against the clock but take great care so you can get a 20 correct in a row. Use this rainforest game to get some practise using coordinates on a map. Follow the instructions to find four locations on the map. A primary maths game where you mark the route for a walking track on a rainforest map by following instructions to choose sections on track based on distances, compass directions and coordinate references. A useful resource for making tessellation patterns using regular polygons. What kind of tessellations can you make out of regular polygons? Try making patterns, tessellations or pictures with shapes. Explore geometry and fractions or investigate symmetry. Great for demonstrating protractors and measuring angles in shapes. This resource from Mathsframe allows you to use a marker to identify the coordinates of points on different grids. You can mark points and draw lines and shapes in either 1, 2 or 4 quadrants. Create angles using a grid and then measure them using the protractor. Their values can be displayed or hidden. For reflex interior angles the value of the exterior angle is shown. See if you can predict which of these nets form into a cube. Make your prediction and then watch the animation to see if you were right. A super tool for demonstrating volume and surface area. There is an option to create your own size of cuboid. A wonderful teaching resource for exploring shapes. Choose from three different geoboard designs and stretch out the bands to make your shapes. You can create all sorts of 2D shapes with the bands on this Geoboard. There are two grids to choose from: circular and rectangular. Can you name the 2D and 3D shapes? The game from ictgames has a draggable torch shining on a hidden shape. You can move the torch to guess the name of the shape and then click the 'eye' to see if you were right. A 2D shapes adventure game where your mission is to plug the holes in the forcefield. This game can help develop spatial awareness. Have fun making your own shapes and tessellating patterns or see if you can complete the pattern puzzles. Can you complete these tricky Tangram puzzles? Excellent for testing your spatial awareness. This interactive teaching tool can be used in a variety of mathematical contexts such as multiplication arrays, finding different shapes with the same area, nets and more. It is useful because there are different backgrounds such as dots. Defend your planet from the invaders. You must complete each alien's symmetry to destroy it but be careful because if you miss they will fire back. There are 20 levels. Calculate the perimeter of rectangles and squares. A tutorial which explains how to find the area of squares and rectangles. There are examples for you to try to work out.