Staffordshire County Council

Dynamic Dominoes

A transition booklet to support and enhance learning

Making the Difference

Education Transformation Division

With many thanks to the working party who have helped to create this booklet.

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Introduction

There will be times when a child can become fragile or vulnerable. One scenario may be when a child moves schools. The teachers who created this pack have ensured to offer learning opportunities which build on prior learning, give clear continuity and progression as well as meeting the needs of the children as they move from one learning environment to another.

This mathematics transition booklet has been produced to support the learning in which every child is involved. There is a particular focus on attainment target 1: using and applying mathematics. The activities focus on problem solving, reasoning, enquiry and communication. All this from a set of dominoes!

These crucial learning tools will be needed if children are to 'choose the life they want rather than accept the life they are offered'.

Other aspects of the curriculum including thinking skills are embedded within the activities.

The booklet has been designed to offer learning activities for pupils in First and Middle schools.

Domino Games have been included for both the First and Middle schools and can also be played at home.

Part 1 activities are to be completed by the **First Schools**.
Part 2 activities are to be completed by the **Middle School**.

Naturally these activities could be used in Primary Schools to support the transition arrangements between classes.

Support, consolidation and challenge activities are included to support the varying learning needs of pupils. There are numerous activities for selection, which have been planned for approximately 10 maths sessions. Schools may want to think creatively about how these are delivered e.g. a domino day.

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Traditional Dominoes

To start shuffle the dominoes face down. Each player takes 6 dominoes and places them so that the other players can't see their value. The remaining dominoes are termed "sleeping" tiles. The first person to play is the person holding the highest double. The domino played must be the highest double. If none of the players have a double, then the dominoes are reshuffled and re-drawn.
Each player must in turn then play a domino onto the table positioning it so that it matches either end of the domino chain. Each domino placed must be positioned so that the two matching ends are adjacent. If a player can lay a domino, then it must be played. Otherwise the player "knocks", or raps the table and play passes to the next player. Normally play stops when one player plays their last domino. If it reaches a point at which no player can proceed, the winner is the player whose combined sum of all spots on their remaining dominoes is the least.

Variations

The Draw Game

Players take fewer dominoes initially but a player who cannot place a domino must pick a sleeping domino to add to their set. When the sleeping dominoes run out, players simply pass their turn when they cannot go. For this variation, two players would start with 7 dominoes, three players with 5 tiles, four players with 4 tiles and five players with 3 tiles.

Cross Dominoes

An extension to the Draw game, this variation gives players more options and also takes up less table space!
The game is played in exactly the same way as the Draw game but with a different start. After the first double is played, the next four tiles played must be played against that double so as to form a cross. So for this first double only, dominoes are played adjacent to all four sides of the tile. Players may have to take sleeping tiles before this is accomplished but as soon as the cross is complete, play continues as in the draw game. Thus from that point on, each turn has four dominoes available to be played against instead of two.

Double Nine Cross Dominoes

This variation is suitable for Double Nine sets. Two or three players start with seven dominoes each, four or more players start with five dominoes each. Play starts as per Cross dominoes with the second to fifth tiles played forming a cross around the initial double. Thereafter play continues as per the Draw game but whenever a double is laid down, two new chains can start from it. Therefore, the number of available chains becomes much larger than for previous games.

Matador

Matador is a variant on traditional dominoes. The main difference is that when you're playing Matador you must try to get the ends of the dominoes to add up to seven. In Matador, you don't even need to play matching dominoes, so long as the number adds up to seven then you're able to play. Any dominoes that have spots that add to seven (3-4, 6-1 etc) are called 'matadors' and can be considered a wild card. Also, the double zero is considered wild and can be played at any point throughout the game. They can be added anywhere to the domino layout and only a matador can be played onto a double zero domino as it can't add up to seven when added to any other tile.

Playing the Game of Matador

All dominoes are placed in the centre of the table and shuffled facing downwards. Each player then draws dominoes for their hand and the number they choose depends on how many players there are. In general, Matador is best played with two to four players. If there are two players, they must choose seven dominoes each. Three players draw six dominoes each and four players must choose only five dominoes each, with the rest being left in the centre.

The player with the highest double must play first. The play continues on to the left and each player tries to play a domino that will add up to seven with an existing piece. If someone has a double in their hand they are able to play it lengthwise on the existing layout. If they have a matador however, this can be played either lengthwise or crosswise. If someone plays their matador crosswise then either end of it can be considered to be in play and used to add up to seven for the next player who is playing their domino.

Winning and Ending the Game

As the game continues in Matador, each player must continue playing their dominoes if they're able to add up to seven. If they can't play a domino to do this, they must choose another from the centre pile. If they still can't play, then they must pass their turn. This is also the same if there are no more tiles left in the centre.

The game will end when a player has played all the dominoes that they have in hand or when nobody is able to play any more. At this point, the player who has the least number of dots left on their dominoes win the accumulative points of all the other players dots. The score is then noted and the game continues to an agreed number, usually 100 or 200.

Chickenfoot Dominoes

The game of Chickenfoot, sometimes known as 'chickie foot', is a different variation of traditional dominos where the overall aim is still the same. To win the game you must try to play all your dominoes or have the lowest score at the end if you can't. As in traditional dominos, your score is counted at the end by how many dots you have left, so always try and get rid of those large dominoes first. At the start of the game, each player has to pick five dominos from a centre pile that is face down on the table. The first player to win 7 games is deemed the champion.

Starting the Game

To start a game of Chickenfoot, the player who has drawn the double 6 must play it. If nobody has the double then the next highest double domino has to be played. All this sounds very familiar to traditional dominos, however the rules start to change slightly as play continues. The player who sits on the left of the original player, must play any domino they have with a 6 on it (or the double played). Each player must continue in the round playing a 6 by adding it to all 4 sides of the original tile. If they don't have a 6, then they must pick up a new domino from the centre and either play this or pass. No other play is allowed until all four sides of the initial double tile have been filled. Once this occurs, then normal game rules apply where you can play any matching domino to the exposed end of a played domino.

The Chickenfoot Twist

The difference when playing Chickenfoot is that any time a player plays a double domino on the exposed domino with the same number as the double, the player has to call out 'Chickie (number)'. This then means that from this point forward, there must be 3 more of this number played before the players can move on to another number. For example, someone may say 'chickie 2'. This means that the next three dominos should all have a two in them and should be placed onto the double two that was placed down. This resembles a chickenfoot shape, hence the name of the game being chickenfoot.
If any player doesn't have a two to play, they must take a domino from the centre pile and play it if it has a two on it. If it doesn't, sadly they must call pass and miss their turn. After there have been three dominoes placed with two's on them, the next player can play any domino they like that matches an exposed end. This continues until there are no dominos left, or until there can be no more dominos placed.

Tricks and Tips for Winning Chickenfoot

Since winning can often come down to who has the least points left on their dominos, it's better to get rid of as many high dominos as you can. Many people will choose to hang onto their low value dominos and use up all the numbers, which they have the double for.

Odds

The aim: Place dominoes in the chain so that the total of the two end numbers is an odd total.

Odds or evens is played with a double six set of dominoes by two to four players. The dominoes are shuffled face down and each player takes five dominoes (regardless of the number of players). The remaining dominoes are placed face down at the side of the game.
The player with the highest total on one domino plays first but does not have to use this domino.
Scoring happens during and at the end of each game so it is important to keep track of your own score.
The first player places any domino and play continues as in traditional dominoes with each player placing a domino so that the domino it connects with matches in number.
Players attempt to place dominoes so that the total of the numbers at either end of the chain add up to an odd number. If a player is able to make an odd total then a point is added to the score of the player. A point can be scored even with the first domino!

If a player is unable to place a domino then a domino is taken from the remaining dominoes placed face down and play moves to the next player.

The game ends as soon as a player has no more tiles left or alternatively when none of the players can play a tile.
The player who has no more tiles left scores 2 bonus points.

The winner is the player who has the most points.

Change the game to Evens

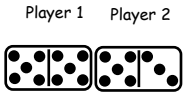
This game is played in the same way as Odds except that evens now count for points. So during the game, if a player places a domino so that the ends add up to an even total, that players scores points for the even number.

All Fives

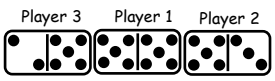
The aim: Place dominoes in the chain so that the total of the two end numbers is a multiple of 5.

All Fives is played with a double six set of dominoes by two to four players. The dominoes are shuffled face down and each player takes five dominoes (regardless of the number of players). The remaining dominoes are placed face down at the side of the game.
The player with the highest total on one domino plays first but does not have to use this domino.
Scoring happens during and at the end of each game so it is important to keep track of your own score.
The first player places any domino and play continues as in traditional dominoes with each player placing a domino so that the domino it connects with matches in number.
Players attempt to place dominoes so that the total of the numbers at either end of the chain add up to 5 or a multiple of 5. If a player is able to make a multiple of 5 then a point is added to the score of the player. A point can be scored even with the first domino!

E.g. The first player places  and scores 1 point because the total of the two ends is 10. The next player places  .



Now the total of the ends is 5 + 3 = 8. Player 2 does not score a point.
Player 3 then places 



Player 3 scores a point because the total of the ends is 2 + 3 = 5.

If a player is unable to place a domino then a domino is taken from the remaining dominoes placed face down and play moves to the next player.

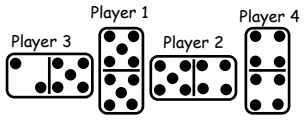
The game ends as soon as a player has no more tiles left or alternatively when none of the players can play a tile.
The player who has no more tiles left scores 2 bonus points.

The winner is the player who has the most points.

Variations

Should a player place a domino so that the ends add up to a multiple of five and fail to declare it, any player can shout "Fives!" as soon as the next domino is placed and claim the point instead.

Change the direction that the doubles are placed as shown below



Now when totalling both ends, all the spots on the double are counted. Here player 4 scores a point because 4 + 4 + 2 = 10 (a multiple of 5)

Change the scoring

If a player makes a total that is a multiple of 5 then this becomes the score. In the game above player 4 would have 10 points for this go.
The winner in this game is the first player to reach a given score e.g. 30 points.

Change the game to all threes

This game is played in the same way as All Fives except that multiples of three now count for points. So during the game, if a player places a domino so that the ends add up to 6, that players scores points for the multiple of 3.

The winner of the game is the same as in All Fives

Change the game to all fives and threes

This game is played in the same way as All Fives except that multiples of three now also count for points. So during the game, if a player places a domino so that the ends add up to 6, that players scores points for the multiple of 3. A total of 10 scores points for a multiple of five and a total of 15 scores double points because it is a multiple of five and three.

The winner of the game is the same as in All Fives

Domino Top Trumps – Part 1

Learning Outcome: To know and use addition, subtraction and multiplication facts.

Resources: 2 to 4 players.
Complete set of double six dominoes
Multiplication grid if needed

PART 1 Domino Top Trumps

Aim

- To use place value, addition, subtraction or multiplication in order to have a better score than other players.

Set up

- Deal face down the set of dominoes equally between all players. Any dominoes left over are not used and remain face down.
- The player with the highest double plays first.

Playing

The starting player calls out one of the operations that he/she feels will win, i.e. have the higher value for a two digit number, addition or multiplication (of the two numbers shown on the domino) and the lower value for subtraction (difference of the two numbers shown on the domino) then lays this domino face up before everyone. The remaining players place their first dominoes face up on the table and the player who has the highest value for a two digit number, addition or multiplication or the lowest value for subtraction (difference) wins. These dominoes are then taken by the winner and placed at the bottom of their pile and then it is their turn to call the next operation.

If more than one player has a higher/lower score that matches then the original caller calls again and the dominoes are left in the middle until someone wins and they then take all of the dominoes. The player that holds all of the dominoes is the winner.

Variation

- Only deal 5 dominoes
- Simplify the game by only using addition and subtraction (difference)

Domino Multiplication Grid
(double six set)

x	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

Domino Top Trumps – Part 2

Learning Outcome: To know and use addition, subtraction and multiplication facts.
To be able to compare proper fractions

Resources: 2 to 4 players.
Complete set of double six dominoes
Fraction wall if needed

PART 2 Domino Top Trumps

Aim

- To use addition, subtraction or multiplication in order to have a better score than other players.
- To use proper fractions to have a better score than other players

Set up

- Deal face down the set of dominoes equally between all players. Any dominoes left over are not used and remain face down.
- The player with the highest double plays first.

Playing

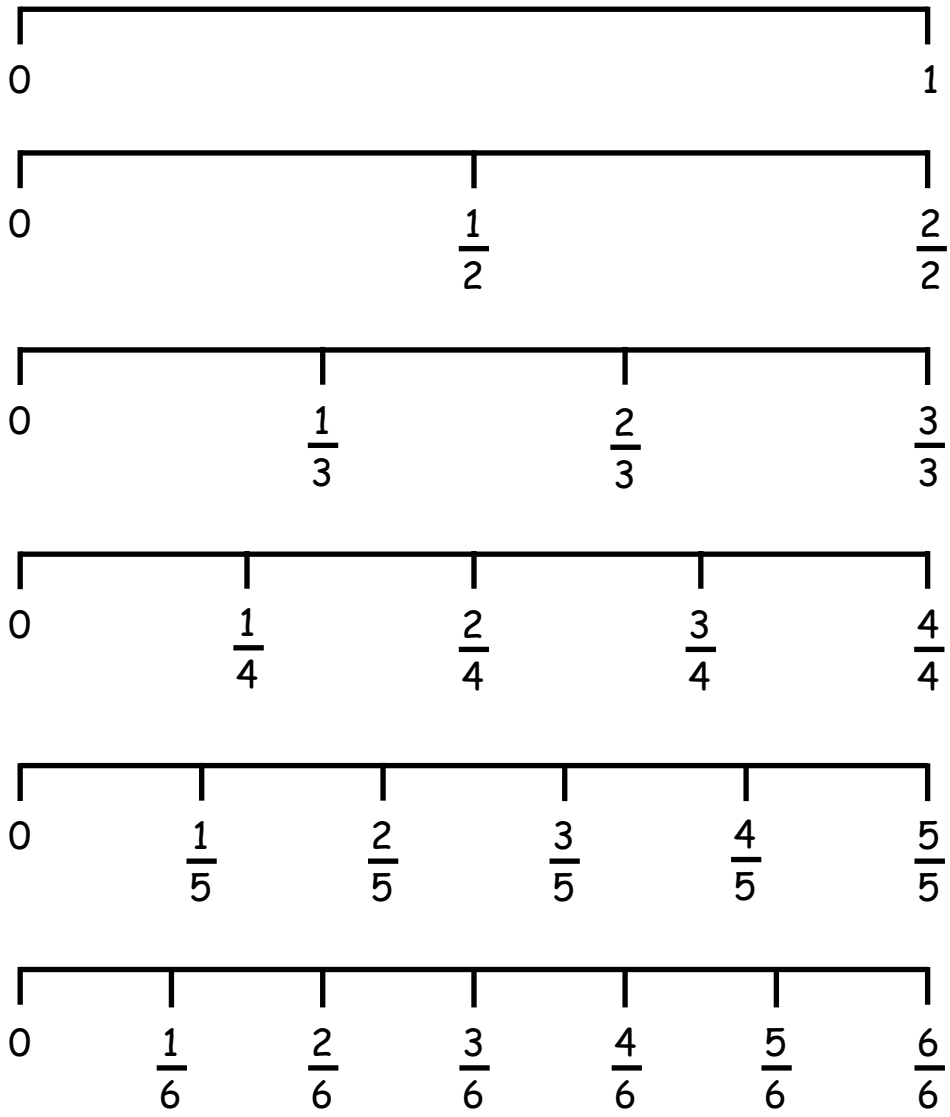
The starting player calls out one of the operations or proper fraction that he/she feels will win, i.e. have the higher value for addition, multiplication or fraction and the lower value for subtraction (difference) then lays this domino face up before everyone. The remaining players place their first dominoes face up on the table and the player who has the highest value for addition, multiplication or fraction, or the lowest value for subtraction (difference) wins. These dominoes are then taken by the winner and placed at the bottom of their pile and then it is their turn to call the next operation.

If more than one player has a higher/lower score that matches then the original caller calls again and the dominoes are left in the middle until someone wins and they then take all of the dominoes. The player that holds all of the dominoes is the winner.

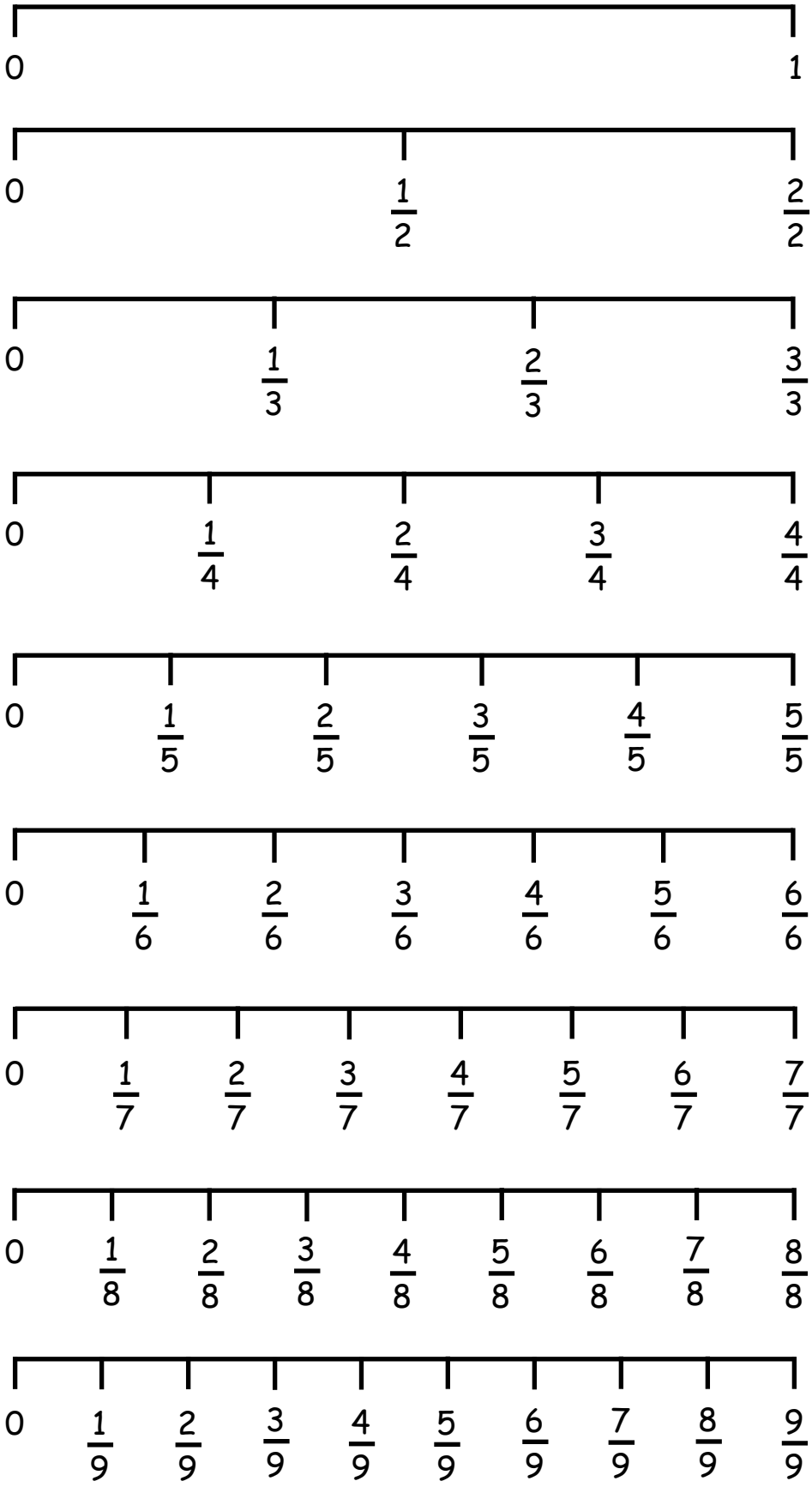
Variation

- Only deal 5 dominoes
- Use a set of double nine dominoes

Domino Fraction Wall
(double six set)



Domino Fraction Wall
(double nine set)



Bunk Beds! - Part 1

Activity A

Learning Objectives:

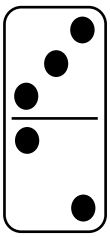
Year Three	To know what each digit represents
Year Four	To explain methods and reasoning about numbers orally

Resources:

A double six set of dominoes.

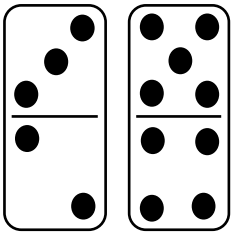
Method:

Place all dominoes face down on the table. Children work in pairs. Child A chooses a domino and places it vertically, thus:-



They can chose whether they want it with 3 on the top or 3 on the bottom.

Child B takes another and places it to the right of the first domino, thus:-



Child A's score

Child B's score

Child A has scored 35, Child B has scored 24.

If it was agreed beforehand that the highest number wins, then Child A wins, if the lower number then Child B wins.

Start a tally for scoring. The first to ten wins. It is a good idea to take turns over which child goes first and who is in the top/bottom bunk!

An extension would be to allow both children two choices of dominoes so they have to decide which domino is more advantageous to winning the game.

Bunk Beds! - Part 1

Activity B

Learning Objectives:

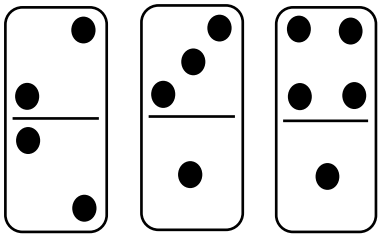
Year Three:	To know what each digit represents.
	To compare three digit numbers.
Year Four:	To explain methods and reasoning about numbers orally.

Resources:

A double six set of dominoes.

Method:

Place all 6 x 6 dominoes face down on the table. Children work in pairs. Child A chooses a domino and places it vertically. Child B does the same and places it alongside. Child A repeats the process. The three dominoes may look like this:-



Child A's score is 234

Child B's score is 211

If it has been agreed that the highest number is the winner then Child A scores one point; if the lowest number then Child B scores one point.
Use a tally for scoring—first to ten wins. As in Activity A, an extension would be to allow both children two choices of dominoes so they have to decide which one is better!

Bunk Beds! - Part 1

Activity C

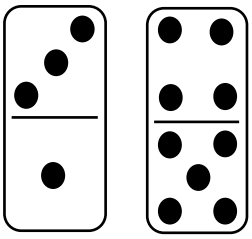
Learning Objectives:

Year Three To know what each digit represents
To extend understanding of addition and subtraction
To find the small difference of a number by counting up from smaller to larger.
Year Four To find a difference by counting.

Resources:
A double six set of dominoes.

Method:

Place all dominoes face down on the table. Children work in pairs. Child A chooses a domino and places it vertically. Child B does the same and places it alongside, thus:-



Top bunk reads 34

Bottom bunk reads 15

Child A now calculates the 'difference' between the two bunks—19. Repeat the above process. Child B now calculates their 'difference'.
Highest difference wins and scores one point. Score on a tally; first to ten wins.

Bunk Beds! - Part 1

Activity D

Learning Objectives:

Year Three	To know what each digit represents. To compare three digit numbers. To find the small difference of a number by counting up from smaller to larger.
Year Four	To find a difference by counting.

Resources:
A double six set of dominoes.

Method:
This activity is the same as Activity C except that there are three dominoes laid (ie a three digit number will result).
Allow the second and third placed domino to be placed in any place-value position!

Bunk Bed Totals! – Part 1

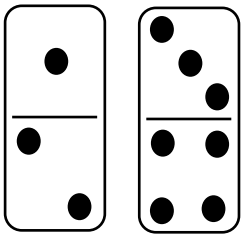
Activity E

Learning Objectives:

Year Three To know what each digit represents.
To extend understanding of addition and subtraction.
Year Four To use known number facts and place value to add or subtract mentally.
To explain methods and reasoning about numbers orally.

Resources:
A double six set of dominoes.

Method:
Place all dominoes face down on the table. Children work in pairs. Child A chooses a domino and places it vertically. Child B does the same and places it alongside, thus:-



Top bunk reads 13

Bottom bunk reads 24

Child A calculates their score 13 + 24 = 37
The process is repeated. The highest total wins.
Use a tally for scoring. The first to ten wins.

Bunk Bed Totals! – Part 1

Activity F

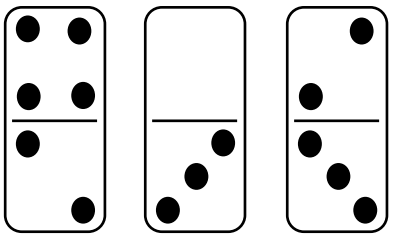
Learning Objectives:

Year Three	To know what each digit represents. To compare three digit numbers. To extend understanding of addition and subtraction.
Year Four	To use known number facts and place values to add and subtract mentally.

Resources:
A double six set of dominoes.

Method:

Place all 6 x 6 dominoes face down on the table. Children work in pairs. Child A chooses a domino and places it vertically. Child B does the same and places it alongside. Child A repeats the process. The three dominoes may look like this:-



Child A calculates their score as 402 + 233 = 635
Child B repeats the process. The highest total wins.
Use a tally for scoring. The first to ten wins.

Bunk Beds! – Part 2

Activity A:

Learning Objectives:

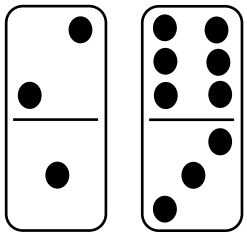
To recall quickly multiplication facts
To extend understanding that multiplication can be done in any order.

Resources:

A double six set of dominoes, leaving out those with blanks.

Method:

Place all the dominoes face down on the table. Children work in pairs and must agree which child will go first and score with the top bunk. Children score by multiplying the 2 numbers in their bunk.



Child A scores 12

Child B scores 3

In the above example Child A wins, assuming you are playing that the highest score wins. Keep a tally. The first to ten wins.

Bunk Beds! – Part 2

Activity B

Learning Objectives:

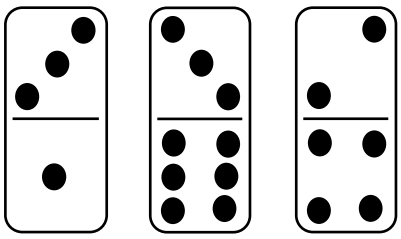
To recall quickly multiplication facts
To extend understanding that multiplication can be done in any order.

Resources:

A double six set of dominoes, leaving out those with blanks.

Method:

Place all the dominoes face a and score with the top bunk. This time three dominoes are chosen, thus:-



Child A scores 3 x 3 x 2 = 18

Child B scores 1 x 6 x 4 = 24

The highest total wins. Keep a tally and the first to ten wins.

Bunk Beds! – Part 2

Activity C

Learning Objectives:

To recall quickly multiplication facts
To extend understanding that multiplication can be done in any order.

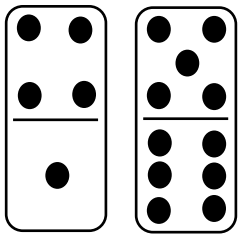
To find differences by counting up through the next multiple of 10 or 100.
To use known number facts and place value for mental addition and subtraction.
To explain methods and reasoning, orally and in writing.

Resources:

A double six set of dominoes, leaving out those with blanks.

Method:

Child A places a domino face up, Child B does the same, thus:-



4 x 5 = 20

1 x 6 = 6

If child A goes first, their score is the difference between 20 and 6, ie 14. Encourage the children to identify their biggest difference.
Repeat the above to find out Child B's score.
Highest score wins!
Keep a tally, first to ten wins.

Bunk Beds! – Part 2

Activity D

Learning Objectives:

To recall quickly multiplication facts
To extend understanding that multiplication can be done in any order.

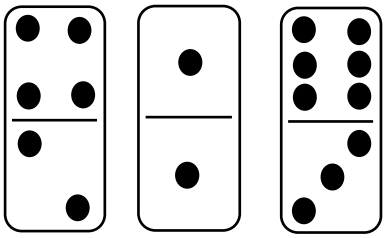
To find differences by counting up through the next multiple of 10 or 100.
To use known number facts and place value for mental addition and subtraction.
To explain methods and reasoning, orally and in writing.

Resources:

A double six set of dominoes, leaving out those with blanks.

Method:

This game is the same as in Activity J except that a three digit number is generated.



$4 \times 1 \times 6 = 24$

$2 \times 1 \times 3 = 6$

The difference is 18. Child B now goes. The child with the highest difference wins. Encourage the children to identify the biggest difference possible by moving the dominoes around.

A further extension of this game would be to leave out all the dominoes containing a one and lay two dominoes each, to make a four digit multiplication sum.

Targets - Part 1

Learning Objectives ~ Add or subtract mentally whole numbers.
Recall addition and subtraction facts

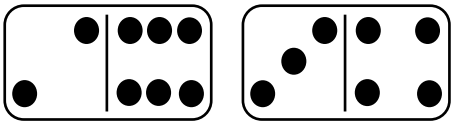
Resources ~ number lines, paper for recording results.

The aim of this game is to make a given target number, using various operations, depending on ability. It could be played individually, in pairs or small groups.

For all abilities the aims and rules are the same. Begin by turning the set of dominoes upside down. Each child takes the required number of dominoes and tries to make the target number. It can be played with 'penalty points' if a child cannot make the exact number. In this case, you might want to give each child 10 points to start with, and you may want to use a number line with negative numbers too.

Target 12 (using addition and subtraction)

Each child chooses 2 dominoes from the upside down set.
Try to make 12 using addition and subtraction.
Get 3 points if 12 can be made exactly.
Points are lost according to how many away from 12 e.g. 3 lost points if dominoes only total 9.
Each number on the dominoes is used as a separate digit.



Here the closest figure to the target would be 11, so one penalty point would be given.
6+4+3-2 = 11
The dominoes are 'dead' after each round and are put to one side.
The winner is the child with the most points after a set number of games.

Children will need to be encouraged/shown that their first answer may not necessarily be the closest. If they had simply added all the digits, they would have reached 15, so would have had 3 penalty points.
You may wish to use a number line (including negative numbers) to support the children.
The winner is the one with the most points after an agreed number of goes.

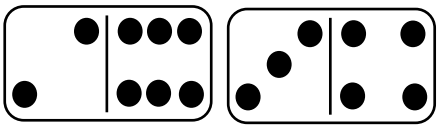
Targets - Part 1

Support
Target 12 (addition only)

Each child chooses 2 dominoes from the upside down set.
Try to make 12 using addition only.
Score in the same way.
The dominoes are 'dead' after each round and are put to one side.
The winner is the child with the most points after a set number of games.

Extension
Target 18 (using addition, subtraction and multiplication)

Again the same rules apply. However, here the children can also use multiplication as well, in order to hit the target. All numbers need to be used, and they will need to do several calculations at times to find the closest number to the target.



E.g. (6x2)+3+4=19 (1 penalty point)
(6x4)-4-3=17 (1 penalty point)
(6-3)x(2+4)=18 (3 points!)

Extension – different target numbers may be given and children could discuss/work out which target numbers are easier to reach and why.

Targets - Part 2

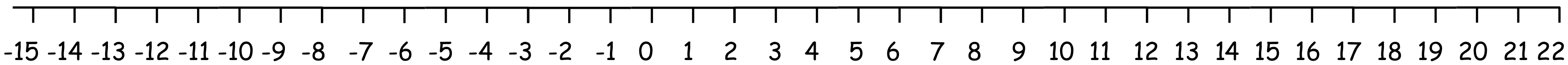
Part 2

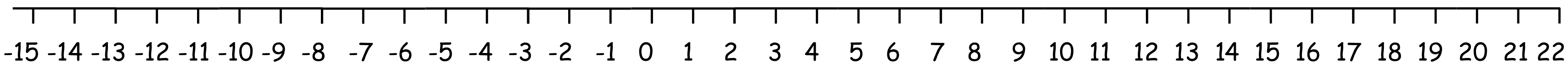
Children can play any of the games from part 1.

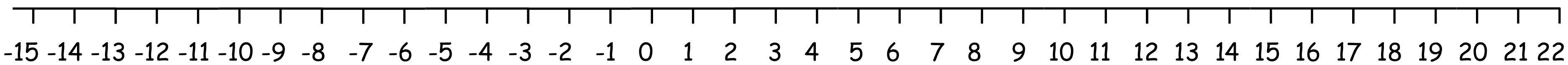
Target 24 (using all 4 operations)

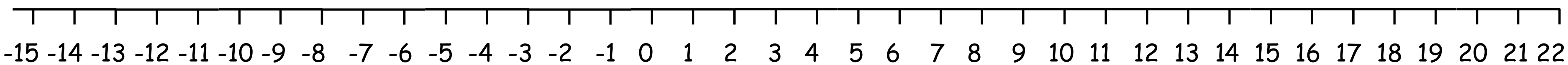
Again the rules remain the same, but now the children can use all 4 operations to reach the target.
Again the target number could be changed and children could work out which numbers it would be impossible to reach.
Lower 'targets' might make children use division more frequently.

Targets - number line record sheet









Squares - Part 1

Activity A

Learning Objectives:

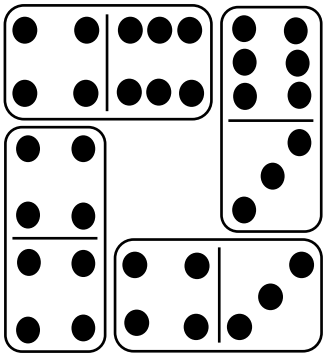
Year Three	Derive and recall addition and subtraction facts
Year Four	To use known number facts and place value to add or subtract mentally.

Resources:

Full double six set of dominoes; Record Sheet 1 (optional)

Method:

Place all the dominoes face up on the table. The aim of the game/challenge is to make a domino square thus with 'matching ends'.



Children can record their domino squares using the Resources sheet and place the total number of spots in the middle. This activity could be enjoyed as a game between two pupils. Child A could try to obtain a higher/lower total than Child B within a given time limit.

Squares - Part 1

Activity B

Learning Objectives:

Year Three	Derive and recall addition and subtraction facts.
Year Four	To use known number facts and place value to add or subtract mentally. To explain methods and reasoning about numbers orally

Resources:

Full double six set of dominoes; Recording Sheet 1 (optional)

Method:

Select a number between ten and sixteen and place this number in the 'total box' in the centre of the recording sheet. Using a set of dominoes how many different ways can be found to complete the square with the chosen total on each side of the square.
Again this activity could be played by pairs or as an investigative individual challenge. If a different number between ten and sixteen is selected are there more solutions?

Squares - Part 1

Activity C

Learning Objectives:

Year Three	Derive and recall addition and subtraction facts.
Year Four	To use known number facts and place value to add or subtract mentally. To explain methods and reasoning about numbers orally

Resources:

Full double six set of dominoes; Recording Sheet 1 (optional)

Method:

Is it possible to use all 28 dominoes by making seven squares as in activity A and B?
Which numbers would be written in the middle?
This activity would be better played in pairs with strategies being discussed.

Squares - Part 1

Activity D

Learning Objectives:

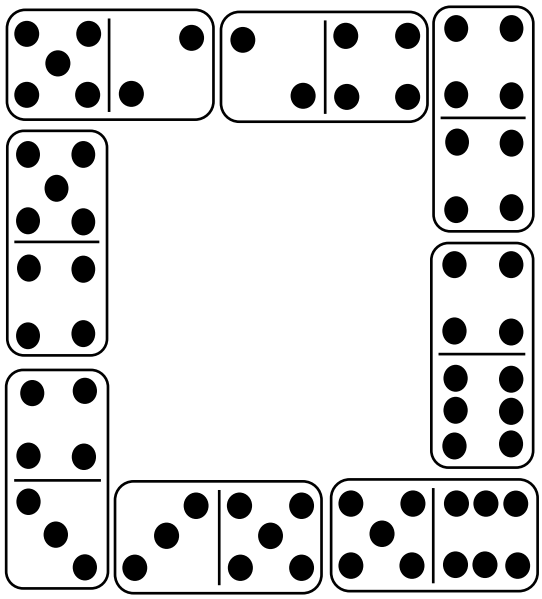
Year Three	Derive and recall addition and subtraction facts.
Year Four	To use known number facts and place value to add or subtract mentally. To explain methods and reasoning about numbers orally

Resources:

Full double six set of dominoes; Recording Sheet 2.

Method:

Place all dominoes face up on the table. The aim of the game/challenge is to make a domino square containing eight dominoes again with 'matching ends':-



Activity A could be repeated; activity B could be repeated if the central numbers chosen were increased to twenty and thirty. Activity C could be attempted as long as four dominoes were left out (28 dominoes into groups of eight leaves four unused!)

Squares - Part 1

Activity E

Learning Objectives:

Year Three	Derive and recall addition and subtraction facts.
Year Four	To use known number facts and place value to add or subtract mentally. To explain methods and reasoning about numbers orally

Resources:

Full double six set of dominoes; Recording Sheet 2.

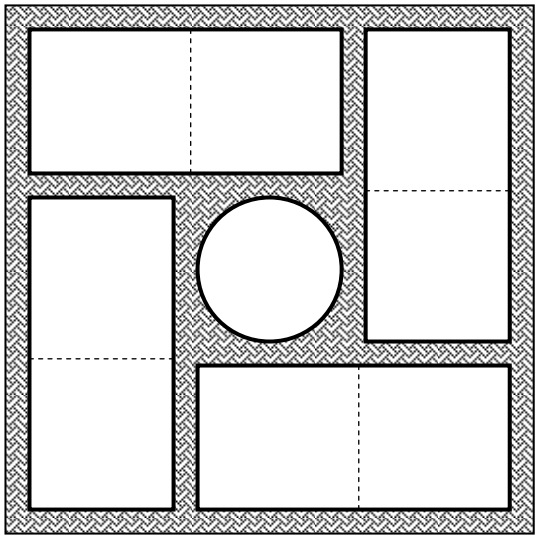
Method:

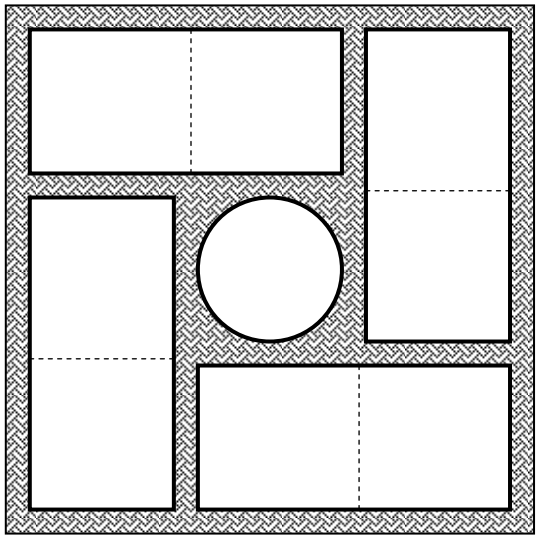
The same as Activity B but the total must be a multiple of five.

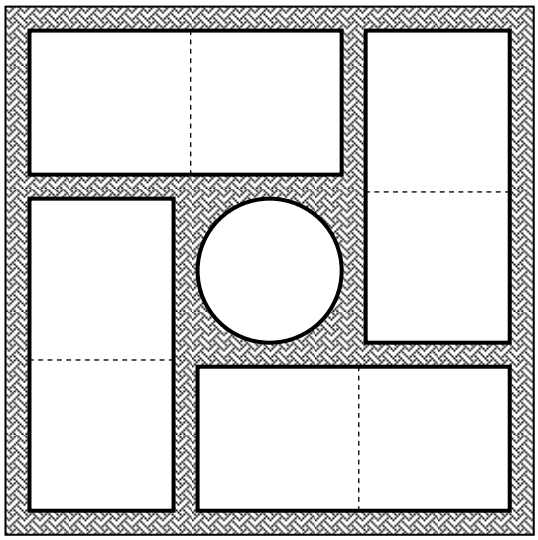
All of the above activities could be repeated using a double nine set of dominoes.

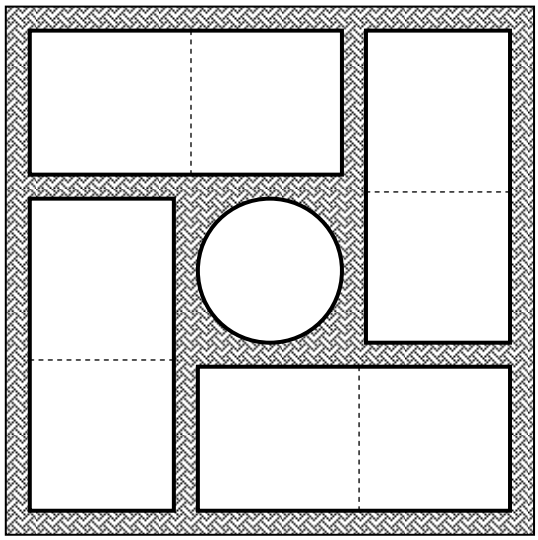
Name: _____

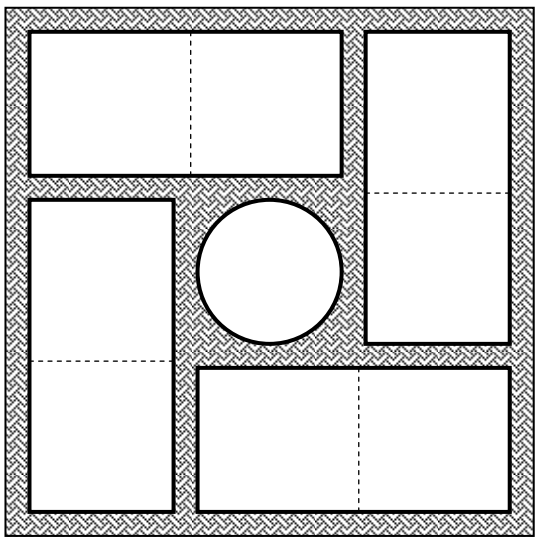
SQUARES RECORD SHEET ~ Part 1

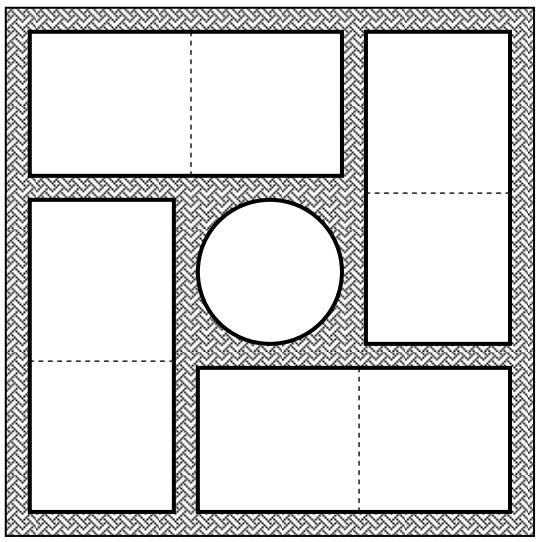






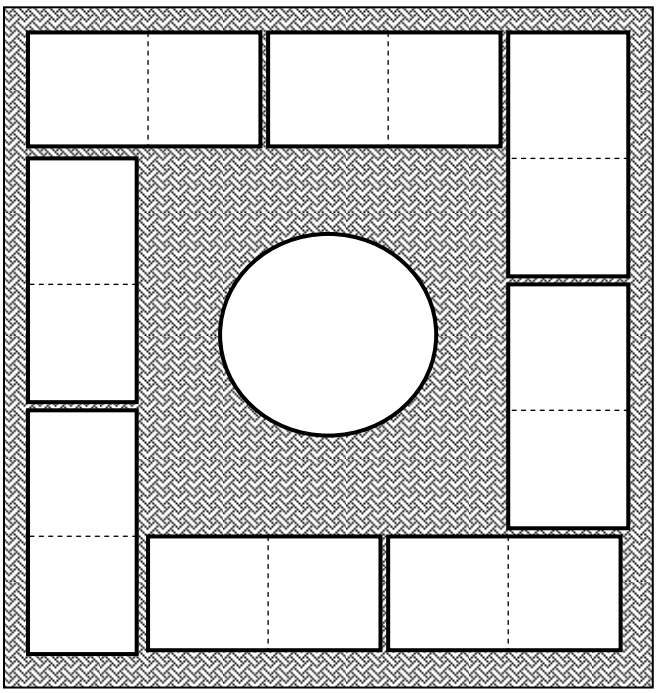


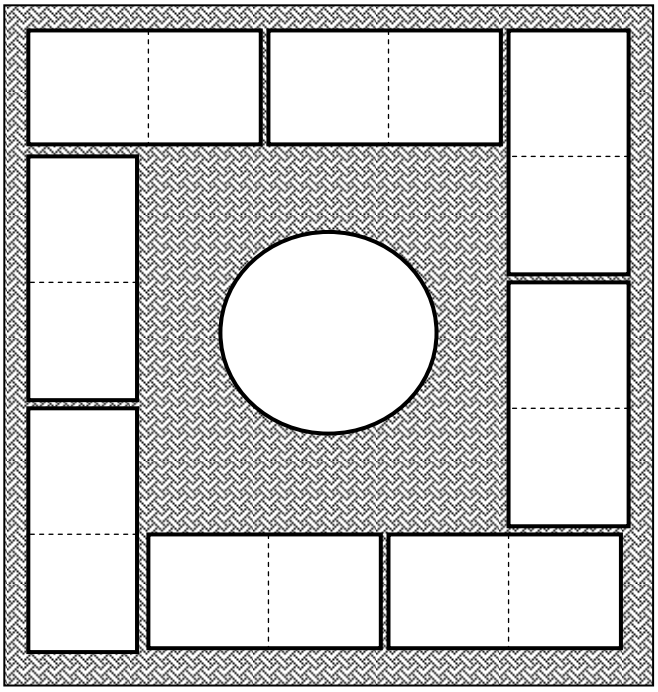


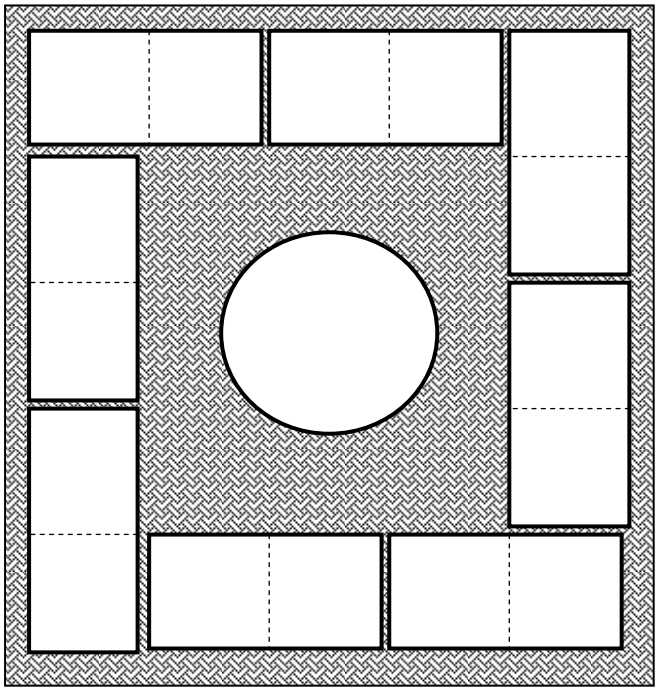


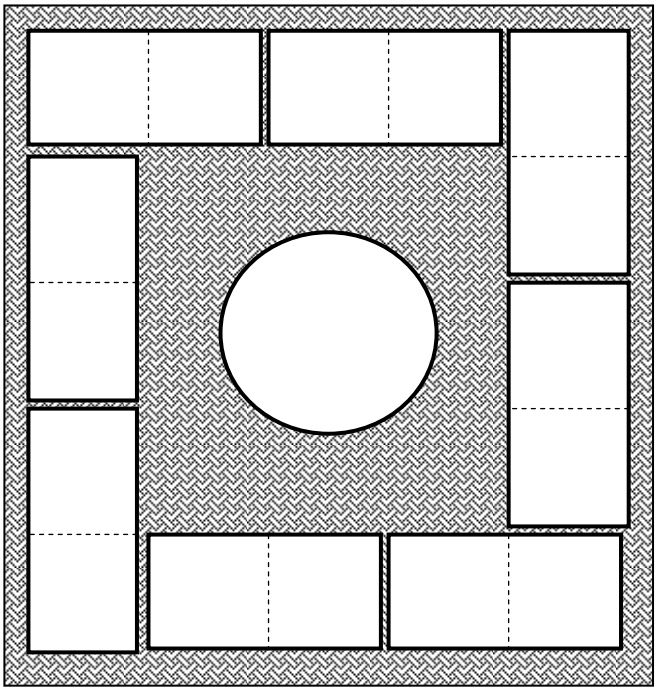
Name: _____

SQUARES RECORD SHEET ~
Part 1 extension









More Squares - Part 2

Activity A

Learning Objectives:

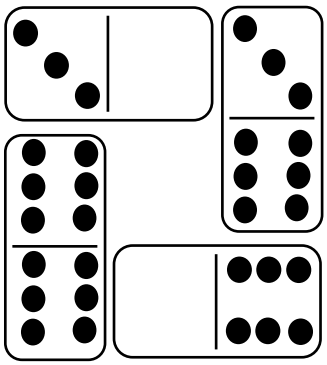
Year Four	To explain methods and reasoning about numbers orally.
Year Five	To further develop the relationship between addition and subtraction.
	To use known number facts and place value for mental addition and subtraction.
	To explain methods and reasoning, orally and in writing.

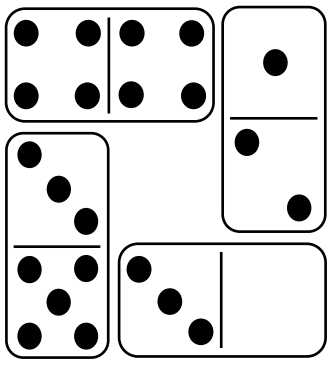
Resources:

Full double six set of dominoes. Recording sheet 1 (optional).

Method:

Using all dominoes in a four square format (see Recording Sheet 1), see how many squares you can make that have sides that are a multiple of three. The sides need not be the same nor are there matching ends. Which dominoes will not be able to be used?





The same activity can be repeated for multiples of four and five.

More Squares - Part 2

Activity B

Learning Objectives:

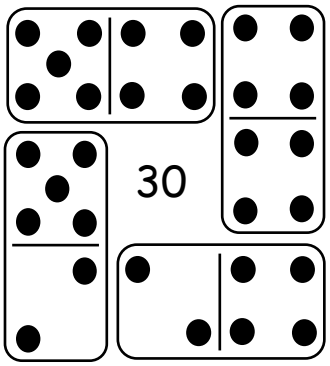
Year Four	To explain methods and reasoning about numbers orally.
Year Five	To explain methods and reasoning, orally and in writing.
	To discuss the chance or likelihood of particular events.

Resources:

Full double six set of dominoes. Recording sheet 1 (optional).

Method:

Using all the dominoes in a four square format (see Resource Sheet 1), see how many squares can be made that have totals that are multiples of three. There must be matching ends:-



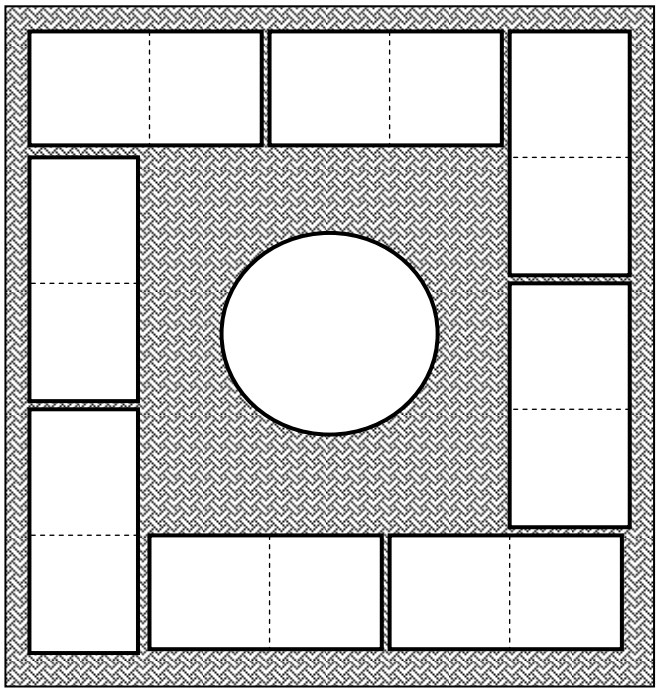
30 is a multiple of 3

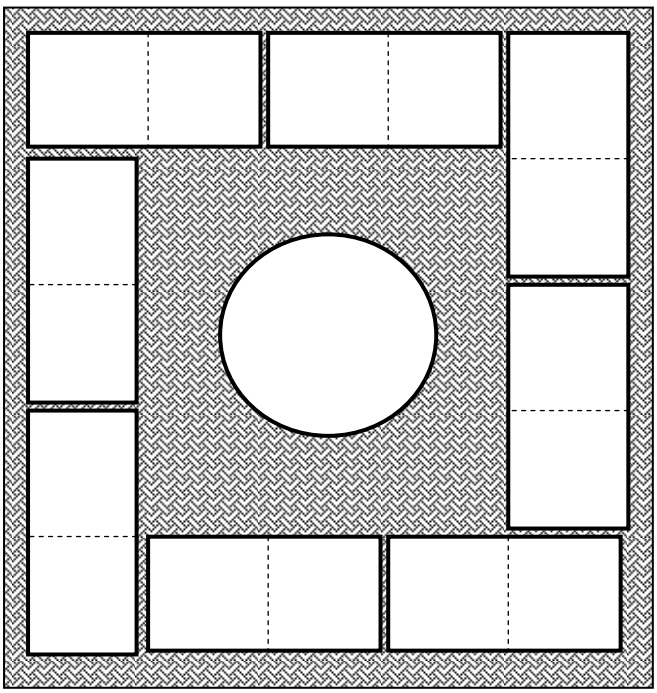
This activity can be repeated for multiples of four and five.

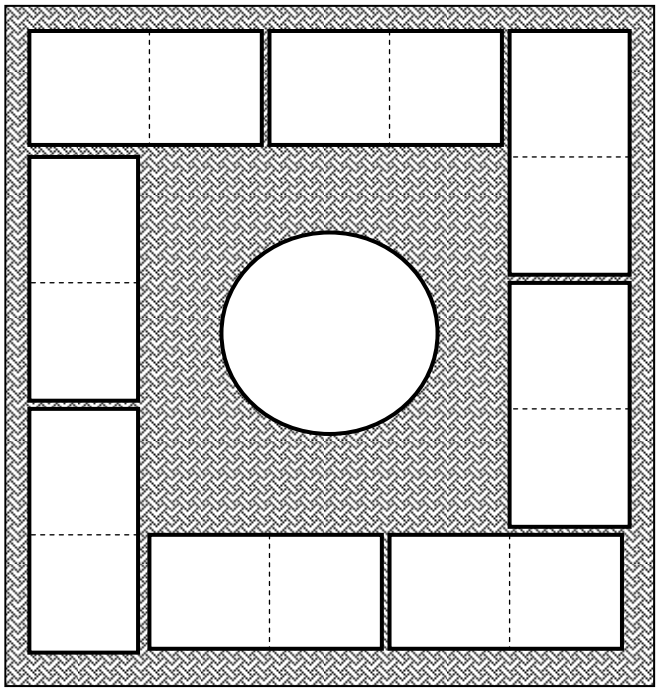
This activity could be repeated using the double nine set of dominoes.

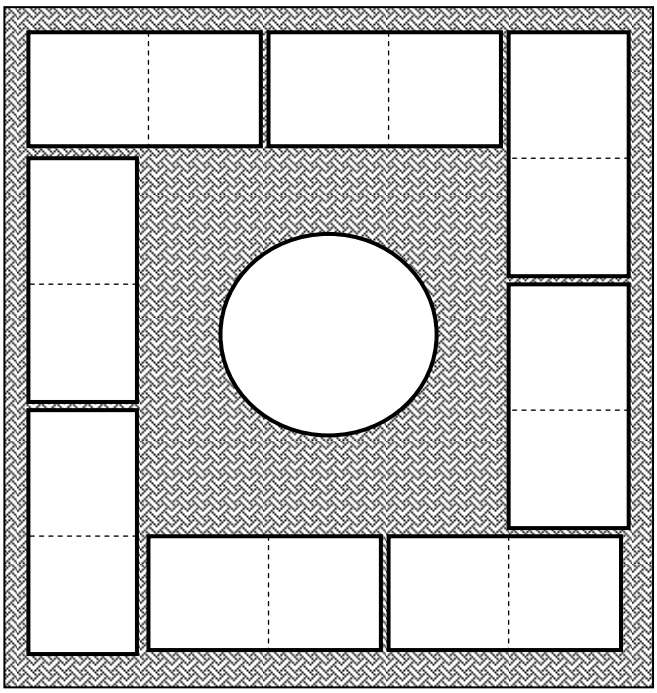
Name: _____

SQUARES RECORD SHEET ~ Part 2









Loops – Part 1

Part 1

Aim~ to use all 28 dominoes to form a loop/square, so that the dominoes with the same number of points meet, just like in the regular game of dominoes.

Resources Full double six set of dominoes

Domino aha!

If you make a chain with all 28 dominoes so that adjacent ends of dominoes match, and it has 5 spots at one end, how many spots will it have at the other end? You can work the answer out mentally and then check with the actual dominoes.

Domino magic

Of course it isn't magic, just logic! There is a reason for everything in maths, sometimes hard to find but always there!

Remove and hide one domino (not a double) without telling anyone. People are unlikely to notice that one is missing. Ask a friend to make the usual chain and when he has put down three or four dominoes tell him the numbers that he will get at the ends when he has completed the chain. How do you do that? (Hint: apply the same logic as to Domino aha.)

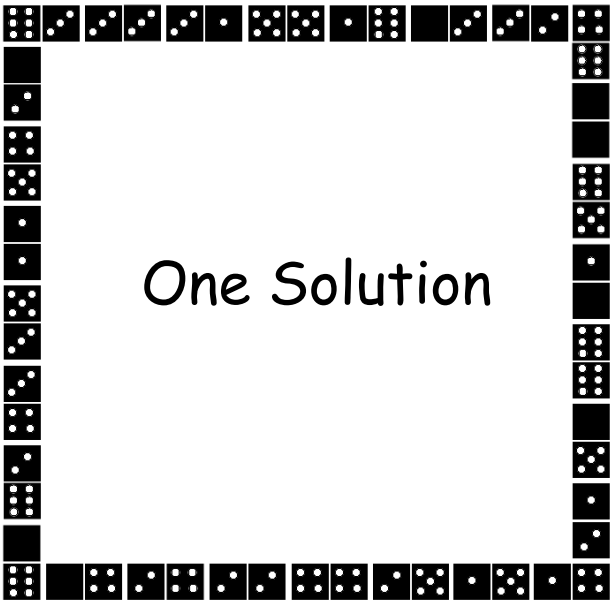
Loops – Part 2

Part 2

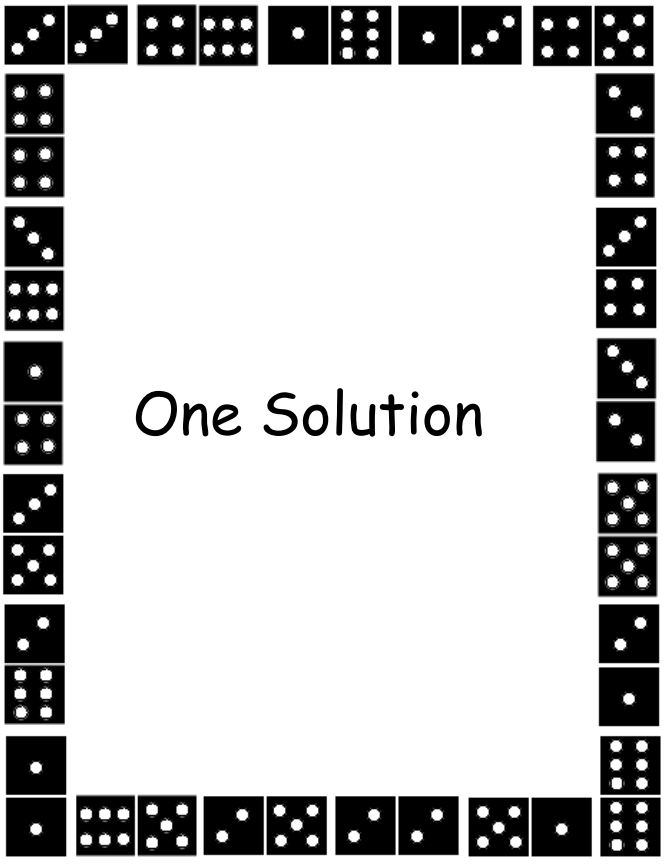
Aim Plan and pursue an enquiry, exploring patterns and relationships

Resources Complete set of double six dominoes

Children should arrange the whole set of dominoes so that all the touching domino pieces add up to 6 and the ends join up.



If you remove the blank dominoes and use the remaining 21, then you can also make a loop whereby the adjacent dominoes total 7.



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Domino Goals Part 1

Learning Outcome: To be able to order a set of integers.

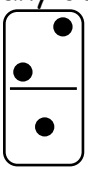
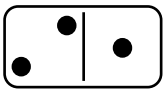
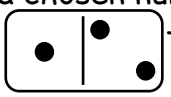
Resources: Paired play
Goal post sheet.
Number lines.
Empty number lines.

PART 1 Goals

Aim

Pupils place the dominoes on an empty number line and score points if the number lands inside the set goal.

Set up

- Pupils pick any domino and orientate it horizontally to make a chosen number.
  e.g. domino  can be orientated  to make 21 or  to make 12.
- Pupils place the value on a given number line and score a *goal* if the number lands inside the goal posts.
- Pupils mark goal on record sheet and initial own numbers.

Variation

- Pupils can draw own goal posts.
- Pupils find the sum of the domino and place the total on the number line.

Support

- Limit the numbers which can be created. e.g. Dominoes can only be orientated to created numbers below 40.
- Use the single digit dominoes only. i.e. blank and number dominoes.
- Pupils use the number lines with more labelled division.

Extension

- Pupils use empty number line for the goal.

Domino Goals Part 1 record sheet

Domino Goals Part 2

Learning Outcome: To be able to order a set of decimals.

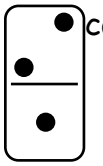
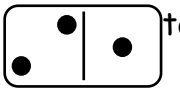
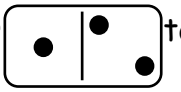
Resources: Paired play
Goal post sheet.
Number lines.
Empty number lines.
Score sheet

PART 2 *Goals*

Aim

Pupils place the dominoes on an empty number line and score points if the number lands inside the set goal.

Set up

- Pupils pick any domino and orientate it horizontally to make a chosen number.
  e.g. domino  can be orientated  to make 2.1 or  to make 1.2.
- Pupils place the value on a given number line and score a *goal* if the number lands inside the goal posts.
- Pupils mark goal on record sheet and initial own numbers.

Variation

- Pupils can draw own goal posts.
- Pupils find the sum of the decimal domino and place the total on the number line.
- Pupils find the product of the integer values on the domino.

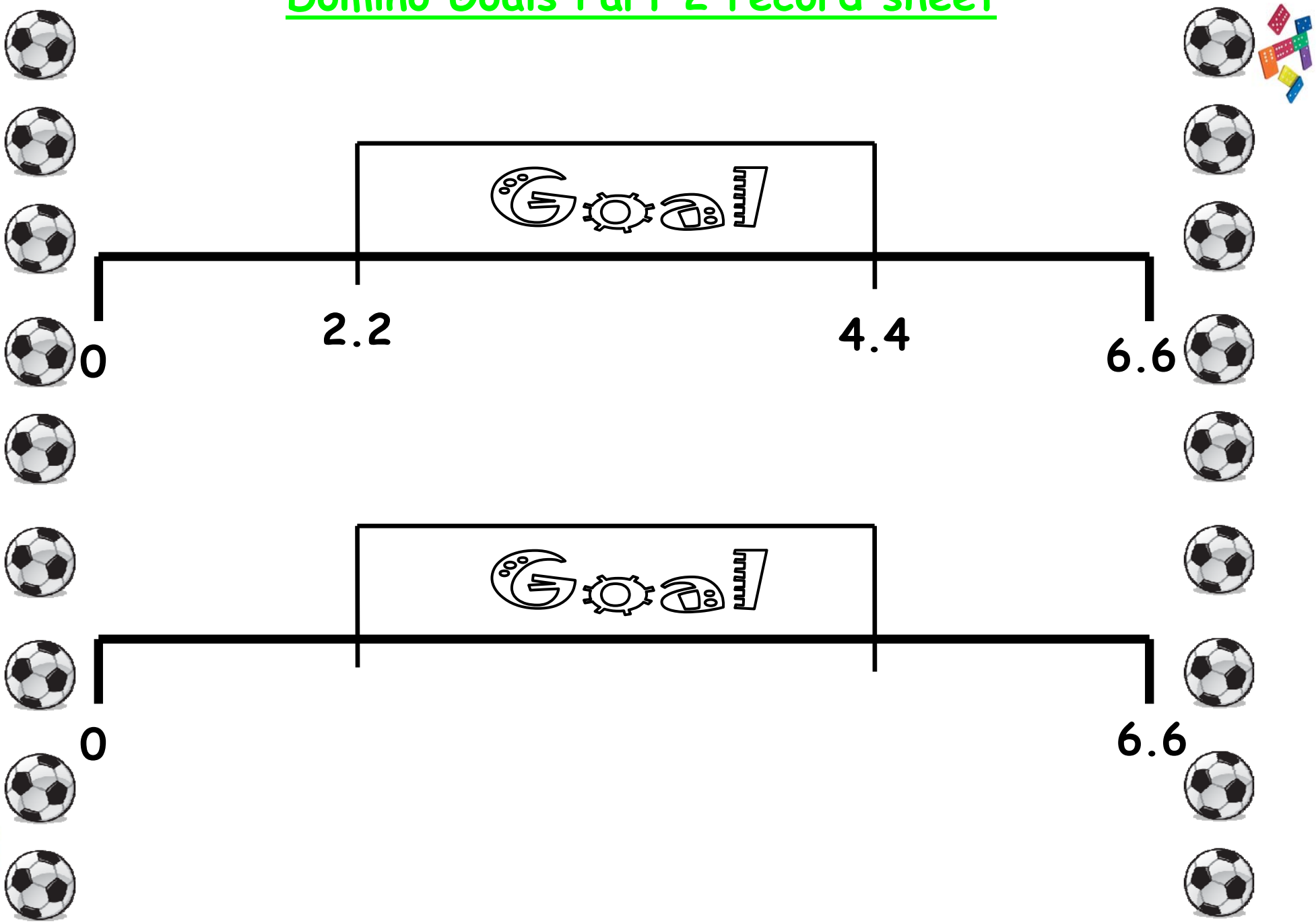
Support

- Limit the numbers which can be created. e.g. Dominoes can only be orientated to created numbers below 4.0.
- Pupils use the number lines with more labelled division.

Extension

- Pupils find the product of the decimal domino value.
  Pupils use empty number line for the goal.

Domino Goals Part 2 record sheet



Domino Walls Part 1

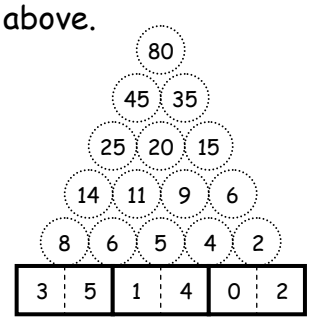
Learning Outcome: Pupils aim to find the largest, smallest and target totals using an addition wall.

Resources: One player. Pairs/group.
Walls record sheet.

PART 1 WALLS

Aim

- To reach the top of the addition wall by totalling two foundation bricks to find the value of the brick above.



Set up

- Pupils pick any three dominoes to create the base of the wall.
- Total the pyramid from the base up.

Variation

- What is the smallest possible total? Can pupils first predict which dominoes to use? Does the position of each domino change the total?
- What is the largest possible total? Can pupils first predict which dominoes to use? Does the position of each domino change the total?
- Can pupils find the dominoes to make a particular total e.g. 100.
- Pupils record their results on the walls record sheet.

Support

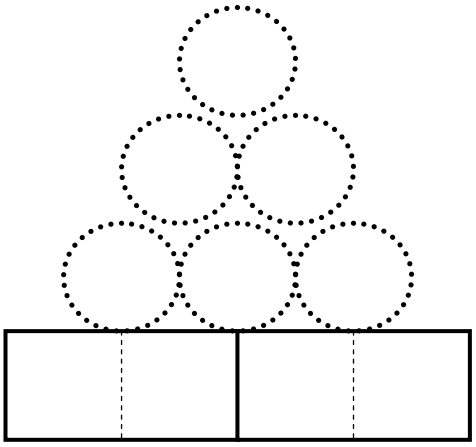
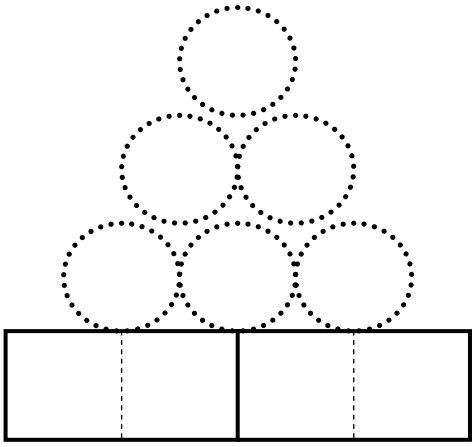
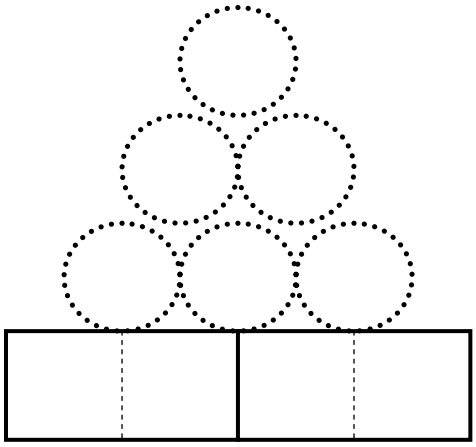
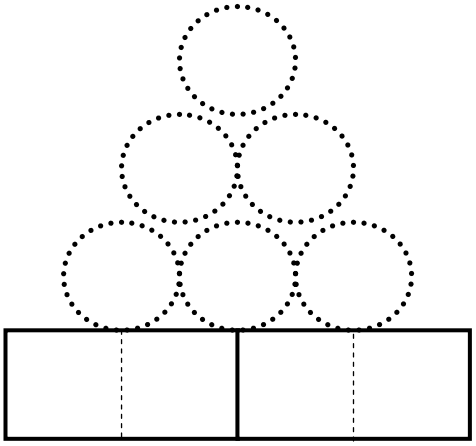
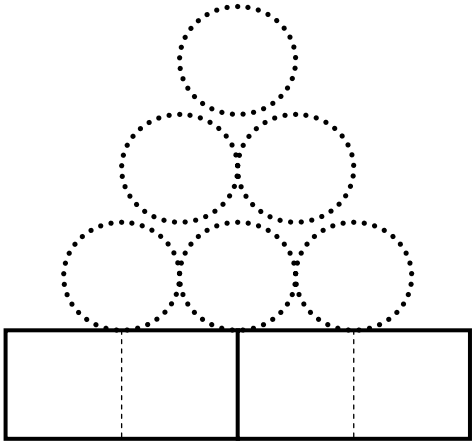
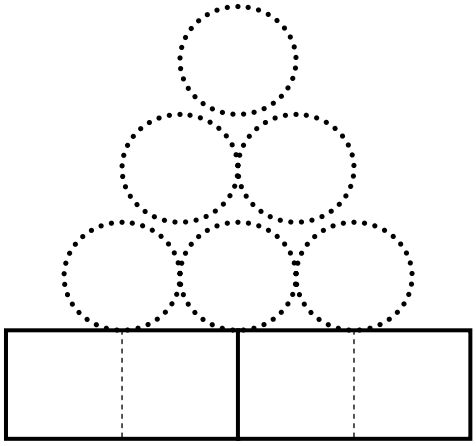
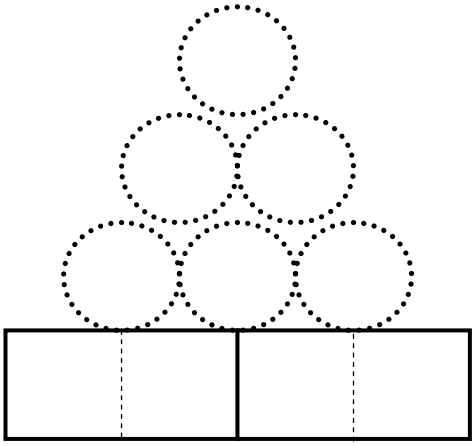
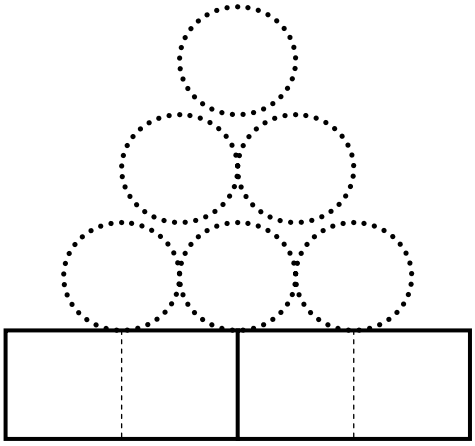
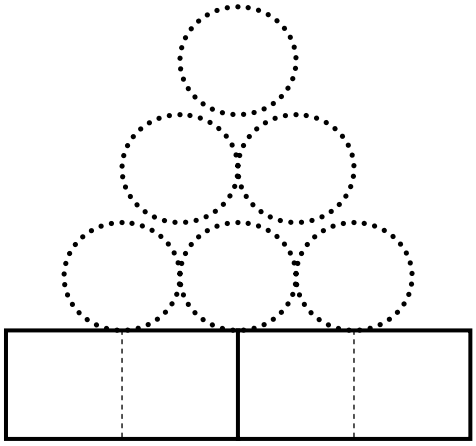
- Pupils start with only two dominoes on the base of the wall.

Extension

Pupils start with four dominoes on the base of the wall.

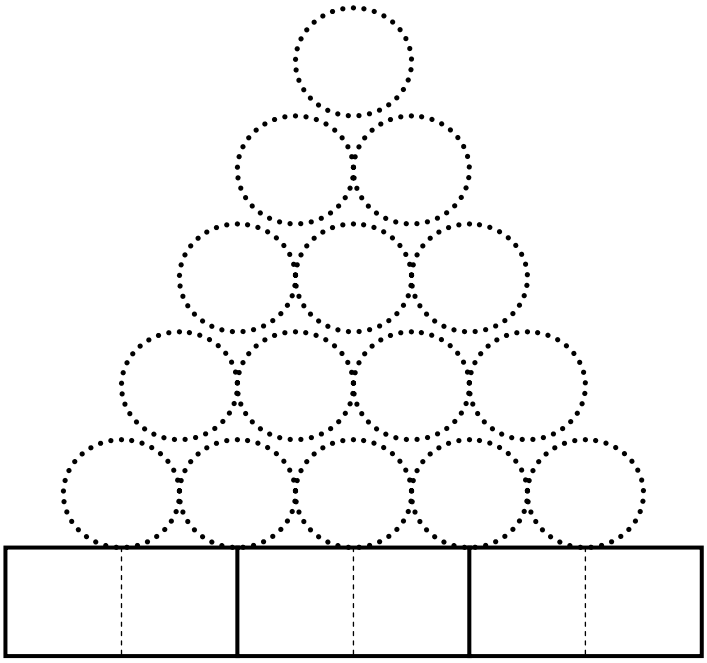
Name: _____

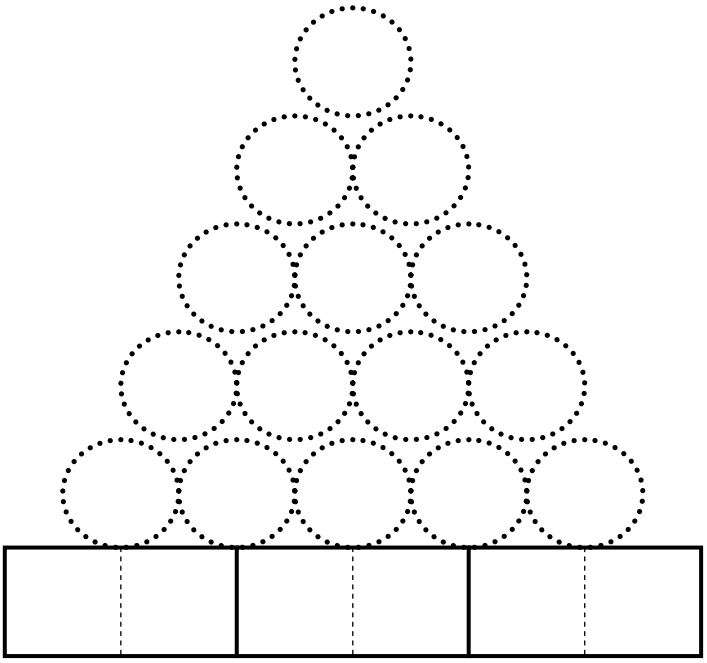
WALLS RECORD SHEET

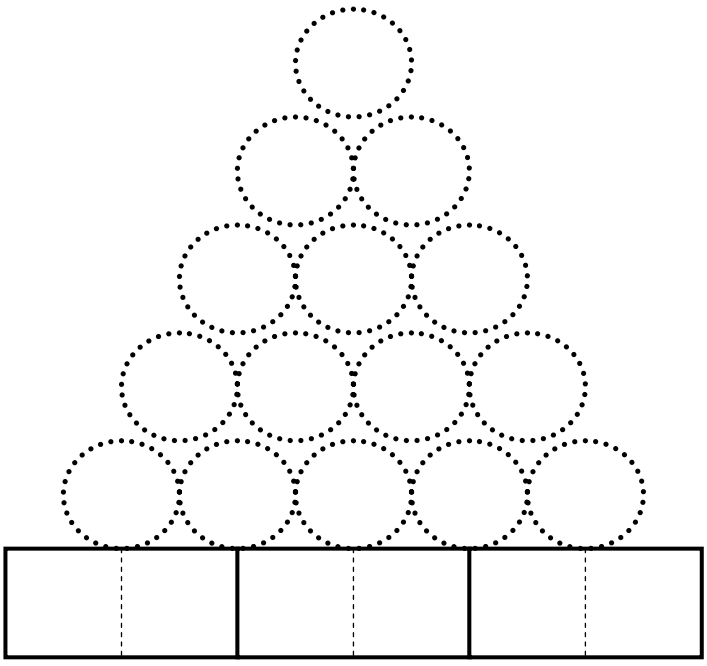










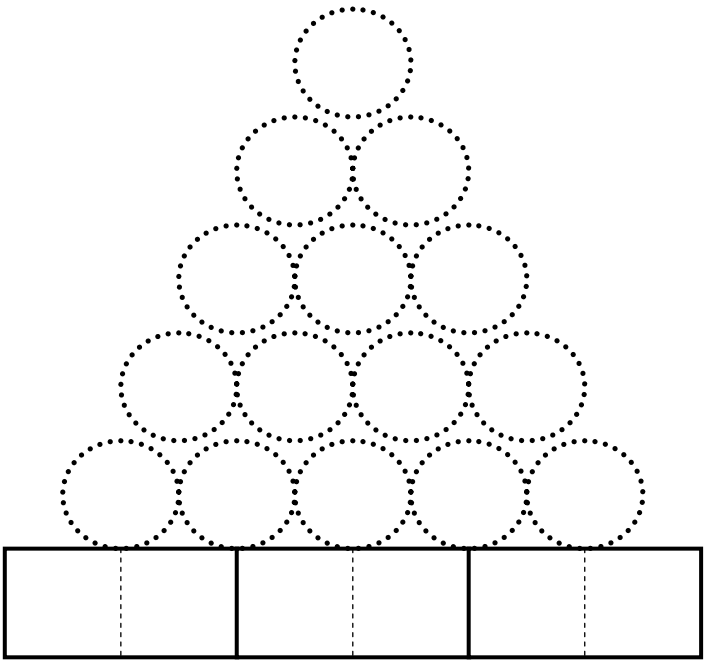
Name: _____

WALLS RECORD SHEET



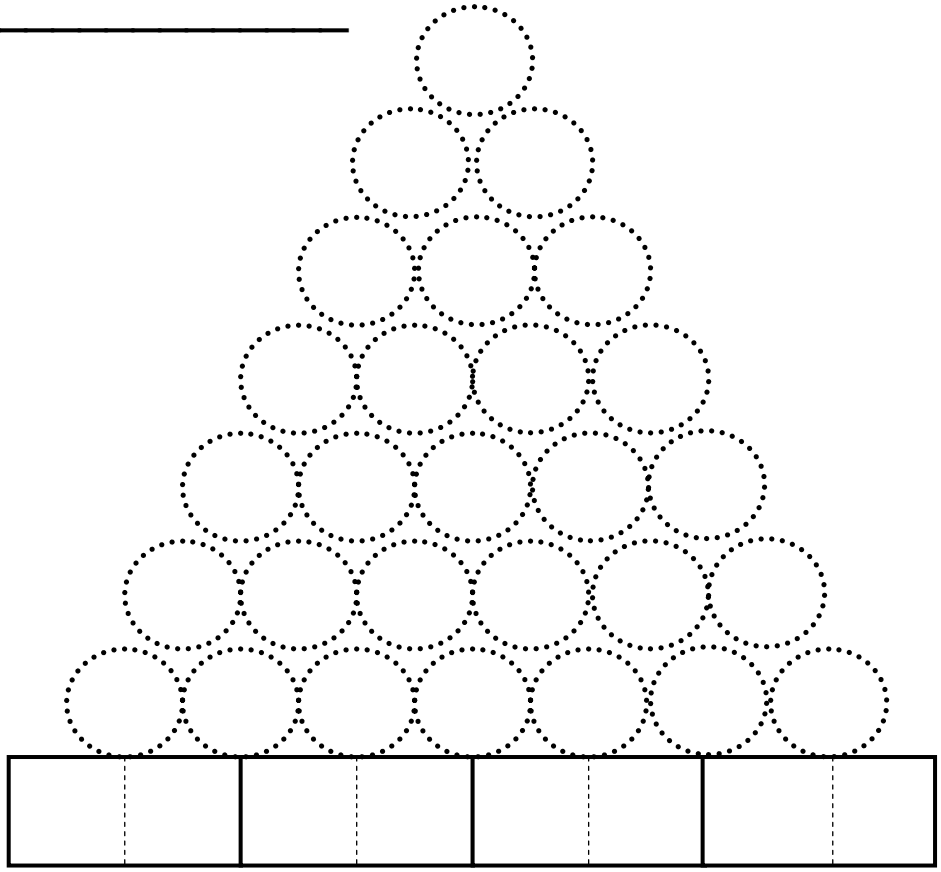


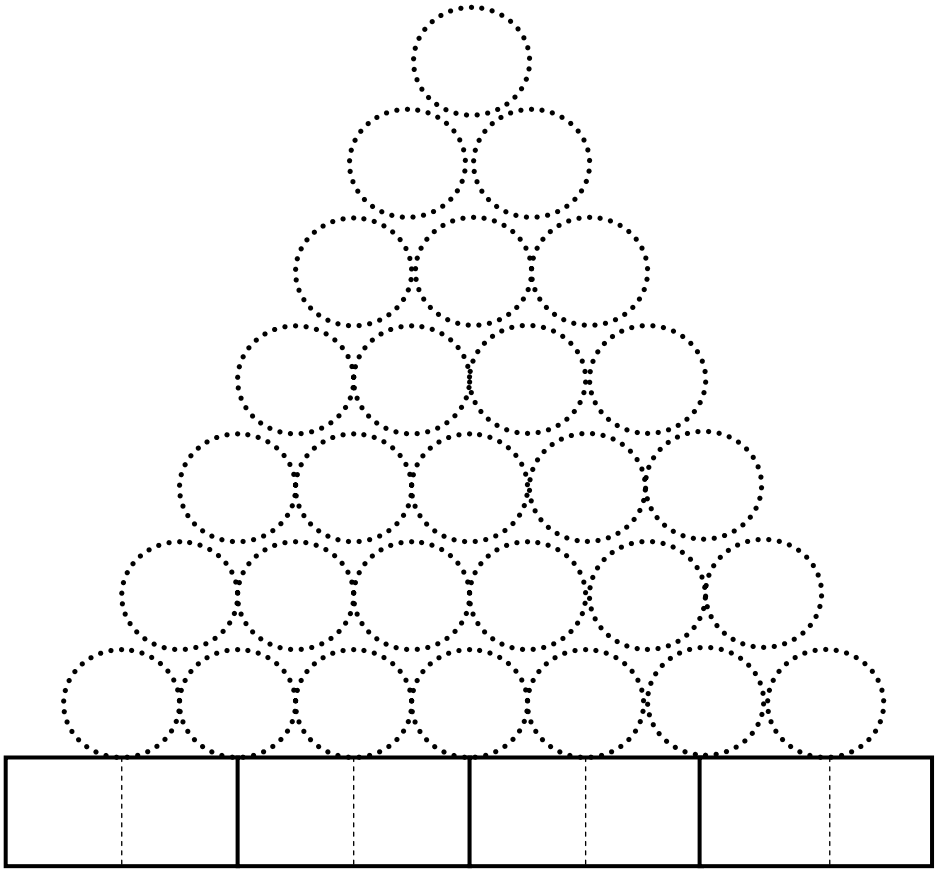




WALLS RECORD SHEET

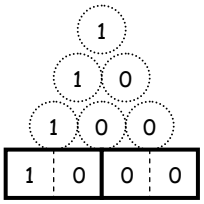
Name: _____



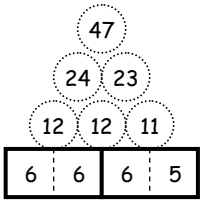


Solutions

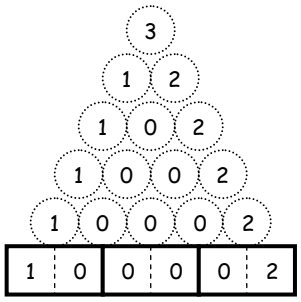
Smallest Total
2 domino base



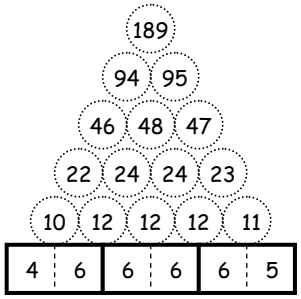
Largest Total
2 domino base



Smallest Total
3 domino base

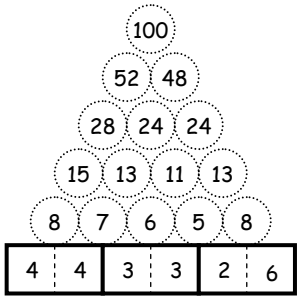


Largest Total
3 domino base



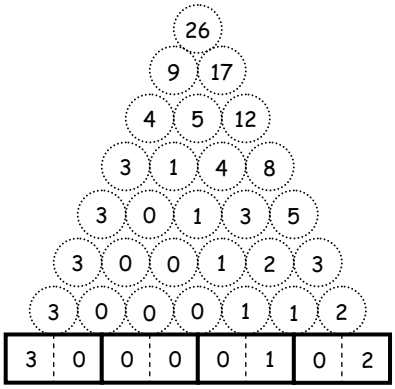
Total 100
3 domino base

Can pupils find other starter dominoes to total 100.

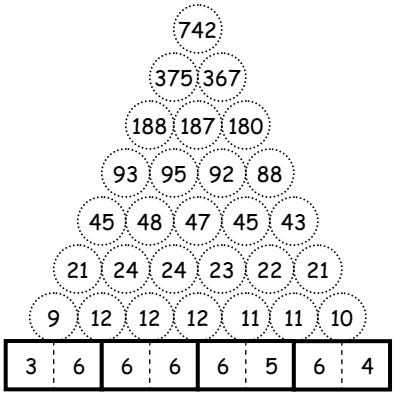


Solutions

Smallest Total
4 domino base



Largest Total
4 domino base



Please use Excel 'Domino Walls Addition Calculator' provided to find other solutions.

Domino Walls Part 2

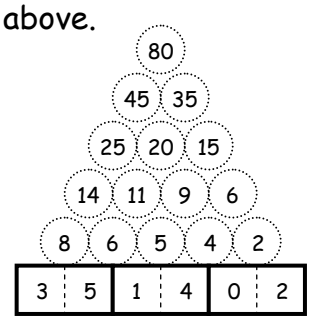
Learning Outcome: Pupils aim to find the largest, smallest and target totals using an addition wall.

Resources: One player.
Pairs/group.
Walls record sheet.

PART 2 WALLS

Aim

- To reach the top of the addition wall by totalling two foundation bricks to find the value of the brick above.



Set up

- Pupils pick any four dominoes to create the base of the wall.
- Total the pyramid from the base up.

Variation

- What is the smallest possible total? Can pupils first predict which dominoes to use? Does the position of each domino change the total?
- What is the largest possible total? Can pupils first predict which dominoes to use? Does the position of each domino change the total?
- Can pupils find the dominoes to make a particular total e.g. 100.
- Pupils record their results on the walls record sheet.

Support

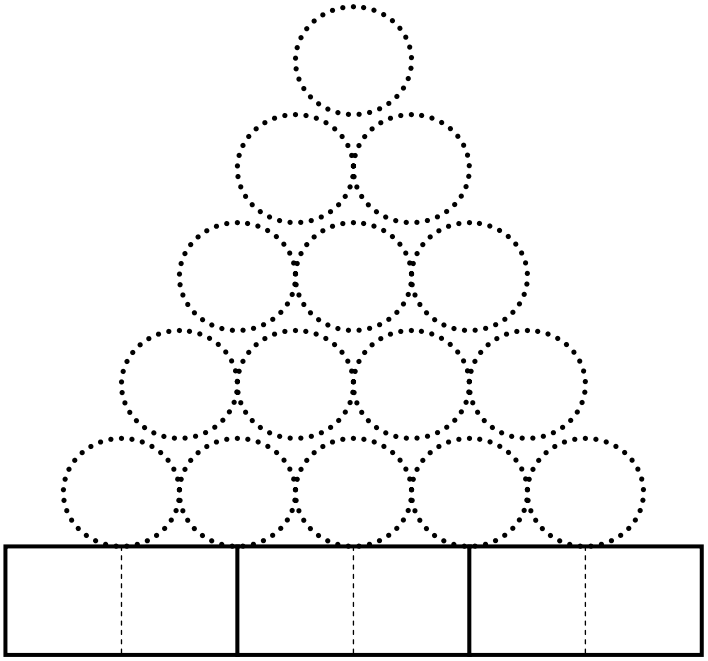
- Pupils start with only three/two dominoes on the base of the wall.

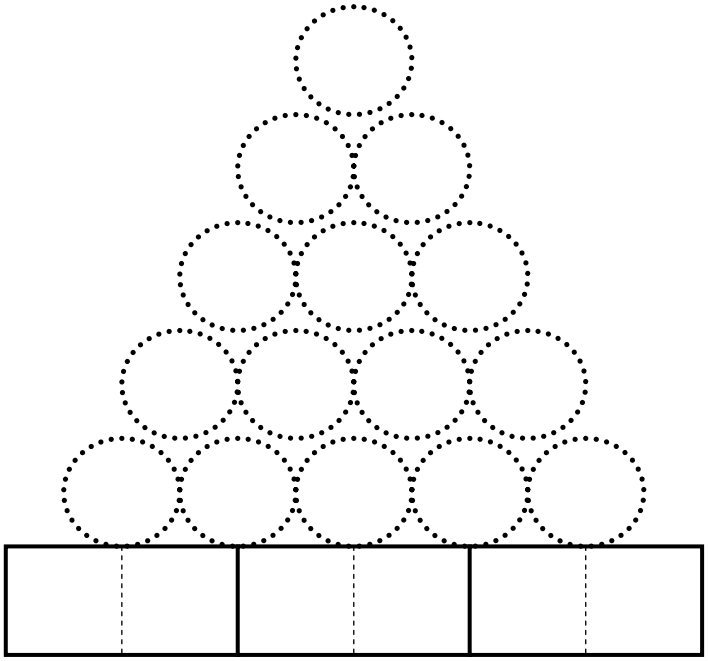
Extension

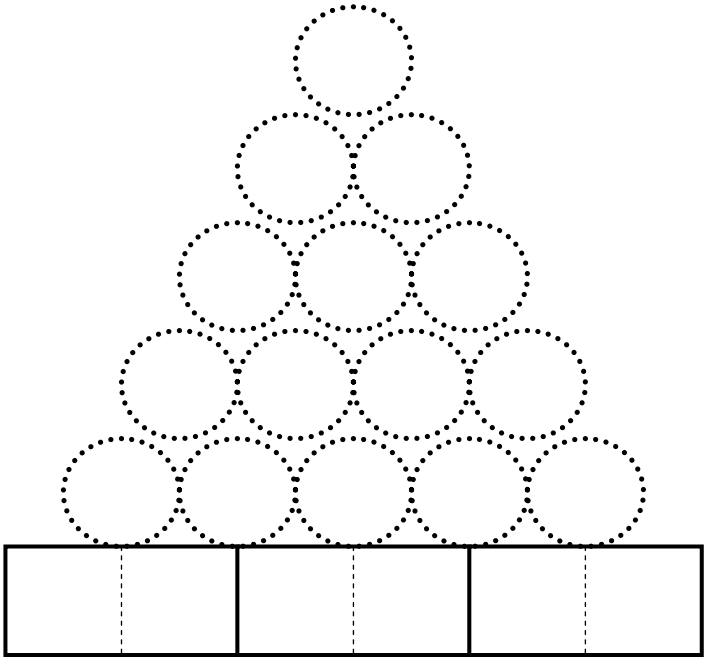
- Pupils start with five/six (or more) dominoes on the base of the wall.
- Pupils could create a multiplication wall. Multiply two foundation bricks. This is only really manageable with 2 or possibly 3 domino base walls.

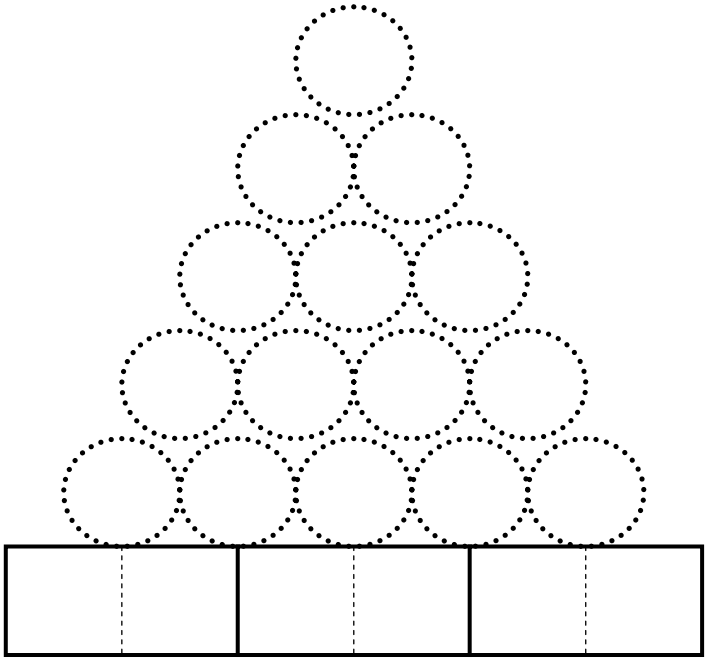
Name: _____

WALLS RECORD SHEET



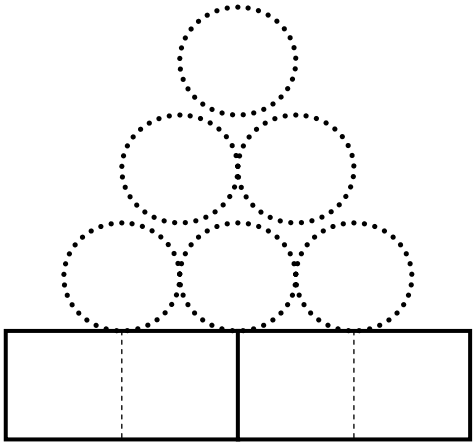
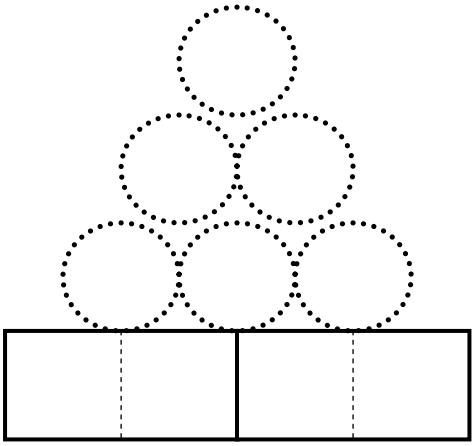
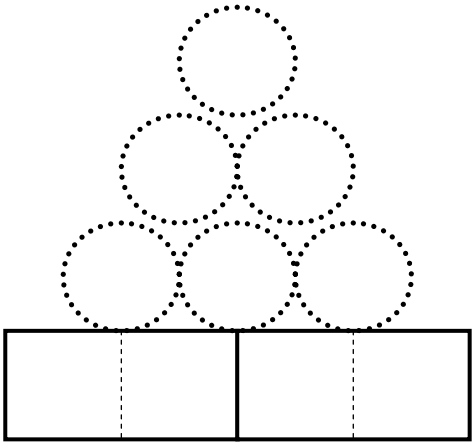
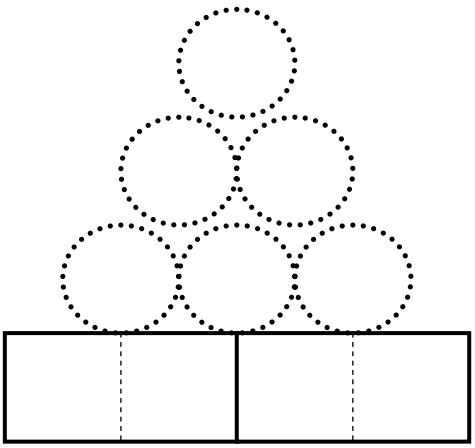
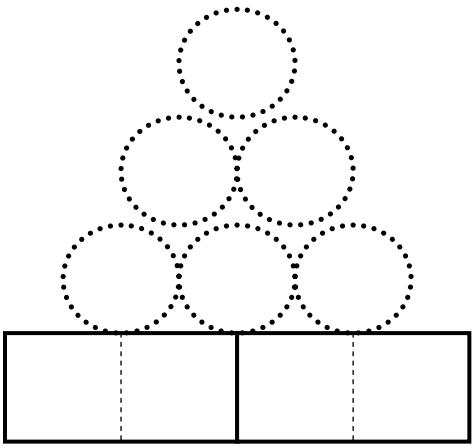
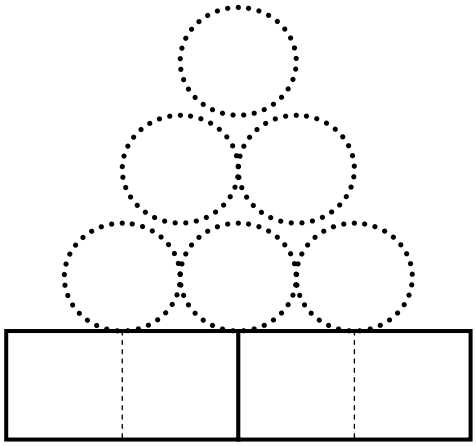
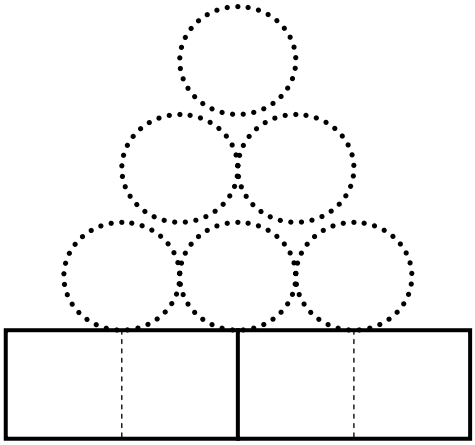
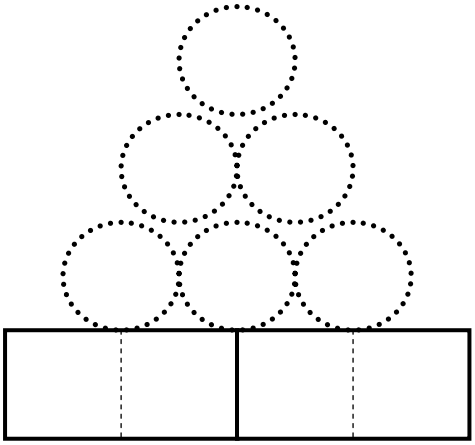
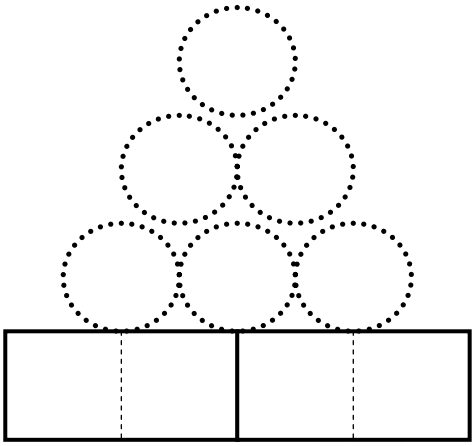






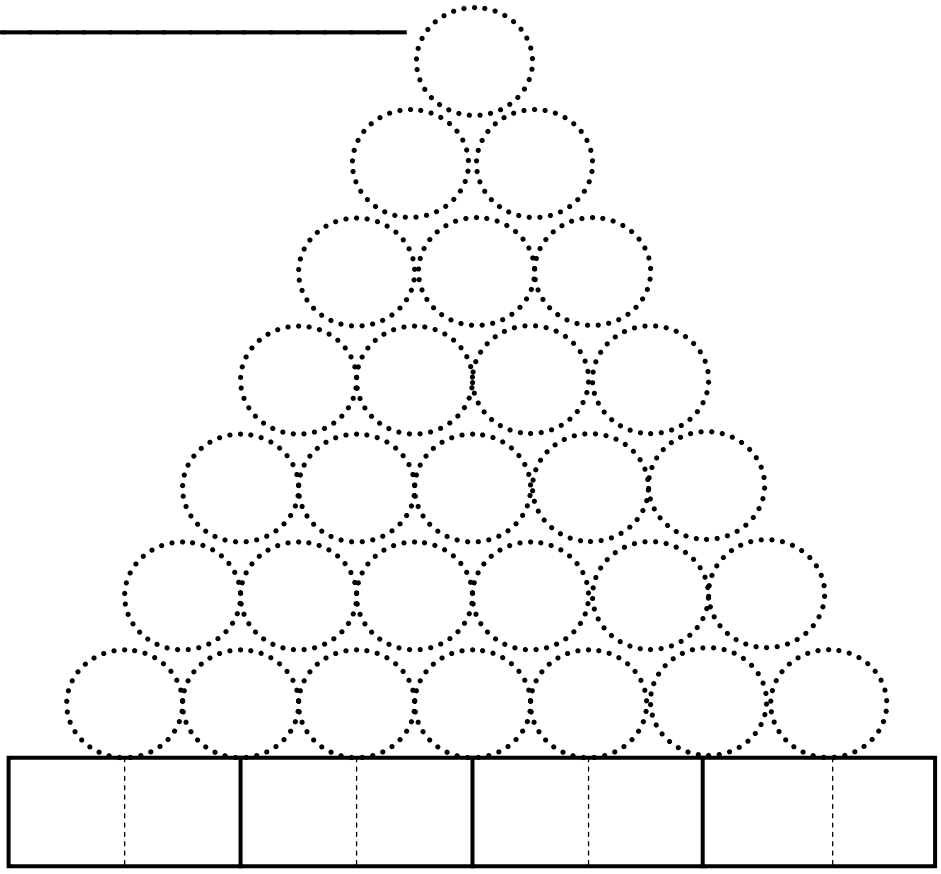
Name: _____

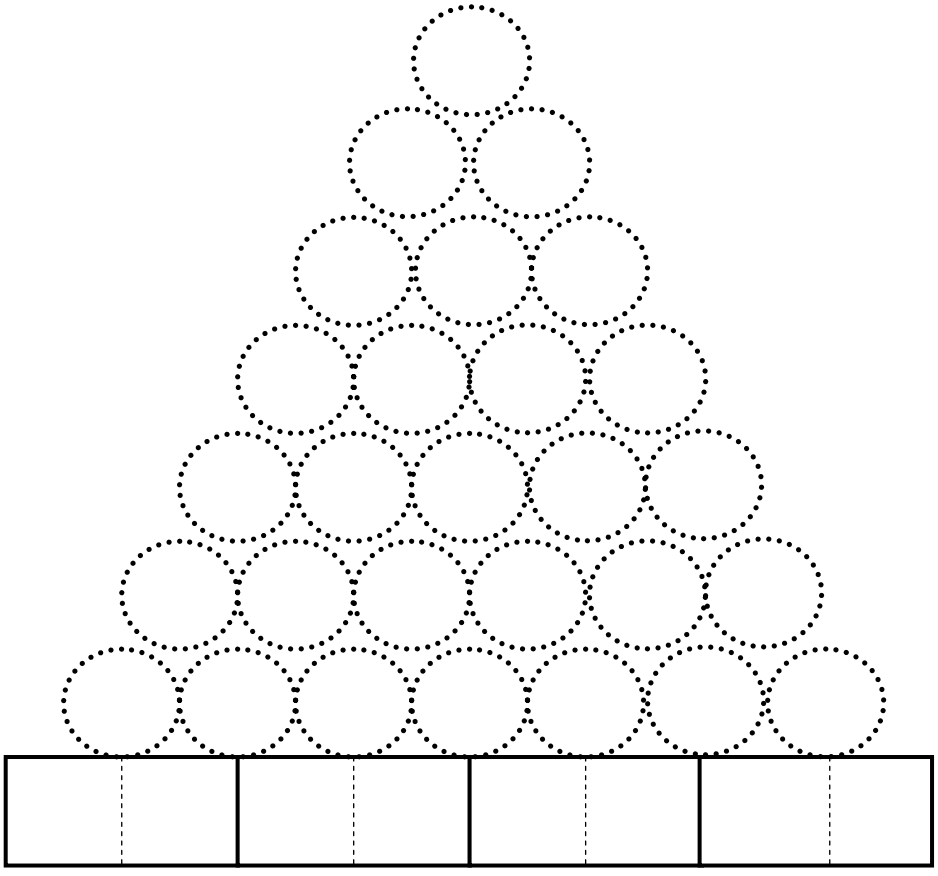
WALLS RECORD SHEET

WALLS RECORD SHEET

Name: _____





WALLS RECORD SHEET

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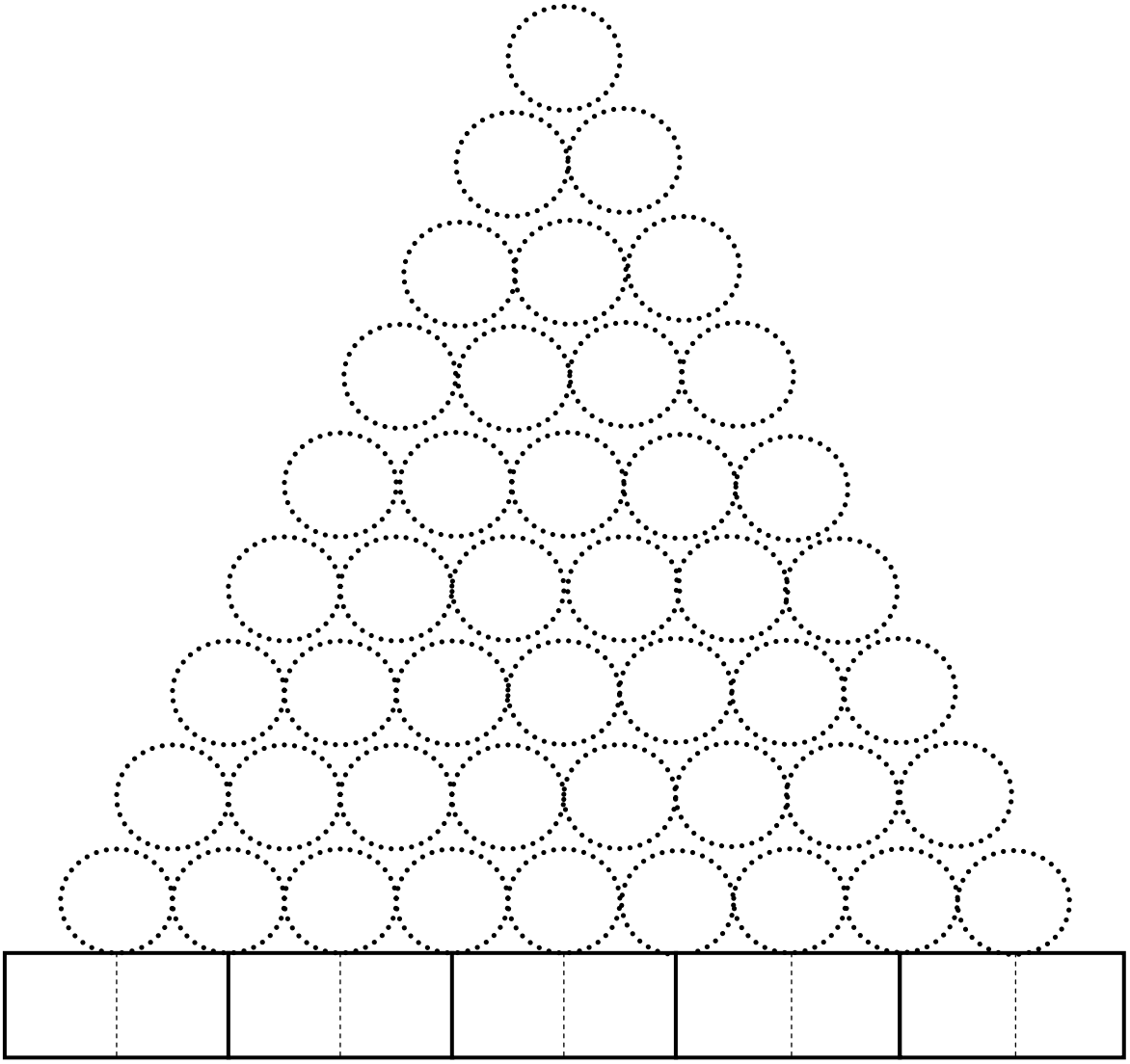

WALLS RECORD SHEET

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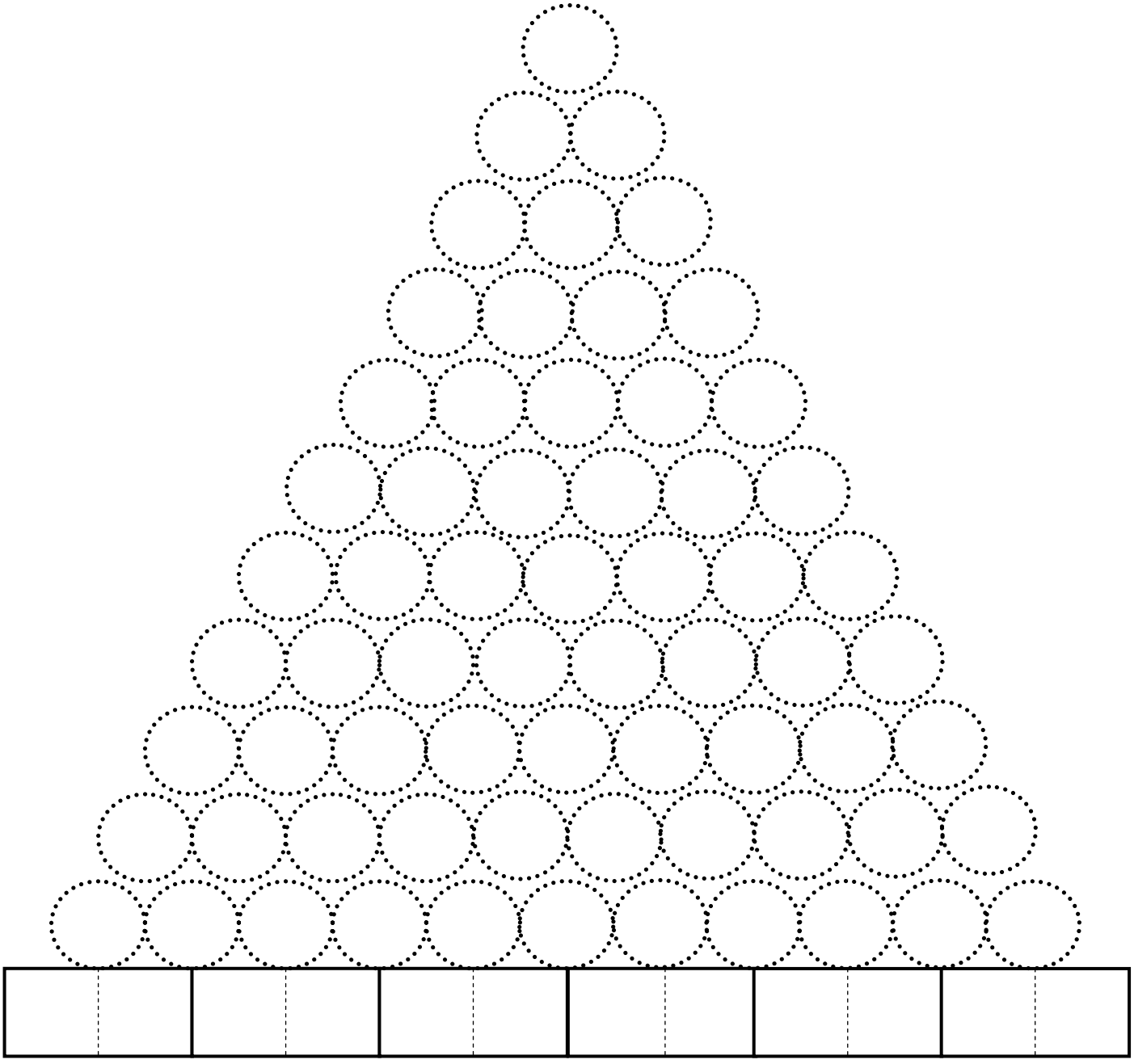
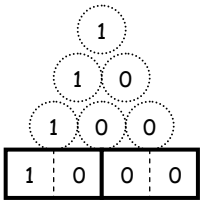
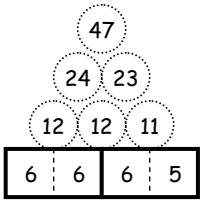


Solutions

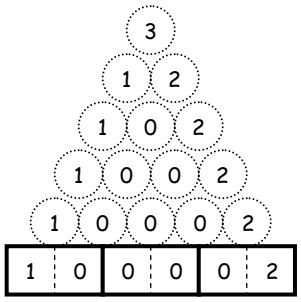
Smallest Total
2 domino base



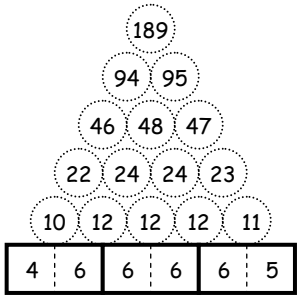
Largest Total
2 domino base



Smallest Total
3 domino base

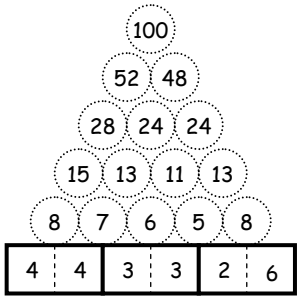


Largest Total
3 domino base



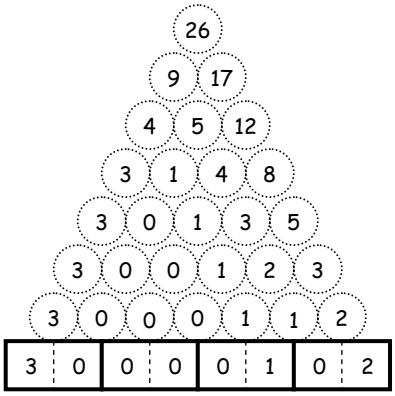
Total 100
3 domino base

Can pupils find other starter dominoes to total 100.

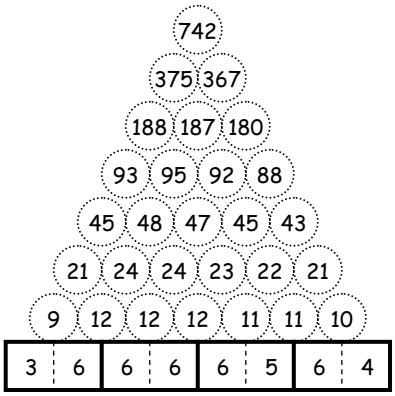


Solutions

Smallest Total
4 domino base



Largest Total
4 domino base



Please use the Excel 'Domino Walls Addition Calculator' provided to find the solutions for larger based pyramids.

Please use the Excel 'Domino Walls Multiplication Calculator' provided to find the solutions for any multiplication walls.

Domino Spots Part 2

Objective Plan and pursue a line of enquiry
To investigate the total number of spots on 0-9 dominoes.

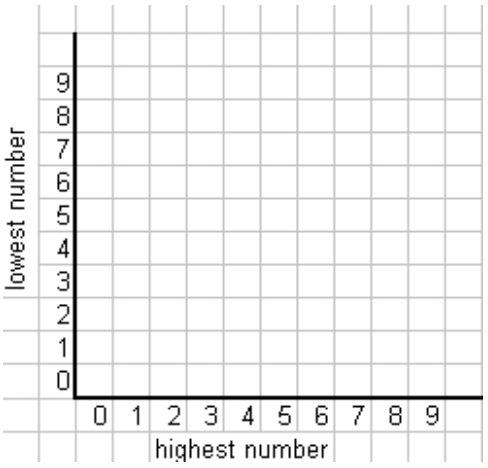
Resources Complete double nine set of dominoes

Ask the children to work out how many dominoes are in double nine set.
Ask the children to jot down pairs of numbers on the faces, e.g. 0,0 0,1 etc)
If they have already noticed how many there are on the packet ask them to write out all of the numbers and see what they find.

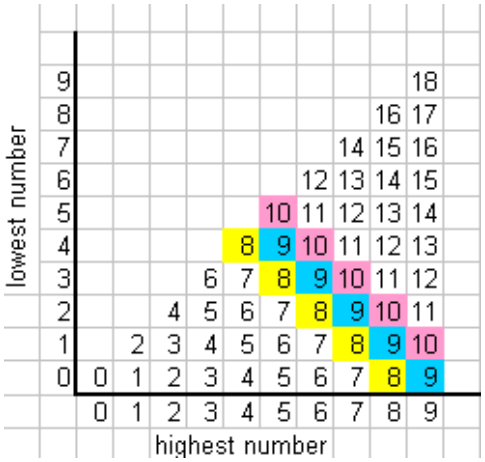
Can they identify there is 1 less each time, or begin to draw it out to show the pattern.

Demonstrate how to record totals in a table like this:

Pupils add together all the spots on the dominoes and complete the diagram.



(This will generate a lot of discussion, as there are lots of patterns in the table, odd numbers, evens, consecutive numbers, equal values on the diagonals, etc.)



Domino Spots Part 2

Transfer this information into a frequency table.

Total number of spots	Frequency
0	1
1	1
2	2
3	2
4	3
5	3
6	4
7	4
8	5
9	5
10	5
11	4
12	4
13	3
14	3
15	2
16	2
17	1
18	1

This will generated a lot of discussion about the pattern in the table.

Do they recognise the symmetry?

Extension:

Put the data in a bar chart or bar-line graph and discuss the shape.

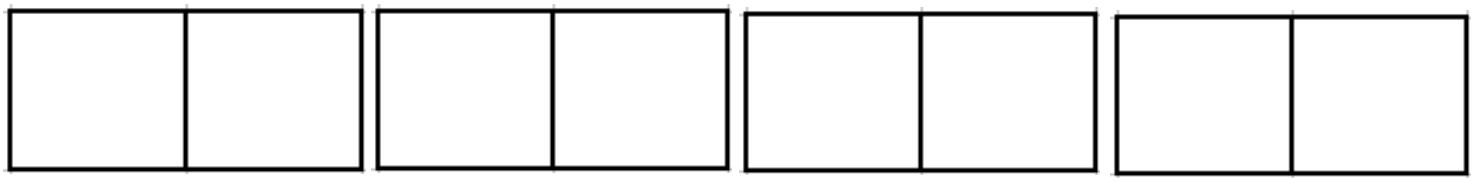
Domino Co-ordinates Part 1

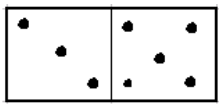
Name: _____

Objective Read and plot co-ordinates in the first quadrant

Resources Double six set of dominoes

1. Choose any 4 dominoes , place them in the spaces provided:



Each of your dominoes represents a co-ordinate pair, like this:  = (3,5)

Write your co-ordinate pairs here:

(,) (,) (,) (,)

Now plot your points on the grid, and join them in order with a ruler.

Describe the properties of the shape you have made?

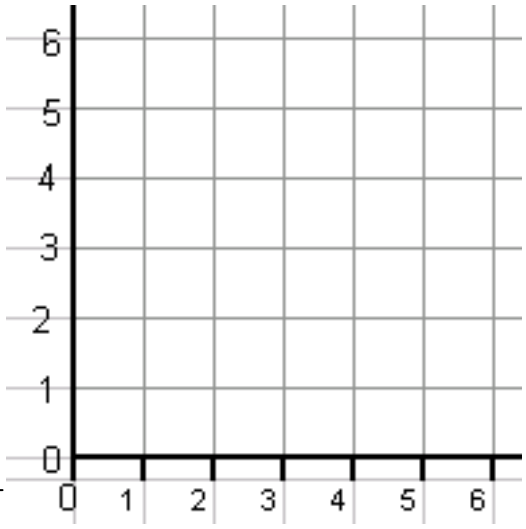
_____

_____

_____

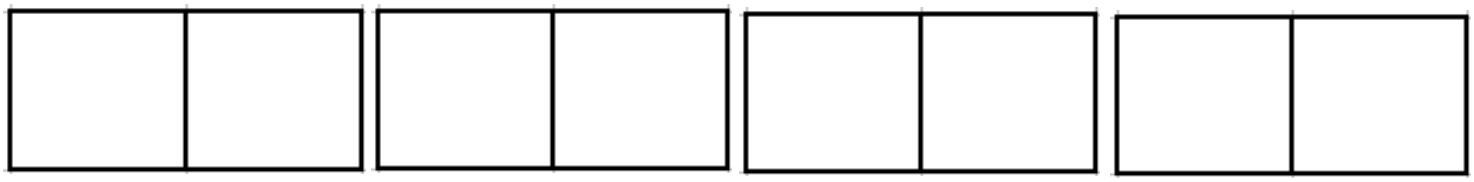
_____

_____



Repeat this activity, choosing 4 different dominoes each time:

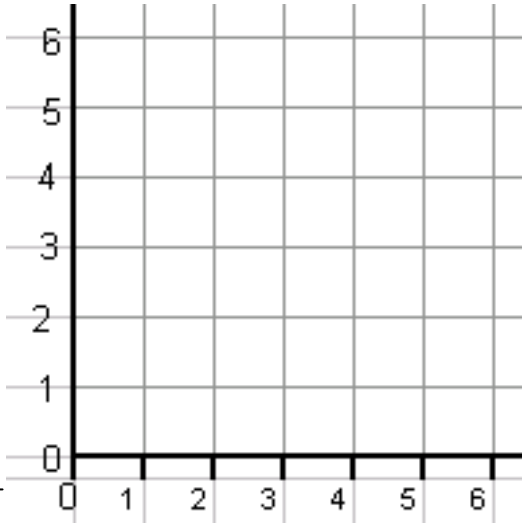
Domino Co-ordinates Part 1

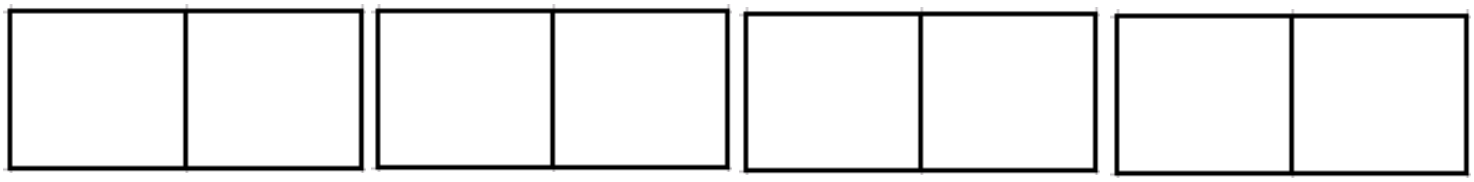


Co-ordinate pairs:

(,) (,) (,) (,)

Describe the properties of the shape you have made?

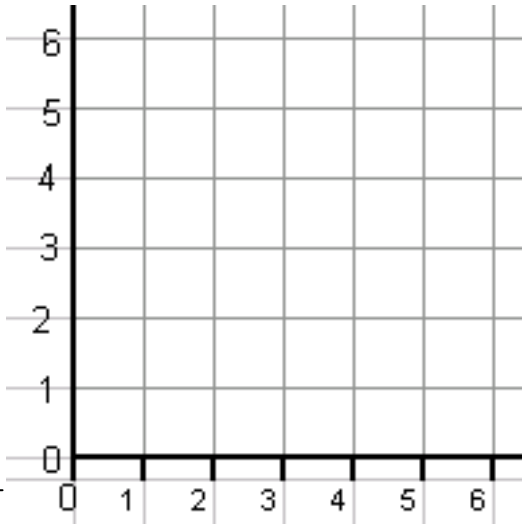




Co-ordinate pairs:

(,) (,) (,) (,)

Describe the properties of the shape you have made?



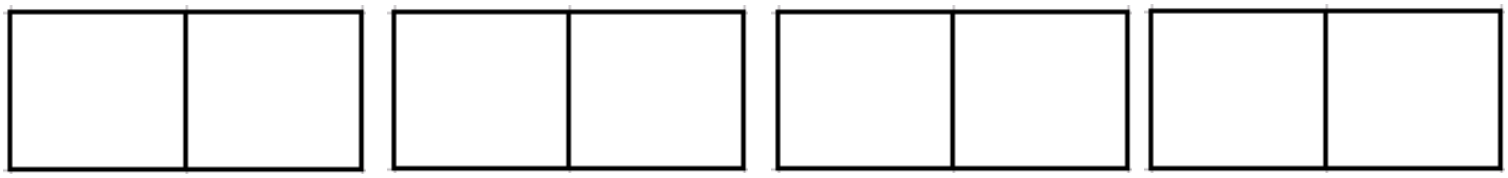
Domino Co-ordinates Part 2

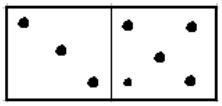
Name: _____

Objective Read and plot co-ordinates in the first quadrant

Resources Double nine set of dominoes

1. Choose any 4 dominoes , place them in the spaces provided:

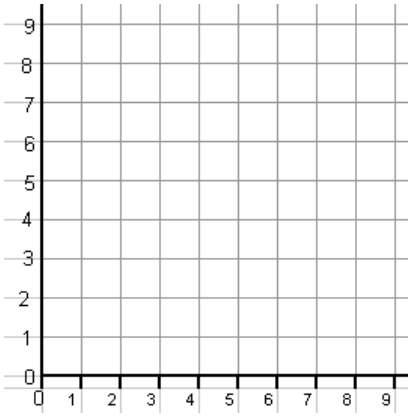


Each of your dominoes represents a co-ordinate pair, like this:  = (3,5)

Write your co-ordinate pairs here:

(,) (,) (,) (,)

Now plot your points on the grid, and join them in order with a ruler.



What is the name of the shape you have made?

_____

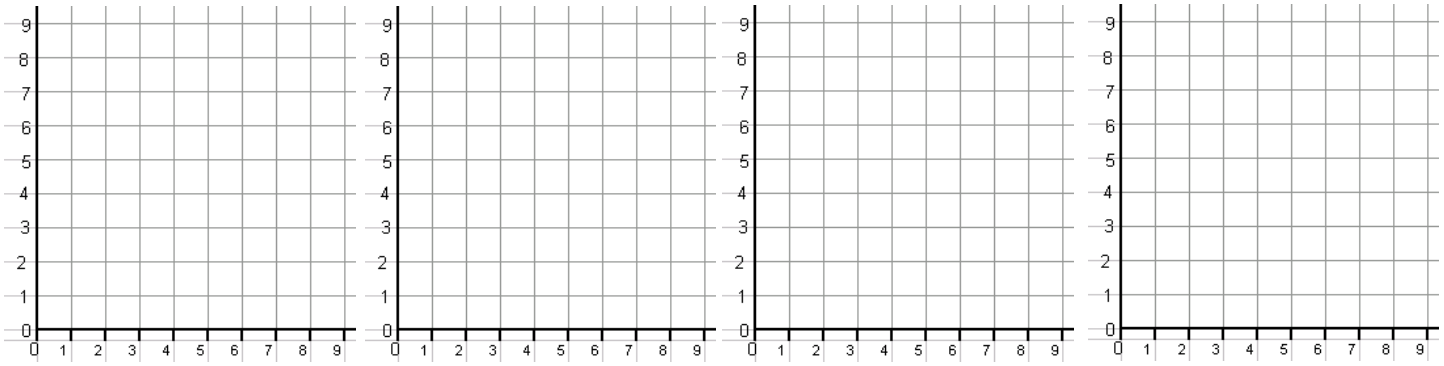
Domino Co-ordinates Part 2

Name: _____

Repeat the activity, choosing 4 different dominoes each time:

	CO-ORDINATES	SHAPE NAME
2.	(,) (,) (,) (,)	_____
3.	(,) (,) (,) (,)	_____
4.	(,) (,) (,) (,)	_____
5.	(,) (,) (,) (,)	_____

2. 3. 4. 5.

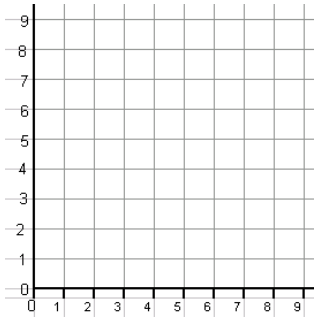


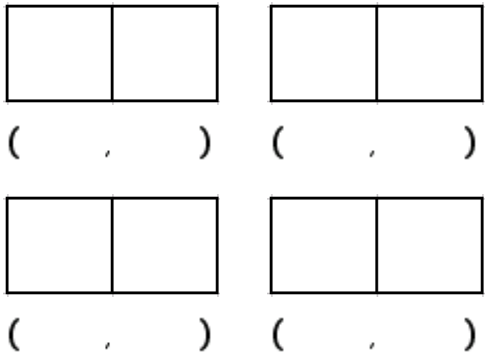
Domino Co-ordinates Part 2

Name: _____

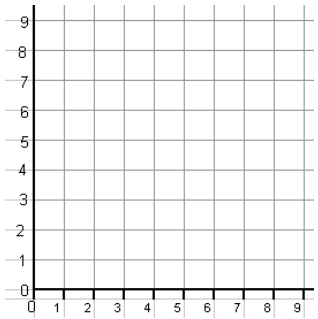
6. Now you are going to work out which dominoes you could choose, which would let you make the following shapes:

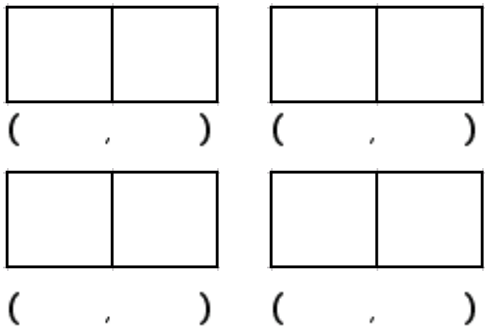
a. A Parallelogram



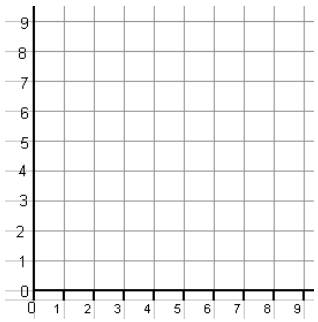


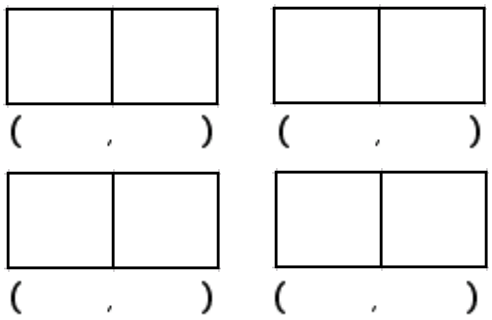
b. A Square





c. A Rectangle

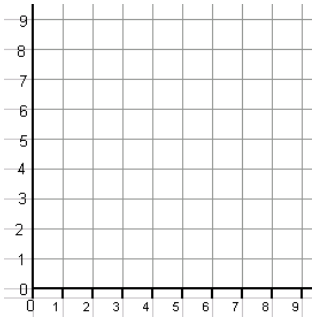
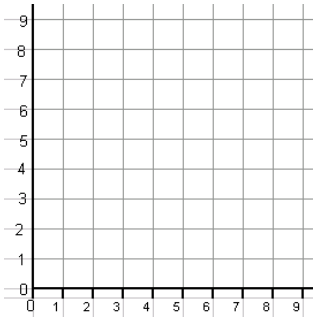
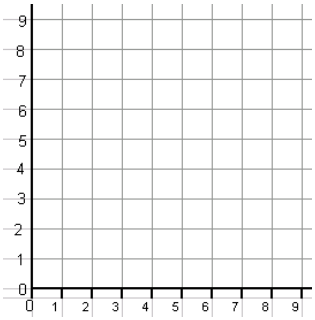
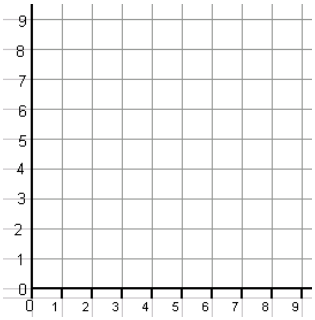




Domino Co-ordinates Part 2

Name: _____

7. On each of the following grids plot 4 points and join them to make different RECTANGLES.

Work out the PERIMETER for each of these rectangles.

_____ _____ _____ _____

Domino CrossCram Part 1 and Part 2

Aim To strategically place dominoes on the grid in order to place the most dominoes

Resources 2 players
A set of dominoes
An 8 x 8 grid

Set up

An empty 8 x 8 grid starts the game. Each player has access to the dominoes. The first player places dominoes in a North-South direction the second player places dominoes in an East-West direction

Playing

On your turn you place a domino to cover two squares on the grid. You may only place your domino in your allowed direction i.e. North-South (for 1st player) and East-West (for 2nd player). You win the game if your opponent has no valid move.

Domino CrossCram playing grid

Useful Websites:

www.nrich.maths.org

www.lancsngfl.ac.org

www.kented.org.uk/ngfl

www.funbrain.com

www.beam.co.uk

www.easiteach.co.uk

www.cleo.net.uk

www.mathsphere.co.uk

www.pagat.com

www.uk.zylom.com

www.atm.org.uk

www.domino-games.com